

## 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 patented 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.



### Related Products

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

### Selection Tables: Single Phase

#### Group 2 – MCR Series, 60 Hz Only



VA	Catalog Number	Voltage Input	Voltage Output	Height (inch)	Width (inch)	Depth (inch)	Ship Weight (lbs)	Design Style	Elec Conn
120	63-23-112-4	120, 208, 240, 480	120	9	4	5	15	1	D
250	63-23-125-4	120, 208, 240, 480	120	10	6	8	27	1	D
500	63-23-150-8	120, 208, 240, 480	120, 208, 240	13	9	7	37	1	E
750	63-23-175-8	120, 208, 240, 480	120, 208, 240	14	9	7	52	1	E
1000*	63-23-210-8	120, 208, 240, 480	120, 208, 240	17	9	7	62	1	E
1500*	63-23-215-8	120, 208, 240, 480	120, 208, 240	17	13	9	95	1	E
2000*	63-23-220-8	120, 208, 240, 480	120, 208, 240	18	13	9	109	1	E
3000*	63-23-230-8	120, 208, 240, 480	120, 208, 240	19	13	9	142	1	E
5000*	63-23-250-8	120, 208, 240, 480	120, 208, 240	28	13	9	222	1	E
7500**	63-28-275-8	208, 240, 480	120, 208, 240	27	26	9	362	2	F
10000**	63-28-310-8	208, 240, 480	120, 208, 240	28	26	9	446	2	F
15000**	63-28-315-8	208, 240, 480	120, 208, 240	28	38	10	710	3	F

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

\*\* UL Listed Only. Use Group 3 for cULus.

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Selection Tables: Single Phase

Group 3 – MCR Series, 60 Hz Only



VA	Catalog Number	Voltage Input	Voltage Output	Height (inch)	Width (inch)	Depth (inch)	Ship weight (lbs)	Design Style	Elec Conn
500	63-31-150-8	600	120, 208, 240	13	9	7	38	1	B
1000	63-32-210-8	600	120, 208, 240	17	9	7	62	1	B
2000	63-32-220-8	600	120, 208, 240	18	13	10	109	1	B
3000	63-32-230-8	600	120, 208, 240	19	13	10	142	1	B
5000	63-29-250-8	208, 240, 480, 600	120, 208, 240	28	13	10	221	1	A
7500	63-29-275-8	208, 240, 480, 600	120, 208, 240	27	25	10	360	2	A
10000	63-29-310-8	208, 240, 480, 600	120, 208, 240	28	25	10	441	2	A
15000	63-29-315-8	208, 240, 480, 600	120, 208, 240	28	38	10	706	3	A

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



VA	Catalog Number	Voltage Input	Voltage Output	Height (inch)	Width (inch)	Depth (inch)	Ship weight (lbs)	Design Style	Elec Conn
120	63-23-612-8	110, 120, 220, 240, 380, 415	110, 120, 220, 240	9	6	8	24	1	C
250	63-23-625-8	110, 120, 220, 240, 380, 415	110, 120, 220, 240	11	6	8	27	1	C
500	63-23-650-8	110, 120, 220, 240, 380, 415	110, 120, 220, 240	13	9	7	40	1	C
1000	63-23-710-8	110, 120, 220, 240, 380, 415	110, 120, 220, 240	18	9	7	64	1	C
2000	63-23-720-8	110, 120, 220, 240, 380, 415	110, 120, 220, 240	18	13	10	113	1	C
3000	63-23-730-8	110, 120, 220, 240, 380, 415	110, 120, 220, 240	27	13	10	162	1	C
5000	63-23-750-8	110, 120, 220, 240, 380, 415	110, 120, 220, 240	30	13	10	266	1	C
7500	63-28-775-8	220, 240, 380, 415	110, 120, 220, 240	28	26	10	393	2	C1
10000	63-28-810-8	220, 240, 380, 415	110, 120, 220, 240	30	26	10	490	2	C2
15000	63-28-815-8	220, 240, 380, 415	110, 120, 220, 240	30	38	10	776	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>		
<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>Approvals</b>	60 Hz Models	UL1012, CSA evaluated by UL
	50 Hz Models	CE (EMC & LVD)
<b>Warranty</b>	See General Information section for details	10 + 2 Years

Notes: 1 - Consult user manual for fuse sizing.  
 2 - It is recommended that the unit run at a minimum of 40-50% load.

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### Electrical Connections

**A**

Primary Voltage	Interconnect	Connect Lines To
208	H1 to H4 H2 to H5	H1 & H5
240	H1 to H4 H3 to H6	H1 & H6
480	H3 to H4	H1 & H6
600	H3 to H4	H1 & H7
Secondary Voltage	Interconnect	Connect Lines To
120		X1 & X2 or X3 & X2
208		X4 & X5
240		X1 & X3

MCR 60 Hz 5000–15000 VA

**B**

475–650 V

Primary Voltage	Interconnect	Connect Lines To
600		H1 & H2
Secondary Voltage	Interconnect	Connect Lines To
120		X1 & X2 or X3 & X2
208		X4 & X5
240		X1 & X3

MCR 60 Hz 500–3000 VA

**C**

Primary Voltage	Interconnect	Connect Lines To
110-120	H1 to H3 H2 to H4	H1 & H4
220-240	H2 to H3	H1 & H4
380-415	H2 to H3	H1 & H5
Secondary Voltage	Interconnect	Connect Lines To
110		X1 & X2 or X3 & X2
120		X4 & X2 or X5 & X2
220		X1 & X3
240		X4 & X5

MCR 50 Hz 120–5000 VA

**C1**

Primary Voltage	Interconnect	Connect Lines To
220-240	H1 to H3 H2 to H5	H1 & H5
380-415	H2 to H3	H1 & H4
Secondary Voltage	Interconnect	Connect Lines To
110		X1 & X2 or X2 & X3
120		X4 & X2 or X5 & X2
220		X1 & X3
240		X4 & X5

MCR 50 Hz 7500 VA

**C2**

Primary Voltage	Interconnect	Connect Lines To
220-240	H2 to H3	H1 & H4
380-415	H2 to H3	H1 & H5
Secondary Voltage	Interconnect	Connect Lines To
110		X1 & X2 or X3 & X2
120		X4 & X2 or X5 & X2
220		X1 & X3
240		X4 & X5

MCR 50 Hz 10000–15000 VA

**D**

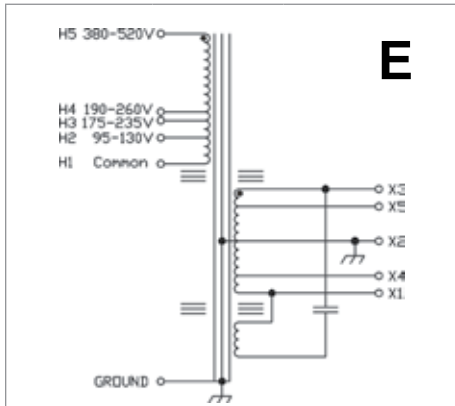
H5 380–520V  
H4 190–260V  
H3 175–235V  
H2 95–130V  
H1 Common

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

MCR 60 Hz 120–250 VA

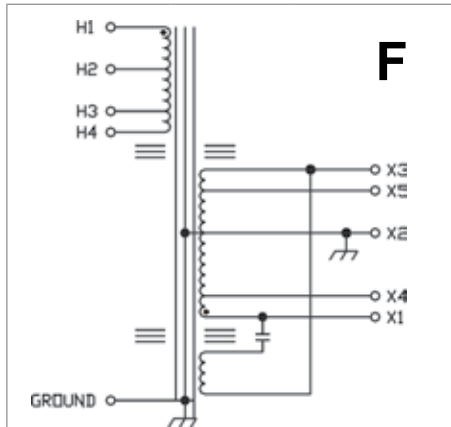
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Electrical Connections



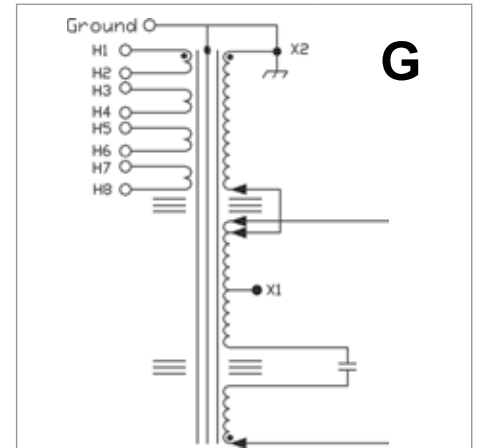
Primary Voltage	Interconnect	Connect Lines To
120		H1 & H2
208		H1 & H3
240		H1 & H4
480		H1 & H5
Secondary Voltage	Interconnect	Connect Lines To
120		X1 & X2 or X3 & X2
208		X4 & X5
240		X1 & X3

MCR 60 Hz 500-5000 VA



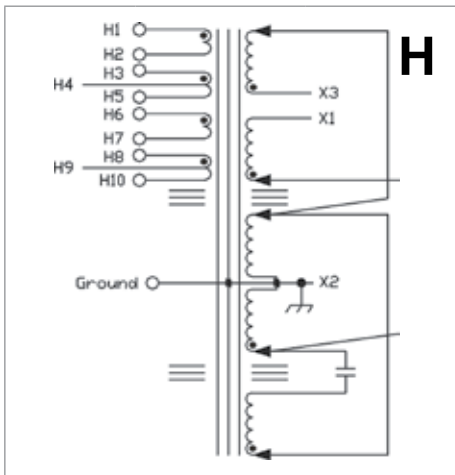
Primary Voltage	Interconnect	Connect Lines To
208		H2 & H3
240		H2 & H4
480		H1 & H4
Secondary Voltage	Interconnect	Connect Lines To
120		X1 & X2 or X3 & X2
208		X4 & X5
240		X1 & X3

MCR 60 Hz 7500, 10000 and 15000 VA



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

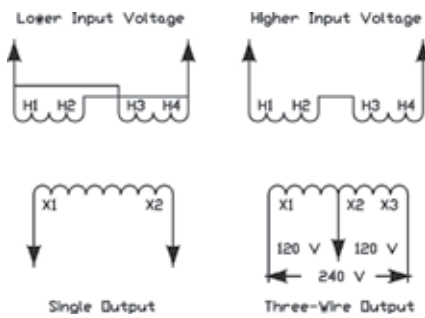
CVS 60 Hz 250 VA only



Primary Voltage	Interconnect	Connect Lines To
120	H1 to H3 to H6 to H8 H2 to H5 to H7 to H10	H1 & H2
208	H2 to H3 H7 to H8 H1 to H6 H4 to H9	H1 & H4
240	H2 to H3 H7 to H8 H1 to H6 H5 to H10	H1 & H5
480	H2 to H3 H5 to H6 H7 to H8	H1 & H10
Secondary Voltage	Interconnect	Connect Lines To
120		X1 & X2 or X3 & X2
240		X1 & X3

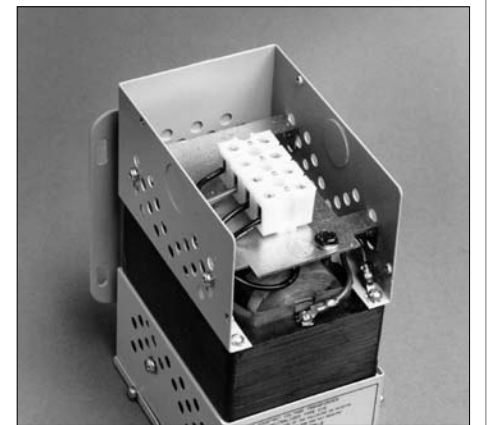
CVS 60 Hz 500-5000 VA

Series-Multiple Primary with Tap for two input voltages J



30 & 60 VA Primary Voltage	120 VA Primary Voltage	7500 VA 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 H2 to H4	H1 & H4
N/A	240	480	H2 to H3	H1 & H4
30 & 60 VA Secondary Voltage	120 VA Secondary Voltage	7500 VA Secondary Voltage	Interconnect	Connect Lines To
120	120	N/A		X1 & X2
N/A	N/A	120		X1 & X2 or 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.

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

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



MCR Portable Series



### 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)
- Harmonic filtering
- Galvanic isolation provides exceptional circuit protection.
- Point-of-use Protection (cord & plug connected)
  - Easy & Flexible Installation
- 25 year typical MTBF
- No maintenance required

### Applications

- Computers/ Printers
- POS terminals
- Laboratory equipment
- Telephone/FAX systems
- Security systems
- LAN networks

### 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>	At Full Load & 80% of nominal input voltage	$I_m \cong (VA/.89)/(V_m \times 80\%)$
<b>Frequency</b>	See Operating Characteristics section for details.	60 Hz depending on model
<b>Output</b>		
<b>Line Regulation</b>	$V_m > 80\%$ and <110% of nominal	$\pm 3\%$ 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>Let-Through</b>	ANSI/IEEE C62.41 Class A & B Waveform	<10V typical
<b>General</b>		
<b>Efficiency</b>	At Full Load	92% Typical
<b>Storage Temperature</b>	Humidity <95% non-condensing	-20° to +85°C
<b>Operating Temperature</b>	Humidity <95% non-condensing	-20° to 40°C
<b>Audible Noise</b>	Full Resistive Noise	35 dBA to 65 dBA
<b>Approvals</b>	60 Hz Models	UL1012 <sup>1</sup> , CSA (or cUL) <sup>1</sup>
<b>Warranty</b>	See General Information section for details	10 + 2 Years

**Notes:** 1 - Depending on model, see selection tables to confirm agency approvals for specific model numbers.

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Selection Tables: Single Phase

Group A – MCR Portable Series, 60 Hz Only

VA	Catalog Number	Voltage Input/Output	Height (inch)	Width (inch)	Depth (inch)	Ship Weight (lbs)	Receptacle (No.) Type (NEMA)	Plug (NEMA)
70	63-13-070-6	120	6	7	9	18	(4) 5-15R	5-15P
150	63-13-115-6	120	6	7	9	21	(4) 5-15R	5-15P
250	63-13-125-6	120	6	7	9	26	(4) 5-15R	5-15P
500	63-13-150-6	120	9	9	16	32	(4) 5-15R	5-15P
750	63-13-175-6	120	9	9	16	64	(4) 5-15R	5-15P
1000	63-13-210-6	120	9	9	16	69	(4) 5-15R	5-15P
1500*	63-13-215-6	120	11	11	17	95	(6) 5-15R	5-20P
2000**	63-13-220-6	120	11	11	17	115	(4) 5-15R, (1) L5-30R	L5-30P
3000**	63-13-230-6	120	11	11	17	143	(4) 5-15R, (1) L5-30R	5-50P

\* This unit is cUL<sub>us</sub> certified.

\*\* This unit is not CSA certified.

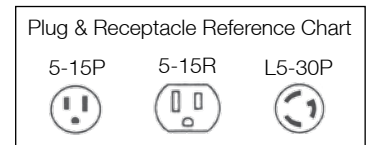
Back Panels



60 Hz, 70 – 1000 VA,  
(4) 5-15R Receptacles



60 Hz, 2000–3000 VA,  
(4) 5-15R and (1)  
L5-30R Receptacle



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## Model Comparison

Description	Hardwired CVS	Hardwired MCR	Portable MCR
<b>VA Ratings</b>	30 to 7500 VA	120 to 15000 VA	70 to 3000 VA
<b>Input Voltage Range</b>	+10/-20% of nominal		
<b>Voltage Regulation</b>	±1% for an input line variation of +10/-20%. No loss of output for line loss of 3 msec.	±3% for an input line variation of +10/-20% (50 Hz hardwired units ±5%.) No loss of output for complete line loss of 3 msec.	
<b>Overload</b>	Limits output current to 1.65 x rated current at nominal input.		
<b>Output Harmonic Distortion</b>	3% total RMS content at full load.		
<b>Noise Isolation</b>	40 dB common and normal code.	120 dB common mode and 60 dB normal mode.	
<b>Surge Protection</b>	Up to 6000 Volt surges are suppressed to a let through of less than 1% per ANSI/IEEE C62.41 Class A & B waveforms.	ANSI/IEEE C62.41 Class A & B 6000 waveforms are suppressed to a let-through of less than 0.2%.	
<b>Efficiency</b>	Up to 92% at full load		Up to 90% at full load
<b>Operating Temperature</b>	-20°C to 50°C		-20°C to 40°C
<b>Audible Noise</b>	32 dB to 65 dB	35 dB to 65 dB	34 dB to 49 dB
<b>Conformance</b>	Listed to UL 1012. CSA Certified	UL Listed and CSA Certified. 50 Hz models in compliance with Low Voltage Directive Specification EN60950.	Listed to UL 1012. CSA Certified on all models except 3000 VA.
<b>Warranty</b>	10 years		

Note: All values are typical and may vary based on VA ratings of actual units.

## BTU Output Chart for CVS and MCR Series

VA Ratings	120	250	500	750	1000	1500	2000	3000	5000	7500	10000	15000
<b>Total BTU's</b>	136	225	280	444	519	686	1229	1331	2117	2407	3209	4813

Note: Ratings are for a 40°C ambient temperature.

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