

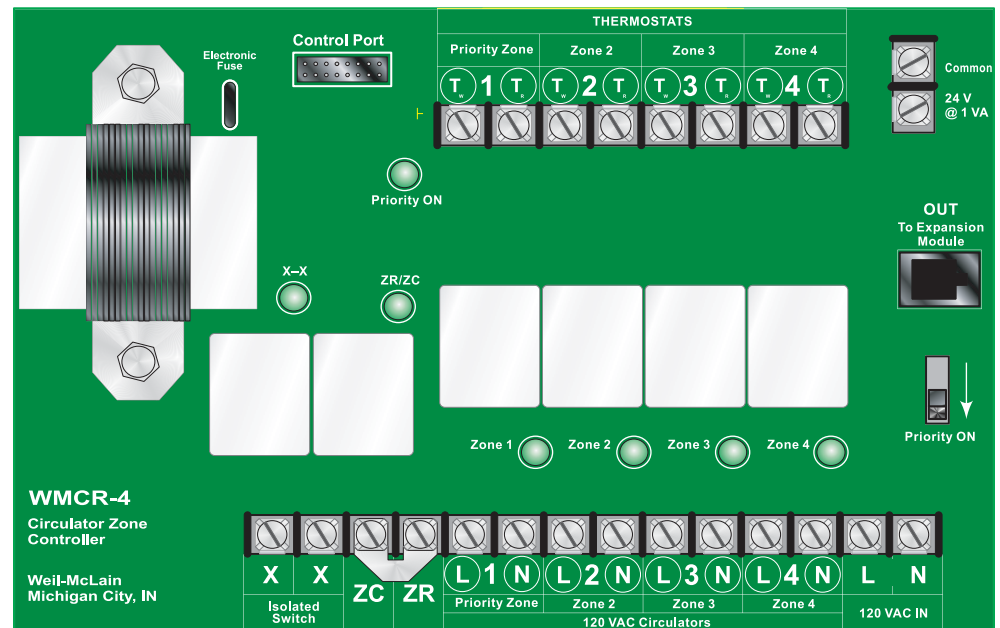


WMCR

Circulator Zone Controllers

Instruction manual

WMCR-2, WMCR-3, WMCR-4 and WMCR-6 Circulator Zone Controllers
 WMCR-1E and WMCR-4E Expansion Modules



WARNING

This manual must only be used by a **qualified heating installer/service technician**. Failure to comply could result in severe personal injury, death or substantial property damage.



Contents

Hazard definitions and notes 2

Replacement parts 2

WMCR features 3

WMCR Circulator Zone Controllers 4

WMCR-E Zone Expansion Modules 6

Wiring 8

Hazard definitions and notes

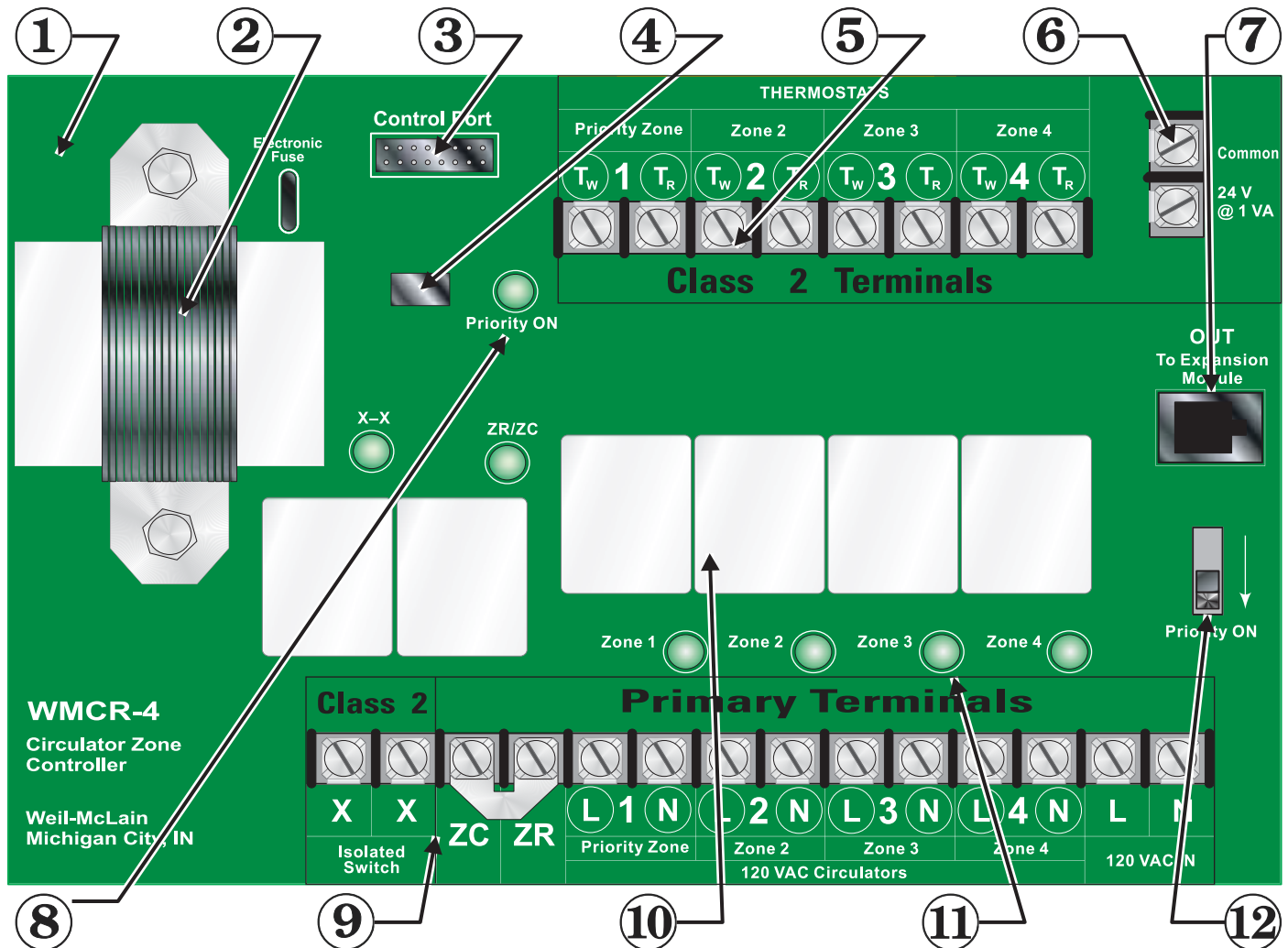
- DANGER** Indicates presence of hazards that **will cause** severe personal injury, death or substantial property damage.
- WARNING** Indicates presence of hazards that **can cause** severe personal injury, death or substantial property damage.
- CAUTION** Indicates presence of hazards that **will or can cause** minor personal injury or property damage.
- NOTICE** Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

- WARNING** Electrical shock hazard — Disconnect power before installing or servicing. Can cause severe personal injury, death or substantial property damage if ignored.
- NOTICE** All wiring must be installed in accordance with:
 - U.S.A.** — National Electrical Code and any other national, state or local code requirements. Wiring must be N.E.C. Class 1.
 - Canada** — C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial or local code requirements. Wiring must be C.S.A. C22.1 C.E.C. Part 1.

Replacement parts

Part description	Weil-McLain part number
Circulator plug-in relay (24 VAC coil)	510-311-021
Control plug-in relay (120 VAC coil) (WMCR-3, 4 and 6 only)	510-311-022
18" Telephone cable connector (connects to WMCR-1E/4E)	591-850-078
Field-mounted 40 VA transformer (not used on WMCR-1E/4E)	511-842-370

WMCR features



1. Double-sided printed circuit board construction 100% factory tested.
Advanced printed circuitry compatible with most digital programmable thermostats.
2. Powerful 30 VA transformer — will operate up to 15 zones. (WMCR-2 uses 20 VA transformer.) Electronic fuse on transformer secondary protects transformer from excessive loading.
3. Control port terminal allows for easy connection of accessory controls (such as WM-ODR reset control).
4. 5-Second time delay for boiler shutoff.
5. Clearly marked terminals with clamping plates and plenty of room for wiring.
6. 24 VAC transformer terminals — for easy connection of 3-wire thermostats and field transformer replacement.
7. Expansion module plug-in — makes adding zone(s) easy and economical.
8. Priority zone indicator — Priority feature will turn off (light off) temporarily if priority zone calls for heat longer than 30 minutes, repeating every 30 minutes.
9. Separate X-X (isolated switch) and ZC/ZR relays protect boiler aquastat — can be used with either “cold start” or “tankless coil” boiler application. WMCR-2 controller does not have ZC/ZR terminals.
NOTE that terminals ZC/ZR are 120 VAC connections.
10. Plug-in replaceable relays for long life.
High relay load rating — 1/3 HP.
CSA listed.
11. LED diagnostic lights for easy troubleshooting.
12. Switchable priority improves versatility.

Note:

The 4-zone WMCR-4 is featured in this manual. The WMCR-2, WMCR-3 and WMCR-6 Circulator Zone Controllers have identical electrical specifications. Differences in operating features are noted in this manual.



WMCR Circulator Zone Controllers

1. The **WMCR** series of zone controllers are controlled by low voltage thermostats or any other low voltage controllers having an SPST switching action. The controls provide intermediate switching to permit one, two, three or up to fifteen separate line voltage loads (circulators).
2. Advanced circuit design will operate with most digital/programmable thermostats.
3. The isolated end switch relay (terminals **X-X**) has a full 10 amp contact rating.

Sequence of operation

When a zone calls for heat (circuit is closed):

1. Isolated switch relay contact closes.
2. Zone light comes on.
3. **X-X** switch is closed. (**X1-X1** and **X2-X2** switches closed on WMCR-2.)
4. **X-X** indicator light turns on.
5. Controller relay closed. A **ZC-to-ZR** connection is required, either by factory-installed jumper or through boiler aquastat. (WMCR-2 does not include ZC/ZR relay or terminals.) **Terminals ZC/ZR are 120 VAC connections.**
6. **ZC/ZR** indicator light turns on. (WMCR-2 does not have **ZC/ZR** light.)
7. Zone circulator will start.

If Priority switch is in **ON** position:

1. Zone 1 becomes priority zone.
2. When zone 1 calls for heat, priority zone is activated and all other zones are deactivated (Circulators for zones 2 and higher and any zone modules will not operate). Priority On light turns on.
3. If priority zone calls for heat longer than 30 minutes, the priority feature is temporarily disabled, Priority On light turns off, and other zones are activated (if calling for heat). After 30 minutes, the priority feature is automatically enabled again.

Electrical specifications

Weil-McLain model number	Zones	Transformer voltage	Relay switching action	Thermostat current (amps)	Single phase motor rating (each circuit)	
					120 VAC	240 VAC
WMCR-2	2	120V, 60 HZ, 20VA	SPST	0.085	1/3 HP	1/2 HP
WMCR-3	3	120V, 60 HZ, 30VA	SPST	0.085	1/3 HP	1/2 HP
WMCR-4	4	120V, 60 HZ, 30VA	SPST	0.085	1/3 HP	1/2 HP
WMCR-6	6	120V, 60 HZ, 30VA	SPST	0.085	1/3 HP	1/2 HP

WARNING

To avoid severe personal injury, death or substantial property damage, never connect the load terminals to a load that takes more current than the amount listed for the relay in the electrical ratings.



Figure 1 — WMCR-2

2-zone Circulator Zone Controller with priority

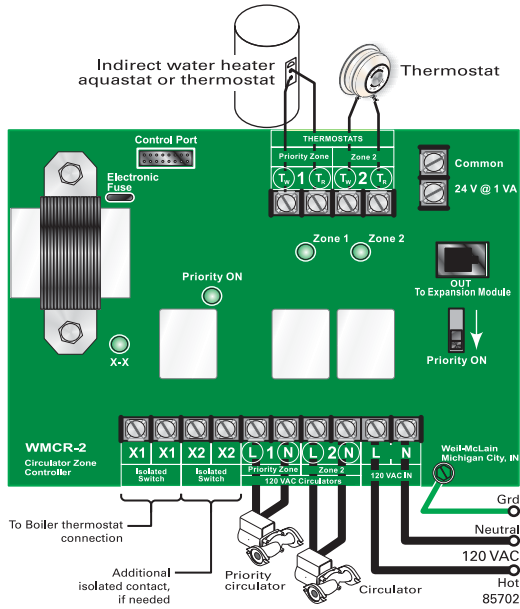


Figure 2 — WMCR-4

4-zone Circulator Zone Controller with priority

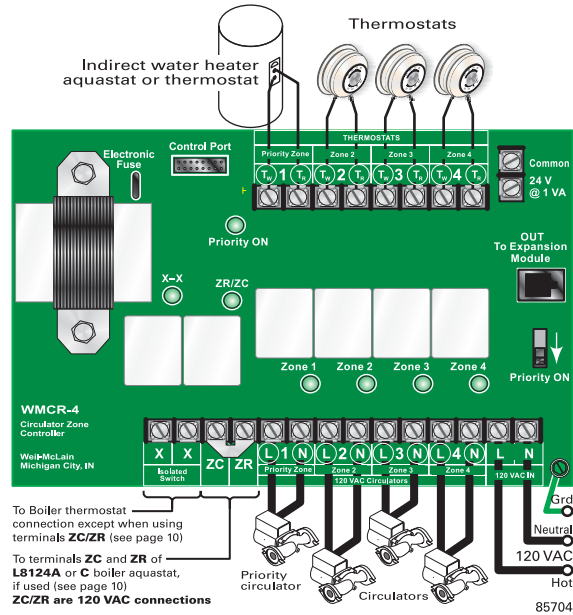


Figure 3 — WMCR-3

3-zone Circulator Zone Controller with priority

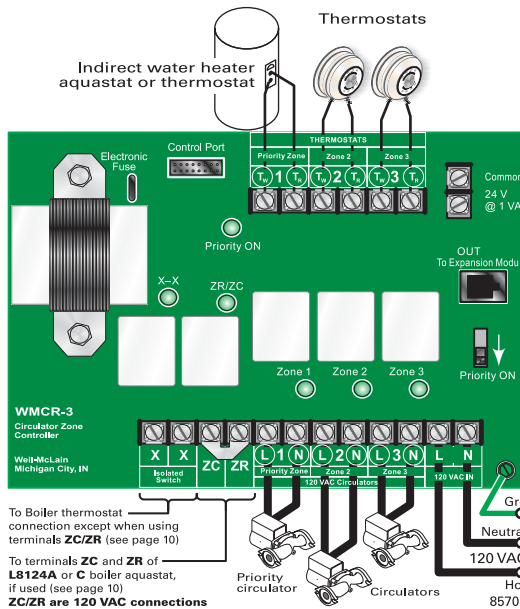
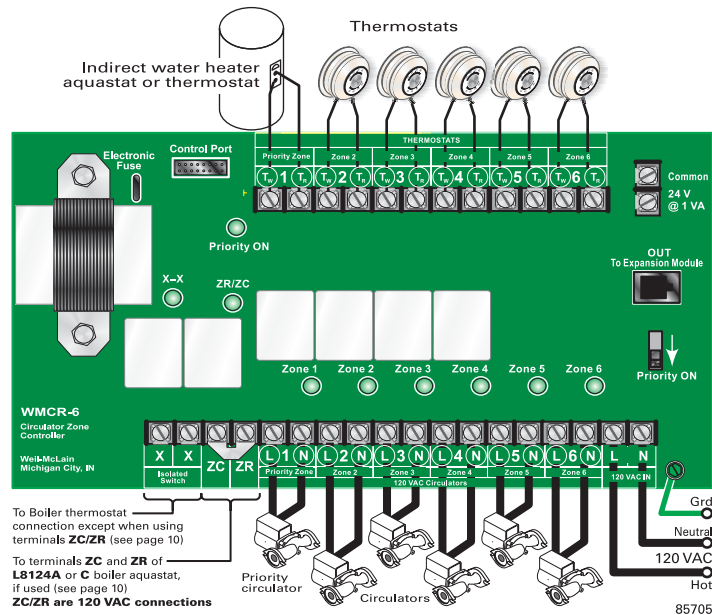


Figure 4 — WMCR-6

6-zone Circulator Zone Controller with priority



Legend

- 24 VAC field wiring
- 24 VAC factory wiring
- 120 VAC ground lead
- 120 VAC field wiring
- 120 VAC factory wiring

WARNING

Electrical shock hazard — Disconnect power before installing or servicing. Can cause severe personal injury, death or substantial property damage if ignored.

NOTICE

All wiring must be installed in accordance with:
U.S.A. — National Electrical Code and any other national, state or local code requirements. Wiring must be N.E.C. Class 1.
Canada — C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial or local code requirements. Wiring must be C.S.A. C22.1 C.E.C. Part 1.



WMCR-E Expansion modules

WMCR-1E

1. The **WMCR-1E** Expansion Module plugs into the WMCR-2, WMCR-3, WMCR-4 or WMCR-6 to provide one additional heating zone.
2. Multiples of WMCR-1E (1-zone) Expansion Modules can be used to provide up to 15 zones maximum. The 18" connecting cable, which plugs into the WMCR Circulator Zone Controller, is supplied with the unit. Separate line voltage is required.

WMCR-4E

1. The **WMCR-4E** Expansion Module plugs into the WMCR-2, WMCR-3, WMCR-4 or WMCR-6 to provide four additional heating zones.
2. Combinations of WMCR-1E (1-zone) with a WMCR-4E (4-zone) Expansion Module can be used to provide up to 15 zones maximum. The 18" connecting cable, which plugs into the WMCR Circulator Zone Controller, is supplied with the unit. Separate line voltage is required.

Specifications

Weil-McLain model number	Zones	Transformer voltage (24 VAC)	Thermostat current (amps)	Relay contact rating (10 amps @ 120 or 240 VAC)
WMCR-1E	1	supplied by master zone circulator control	0.085	1/3 HP @ 120 VAC 1/3 HP @ 240 VAC
WMCR-4E	4	supplied by master zone circulator control	0.085	1/3 HP @ 120 VAC 1/3 HP @ 240 VAC

WARNING

To avoid severe personal injury, death or substantial property damage, never connect the load terminals to a load that takes more current than the amount listed for the relay in the electrical ratings.



Figure 5

WMCR-1E wiring schematic

Single-zone Expansion Module

See page 12 for examples of wiring.

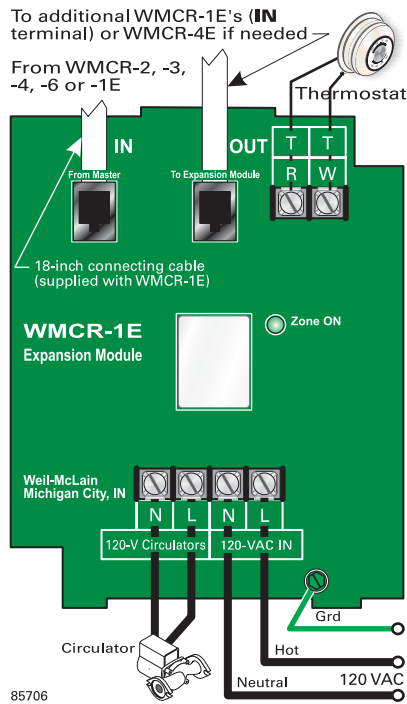
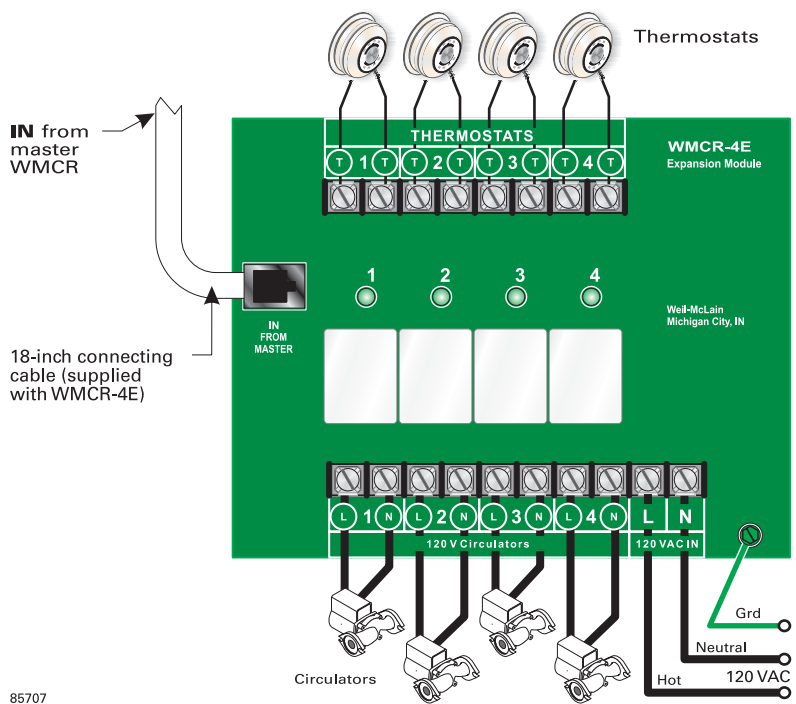


Figure 6

WMCR-4E wiring schematic

Four-zone Expansion Module

See page 12 for examples of wiring.



Legend

- 24 VAC field wiring
- 120 VAC ground lead
- 120 VAC factory wiring
- 24 VAC factory wiring
- 120 VAC field wiring

WARNING

Electrical shock hazard — Disconnect power before installing or servicing. Can cause severe personal injury, death or substantial property damage if ignored.

NOTICE

All wiring must be installed in accordance with:

U.S.A. — National Electrical Code and any other national, state or local code requirements. Wiring must be N.E.C. Class 1.

Canada — C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial or local code requirements. Wiring must be C.S.A. C22.1 C.E.C. Part 1.



Wiring

NOTICE

There are numerous applications possible for WMCR controls. The suggested wiring diagrams shown in this manual indicate the proper terminals for the power supply, load and thermostat for most applications.

Each WMCR-1E (1-zone) or WMCR-4E (4-zone) Expansion module is supplied with an 18" connector that plugs into a WMCR Circulator Zone Controller (WMCR-2, -3, -4, -6 control or WMCR-1E Expansion module). See Figures 13 & 14. Separate line voltage is required.

“Cold start” boiler application

Each zone thermostat will signal the WMCR to operate its zone circulator and start the boiler (through the X-X or X1-X1 isolated switch). (See Figures 10 and 11 for suggested wiring.)

Jumper

To be placed between terminals **ZC** and **ZR**. (Jumper is factory-installed in this position.) When priority switch is **not ON**, all zones operate independently of each other. Terminals **ZC/ZR** are 120 VAC connections.

Connect isolated switch (terminals **X-X** or **X1-X1**) to boiler thermostat connection (see boiler manual).

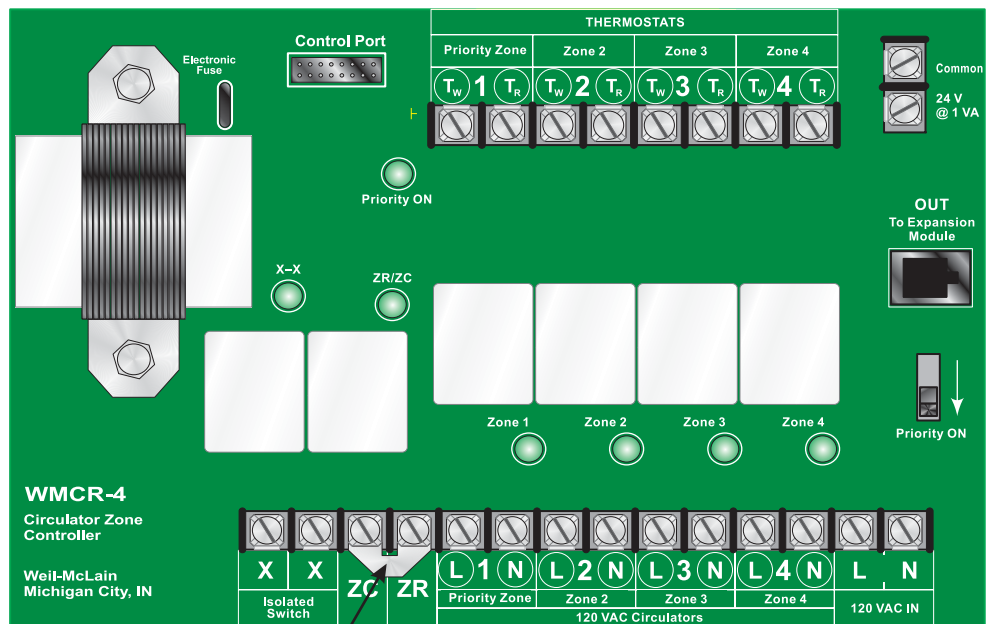
Priority

Circulators for zones 2 and higher will **not** operate when zone 1 (priority) circulator is actuated. (Priority switch is **ON**.)

Figure 7

“Cold start” application
(No tankless coil in boiler)

WMCR-4 shown — also
applies to WMCR-3 and -6



Factory-installed jumper
between **ZC** and **ZR**

85708



“Tankless coil” boiler application

(Requires a L8124A or C boiler aquastat.) Each zone thermostat will signal the WMCR to start its zone circulator and start the burner. If boiler temperature drops below low limit (circulator) setting, all circulating will cease until temperature of boiler water is increased. (See Figure 9 for suggested wiring.)

Jumper

Remove factory-installed jumper between terminals **ZC** and **ZR**.

Connect terminals **ZC** and **ZR** to corresponding **ZC** and **ZR** terminals on boiler aquastat. Circulators for zones connected to the WMCR controller will not operate if the boiler tankless coil aquastat low limit is not satisfied. **Terminals ZC/ZR are 120 VAC connections.**

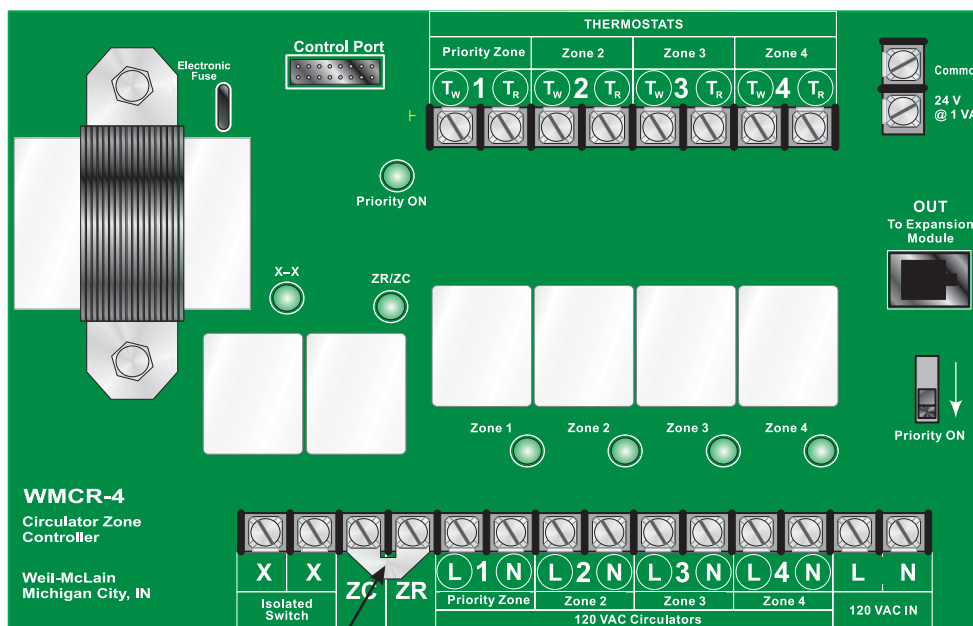
Priority

Circulators for zones 2, 3 or 4 will **not** operate when zone 1 (priority) circulator is actuated. (Priority switch is **ON**.) When priority switch is **not ON**, all zones operate independently of each other.

Notes

WMCR controllers will not work properly if 120 VAC polarity is not the same at the WMCR and L8124A or C aquastat 120 VAC power terminals. The neutral and hot wires must not be reversed.

Any control connected to the WMCR (Example: L8124A or L8124E) is **isolated** and **protected** from circulator current with built-in 120 volt control relay.



REMOVE factory-installed jumper between **ZC** and **ZR**

Figure 8

Tankless coil boiler application

WMCR-4 shown — also applies to WMCR-3 and -6, but not WMCR-2 (which has no ZC/ZR relay)

85709



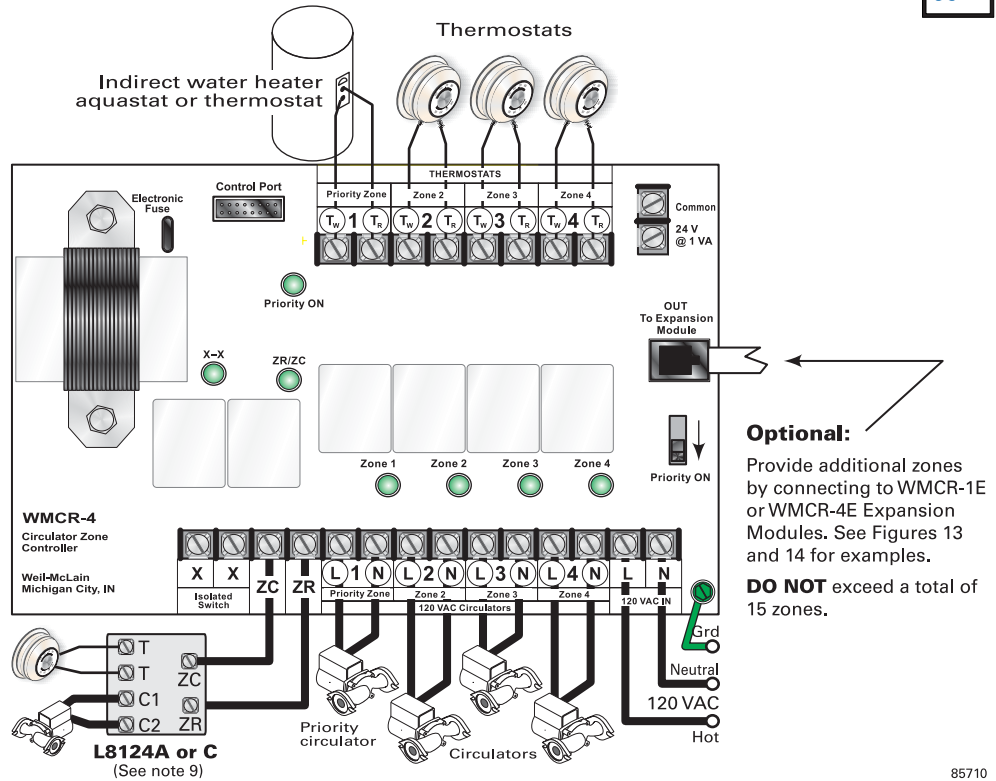
Figure 9

Tankless coil boiler —
WMCR-4 to L8124A or C
aquastat/relay

Note 9:

The L8124A or C can be used for an additional zone, responding to the thermostat connected to the L8124A or C T-T terminals. Connect the zone circulator to the C1/C2 terminals as shown. This zone would not be overridden by the WMCR priority switch.

If the boiler is installed in a primary/secondary piping system, do not wire per Figure 9. Use Figure 10 or 11.



Optional:
Provide additional zones by connecting to WMCR-1E or WMCR-4E Expansion Modules. See Figures 13 and 14 for examples.
DO NOT exceed a total of 15 zones.

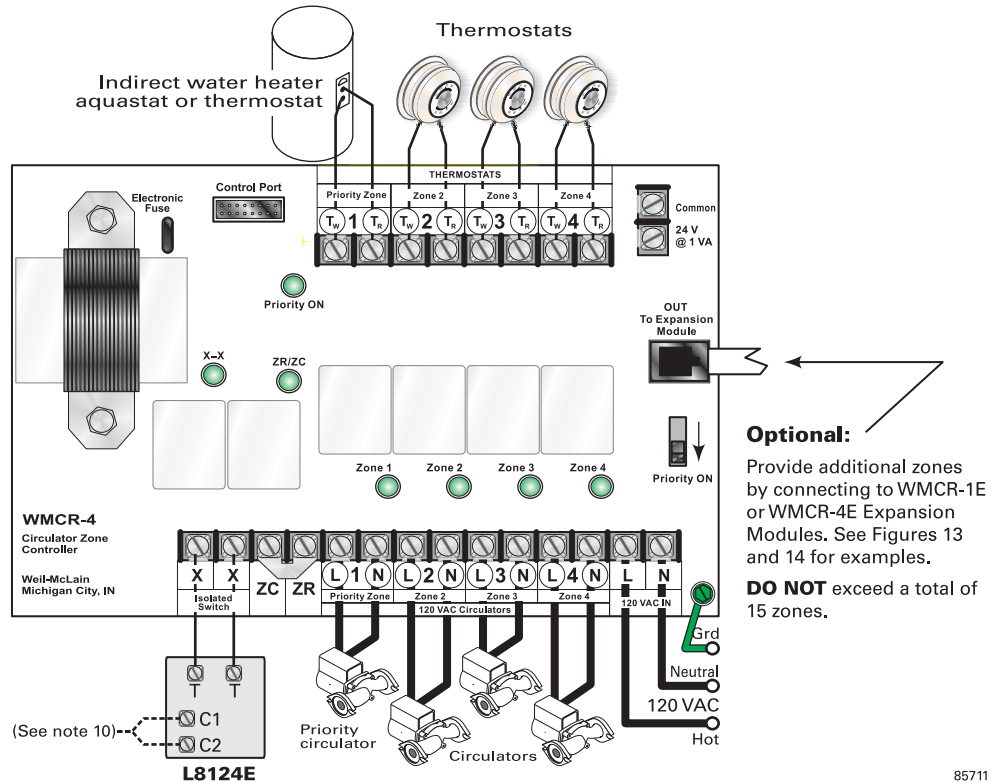
85710

Figure 10

Tankless coil boiler
WMCR-4 to L8124E

Note 10:

Terminals C1 and C2 are not used except to operate a boiler loop pump on a primary/secondary piping system. The pump will operate when any zone calls for heat.



Optional:
Provide additional zones by connecting to WMCR-1E or WMCR-4E Expansion Modules. See Figures 13 and 14 for examples.
DO NOT exceed a total of 15 zones.

85711

Legend

- 24 VAC field wiring
- 120 VAC ground lead
- 120 VAC factory wiring
- 24 VAC factory wiring
- 120 VAC field wiring

WARNING

Electrical shock hazard — Disconnect power before installing or servicing. Can cause severe personal injury, death or substantial property damage if ignored.

NOTICE

All wiring must be installed in accordance with:

U.S.A. — National Electrical Code and any other national, state or local code requirements. Wiring must be N.E.C. Class 1.

Canada — C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial or local code requirements. Wiring must be C.S.A. C22.1 C.E.C. Part 1.

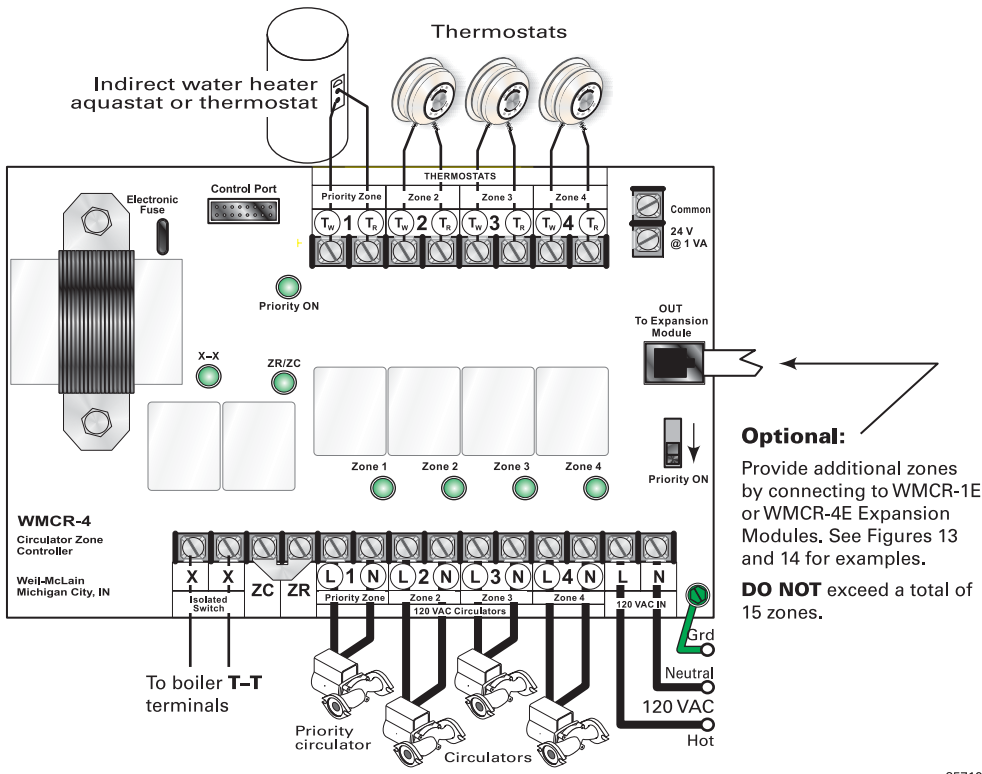


Figure 11

WMCR-4 to “cold start” gas or oil boiler, connected to boiler thermostat connection

Optional: Provide additional zones by connecting to WMCR-1E or WMCR-4E Expansion Modules. See Figures 13 and 14 for examples.
DO NOT exceed a total of 15 zones.

85712

TURN OFF POWER. Remove plastic tap on each side of transformer. Then clip both the primary and secondary wires soldered to the PC board. Apply electrical tape to loose ends.

These terminals are normally used to provide auxiliary 24 VAC power to low-load controls only (max 1 VA load). Use these terminals to connect an external transformer only when the on-board transformer has to be replaced.

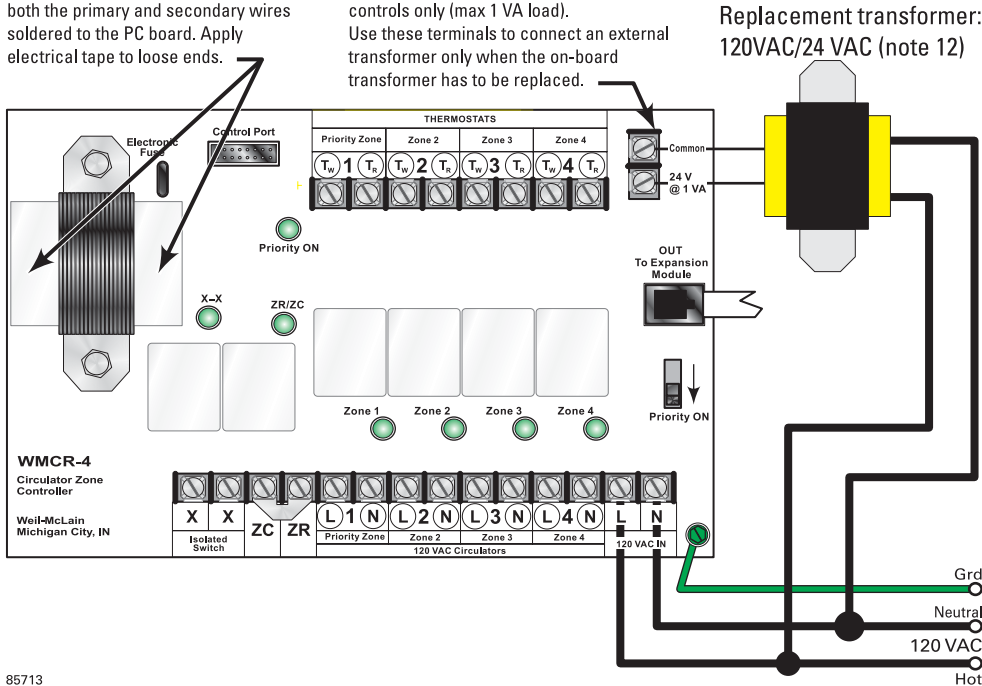


Figure 12

Field replacement of PC-board transformer

Note 12: Minimum transformer rating:
WMCR-3, -4 or -6 — 30 VA
WMCR-2 — 20 VA

85713

Legend

- 24 VAC field wiring
- 24 VAC factory wiring
- 120 VAC ground lead
- 120 VAC field wiring
- 120 VAC factory wiring

WARNING

Electrical shock hazard — Disconnect power before installing or servicing. Can cause severe personal injury, death or substantial property damage if ignored.

NOTICE

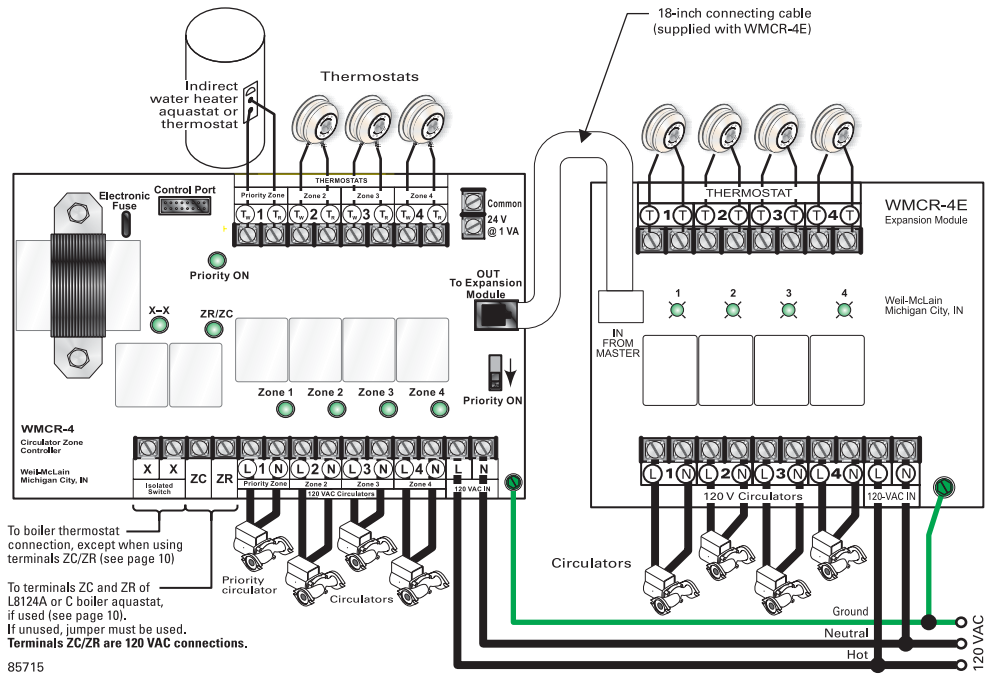
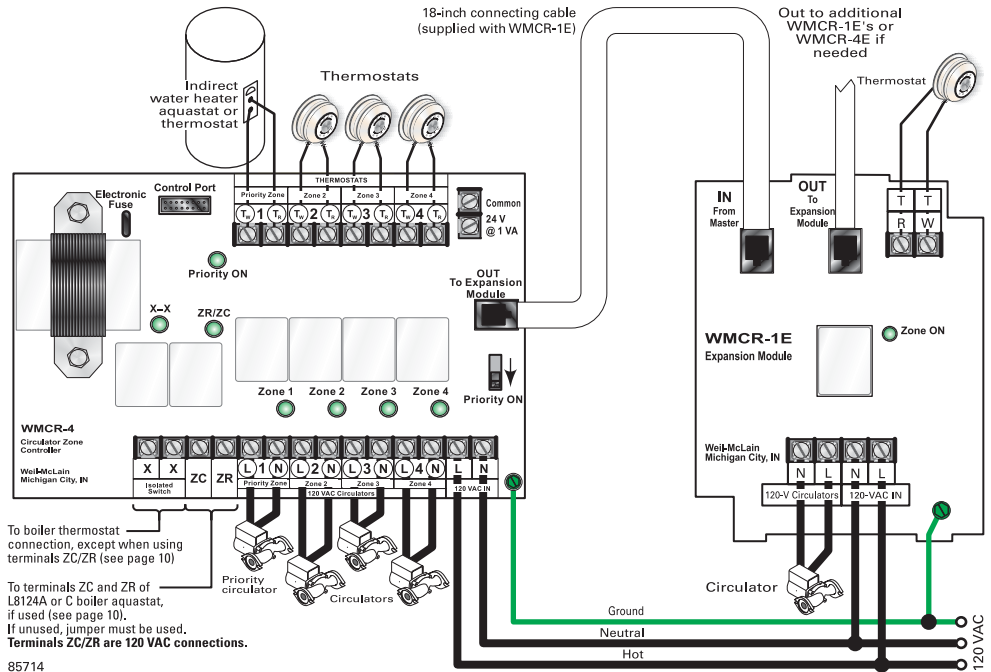
All wiring must be installed in accordance with:
U.S.A. — National Electrical Code and any other national, state or local code requirements. Wiring must be N.E.C. Class 1.
Canada — C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial or local code requirements. Wiring must be C.S.A. C22.1 C.E.C. Part 1.

WMCR Circulator Zone Controllers



Figure 13

WMCR-2, -3, -4, -6 or -1E to WMCR-1E Expansion Module(s)



Legend

- 24 VAC field wiring
- 120 VAC ground lead
- 120 VAC factory wiring
- 24 VAC factory wiring
- 120 VAC field wiring

NOTICE

All wiring must be installed in accordance with:

U.S.A. — National Electrical Code and any other national, state or local code requirements. Wiring must be N.E.C. Class 1.

Canada — C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial or local code requirements. Wiring must be C.S.A. C22.1 C.E.C. Part 1.

WARNING

Electrical shock hazard — Disconnect power before installing or servicing. Can cause severe personal injury, death or substantial property damage if ignored.



Without compromise | 1881

Well-McLain
500 Blaine Street
Michigan City, IN 46360-2388
<http://www.weil-mclain.com>