

## MCR Hardwired Series – Power Line Conditioning with Voltage Regulation

The MCR Hardwired Series provides excellent noise filtering and surge protection to safeguard connected equipment from damage, degradation or misoperation. Combined with the excellent voltage regulation inherent to SolaHD's ferroresonant design, the MCR can increase the actual Mean Time Between Failure (MTBF) of protected equipment. The MCR is a perfect choice where dirty power, caused by impulses, swell, sags, brownouts and waveform distortion can lead to costly downtime because of damaged equipment.

### Applications

- Industrial automation and control equipment PLCs
- Machine tools
- Computer loads and electronic equipment
- Robotics
- Semiconductor fabrication equipment

### Features

- $\pm 3\%$  output voltage regulation
- Noise attenuation
  - 120 dB common mode
  - 60 dB transverse mode
- Surge protection tested to ANSI/IEEE C62.41 Class A & B Waveform:
  - <10 V let through typical
- Acts as a step-up or step-down transformer
- Harmonic filtering
- Hardwired
- Galvanic isolation provides exceptional circuit protection
- 25 year typical MTBF
- No maintenance required

### Selection Tables: Single Phase

#### Group 2 – MCR Series, 60 Hz Only

| VA     | Catalog Number     | Voltage Input      | Voltage Output | Height in (mm) | Width in (mm) | Depth in (mm) | Ship Weight lbs (kg) | Design Style | Elec Conn |
|--------|--------------------|--------------------|----------------|----------------|---------------|---------------|----------------------|--------------|-----------|
| 120    | <b>63-23-112-4</b> | 120, 208, 240, 480 | 120            | 9.00 (228.6)   | 4.00 (101.6)  | 5.00 (127.0)  | 15.0 (6.80)          | 1            | D         |
| 250    | <b>63-23-125-4</b> | 120, 208, 240, 480 | 120            | 10.00 (254.0)  | 6.00 (152.4)  | 8.00 (203.2)  | 27.0 (12.25)         | 1            | D         |
| 500    | <b>63-23-150-8</b> | 120, 208, 240, 480 | 120, 208, 240  | 13.00 (330.2)  | 9.00 (228.6)  | 7.00 (177.8)  | 37.0 (16.78)         | 1            | E         |
| 750    | <b>63-23-175-8</b> | 120, 208, 240, 480 | 120, 208, 240  | 14.00 (355.6)  | 9.00 (228.6)  | 7.00 (177.8)  | 52.0 (23.60)         | 1            | E         |
| 1000 * | <b>63-23-210-8</b> | 120, 208, 240, 480 | 120, 208, 240  | 17.00 (431.8)  | 9.00 (228.6)  | 7.00 (177.8)  | 62.0 (28.12)         | 1            | E         |
| 1500 * | <b>63-23-215-8</b> | 120, 208, 240, 480 | 120, 208, 240  | 17.00 (431.8)  | 13.00 (330.2) | 9.00 (228.6)  | 95.0 (43.10)         | 1            | E         |
| 2000 * | <b>63-23-220-8</b> | 120, 208, 240, 480 | 120, 208, 240  | 18.00 (457.2)  | 13.00 (330.2) | 9.00 (228.6)  | 109.0 (49.44)        | 1            | E         |
| 3000 * | <b>63-23-230-8</b> | 120, 208, 240, 480 | 120, 208, 240  | 19.00 (482.6)  | 13.00 (330.2) | 9.00 (228.6)  | 142.0 (64.41)        | 1            | E         |
| 5000 * | <b>63-23-250-8</b> | 120, 208, 240, 480 | 120, 208, 240  | 28.00 (711.2)  | 13.00 (330.2) | 9.00 (228.6)  | 222.0 (100.70)       | 1            | E         |
| 7500   | <b>63-28-275-8</b> | 208, 240, 480      | 120, 208, 240  | 27.00 (685.8)  | 26.00 (660.4) | 9.00 (228.6)  | 362.0 (164.20)       | 2            | F         |
| 10000  | <b>63-28-310-8</b> | 208, 240, 480      | 120, 208, 240  | 28.00 (711.2)  | 26.00 (660.4) | 9.00 (228.6)  | 446.0 (202.30)       | 2            | F         |
| 15000  | <b>63-28-315-8</b> | 208, 240, 480      | 120, 208, 240  | 28.00 (711.2)  | 38.00 (965.2) | 10.00 (254.0) | 710.0 (322.05)       | 3            | F         |

\* Canadian option: cULus units must be ordered by changing "-8" (UL only) to "-C8".



### Certifications and Compliances

#### All Models

- RoHS Compliant

#### Selection Table: Group 2

- cULus Listed (120VA-5kVA Units)
  - UL 1012, CSA C22.2 No. 107.1
- UL Listed (7.5kVA-15kVA Units)
  - UL 1012

#### Selection Table: Group 3

- cULus Listed (500VA-3kVA Units)
  - UL 1012, CSA C22.2 No. 107.1
- SP Certified (5kVA-15kVA Units)
  - CSA C22.2 No. 107.1

#### Selection Table: Group 4

- cULus Listed
  - UL 1012, CSA C22.2 No. 107.1

### Related Products

- On-line UPS (S4K Industrial)
- Surge Protection
- Three Phase Power Conditioners
- Active Tracking® Filters

## Selection Tables: Single Phase

### Group 3 – MCR Series, 60 Hz Only

| VA    | Catalog Number     | Voltage Input      | Voltage Output | Height in (mm) | Width in (mm) | Depth in (mm) | Ship Weight lbs (kg) | Design Style | Elec Conn |
|-------|--------------------|--------------------|----------------|----------------|---------------|---------------|----------------------|--------------|-----------|
| 500   | <b>63-31-150-8</b> | 600                | 120, 208, 240  | 13.00 (330.2)  | 9.00 (228.6)  | 7.00 (177.8)  | 38.0 (17.24)         | 1            | B         |
| 1000  | <b>63-32-210-8</b> | 600                | 120, 208, 240  | 17.00 (431.8)  | 9.00 (228.6)  | 7.00 (177.8)  | 62.0 (28.12)         | 1            | B         |
| 2000  | <b>63-32-220-8</b> | 600                | 120, 208, 240  | 18.00 (457.2)  | 13.00 (330.2) | 10.00 (254.0) | 109.0 (49.44)        | 1            | B         |
| 3000  | <b>63-32-230-8</b> | 600                | 120, 208, 240  | 19.00 (482.6)  | 13.00 (330.2) | 10.00 (254.0) | 142.0 (64.41)        | 1            | B         |
| 5000  | <b>63-29-250-8</b> | 208, 240, 480, 600 | 120, 208, 240  | 28.00 (711.2)  | 13.00 (330.2) | 10.00 (254.0) | 221.0 (100.24)       | 1            | A         |
| 7500  | <b>63-29-275-8</b> | 208, 240, 480, 600 | 120, 208, 240  | 27.00 (685.8)  | 25.00 (635.0) | 10.00 (254.0) | 360.0 (163.30)       | 2            | A         |
| 10000 | <b>63-29-310-8</b> | 208, 240, 480, 600 | 120, 208, 240  | 28.00 (711.2)  | 25.00 (635.0) | 10.00 (254.0) | 441.0 (200.03)       | 2            | A         |
| 15000 | <b>63-29-315-8</b> | 208, 240, 480, 600 | 120, 208, 240  | 28.00 (711.2)  | 38.00 (965.2) | 10.00 (254.0) | 706.0 (320.24)       | 3            | A         |

### Group 4 – MCR Series, 50 Hz Only (±5% output voltage regulation)

| VA    | Catalog Number     | Voltage Input                | Voltage Output     | Height in (mm) | Width in (mm) | Depth in (mm) | Ship Weight lbs (kg) | Design Style | Elec Conn |
|-------|--------------------|------------------------------|--------------------|----------------|---------------|---------------|----------------------|--------------|-----------|
| 120   | <b>63-23-612-8</b> | 110, 120, 220, 240, 380, 415 | 110, 120, 220, 240 | 9.00 (228.6)   | 6.00 (152.4)  | 8.00 (203.2)  | 24.0 (10.90)         | 1            | C         |
| 250   | <b>63-23-625-8</b> | 110, 120, 220, 240, 380, 415 | 110, 120, 220, 240 | 11.00 (279.4)  | 6.00 (152.4)  | 8.00 (203.2)  | 27.0 (12.25)         | 1            | C         |
| 500   | <b>63-23-650-8</b> | 110, 120, 220, 240, 380, 415 | 110, 120, 220, 240 | 13.00 (330.2)  | 9.00 (228.6)  | 7.00 (177.8)  | 40.0 (18.14)         | 1            | C         |
| 1000  | <b>63-23-710-8</b> | 110, 120, 220, 240, 380, 415 | 110, 120, 220, 240 | 18.00 (457.2)  | 9.00 (228.6)  | 7.00 (177.8)  | 64.0 (29.03)         | 1            | C         |
| 2000  | <b>63-23-720-8</b> | 110, 120, 220, 240, 380, 415 | 110, 120, 220, 240 | 18.00 (457.2)  | 13.00 (330.2) | 10.00 (254.0) | 113.0 (51.26)        | 1            | C         |
| 3000  | <b>63-23-730-8</b> | 110, 120, 220, 240, 380, 415 | 110, 120, 220, 240 | 27.00 (685.8)  | 13.00 (330.2) | 10.00 (254.0) | 162.0 (73.48)        | 1            | C         |
| 5000  | <b>63-23-750-8</b> | 110, 120, 220, 240, 380, 415 | 110, 120, 220, 240 | 30.00 (762.0)  | 13.00 (330.2) | 10.00 (254.0) | 266.0 (120.66)       | 1            | C         |
| 7500  | <b>63-28-775-8</b> | 220, 240, 380, 415           | 110, 120, 220, 240 | 28.00 (711.2)  | 26.00 (660.4) | 10.00 (254.0) | 393.0 (178.26)       | 2            | C1        |
| 10000 | <b>63-28-810-8</b> | 220, 240, 380, 415           | 110, 120, 220, 240 | 30.00 (762.0)  | 26.00 (660.4) | 10.00 (254.0) | 490.0 (222.26)       | 2            | C2        |
| 15000 | <b>63-28-815-8</b> | 220, 240, 380, 415           | 110, 120, 220, 240 | 30.00 (762.0)  | 38.00 (965.2) | 10.00 (254.0) | 776.0 (352.00)       | 3            | C2        |

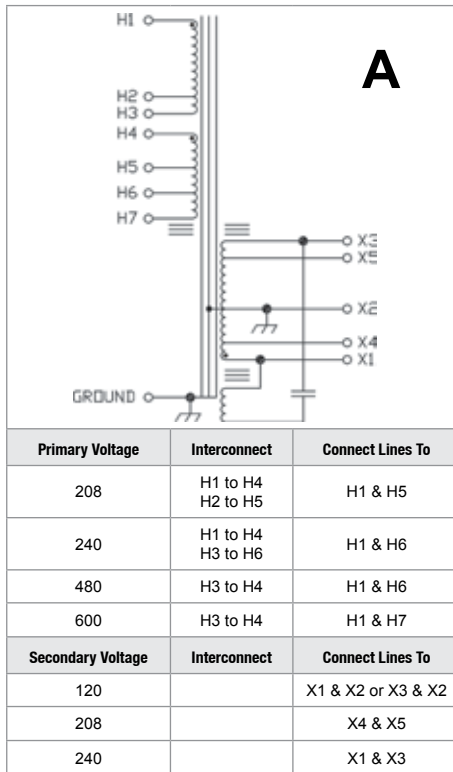
## Specifications

| Parameter                         | Condition                                                              | Value                                        |
|-----------------------------------|------------------------------------------------------------------------|----------------------------------------------|
| <b>Input</b>                      |                                                                        |                                              |
| <b>Voltage</b>                    | Continuous at full load (lower input voltage possible at lighter load) | +10% to -20% of nominal                      |
|                                   | For temporary surge or sags                                            | +20% to -35% of nominal                      |
| <b>Current</b> <sup>1</sup>       | at Full Load & 80% of nominal input voltage                            | $I_{in} \cong (VA/.89)/(V_{in} \times 80\%)$ |
| <b>Frequency</b>                  | See Operating Characteristics section for details.                     | 50 Hz or 60 Hz depending on model            |
| <b>Output</b> <sup>2</sup>        |                                                                        |                                              |
| <b>Line Regulation</b>            | $V_{in} > 80\%$ and $< 110\%$ of nominal                               | ± 5% for 50 Hz units, ± 3% for 60 Hz units   |
| <b>Overload Protection</b>        | At Nominal Input Voltage                                               | Current limited at 1.65 times rated current  |
| <b>Output Harmonic Distortion</b> | At full load within input range                                        | 3% total RMS content                         |
| <b>Noise Attenuation</b>          | Common Mode                                                            | 120 dB                                       |
|                                   | Transverse Mode                                                        | 60 dB                                        |
| <b>General</b>                    |                                                                        |                                              |
| <b>Efficiency</b>                 | At Full Load                                                           | Up to 92%                                    |
| <b>Storage Temperature</b>        | Humidity <95% non-condensing                                           | -20° to +85°C                                |
| <b>Operating Temperature</b>      | Humidity <95% non-condensing                                           | -20° to 50°C                                 |
| <b>Audible Noise</b>              | Full Resistive Noise                                                   | 35 dBA to 65 dBA                             |
| <b>Warranty</b>                   | 10 + 2 year limited warranty                                           |                                              |

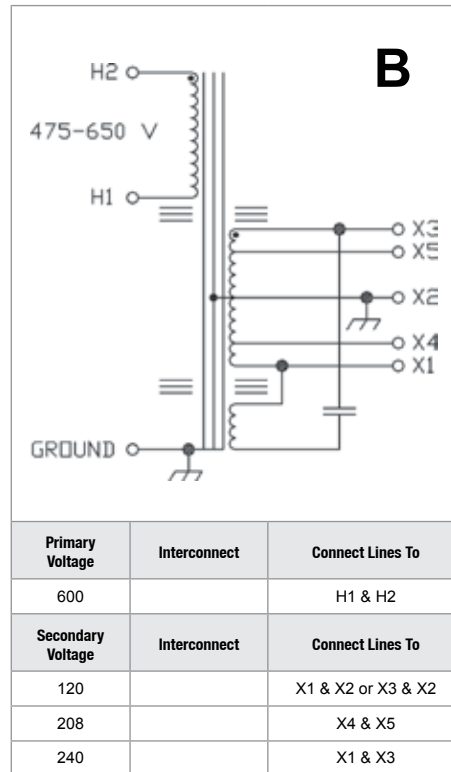
Notes: 1 - Consult user manual for fuse sizing.

2 - It is recommended that the unit run at a minimum of 40-50% load.

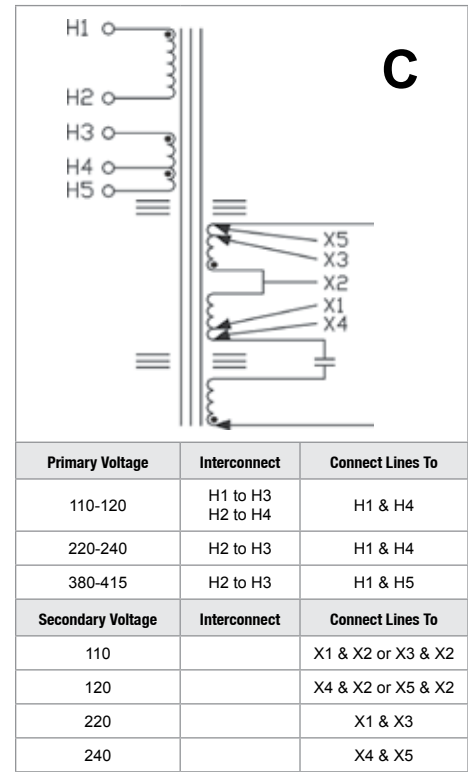
## Electrical Connections



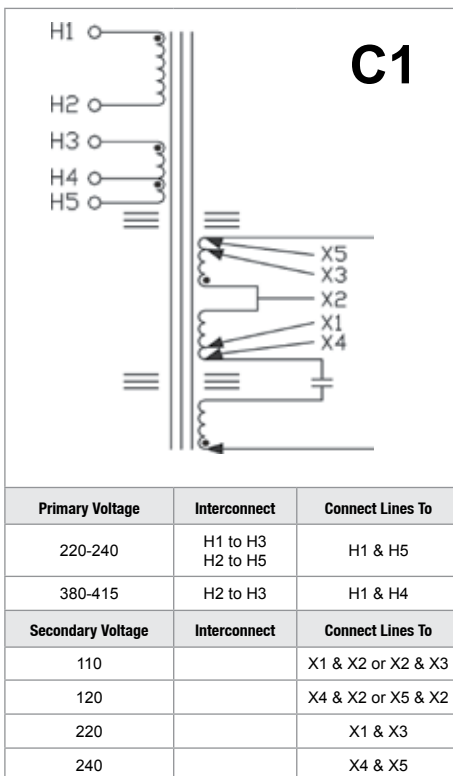
MCR 60 Hz 5000–15000 VA



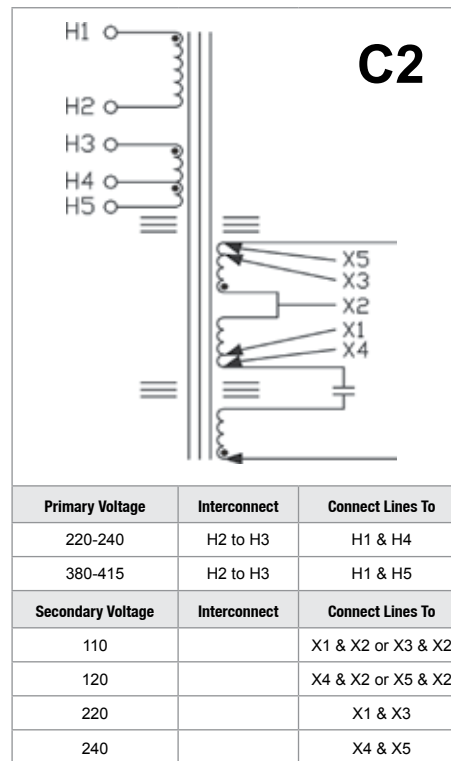
MCR 60 Hz 500–3000 VA



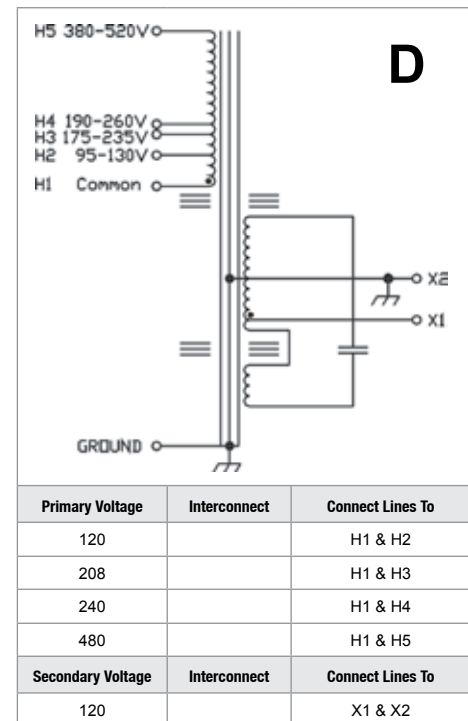
MCR 50 Hz 120–5000 VA



MCR 50 Hz 7500 VA

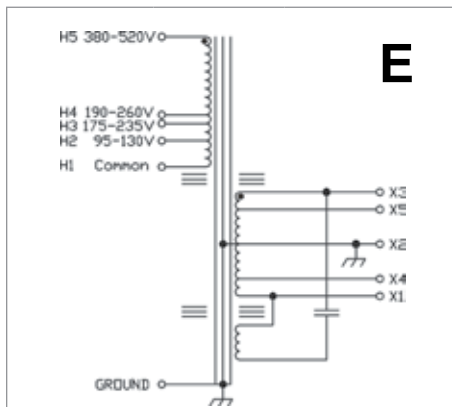


MCR 50 Hz 10000–15000 VA



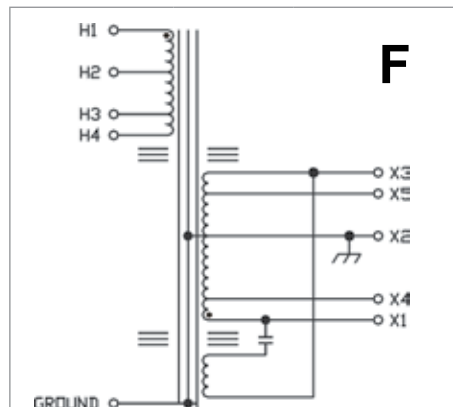
MCR 60 Hz 120–250 VA

## Electrical Connections



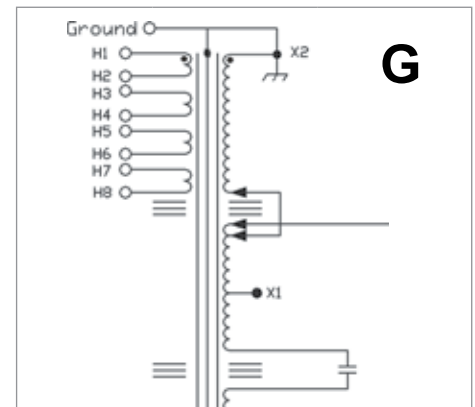
| Primary Voltage   | Interconnect | Connect Lines To   |
|-------------------|--------------|--------------------|
| 120               |              | H1 & H2            |
| 208               |              | H1 & H3            |
| 240               |              | H1 & H4            |
| 480               |              | H1 & H5            |
| Secondary Voltage | Interconnect | Connect Lines To   |
| 120               |              | X1 & X2 or X3 & X2 |
| 208               |              | X4 & X5            |
| 240               |              | X1 & X3            |

MCR 60 Hz 500-5000 VA



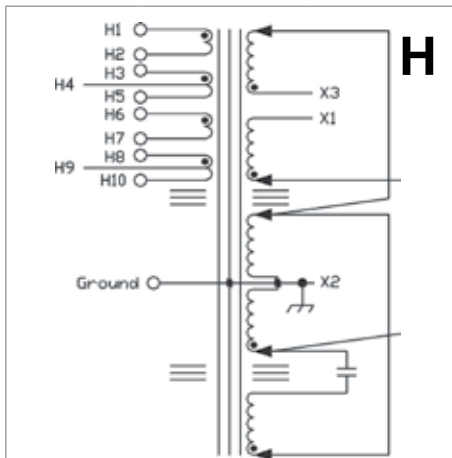
| Primary Voltage   | Interconnect | Connect Lines To   |
|-------------------|--------------|--------------------|
| 208               |              | H2 & H3            |
| 240               |              | H2 & H4            |
| 480               |              | H1 & H4            |
| Secondary Voltage | Interconnect | Connect Lines To   |
| 120               |              | X1 & X2 or X3 & X2 |
| 208               |              | X4 & X5            |
| 240               |              | X1 & X3            |

MCR 60 Hz 7500, 10000 and 15000 VA



| Primary Voltage   | Interconnect                                 | Connect Lines To |
|-------------------|----------------------------------------------|------------------|
| 120               | H1 to H3 to H5 to H7<br>H2 to H4 to H6 to H8 | H1 & H2          |
| 240               | H2 to H3 H6 to H7<br>H1 to H5 H4 to H8       | H1 & H4          |
| 480               | H2 to H3 H4 to H5<br>H6 to H7                | H1 & H8          |
| Secondary Voltage | Interconnect                                 | Connect Lines To |
| 120               |                                              | X1 & X2          |

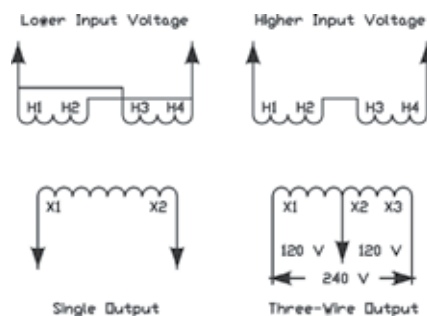
CVS 60 Hz 250 VA only



| Primary Voltage   | Interconnect                                  | Connect Lines To   |
|-------------------|-----------------------------------------------|--------------------|
| 120               | H1 to H3 to H6 to H8<br>H2 to H5 to H7 to H10 | H1 & H2            |
| 208               | H2 to H3 H7 to H8<br>H1 to H6                 | H1 & H4            |
| 240               | H2 to H3 H7 to H8<br>H1 to H6 H5 to H10       | H1 & H5            |
| 480               | H2 to H3 H5 to H6<br>H7 to H8                 | H1 & H10           |
| Secondary Voltage | Interconnect                                  | Connect Lines To   |
| 120               |                                               | X1 & X2 or X3 & X2 |
| 240               |                                               | X1 & X3            |

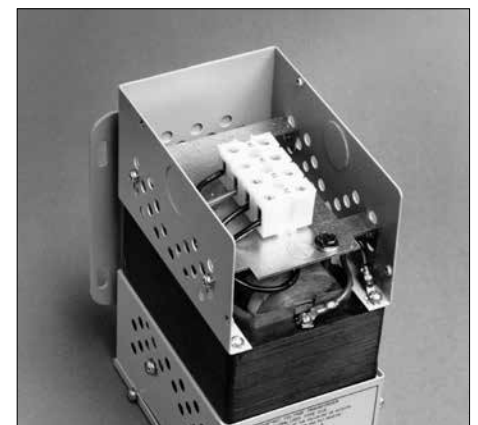
CVS 60 Hz 500-5000 VA

## Series-Multiple Primary with Tap for two input voltages J



| 30 & 60 VA<br>Primary Voltage   | 120 VA<br>Primary Voltage   | 7500 VA<br>Primary Voltage   | Interconnect               | Connect Lines To      |
|---------------------------------|-----------------------------|------------------------------|----------------------------|-----------------------|
| 120                             | N/A                         | N/A                          | Note: H3 & H4 are not used | H1 & H2               |
| N/A                             | 120                         | 240                          | H1 to H3<br>H2 to H4       | H1 & H4               |
| N/A                             | 240                         | 480                          | H2 to H3                   | H1 & H4               |
| 30 & 60 VA<br>Secondary Voltage | 120 VA<br>Secondary Voltage | 7500 VA<br>Secondary Voltage | Interconnect               | Connect Lines To      |
| 120                             | 120                         | N/A                          |                            | X1 & X2               |
| N/A                             | N/A                         | 120                          |                            | X1 & X2 or<br>X3 & X2 |
| N/A                             | N/A                         | 240                          |                            | X1 & X3               |

CVS 60 Hz 30-120 VA & 7500 VA



Open MCR/ CVS terminal

Note: Secondaries are not grounded. Ground X<sub>2</sub> per Code.