

Technical Information

Air-to-Water

**WH-MXC09J3E8 WH-MDC05J3E5
WH-MXC12J6E5 WH-MDC07J3E5
WH-MXC12J9E8 WH-MDC09J3E5
WH-MXC16J9E8 WH-MXC09J3E5**

Subject: Anti-Freeze Control When Connected to Compressor External Switch

WARNING

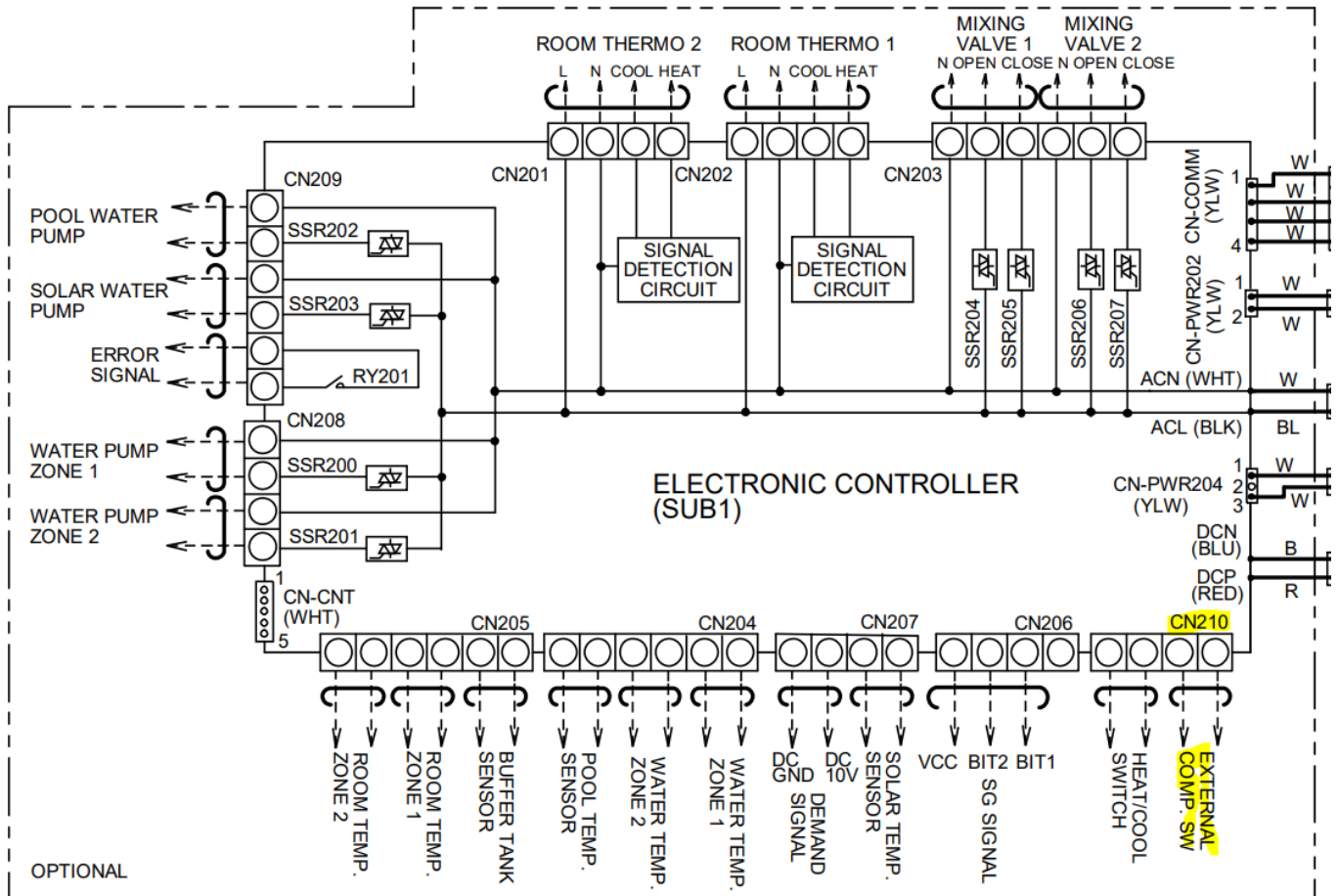
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1. Background

Some customers connect the heat pump unit to an External Compressor Switch to control power consumption (CN210 terminal on optional PCB). When this switch is OFF, the compressor is stopped, while the heating operation etc. are not cancelled.



External Compressor Switch

When the External Compressor Switch is ON:

- 1) Heat pump system operate normally

When the External Compressor Switch is OFF:

- 1) Heat pump, Indoor water pump & Heater (Booster heater & Backup Heater) need to turn OFF
 - 2) Solar, Boiler and zone control can be operated following normal control condition.
- *pump delay OFF also included in this control

Since the indoor water pump is OFF when External Compressor Switch is OFF, some customers are concerned that if the unit is not connected to an additional heat source such as a boiler or solar, the water in the water circuit might freeze during low ambient temperature.

2. Control Details

The anti-freeze control is meant to prevent the water in the water circuit from freezing.
Details on anti-freeze control is below:

Anti-Freeze Control

Anti-freeze protection control can be set to YES or NO in the control panel. There are 3 types of anti-freeze control:

1) Expansion tank anti-freeze control

Control Details:

Expansion tank anti-freeze heater ON condition: Outdoor ambient temp. $< 3^{\circ}\text{C}$

Expansion tank anti-freeze heater OFF condition: Outdoor ambient temp. $> 4^{\circ}\text{C}$

2) Water pump circulation anti-freeze control

Control Details:

Water pump turns ON when ALL below conditions are fulfilled:

- Heat pump OFF by remote control (in stand-by mode) OR error occurs.
- Water flowing flag is ON
- Water flow switch is not abnormal
- Outdoor ambient temp. $< 3^{\circ}\text{C}$ OR outdoor ambient temp. sensor is abnormal
- Water inlet/outlet temp. $< 6^{\circ}\text{C}$
- After 5 minutes from previous water pump OFF

Water pumps turn OFF when ANY of below conditions is fulfilled

- Outdoor ambient temperature $\geq 4^{\circ}\text{C}$
- During $-5^{\circ}\text{C} < \text{outdoor ambient temp.} < 4^{\circ}\text{C}$:
After water pump ON for 4 minutes, and water inlet temp. $\geq 8^{\circ}\text{C}$
Else, shift to back up heater anti-freeze control
- During outdoor ambient temp. $< -5^{\circ}\text{C}$:
After water pump ON for 4 minutes, and water inlet/outlet $\geq 20^{\circ}\text{C}$
Else, shift to back up heater anti-freeze control

* If flow switch is abnormal (H62), then water pump circulation anti-freeze control will not activate

3) Back up heater anti-freeze control

Control Details:

Back up heater turn ON when ALL below conditions are fulfilled

- Water inlet/outlet temp. $< 6^{\circ}\text{C}$
- Water pump circulation anti-freeze control activated, and water pump ON for 4 minutes.

Back up heater turns OFF when ANY of below conditions is fulfilled:

- Water inlet/outlet temp. $> 28^{\circ}\text{C}$
- Water pump circulation anti-freeze control deactivated/water pump OFF

* If back up heater is abnormal (H70) then back up heater anti-freeze control will not activate

*If the unit is not in standby mode, the water pump circulation anti-freeze control will not activate

***If the unit is connected to External Compressor Switch and the switch is OFF, the water pump circulation anti-freeze control is not activated.**

3. Countermeasure

To mitigate customers' concerns that water in the water circuit might freeze because this control is not activated when the EXT Compressor Switch is OFF, **the software has been revised to ACTIVATE the anti-freeze protection control when the EXT Compressor Switch is OFF.**

The summary of the models involved in the software revision pertaining to the Anti-Freeze control status in relation to the EXT Compressor Switch is as in Table 1:

Series	Concerned Model	Anti-freeze control status when Compressor External Switch OFF (BEFORE)	Anti-freeze control status when Compressor External Switch OFF (AFTER / Starting Serial Number)
G-series	All	Not Activated	Not Activated / N/A
H-Series	All	Not Activated	Not Activated / N/A
J-Series	WH-MXC16J9E8	Not Activated	Activated / 56235 01578
	WH-MXC12J9E8	Not Activated	Activated / 56234 01762
	WH-MXC12J6E5	Not Activated	Activated / 56232 02366
	WH-MXC09J3E5	Not Activated	Activated / 56231 02718
	WH-MXC09J3E8	Not Activated	Activated / 56233 02441
	WH-MDC09J3E5	Not Activated	Activated / 56226 06467
	WH-MDC07J3E5	Not Activated	Activated / 56224 06766
	WH-MDC05J3E5	Not Activated	Activated / 56227 06822
	Other J-Series Models	Not Activated	Not Activated / N/A
K-Series onwards	All	Activated	Activated / All

Table 1