

MICROFUSION

MULTIZONE SYSTEMS

EXTERNAL PANEL MOUNT / LIQUID COOLED

- Multizone system
- Up to 10 MicroFUSION units
- External panel mount or liquid-cooled heatsink
- Reduces enclosure size
- Reduces air conditioning requirements by moving heat outside the enclosure
- UL, cUL, CE, RoHS, and 100kA SCCR certifications
- IP65, UL Type 4



MicroFUSION is an ultra-compact high-performance microprocessor-based power controller, available in single or three phase models to control AC loads.

Resistive or transformer-connected loads can be controlled in either Phase Angle, Zero Cross, or Zero Cross Transformer (ZCT) Mode. Output is controlled linearly with respect to command signal and can be set to the average or RMS value of the voltage and current, as well as true instantaneous power or external feedback.

MicroFUSION Series power controllers are available in current ratings from 8, 16, 32, 50, 80 amps AC. Auto-ranging voltage circuitry enables mains supply voltage from 24-600 VAC, (45-65 Hz) eliminating the need for hardware jumpers or stocking multiple controllers for international voltages. A separate power source supplies the control electronics and maintains critical communications to your control system when the mains are absent.



SPECIFICATIONS

PERFORMANCE

	Standard	High Performance Option
Setpoint Resolution	10,000 counts	Selectable 10,000 or 64,000 counts
Internal Control Loop Resolution	16,000 counts	64,000 counts
Output Resolution	12,000 counts @ 50Hz, 10,000 counts @ 60Hz	50,000 counts @ 50Hz, 42,000 counts @ 60Hz
Accuracy (Full Conduction)		
Voltage	3% of span	0.5% of span
Current	3% of span	0.5% of span
Power	3% of span	1% of span
Output Linearity	4% from 5 to 100% output range	1% from 5 to 100% output range
Accuracy	A +10% to -15% line voltage change will result in a max output change of 0.5% from 5 to 100% output range	A +10% to -15% line voltage change will result in a max output change of 0.05% from 5 to 100% output range
Temperature Drift	Output shall not change greater than 0.5% per degree C max over the operating temperature range from 5 to 100% output range	Output shall not change greater than 0.2% per degree C max over the operating temperature range from 5 to 100% output range

POWER

Line Voltage (Auto Ranging)	24 - 600 Vac (Nominal) +10% / -15% (Contact factory for other options)
Line Frequency (Auto Ranging)	45 - 65 Hz
Current Rating- Peak Surge	20X frame rating
Minimum Hold/Latch Current	500 mA
SCR Rating (PIV)	1600 V peak forward & reverse
Fusing	Optional external Class T, branch-rated, touch-safe fusing
Thermal	Integrated heat sink thermal sensor
Current Limit	20% – 105% of continuous rating of Frame Amp Rating
Current Trip	50% - 450% of continuous rating
Power Dissipation	1.3 Watt per amp of load current per phase
Control Power / Operates Internal Control Electronics	24 Vdc +10 / -15%

ENVIRONMENTAL

Surrounding Air Operating Temperature - External Panel Mount	32°F [0°C] - 122°F [50°C] with no derating
Surrounding Air Operating Temperature - Liquid Cooled	32°F [0°C] - 140°F [60°C] with no derating
Humidity	20% to 90% RH Non-Condensing
Rated Operating Altitude	Up to 6000 ft [1750m] at full rated current
Contaminates	ROHS Compliant, CE Pollution Degree 2
Storage Temperature	- 4 to 176°F [- 20 to 80°C]

DC POWER CONSUMPTION

16 - 80 Amp Single Phase	9 Watts per controller
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RELIABILITY

Mean Time Between Failure (MTBF)	Designed for 50,000 Hours
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SCCR

Frame 1 Ø	Recommended Fusing	SCCR Rating
8 Amp	10 Amp Fast Acting J or T	100 kA
16 Amp	20 Amp Fast Acting J or T	100 kA
32 Amp	40 Amp Fast Acting J or T	100 kA
50 Amp	60 Amp Fast Acting J or T	100 kA
80 Amp	100 Amp Fast Acting J or T	100 kA

COOLING																			
External Panel Mount	Natural Convection																		
Liquid Cooled	Flow rate: 1 GPM [3.79 LPM] minimum Maximum inlet temperature: 122° F [50° C] Maximum pressure: 60 PSI [4.137 Bar] Up to 50% glycol water solution Pressure Drop <table border="1"> <tr> <td>3 Zone</td> <td>2.64 PSI at 1 GPM</td> </tr> <tr> <td>6 zone</td> <td>2.9 PSI at 1 GPM</td> </tr> <tr> <td>10 zone</td> <td>3.35 PSI at 1 GPM</td> </tr> </table> Particulate filtered water containing less than: <table border="1"> <thead> <tr> <th>Mineral</th> <th>Recommended Limit</th> </tr> </thead> <tbody> <tr> <td>Calcium</td> <td>< 50 PPM</td> </tr> <tr> <td>Magnesium</td> <td>< 50 PPM</td> </tr> <tr> <td>Total Hardness</td> <td>< 100 PPM (5 Grains)</td> </tr> <tr> <td>Chloride</td> <td>< 25 PPM</td> </tr> <tr> <td>Sulfate</td> <td>< 25 PPM</td> </tr> </tbody> </table> A corrosive inhibitor must be used for deionized or demineralized water	3 Zone	2.64 PSI at 1 GPM	6 zone	2.9 PSI at 1 GPM	10 zone	3.35 PSI at 1 GPM	Mineral	Recommended Limit	Calcium	< 50 PPM	Magnesium	< 50 PPM	Total Hardness	< 100 PPM (5 Grains)	Chloride	< 25 PPM	Sulfate	< 25 PPM
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ENCLOSURE PROTECTIVE RATING	
International	IP 20
Remote Display	IP 65, UL Type 1 & 12
External Panel Mount	IP 65, UL Type 4
Liquid Cooled	IP 65, UL Type 4

ISOLATION	
Signal to Line/Load	3750 Vac minimum
Line/Load to Ground	2500 Vac minimum
Signal to Ground	1500 Vac minimum
Line to Load	1400 Vac minimum
Network	1500 Vac minimum
USB	2500 Vac minimum
Signal to Processor	1500 Vac minimum
Remote Display	2500 Vac minimum

All controllers have 100kA when using less than or equal to 100 Amp class J or T. Installed in enclosure with two latches, 150% of controller size.

Control Concepts recommends sizing fuses approximately 125% frame rating.

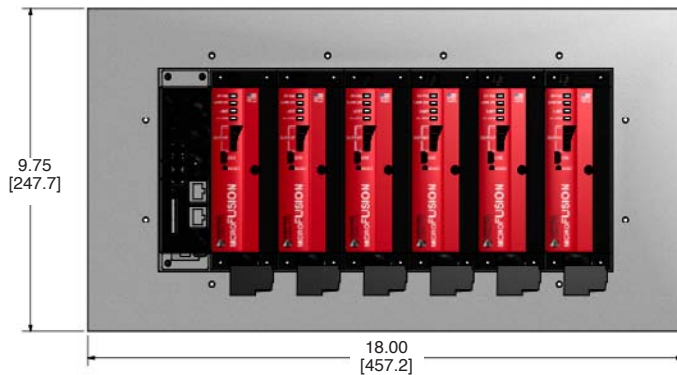
DIMENSIONS

Dimensions:
Inches [mm]

EXTERNAL PANEL MOUNT



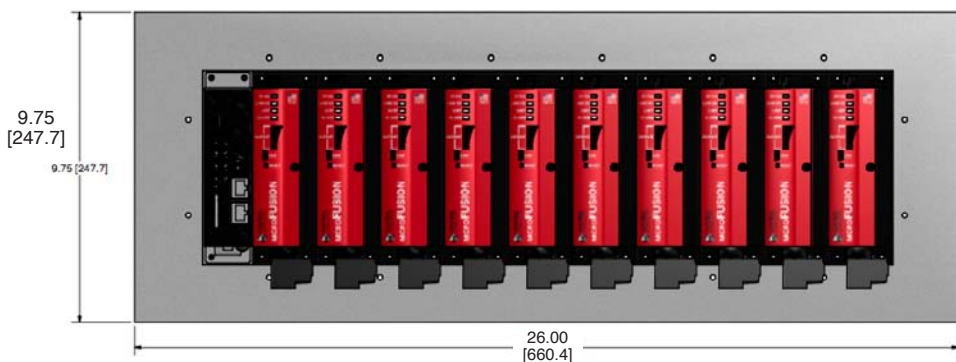
Single Phase - 6 Zone



NOTE: controllers are pictured with an optional Connect fieldbus interface.

Zone 1 is considered the controller closest to the Connect module.

Single Phase - 10 Zone



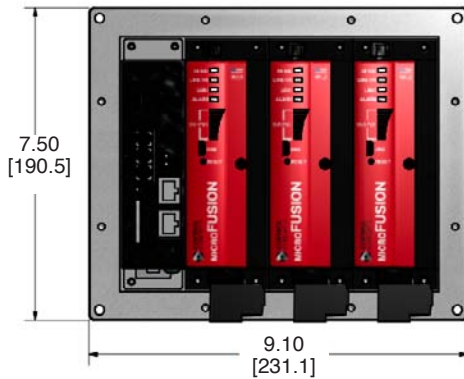
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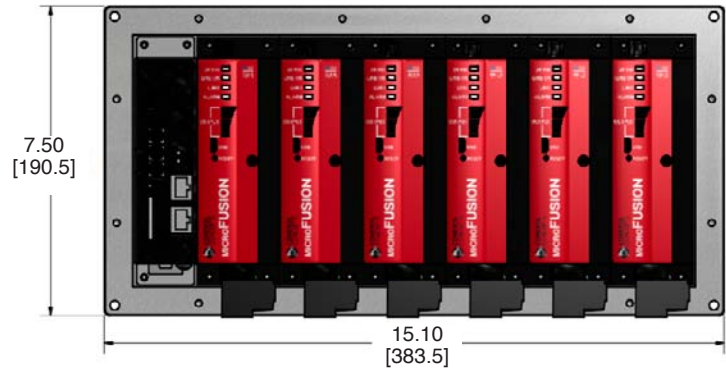
LIQUID COOLED

NOTE: controllers are pictured with an optional Connect fieldbus interface. Zone 1 is considered the controller closest to the Connect module.

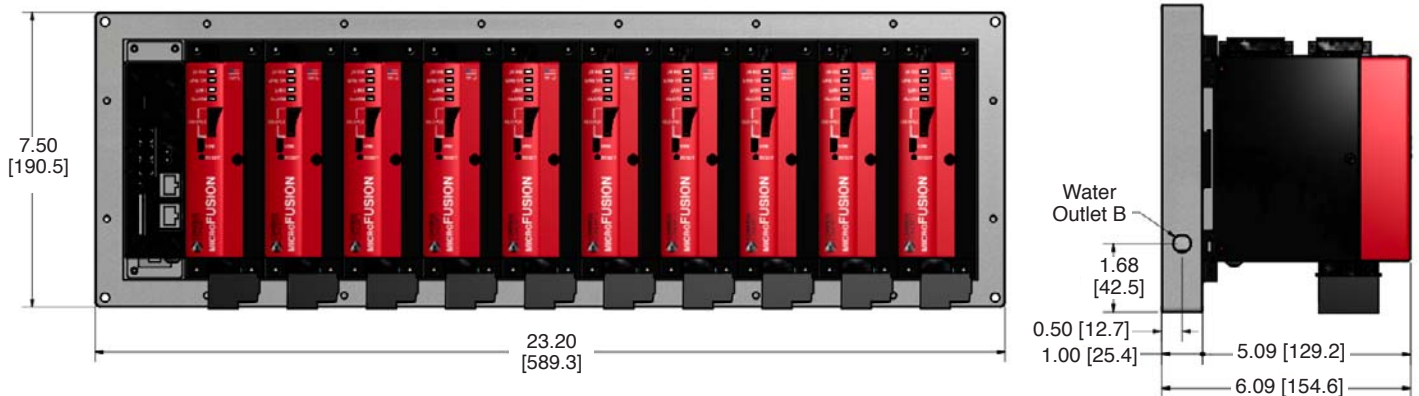
Single Phase - 3 Zone



Single Phase - 6 Zone



Single Phase - 10 Zone

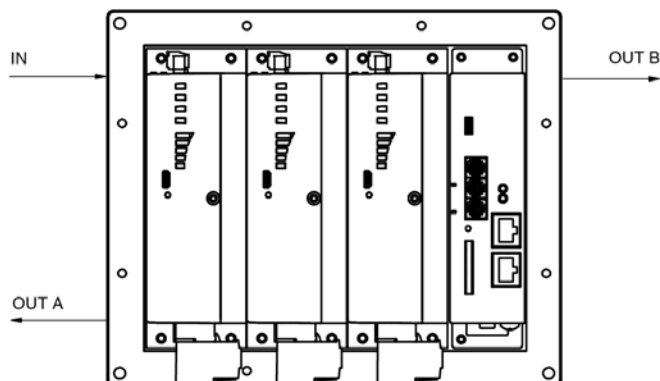


Layout for water inlet position

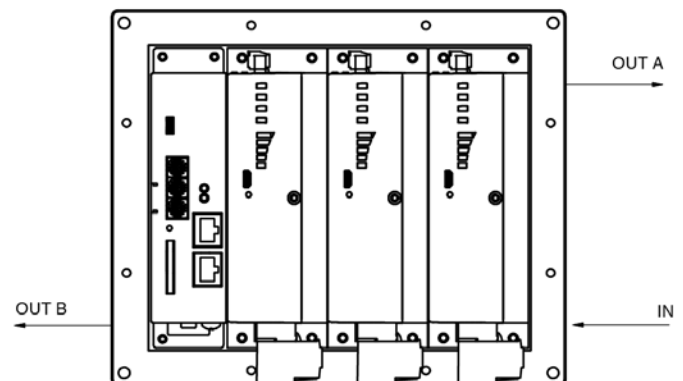
Use the following diagrams to determine the Water Inlet Position in the system model number.

Note: The position of the fieldbus module changes per option.

Option L



Option R



MODEL NUMBERS

Select heatsink type and number of zones to create a system model number, then create model numbers for each individual unit.

CONTROLLER MODEL NUMBER

uF1 - -

Board Type _____

SX = Standard. See feature comparison on previous page.
 HX = High performance. See feature comparison on previous page.

Terminal _____

T = Pluggable terminal block R = Ring terminal ¹

Frame Style _____

C = 16 - 32A
 D = 50 - 80A
 F = 8A

Option Board _____

∅ = None E = Modbus TCP
 I = EtherNet/IP N = PROFINET

Amp Size _____

08 = 8 Amps ² 16 = 16 Amps 32 = 32 Amps
 50 = 50 Amps 80 = 80 Amps (Only available with liquid-cooled heatsink)

Performance _____

Available with SX:

S = Standard
 L = Adjustable Current Limit

Available with HX:

L = Adjustable Current Limit, current feedback, load voltage feedback, and voltage limit
 P = High Performance (Includes Load Voltage Feedback, True Power Control, Current Limit, Power Limit, High Resolution Control Loop)

I/O _____

- ∅ = None (Only applicable for SX; HX board is equipped with an alarm relay by default)
- 1 = Alarm Relay (1x Form C)
- 2 = General Purpose Input / Analog Input Channel 2 / Pulse Width Modulation Input
- 3 = Alarm Relay and General Purpose Input / Analog Input Channel 2 / Pulse Width Modulation
- 4 = Isolated I/O (Only applicable for SX; HX board is equipped with an alarm relay by default)
- 5 = Isolated I/O with Alarm Relay
- 6 = Isolated I/O with Gen. Purpose Input / Analog Input Channel 2 / Pulse Width Modulation
- 7 = Isolated I/O with Alarm Relay and Gen. Purpose Input / Analog Input Channel 2 / Pulse Width Modulation

Retransmits _____

∅ = None
 R = Retransmits ² (Two 16-bit analog retransmits for voltage, current, or power)

Sync _____

∅ = None
 S = Digital SYNC-GUARD™

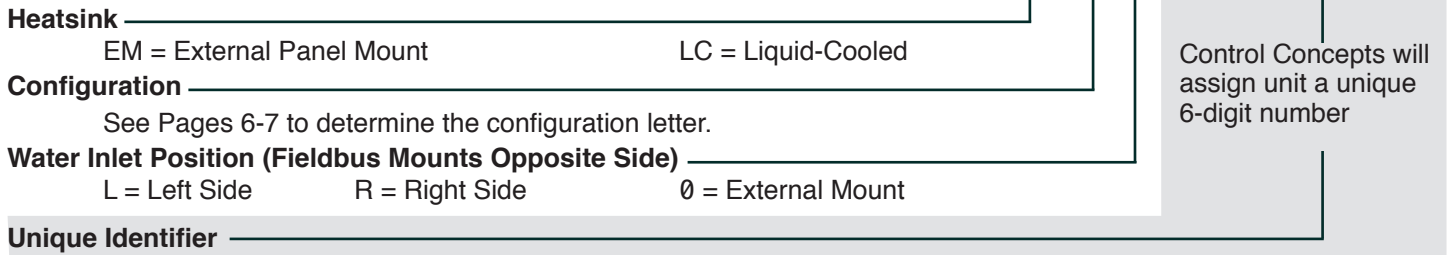
Zero Cross Transformer Mode _____

∅ = None
 Z = Zero Cross Transformer Mode ²

¹ Contact factory for availability

² Only available with HX type board

SYSTEM MODEL NUMBER



AMP CONFIGURATION

LIQUID-COOLED (LC)

Amp Configuration	Max Zones	Positions										Weight*	
		1	2	3	4	5	6	7	8	9	10		
A	3	80A	80A	80A									11.3 [5.13 kg]
B	6	80A	80A	80A	80A	80A	80A						20.6 [9.24 kg]
C	10	80A	80A	80A	80A	80A	80A	80A	80A	80A	80A	80A	33.2 [15.06 kg]

Liquid cooled heatsinks can have up to 80A in each position. Maximum position and ratings listed. Configurations with fewer zones and/or lower current ratings available.

EXTERNAL PANEL MOUNT (EM)

Amp Configuration	Positions						Weight*
	1	2	3	4	5	6	
A	16A	16A	16A	16A	16A	16A	21.8 [9.89 kg]
B	16A	16A	16A	-	32A	-	18.0 [8.16 kg]
C	32A	-	32A	-	32A	-	16.1 [7.30 kg]
D	16A	16A	-	-	50A	-	16.1 [7.30 kg]
E	-	-	50A	-	50A	-	14.2 [6.44 kg]

* Add 1 lbs [0.45 kg] when Connect Module is present.

(Dash signifies empty position)

External panel mount heatsinks are limited to specific amp configurations. Maximum position and ratings listed. Configurations with fewer zones and/or lower current ratings available.

AMP CONFIGURATIONS

EXTERNAL PANEL MOUNT (EM)

Amp Configuration	Positions / Number of Zones										Weight*
	1	2	3	4	5	6	7	8	9	10	
F	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A	33.8 [15.33 kg]
G	16A	16A	16A	16A	16A	16A	16A	16A	-	32A	31.9 [14.47 kg]
H	16A	16A	16A	16A	16A	16A	-	32A	-	32A	30.0 [13.61 kg]
I	16A	16A	16A	16A	-	32A	-	32A	-	32A	28.1 [12.75 kg]
J	16A	16A	-	32A	-	32A	-	32A	-	32A	26.2 [11.88 kg]
K	-	32A	-	32A	-	32A	-	32A	-	32A	24.3 [11.02 kg]
L	16A	16A	16A	16A	16A	16A	-	-	-	50A	28.1 [12.75 kg]
M	16A	16A	-	-	-	50A	-	-	-	50A	22.4 [10.16 kg]
N	-	32A	-	-	-	50A	-	-	-	50A	20.5 [9.30 kg]
O	-	32A	-	32A	-	32A	-	-	-	50A	22.4 [10.16 kg]
P	16A	16A	16A	16A	-	32A	-	-	-	50A	26.2 [11.88 kg]
Q	16A	16A	-	32A	-	32A	-	-	-	50A	24.3 [11.02 kg]
R	50A	-	-	-	-	50A	-	-	-	50A	20.5 [9.30 kg]

*Add 1 lbs [0.45 kg] when Connect Module is present.

(Dash signifies empty position)

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Maximum position and ratings listed. Configurations with fewer zones and/or lower current ratings available.

CONTACT/ORDERING INFORMATION

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