

**40VM Series
Indoor Units and Controllers for
Variable Refrigerant Flow (VRF) Heat Pump System**

Service Manual



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INDOOR UNITS

General Information

INDOOR UNIT MODEL NUMBER NOMENCLATURE

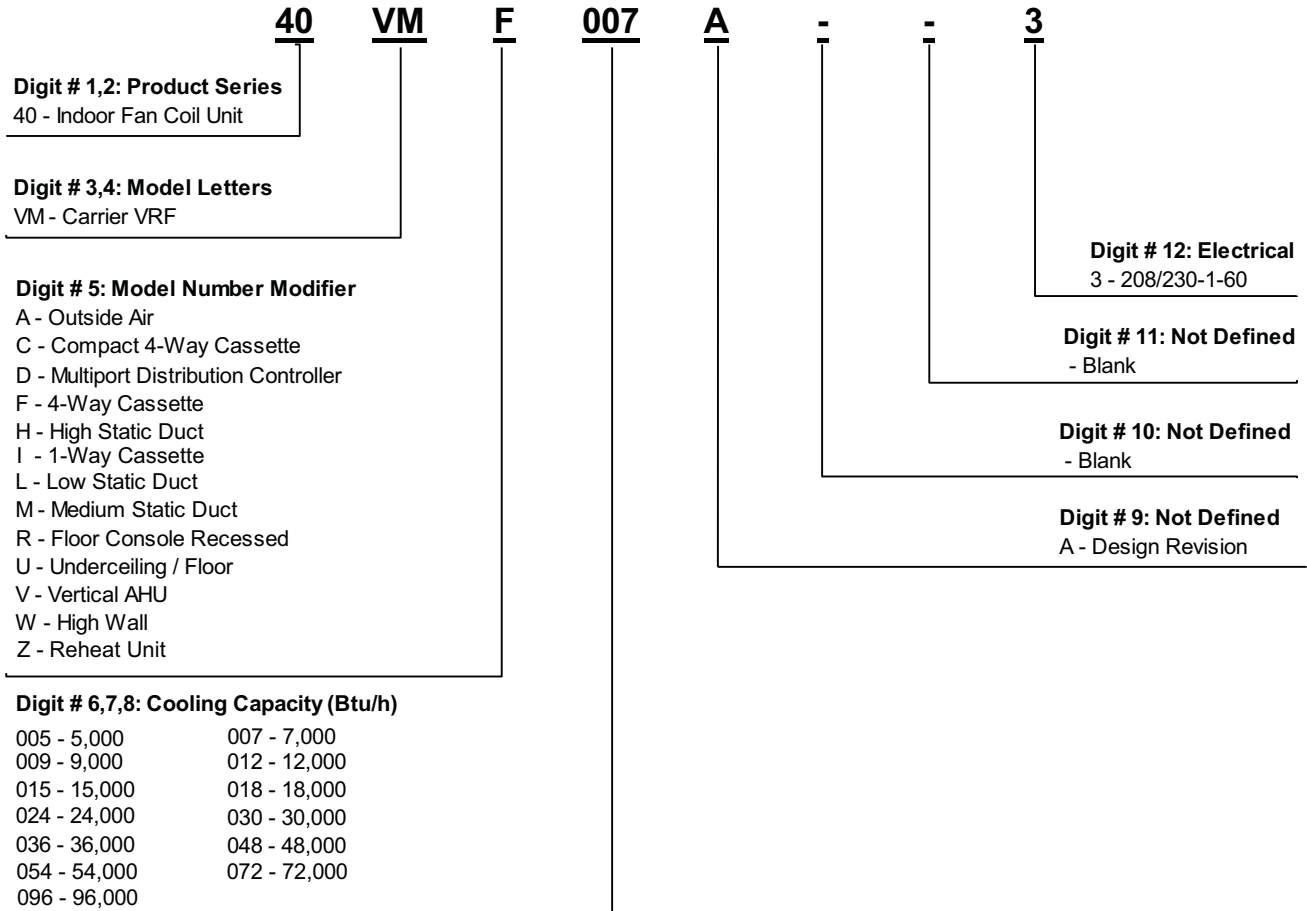


Fig. 1 —Model Nomenclature (Indoor Units)

Table 1 —Indoor Unit Capacity

INDOOR UNIT CAPACITY		5	7	9	12	15	18	24	30	36	48	54	72	96
4-Way Cassette	40VMF			•	•	•	•	•	•	•	•			
Compact 4-Way Cassette	40VMC	•	•	•	•	•								
1-Way Cassette	40VMI	•	•	•	•	•	•	•						
High Wall	40VMW	•	•	•	•	•	•	•	•					
Low Static Duct	40VML		•	•	•	•	•	•						
Medium Static Duct	40VMM		•	•	•	•	•	•	•	•	•			
High Static Duct	40VMH							•	•	•	•	•	•	•
Reheat Unit	40VMZ			•	•	•	•	•						
Vertical AHU	40VMV				•		•	•	•	•	•	•		
Underceiling/Floor	40VMU				•	•	•	•	•	•	•			
Floor Console Recessed	40VMR		•	•	•	•	•	•						
Outside Air	40VMA									•	•	•	•	•

INDOOR UNITS LINEUP



Figure 2 - 4-Way Cassette
(40VMF)



Figure 3 - Compact 4-Way Cassette
(40VMC)

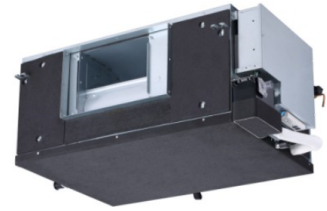


Figure 4 - High Static Duct
(40VMH)



Figure 5 - High Wall
(40VMW)



Figure 6 - Low Static Duct (40VML)



Figure 7 - Medium Static Duct (40VMM)



Figure 8 - Underceiling / Floor (40VMU)



Figure 9 - Floor Console Recessed
(40VMR)



Figure 10 - Vertical AHU
(40VMV)



Figure 11 - Outside Air
(40VMA)



Figure 12 - 1-Way Cassette
(40VMI)

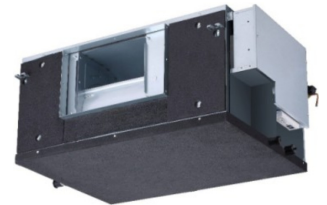


Figure 13 - Reheat Unit
(40VMZ)

Refrigerant Circuit

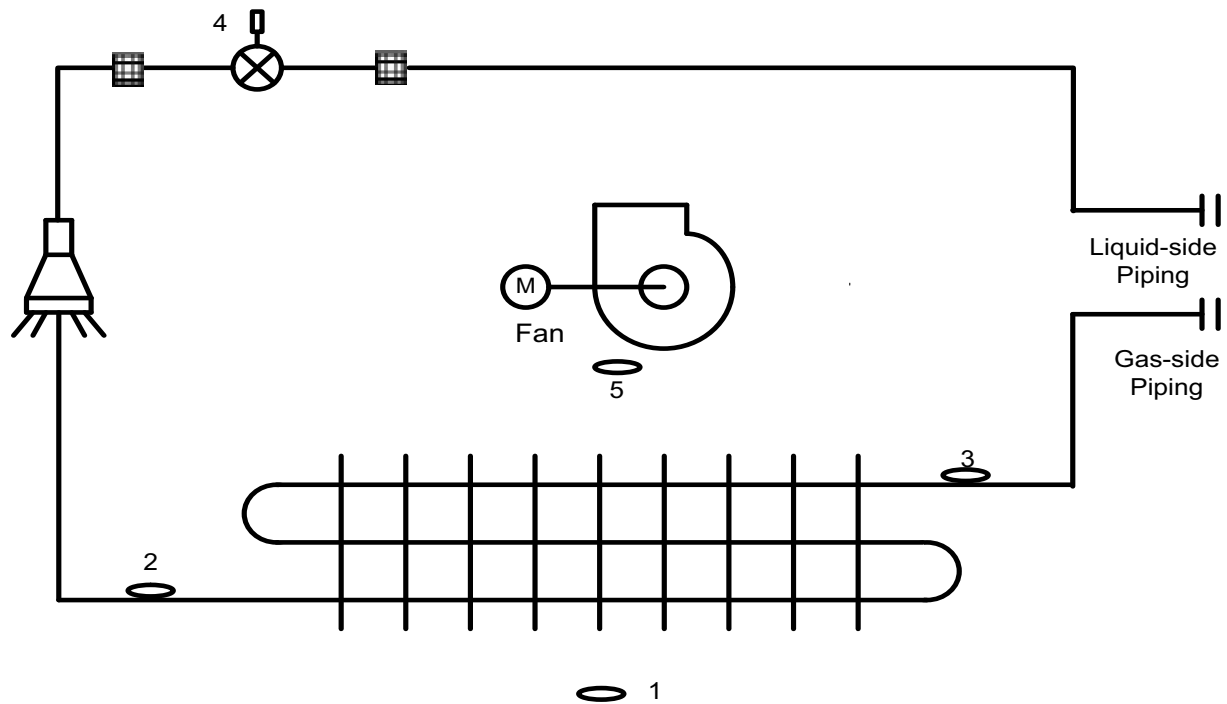


Fig. 14 — Refrigerant Circuit Schematic Diagrams for Indoor Units (40VMA, Z)

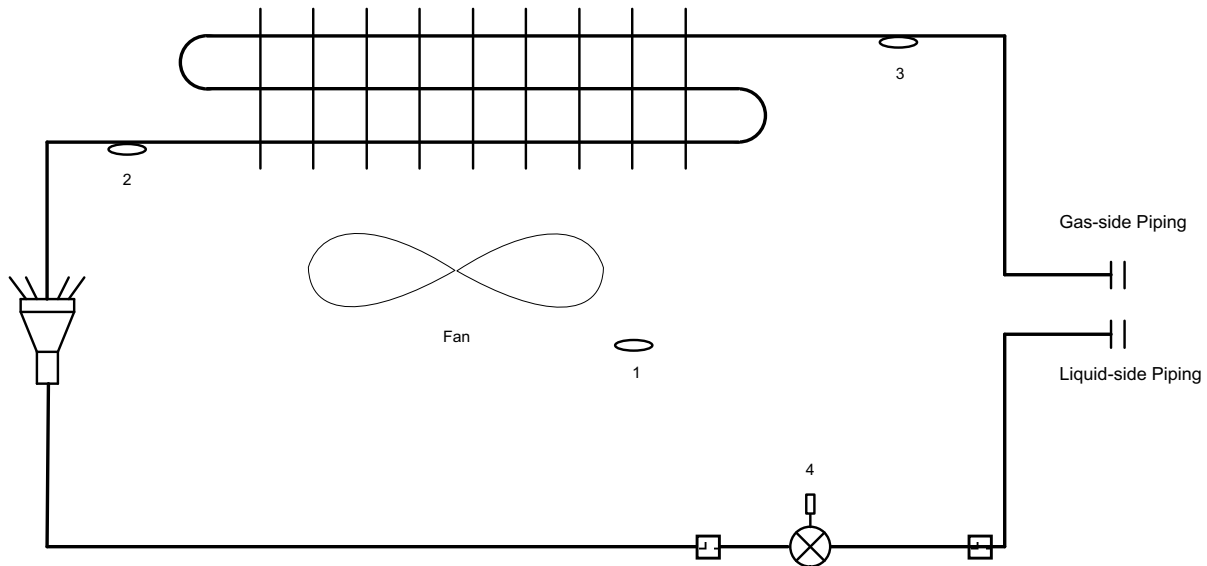


Fig. 15 —Refrigerant Circuit Schematic Diagrams for Indoor Units (40VMC, F, H, I, L, M, R, U, V, W)

Table 2 —Refrigerant Circuit Component Function

NO.	NAME	SYMBOL	FUNCTION
1	Room or return air temperature sensor	T1 (T0 for 40VMA)	Used for thermostat control
2	Inlet pipe temperature sensor	T2A	Used to calculate subcooling (SC) when heating
3	Outlet pipe temperature sensor	T2B	Used to calculate superheated (SH) when cooling
4	Electronic expansion valve	EEV	Used to control SH in cooling and SC in heating
5	Room temperature sensor	TA (Only for 40VMA)	Used to stabilize outlet air temperature by controlling fan speed or EEV opening
6	Solenoid valve	SVD (Only for 40VMA)	Used to prevent refrigerant trapping in the heat exchanger

Table 3 —List of Electronic Expansion Valve Types

CAPACITY INDEX	5	7	9	12	15	18	24	30	36	48	54	72	96
1-Way Cassette (40VMI)	•	•	•	•	•	•	•	•	•	•			
4-Way Cassette (40VMF)			•	•	•	•	•	•	•	•			
High Wall (40VMW)	□	□	□	□	□	□	□	□	□				
Medium Static Duct (40VMM)		□	□	□	□	□	•	•	•	•			
Low Static Duct (40VML)		□	□	□	□	□	□						
Vertical Air Handling Unit (40VMV)				•		•	•	•	•	•	•		
High Static Duct (40VMH)							•	•	•	•	•	•	•
Outside air (40VMA)									•	•	•	•	•
Compact 4-Way Cassette (40VMC)	•	•	•	•	•								
Underceiling/Floor (40VMU)				•	•	•	•	•	•	•			
Floor Console Recessed (40VMR)		□	□	□	□	□							
Reheat Unit (40VMZ)			•	•	•	•	•						

- 500 Pulses
- 2000 Pulses

Operating Temperature Range

The 40VMA (outside air) functions are cooling, heating, and fan operation.

The 40VMZ (reheat) functions are heating and fan operation.

Other indoor units can operate in cooling, heating, auto, fan, and dry mode.

COOLING MODE —

Indoor unit (except 40VMA) thermal OFF is activated when the return air temperature is below 59°F WB.

HEATING MODE —

Indoor unit (except 40VMA) thermal OFF is activated when return air temperature is above 86°F DB.

Table 4 —40VMC, F, H, I, L, M, R, U, V, W

MODE	INLET TEMPERATURE
Cooling	50~75°F WB
Heating	54~86°F DB

Table 5 —40VMA

MODE	INLET TEMPERATURE
Cooling and Fan	60~109°F DB
Heating	23~59°F DB

Table 6 —40VMZ

MODE	INLET TEMPERATURE
Heating	53~86°F DB

Function and Control

ELECTRONIC EXPANSION VALVE OPERATION — Electronic expansion valves of the indoor unit regulate the refrigerant flow to control superheat during cooling operation and subcooling during heating operation.

Table 6 —List of 500P EEV Opening in Cooling Mode

CAPACITY INDEX	INITIAL OPENING	MINIMUM OPENING	MAXIMUM OPENING
7~18	120	54	480
24	120	54	480
30	120	54	480
36	120	54	480
Larger than 48	120	54	480

Table 7 —List of 2000P EEV Opening in Cooling Mode

CAPACITY	INITIAL OPENING	MINIMUM OPENING	MAXIMUM OPENING
Less than 12	300	104	2000
15~18	200	104	2000
24	300	104	2000
30	400	104	2000
Larger than 36	400	104	2000

500P EEV Operation Driver

When the indoor unit receives the following signal:

- Signal to turn OFF
- Indoor unit error signal
- Indoor unit turns to fan mode
- Indoor unit turns to thermo-OFF
- Indoor unit shut down due to low temperature protection on the evaporator

The EEV's control uses the following logic:

- If the outdoor unit shuts down without cooling capacity requirement:
The EEVs keep previous opening for three minutes.
Then EEVs conduct 300P opening (EEV whose opening is not equal to zero will close to 0P first, then open to 300P).
- If the cooling capacity requirement of the outdoor unit is not equal to 0, the EEVs keep the previous opening for 25 seconds after the indoor unit turns off, then close to -16P to reset the opening and standby.

When the indoor unit receives the turn ON signal, the EEVs control uses the following logic:

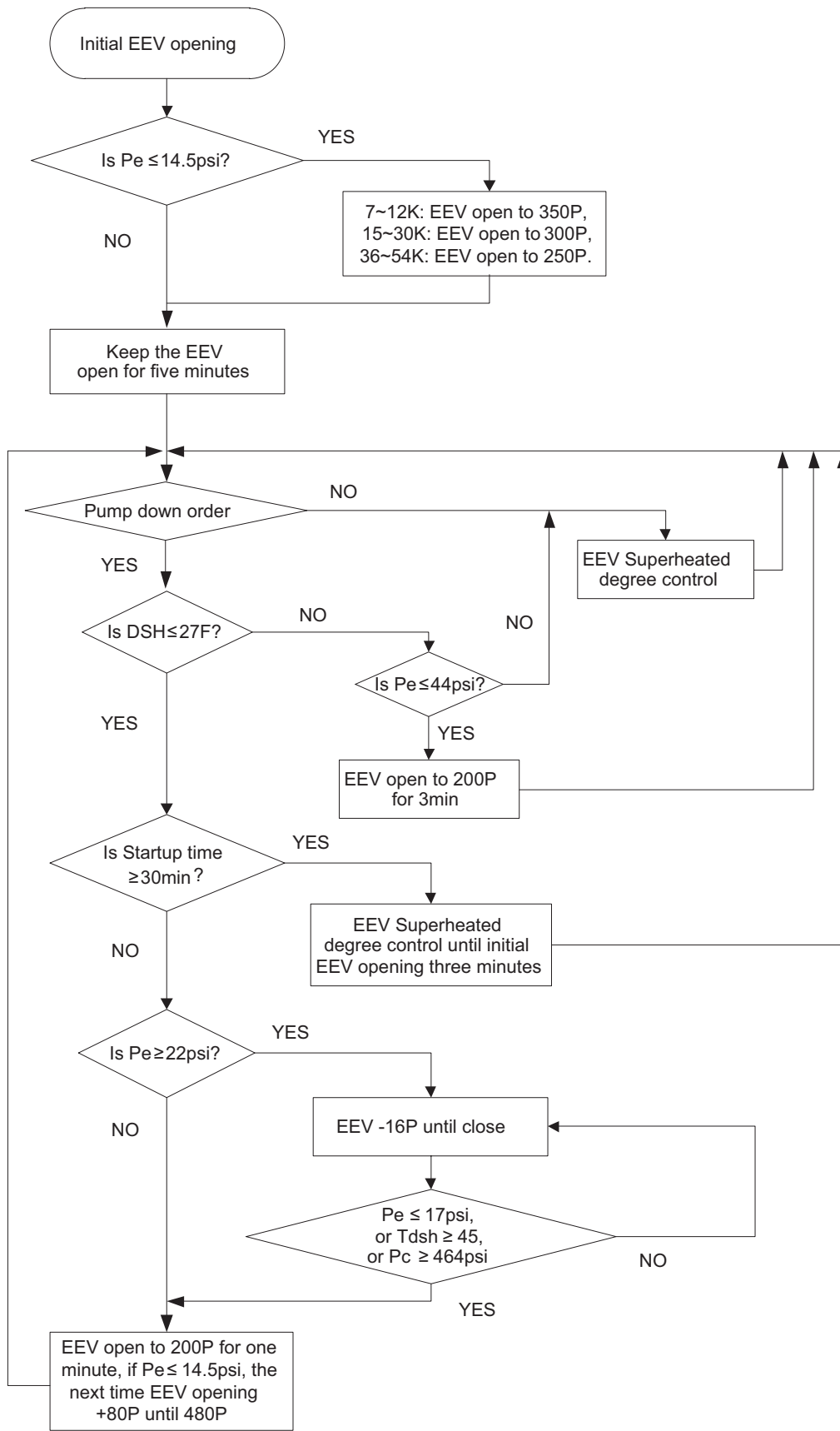


Fig. 16 —500P EEV Operation Driver

2000P EEV Operation Driver

When the indoor unit receives the following signal:

- Signal to turn OFF
- Indoor unit error signal
- Indoor unit turns to fan mode
- Indoor unit turns to thermo-OFF
- Indoor unit shut down due to low temperature protection of the evaporator

The EEV's control uses the following logic:

- If the outdoor unit shuts down without cooling capacity requirement:
The EEVs keep previous opening for three minutes. Then EEVs conduct 1200P opening (EEVs whose opening is not equal to zero will close to 0P first, and then open to 1200 P).
- If the cooling capacity requirement of the outdoor unit is not equal to 0, the EEVs keep the previous opening for 25 seconds after the indoor unit turns off, and then close to -40P to reset the opening and open to 224P (Standby).

When the indoor unit receives the turn ON signal, the EEVs controls use the following logic:

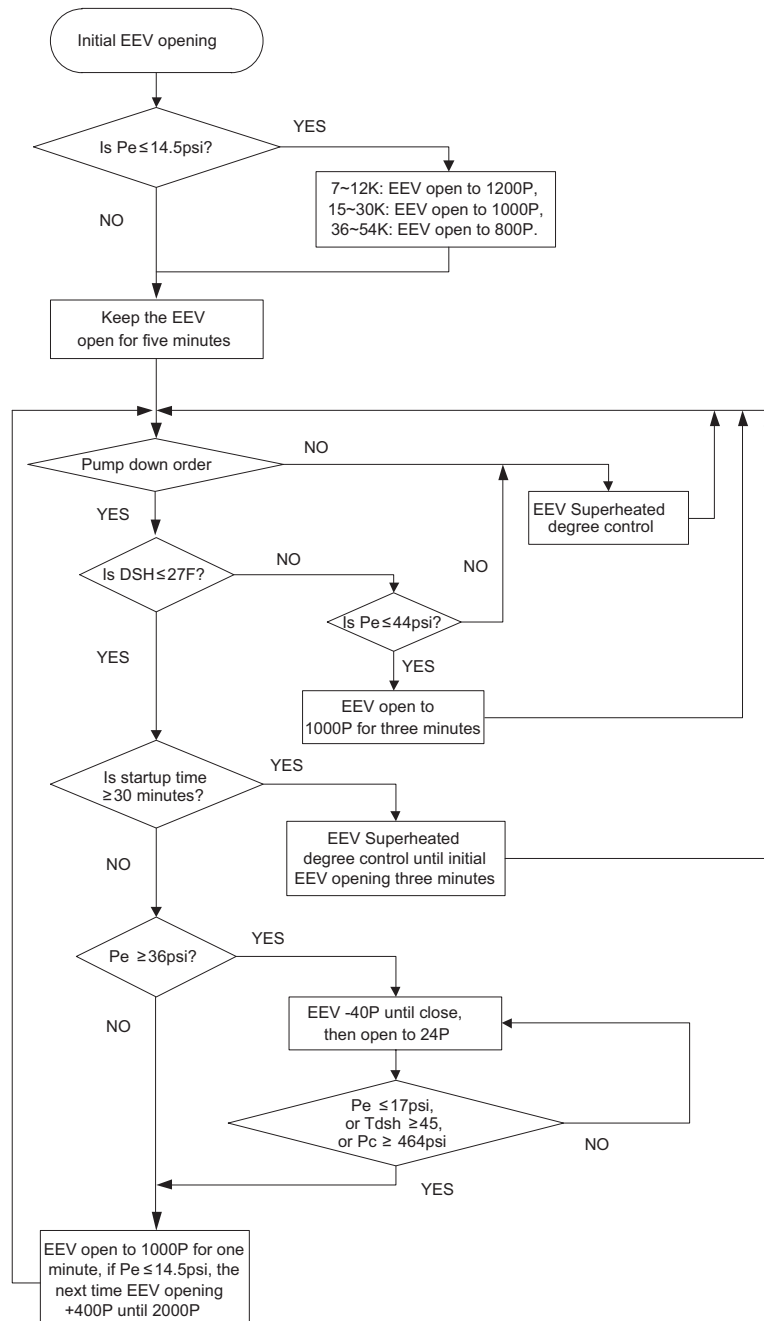


Fig. 16 —2000P EEV Operation Driver

SUPERHEAT CONTROL

This function is used to adjust the opening of the electronic expansion valve so that superheat (SH) will reach a targeted superheat value (SHS).

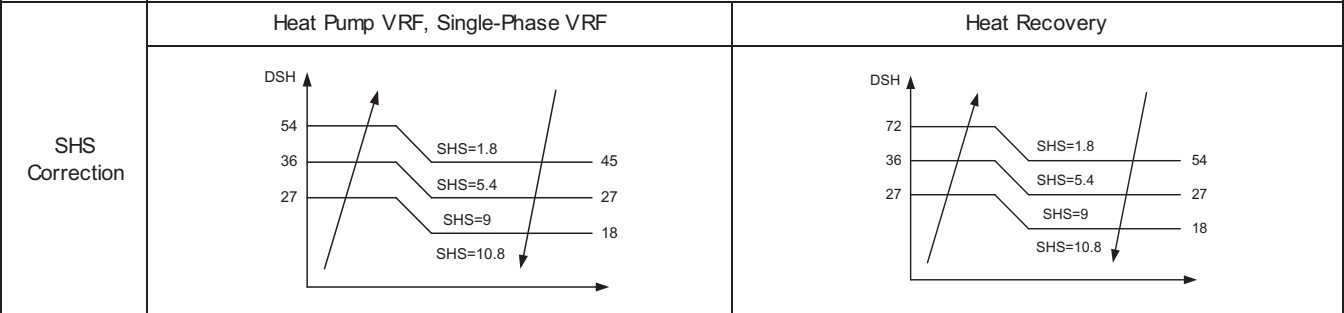
The superheat is calculated by reading the temperature of the gas pipe thermistor (T2B) and the temperature of the liquid pipe thermistor (T2A) of the indoor unit.

SH = T2B - T2A SH: Evaporator outlet superheat (°F)
SHS: Target SH value T2B: Indoor unit gas pipe temperature (°F)
T2A: Indoor unit liquid pipe temperature (°F)
DSH: Discharge superheat of outdoor unit

40VMC, F, H, I, L, M, R, U, V, W Series

Initial SHS = 9°F for the first ten minutes after outdoor unit starts. SHS corrections are made according to the following logic:

Table 8 —SHS Correction by DSH of Outdoor Unit



HEATING OPERATION

Startup and Stop Control of 500P EEV

When the indoor unit receives any of the following signal:

- signal to turn off
- indoor unit error signal
- indoor unit turns to thermo-off

The EEV’s control uses the following logic:

- If the outdoor unit shuts down without heating capacity requirement:
The EEVs keep the previous opening for three minutes.
Then EEVs conduct 300P opening (EEV whose opening is not equal to 0 will close to 0P first, then open to 300P).
- If the heating capacity requirement of the outdoor unit is not equal to 0:
The EEVs keep previous opening for 25 seconds after the indoor unit turns off, and then close to -16P to reset the opening and open to 72P (Standby).

When the indoor unit receives the signal to turn ON, the EEV’s control uses the following logic:

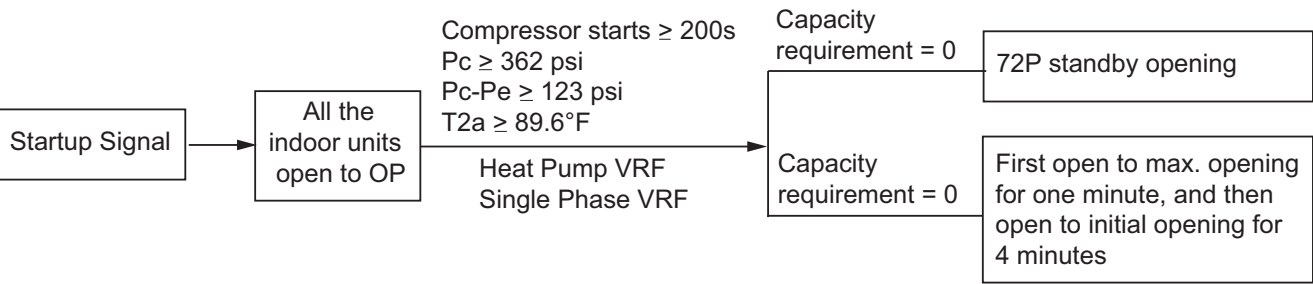


Fig. 18 —For Heat Pump and Single Phase-VRF

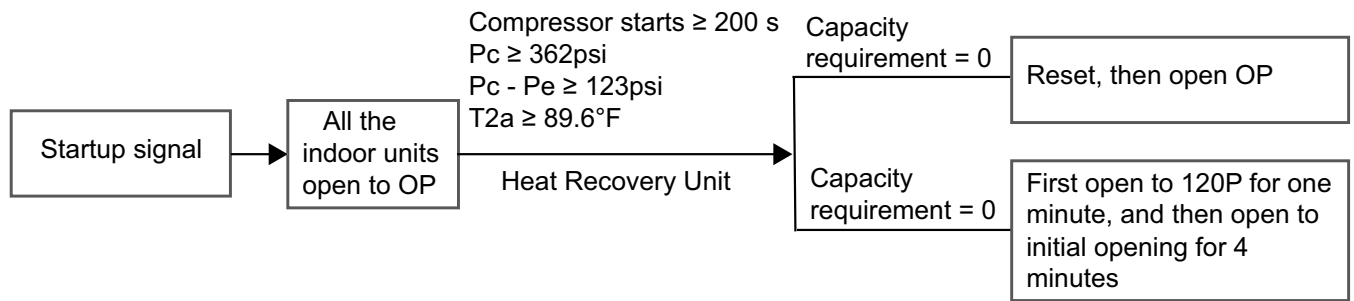


Fig. 19 —For Heat Recovery Outdoor Unit

Table 9 —List of 500P EEV Valve Opening in Heating Mode

CAPACITY INDEX	INITIAL OPENING		MINIMUM OPENING		MAXIMUM OPENING	
	HEAT PUMP AND SINGLE PHASE VRF	HEAT RECOVERY	HEAT PUMP AND SINGLE PHASE VRF	HEAT RECOVERY	HEAT PUMP AND SINGLE PHASE VRF	HEAT RECOVERY
7~24	400	330	144	120	480	480
30~54	400	330	200	160	480	480

Start and Stop Control of 2000P EEV

When the indoor unit receives any of the following signal:

- Signal to turn off
- Indoor unit error signal
- Indoor unit turns to thermo-off

The EEV's control uses the following logic:

- If the outdoor unit shuts down without heating capacity requirement:
The EEVs keep the previous opening for three minutes. Then all EEVs conduct 1200P opening (EEVs whose opening is not equal to zero will close to 0P first, and then open to 1200P).
- If the heating capacity requirement of the outdoor unit is not equal to 0:
The EEVs keep the previous opening for 25 seconds after the indoor unit turns off, and then close to -40P to reset the opening and open to 224P (Standby).

When the indoor unit receives the signal to turn on, the EEV's control uses the following logic:

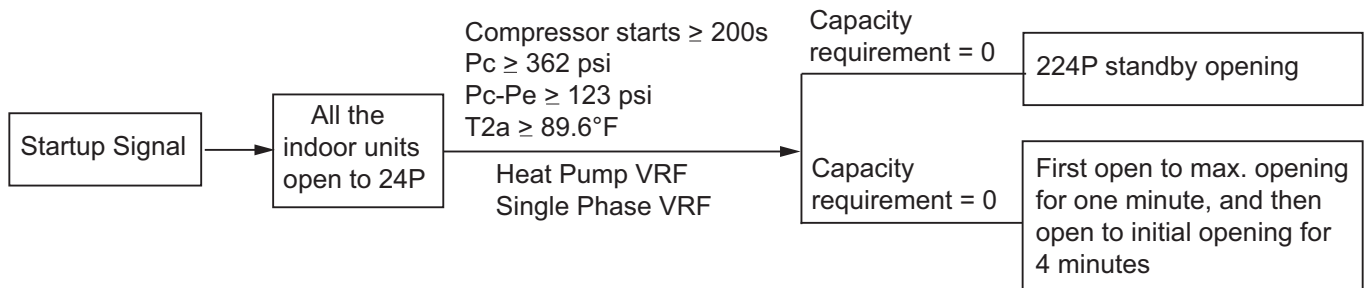


Fig. 20 —For Heat Pump Capacity

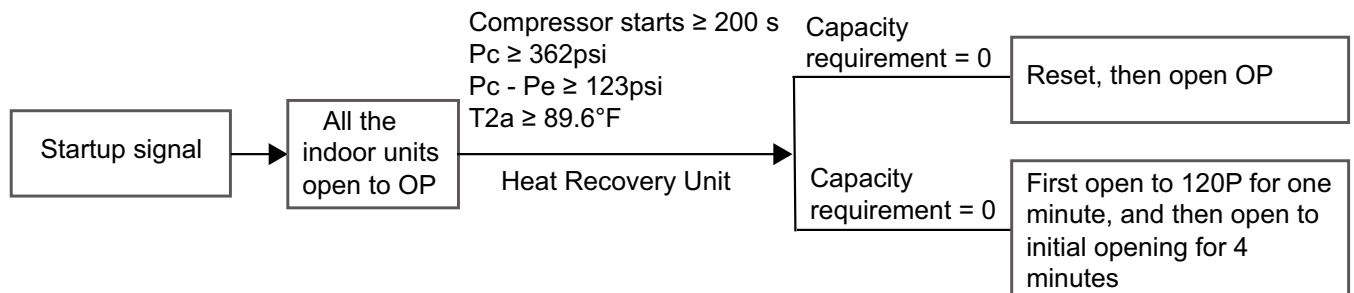


Fig. 21 —For Heat Recovery Outdoor Unit

Table 10 —List of 2000P EEV Valve Opening in Heating Mode

CAPACITY INDEX	INITIAL OPENING	MINIMUM OPENING	MAXIMUM OPENING
≥48	1400	700	2000
36	1400	700	2000
24~30	1000	500	2000
15~18	600	500	2000
≤12	600	500	2000

SUBCOOLING CONTROL — This function is used to adjust the opening of the electronic expansion valve (EEV) so that subcooling (SC) will reach the target subcooling value (SCS).

Subcooling is calculated as the difference between the condensing temperature (Tc) and inlet pipe temperature (T2A) on the indoor unit.

$$SC = T_c - T_{2A}$$

SCS: Target subcooling value

SC: Evaporator outlet subcooling (°F)

Tc: Condensing temperature (°F)

T2A: Inlet pipe temperature (°F)

40VMC, F, H, I, L, M, R, U, V, W Series

Initial SCS = 9°F in the first ten minutes after the outdoor unit starts up.

The SCS corrections are made according to the following logic:

1. SCS = 9°F in test operation, trial operation, and forced heating operation.
2. Lack of refrigerant signal = OFF, SCS control uses the follow logic:

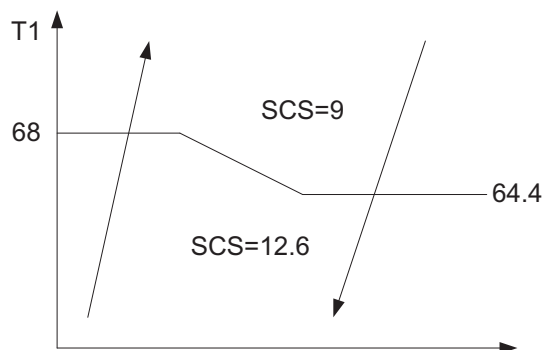


Fig. 22 —40VMC, F, H, I, L, M, R, U, V, W Series

SCS' = the preceding SCS in the picture above.

Lack of refrigerant signals = ON, SCS = SCS' + 3.6

3. If only one or two indoor units in the system are in heating operation, the EEV opening of these indoor units is forced to maximum and fixed.

LOUVER CONTROL OPERATION

This control feature allows the user to set the air flow direction by controlling the position of the louver and discrete motor steps as shown below. The range of air flow direction varies based on the indoor unit style.

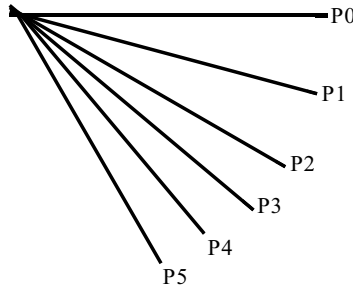


Fig. 23 —Louver Position

Table 11 —Louver Position (40VMC, F, W)

INDOOR UNIT	OPERATION MODE	POSITION					SWING		FACTORY SETTING	STOP
		P0	P1	P2	P3	P4	P0	P4		
40VMF	Cooling	15	30	40	50	60	15	60	P2	0
	Heating	15	30	40	50	60	15	60	P4	0
40VMC	Cooling	200	230	260	290	318	200	318	P2	0
	Heating	200	230	260	290	318	200	318	P4	0
40VMW	Cooling	61	65	75	85	93	61	93	P1	0
	Heating	68	80	90	100	110	68	110	P4	0

Table 12 —Louver Position (40VMU, 40VMI)

INDOOR UNIT	OPERATION MODE	POSITION (VERTICAL ANGLE)					SWING		FACTORY SETTING	STOP		RANGE OF HORIZONTAL ANGLE
		P0	P1	P2	P3	P4	P0	P4		VERTICAL ANGLE	HORIZONTAL ANGLE	
40VMU	Cooling	50	57	65	72	80	50	80	P3	0	32	[5,64]
	Heating	80	87	95	105	110	80	110	P4	0	32	[5,64]
40VMU *	Cooling	55	62	70	77	85	55	85	P3	0	60	[10,100]
	Heating	80	87	95	105	110	80	110	P4	0	60	[10,100]
40VMI (05, 07, 09, 12)	Cooling	25	43	60	70	80	25	80	60	0	/	/
	Heating	25	43	60	70	80	25	80	60	0	/	/
40VMI (15, 18, 24)	Cooling	25	43	60	70	80	25	80	60	0	48	[3, 93]
	Heating	25	43	60	70	80	25	80	60	0	48	[3, 93]

* 40VMU048---3 only

OPERATION OF FAN IN AUTO FAN MODE

When the fan speed mode is set to Auto, the fan will run at constant speed for three minutes before determining the range based on supply air and evaporator pipe temperature. Fan speed control is based on the following tables:

Table 13 —Fan Speed Operation in the First Three Minutes

RANGE	COOLING OPERATION	$\Delta TR < 21.6^{\circ}\text{F}$	$21.6^{\circ}\text{F} \geq \Delta TR < 36^{\circ}\text{F}$	$\Delta TR \geq 36^{\circ}\text{F}$
	$\Delta TA = T1 - TS$	$\Delta TR = TS - T2A$		
1	$\Delta ta \geq 4.5^{\circ}\text{F}$	High	High	High
2	$2.7^{\circ}\text{F} \geq \Delta ta < 4.5^{\circ}\text{F}$	High	High	Medium
3	$0.9^{\circ}\text{F} \geq \Delta ta < 2.7^{\circ}\text{F}$	High	Medium	Medium
4	$\Delta ta < 0.9^{\circ}\text{F}$	Medium	Medium	Medium

RANGE	COOLING OPERATION	$\Delta TR < 21.6^{\circ}\text{F}$	$21.6^{\circ}\text{F} \geq \Delta TR < 36^{\circ}\text{F}$	$\Delta TR \geq 36^{\circ}\text{F}$
	$\Delta TA = T1 - TS$	$\Delta TR = TC - TS$		
1	$\Delta ta \geq 4.5^{\circ}\text{F}$	High	High	High
2	$2.7^{\circ}\text{F} \geq \Delta ta < 4.5^{\circ}\text{F}$	Medium	Medium	Medium
3	$0.9^{\circ}\text{F} \geq \Delta ta < 2.7^{\circ}\text{F}$	Medium	Low	Medium
4	$\Delta ta < 0.9^{\circ}\text{F}$	Medium	Low	Low

T1: Room or return air temperature

T2A: Inlet pipe temperature

TS: Target room temperature

Tc: Condensing temperature

ta: Air side temperature

tr: Refrigerant side temperature

FAN SPEED CONTROL AFTER THE FIRST THREE MINUTES

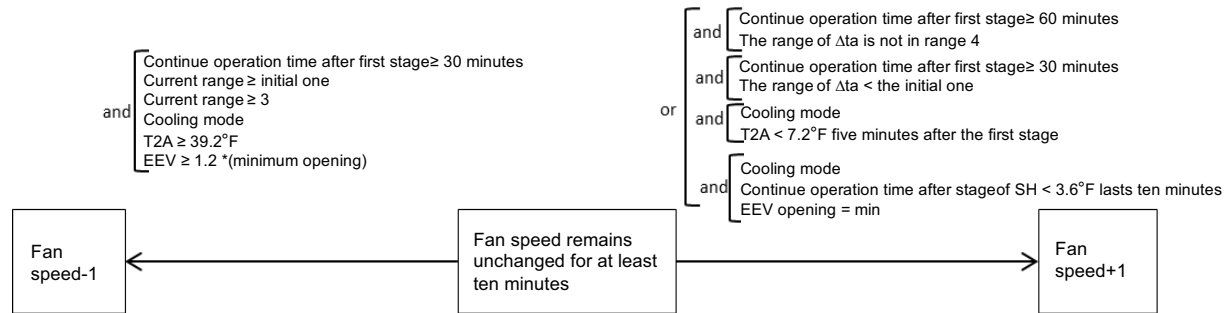


Fig. 24 —Cooling Operation

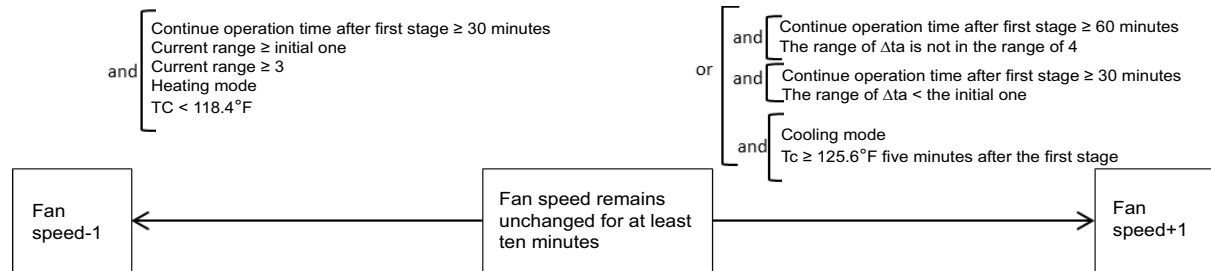


Fig. 25 —Heating Operation

INDOOR UNIT AND OUTDOOR UNIT OPERATION MODE

Operating mode of indoor unit should be the same as outdoor unit. If not, a mode conflict error will be displayed on indoor unit.

40VMC, F, H, I, L, M, R, U, V, W Series

Table 14 —Heat Pump or Single-Phase

OUTDOOR UNIT OPERATION MODE	INDOOR UNIT OPERATION MODE		
	COOLING OPERATION	AUTO/FAN/DRY	HEATING OPERATION
OFF	-	-	-
Cooling *1	OK	OK	Mode conflict
Heating *1	Mode conflict	Mode conflict	OK
Forced Cooling	OK	OK	N/A
Forced Heating	N/A	N/A	OK

*1 Mode conflict on indoor units operating in a different mode than the outdoor unit.

Table 15 —Heat Recovery

OUTDOOR UNIT OPERATION MODE	INDOOR UNIT OPERATION MODE		
	COOLING OPERATION	AUTO/FAN/DRY	HEATING OPERATION
OFF	-	-	-
Cooling *2	OK	OK	OK
Heating *2	OK	OK	OK
Forced Cooling	OK	OK	N/A
Forced Heating	N/A	N/A	OK

*2 Indoor units connected to same port on MDC have the same operating mode.

40VMA Series

Table 16 —For Heat Pump or Single-Phase

OUTDOOR UNIT OPERATING MODE	INDOOR UNIT OPERATING MODE		
	COOLING OPERATION	FAN	HEATING OPERATION
OFF	-	-	-
Cooling	OK	OK	Mode conflict
Heating	Mode conflict	OK	OK
Forced Cooling	OK	OK	N/A
Forced Heating	N/A	N/A	OK

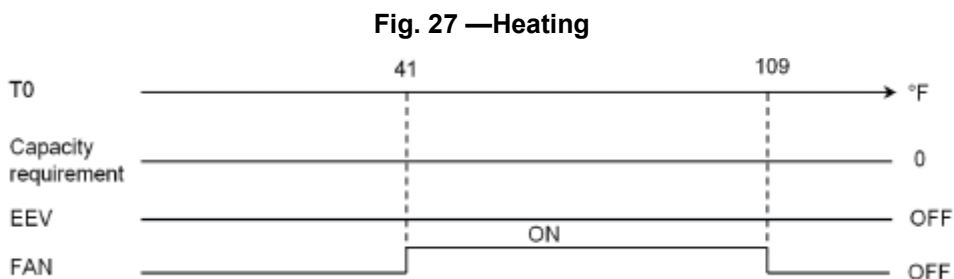
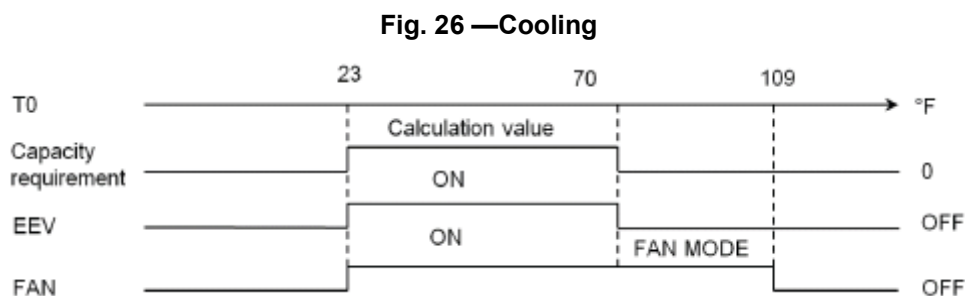
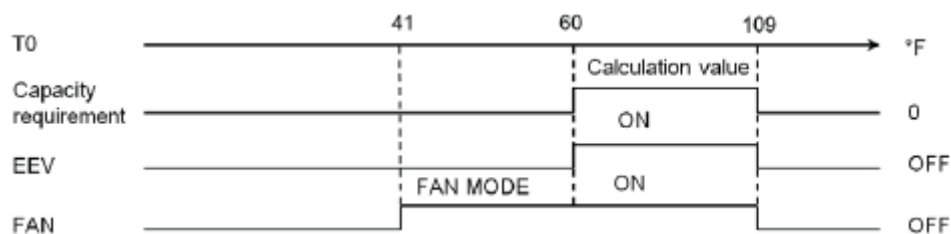
*1 Mode conflict on indoor units operating in different modes than the outdoor unit.

Table 17 —Heat Recovery

OUTDOOR UNIT OPERATING MODE	INDOOR UNIT OPERATING MODE		
	COOLING OPERATION	FAN	HEATING OPERATION
OFF	-	-	-
Cooling *2	OK	OK	OK
Heating *2	OK	OK	OK
Forced Cooling	OK	OK	N/A
Forced Heating	N/A	N/A	OK

*2 Indoor units connected to same port on MDC have the same operating mode.

Even though the outside air unit is in mode conflict, it will operate fan mode if the condition is satisfied (T0 is between 41°F and 109°F), but the mode conflict code (dd) will always be displayed.



40VMZ Series

Table 18 —Heat Recovery

OUTDOOR UNIT OPERATING MODE	INDOOR UNIT OPERATING MODE		
	COOLING OPERATION	FAN	HEATING OPERATION
OFF	-	-	-
Cooling	N/A	OK	OK
Heating	N/A	OK	OK
Forced Cooling	N/A	OK	N/A
Forced Heating	N/A	N/A	OK

When the indoor unit is in cooling mode, the drain pump operation is on. If the indoor unit stops or changes to another mode, the drain pump runs for 40 seconds before turning OFF.

- The float switch is tripped when the water level rises to a certain level within the drain pan.

- The float switch resets when the water level drops below a certain level in the drain pan.

The pump keeps its previous operating condition for another one minute, and then goes to normal operating conditions. Otherwise, the thermostat turns off and returns an error if the water level does not decrease in three minutes. The preset thermostat mode operation will not continue until the float switch is reset.



FREEZE PROTECTION

Freeze protection control is only activated in cooling or dry operation mode. When freeze protection is activated, the cooling demand turns to zero. The fan speed does not change and the electronic expansion valve is fully closed.

- Freeze protection is activated when the inlet pipe temperature (T2A) is $< 30.2^{\circ}\text{F}$ for 40 minutes or $< 23^{\circ}\text{F}$ for 10 minutes.
- Freeze protection is deactivated when the inlet pipe temperature (T2A) is $> 44.6^{\circ}\text{F}$ for 10 minutes or $> 39.2^{\circ}\text{F}$ for 20 minutes.

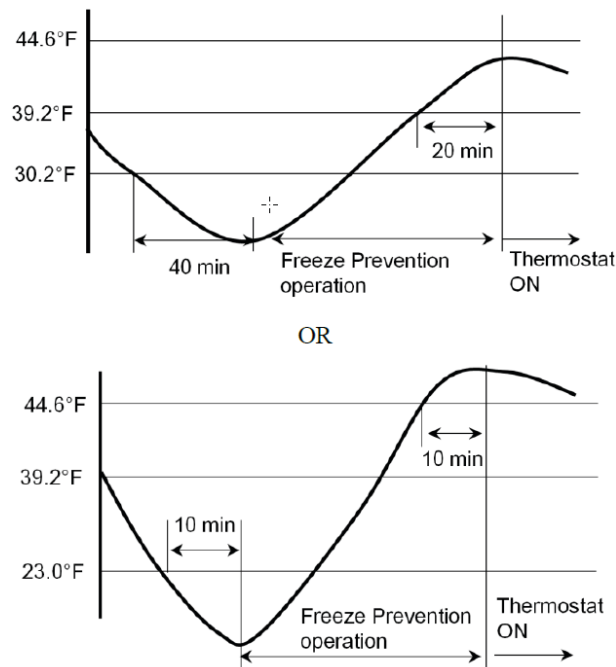


Fig. 31 —Freeze Protection

Before freeze protection operation, the compressor will stop for a period of time before restarting.

COLD BLOW PROTECTION DURING HEATING OPERATION

Cold Blow Protection is only available in heating operation and prior to other control modes (i.e. Defrost and Oil Recovery).

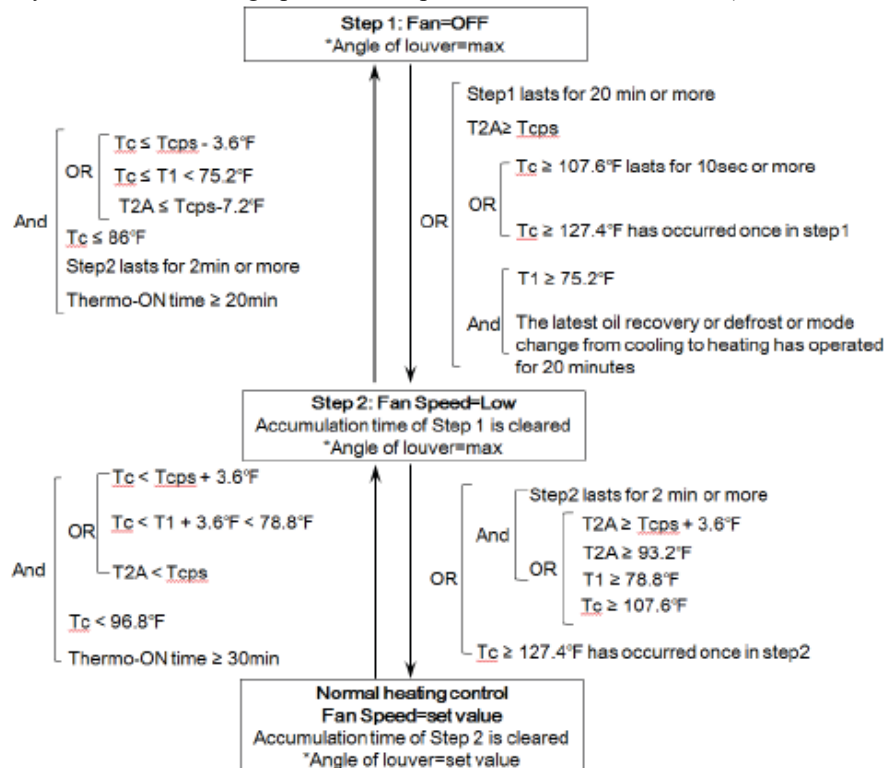


Fig. 32 —40VMC, F, H, I, L, M, R, U, V, W Series

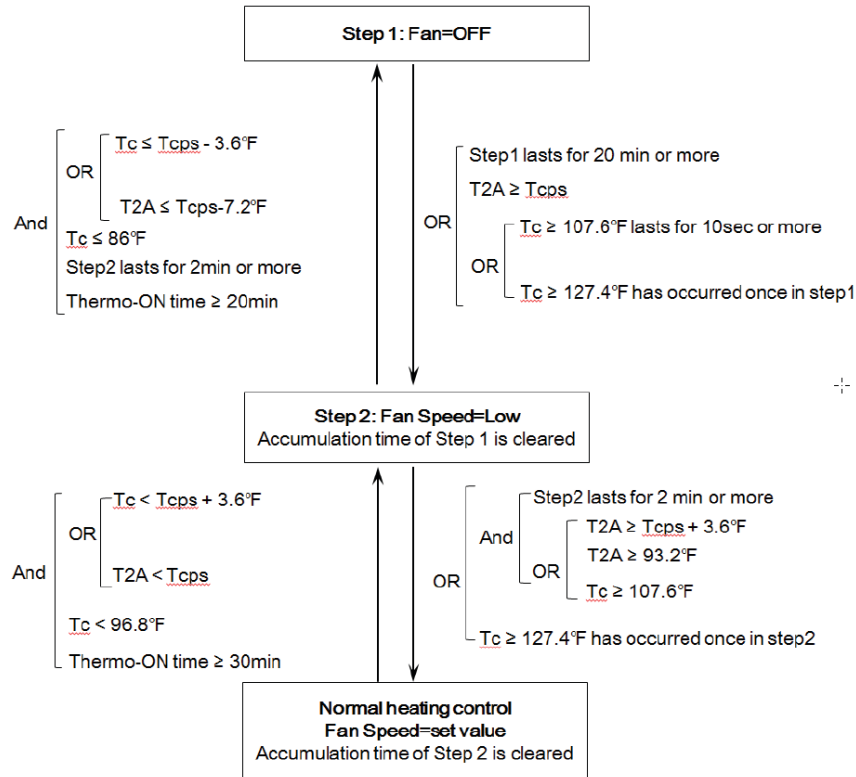


Fig. 33 —40VMA Series

Tc: Condensing temperature for Heat Pump

Saturation temperature of PS1 at main MDC unit for Heat Recovery

Tcps: Cold Blow Protection is activated at temperature: 50°F, 59°F, 68°F, 75.2°F, 82.4°F (Factory setting: 68°F)

The louver position is only valid for indoor units with louver function.

The Cold Blow function temperature can be adjusted using the wired remote controller.

HEATER CONTROL — The heater control is conducted as follows:

- Normal Control
While in heating operation, the heater control (ON/OFF) uses the following logic.

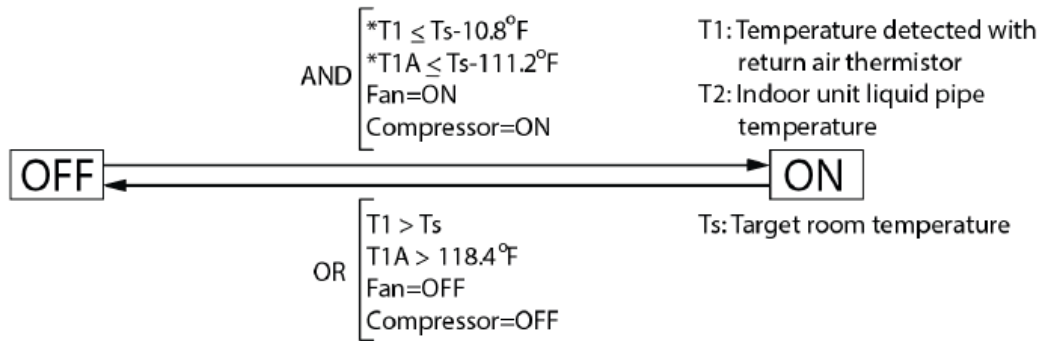


Fig. 34 —Heater Control Logic

NOTE: The requirement is invalid while the remote controller receives fast check instruction.

- Fan Previous Operation
To protect the heater, the fan conducts the previous operation for fifteen seconds after it turns off.
- Close Operation
The heater will never open if it was set to close from the remote controller.

OPERATION WITH INDOOR CAPACITY OVERLOAD

$$\text{Operating Combination Ratio} = \frac{\text{Total capacity index of the operating indoor units}}{\text{Capacity index of the outdoor unit}}$$

When the operating combination ratio is > 120%, the outdoor unit transmits an overload operation signal to indoor units. All indoor units* conduct the following operations until the running combination ratio < 105%:

- Enforced low speed for all operating indoor units except for the ones in fan mode.
- The maximum opening of the electronic expansion valves decreases to 1200P for 2000P (350P for the 500P).

It will never go to overload operation when the Heat Recovery system is in simultaneous heating and cooling mode.

* If the fourth code of SW1 is set to ON and the address is set to 63#, the Mode Priority indoor unit is excluded. Only one Mode Priority indoor unit is allowed to exist in a refrigerant system.

Refer to the dip switch settings in Appendix A of the Indoor Unit Installation Manual.

LOCKING FUNCTION

Part of the indoor unit functions can be locked from the host computer, but the locking instruction affects the remote controller because the indoor unit will keep its current status.

- **Startup locking**
If the startup function is locked, the indoor unit can only answer to the startup signal, and it ignores the shutdown signal from the remote controller.
- **Shutdown locking**
If the shutdown function is locked, the indoor unit can only answer to the shutdown signal, and it ignores the startup signal from remote controller.
- **The lowest cooling temperature locking**
The host computer locks the lowest setting temperature for space in cooling mode. Therefore, the cooling thermostat only answers to the setting temperature, which is equal to or higher than the locked value. The locked value will be received instead of the setting temperature, which is lower than it for the indoor unit.
- **The highest heating temperature locking**
The host computer locks the highest setting temperature for space in heating mode. Therefore, the heating thermostat only answers to setting temperatures that are ≤ the locked value. The locked value will be received instead of the setting temperature, which is higher than the one for the indoor unit.
- **Fan speed locking**
Locks the fan speed setting.

EEV AND FAN

Table 19 —Oil Recovery*

OIL RECOVERY MODE	BEFORE OIL RECOVERY			OIL RECOVERY OPERATING		
				2000P EEV	500P EEV	FAN
	OPERATING	MODE	ENERGY DEMAND	OPENING	OPENING	
Cooling Operation	OFF	--	0	1200P	300P	OFF
	Error	--	0	1200P	300P	OFF
	Fan	--	0	1200P	300P	Keep unchanged
	Cooling thermo-ON	Cooling	Not 0	SH control	SH control	Keep unchanged
	Cooling thermo-OFF	Cooling	0	1200P	300P	Keep unchanged
Heating Operation *	Heating thermo-ON	Heating	Not 0	1504P	480P	OFF
	Heating thermo-OFF	--	0	1504P	480P	OFF
	Error	--	0	1504P	480P	OFF
	OFF	--	0	1504P	480P	OFF

* For Heat Recovery systems, oil recovery in heating operation is the same as the defrost operation.

Table 20 —Defrosting Operation (For Heat Recovery Only)

BEFORE DEFOSTING			DEFOST OPERATING						
			2000P EEV			500P EEV			FAN
OPERATING	MODE	ENERGY DEMAND	< 1 MIN	[1,3] MIN	≥ 3 MIN	< 1 MIN	[1,3] MIN	≥ 3 MIN	
Cooling Thermo-ON	Cooling	Not 0	800P	800P	1504P	120P	120P	300P	Keep unchanged
Cooling Thermo-OFF	Cooling	0	800P	800P	1504P	120P	120P	300P	Keep unchanged
Heating Thermo-ON	Heating	Not 0	504P	800P	1504P	72P	120P	300P	OFF
Heating Thermo-OFF	Heating	0	504P	800P	1504P	72P	120P	300P	OFF
OFF	None	0	800P	800P	800P	120P	120P	120P	OFF
Error	--	0	800P	800P	800P	120P	120P	120P	OFF
Fan	None	0	800P	800P	800P	120P	120P	120P	Keep unchanged

Table 21 —Defrosting Operation (For Heat Pump and Single Phase VRF Only)

BEFORE DEFOSTING			DEFOSTING OPERATING		
			2000P EEV	500P EEV	FAN
OPERATING	MODE	ENERGY DEMAND	OPENING	OPENING	
Heating Thermo-ON	Heating	Not 0	1504P	480P	OFF
Heating Thermo-OFF	Heating	0	1504P	480P	OFF
OFF	None	0	1504P	480P	OFF
Error	--		1504P	480P	OFF

When receiving the signal for defrosting completion, the opening of the heating thermo-ON indoor unit is 240P for 500P-Opening EEV and 960P for 2000P-EEV. It will remain like this for three minutes, and then go to normal control.

The thermo-OFF or fan mode indoor unit will recover standby or fan mode control after defrost completion.

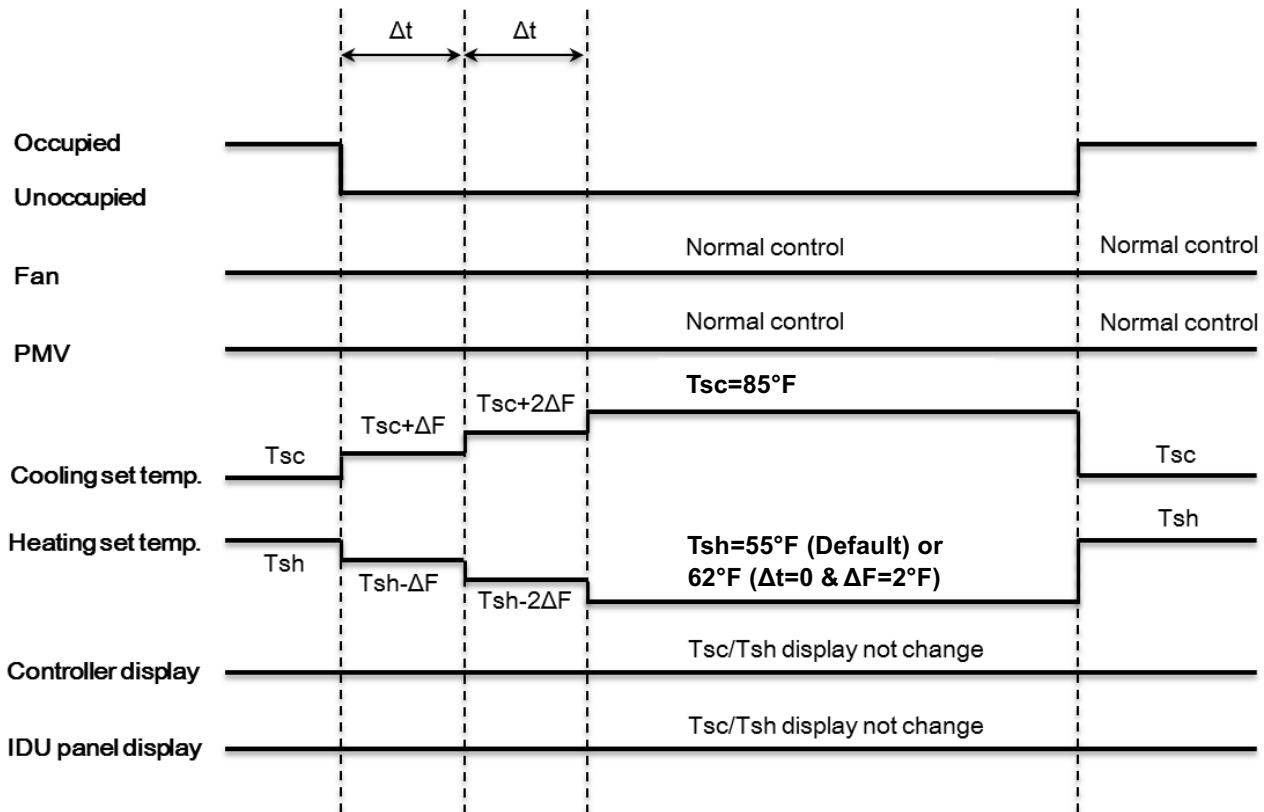


Fig. 35 —Defrosting Operation

Fan Speed Setting in Cooling Thermo-OFF

This can be set from the wired remote controller. The default setting is holding on the current speed.

Fan Speed Setting in Heating Thermo-OFF

It is invalid for Heat Pump and Mini-VRF systems to set fan speed in heating thermo-OFF, but for Heat Recovery systems, it can be set from the wired remote controller. The default setting is OFF.

DOUBLE SETTING OF TEMPERATURE

NOTE: This function is only for Heat Recovery systems.

The indoor unit can conduct auto mode described as specified heating and cooling temperature.

- Variation range of the setting temperature in auto-mode:
Cooling: 62°F to 86°F
Heating: 54°F to 86°F
- The Cooling Setting temperature (TSc) should be set before the Heating Set temperature (TSh), and the difference between TSc and TSh should satisfy the condition: $\Delta T2 = TSc - TSh \geq 0^\circ\text{F}$.
 - If $\Delta T2 \geq 3^\circ\text{F}$, $\Delta T1 = \Delta T3 = 1^\circ\text{F}$
 - If $0^\circ\text{F} \leq \Delta T2 < 3^\circ\text{F}$
 - $\Delta T1 = 1^\circ\text{F}$ and $\Delta T3 = 3^\circ\text{F}$ while the indoor unit is in cooling mode, including cooling thermal-off or fan
 - $\Delta T1 = 3^\circ\text{F}$ and $\Delta T3 = 1^\circ\text{F}$ while the indoor unit is in heating mode, including heating thermal-off
- The wired controller setting temperature is used to calculate the capacity requirement in Auto mode.
- Temperature display in auto mode:
 - While the indoor unit mode is changed from cooling/heating mode to auto mode, the double setting temperature (cooling and heating) of auto mode is displayed on the controller.
 - While the indoor unit mode is changed from auto mode to cooling/heating mode, the double setting temperature TSc or TSh will be displayed on the controller for cooling or heating operation.
 - The factory double setting temperature for Heat Recovery systems is 75.2°F for cooling and 69.8 °F for heating.
 - The indoor unit changes its operation mode immediately the first time, but it needs a time interval* from the second time of operation mode change.

*15/30/60/90 minutes available from the remote controller.

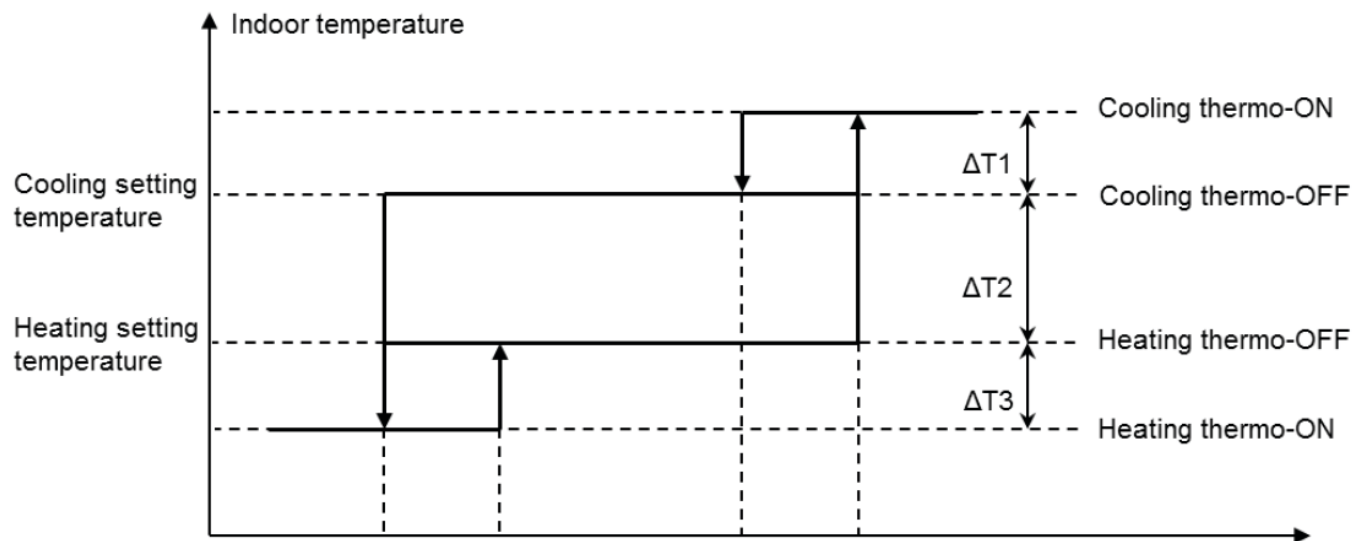


Fig. 36 —Operation Mode Change

SVD Control (Only Valid for Outside Air)

When the outdoor unit is operating as heating only or simultaneously cooling and heating (cooling main or heating main operation), and the outside air unit is without the heating capacity requirement (Stop, Heating thermo-off, or Fan in heating control), then SVD will be opened. Otherwise, it stays closed.

DRY CONTACT

The interface in the main board of the indoor unit is a dry contact board that can output up to four signals.

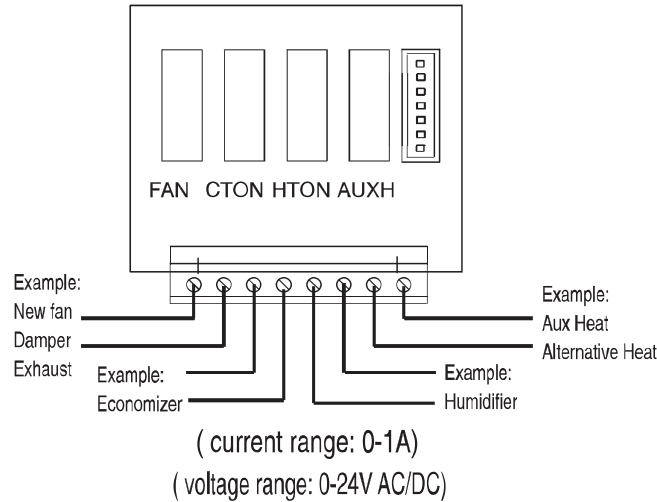


Fig. 37 —Dry Contact Board

- Dry contact 1-FAN is used to turn on the exhaust fan. Standard configuration is closed.
Closed Condition: The dry contact is set valid from the remote controller and the fan is turned on.
Open Condition: The fan is turned off or the dry contact is set invalid by the remote controller.
- Dry contact 2-CTON is used to bring in fresh air when the outside air temperature is lower than the inside temperature as economizer is connected. Standard configuration is closed.
Closed Condition: The dry contact is set to valid from the remote controller and the cooling thermo-ON.
Open Condition: Cooling thermo-OFF or dry contact is set to invalid by remote controller.
- Dry contact 3-HTON is used to humidify the room air when a humidifier is installed. Standard configuration is closed.
Closed Condition: The dry contact is set valid from the remote controller and heating thermo-ON.
Open Condition: Heating thermo-OFF or the dry contact is set invalid by the remote controller.
- Dry contact 4-AUXH is used to turn on the auxiliary heat source.

NOTE: Dry contact 4-AUXH is only suitable for indoor units except the 40VMA series.

1. The dry contact 4 closes while all the following requirements are met:
 - The indoor unit conducts heating mode or heating operation in auto mode.
 - The return air temperature T1 is lower than the setting temperature, Ts ($T_s - T_1 = 1^\circ\text{F}/2^\circ\text{F}/3^\circ\text{F}/4^\circ\text{F}/5^\circ\text{F}$). This can be set by the remote controller. The default setting is 3°F .
 - The indoor unit is in operation.
 - The ambient temperature T4 transferred from the outdoor unit is 1.8°F lower than the auxiliary heat source turning on the temperature set at the outdoor unit.
 - The dry contact function is enabled on the wired controller.
2. The dry contact 4 disconnects when any of the following requirements are met:
 - The operation mode of the indoor unit is not heating.
 - The indoor unit is not in operation.
 - T4 transferred from the outdoor unit is higher than the auxiliary heat source turning on the temperature.
 - The dry contact function is prohibited from the wired controller.
 - Heating thermo-OFF.
3. The dry contact 4 conducts time-delayed close while any of the following requirements are met:
 - The thermostat conducts the heating operation for the first time.
 - The setting temperature for the room rises and the ΔT_s is larger than 3°F .
 - Delay time can be adjusted by wired controller (15 minutes, 30 minutes, and 45 minutes). Factory setting is 15 minutes.
4. The control logic of dry contact 4:

Dry contact 4 can be set to Enabled or Disabled with the wired controller. The fan on the indoor unit can be set to ON. If the fan is set to ON, it runs at setting speed when dry contact 4 closes. Otherwise, it is Normal.

REMOTE CONTROLLERS

Wireless Remote Controller

Table 22 —Applicable Models for VRF Indoor Units

MODEL SERIES	ALL INDOOR UNITS
Remote Controller	40VM900001

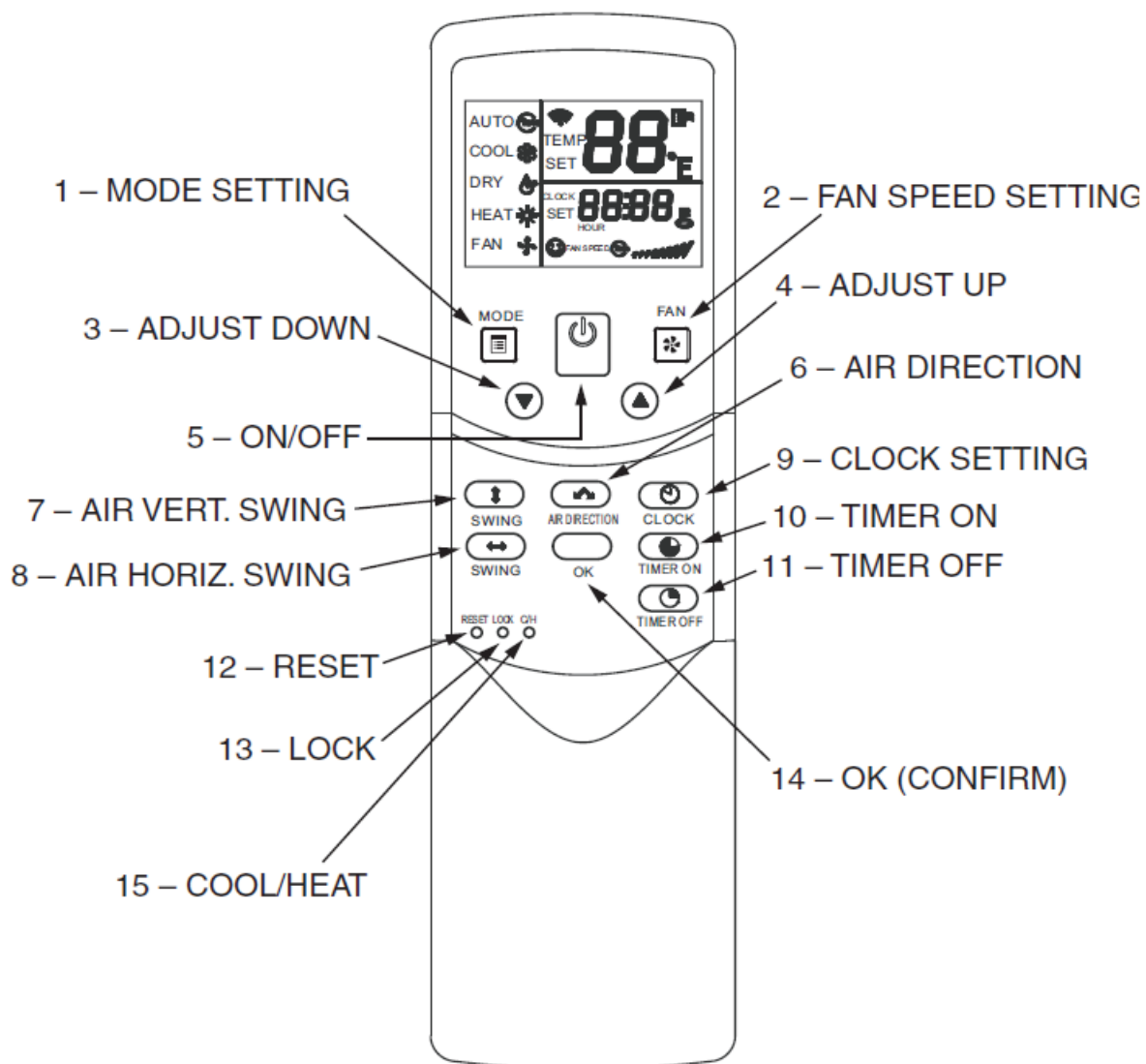


Fig. 38 —Names and Functions (40VM900001)

Address Setting

Each indoor unit must have a unique address that can be set from 0-63 for proper system operation.

Indoor unit addressing can be done from the remote controller. The entire system (outdoor units, indoor units, and MDC) are included, and should be powered on when setting an address by the remote controllers. There is no address for this unit if “FE” displays on the controller’s LED screen or on the indoor unit’s display board. After setting all indoor unit addresses, cut off the power supply of indoor units and power on again to clear this error.

The remote controller can also be used to set many additional functions on the indoor unit. For more details, refer to the Remote Controller’s Installation and Owner’s Manual.

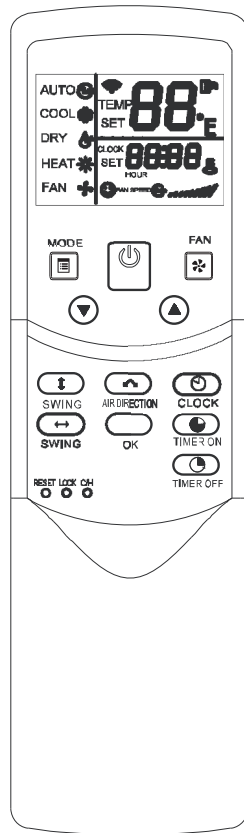


Fig. 39 —Wireless Remote Controller (40VM900001)

When using this controller, the user must maintain line of sight with the receiver on the indoor unit.

To use the controller:

1. Use a tool to press and hold the lock button for at least five seconds.
2. Press  to activate.
3. Click  or  to select any address you want to set.
4. Press  to send the setting.

To display the indoor unit address:

5. Use a tool to press and hold the lock button for at least five seconds.
6. Press  to query the addresses.

Wired Remote Controller

Table 23 —Applicable Models for VRF Indoor Units

MODEL SERIES	40VMF	40VMC	40VMI	40VMW	40VMM	40VMU	40VMH	40VMV	40VML	40VMR	40VMZ	40VMA	ERV
Remote Controller (Programmable Controller)	40VM900003, 40VM900013, 40VM910003												
Remote Controller (Non-Programmable Controller)	40VM900002, 40VM900012, 40VM910002											X	X

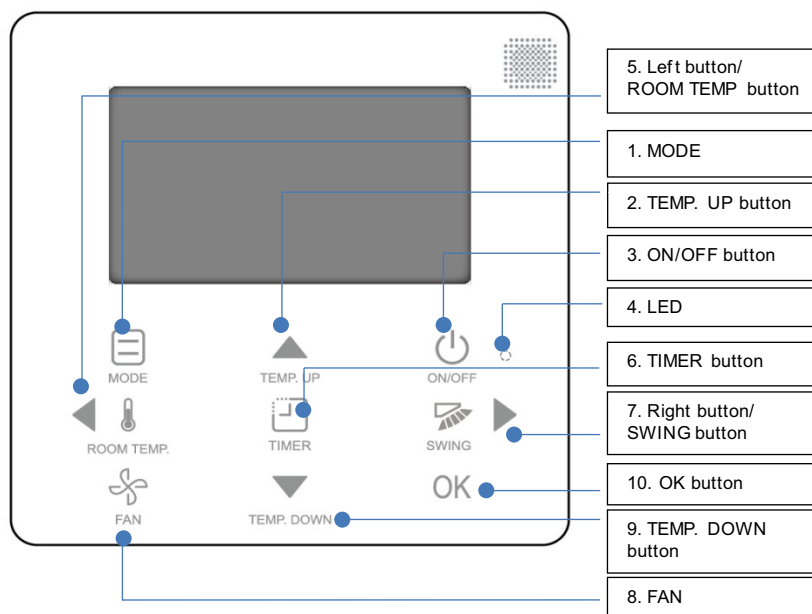


Fig. 40 —Names and Functions—40VM900002, 40VM900012, 40VM910002 (Non-Programmable Controller)

Table 24 —Functional Description

BUTTON	DESCRIPTION
1. MODE	Selects the running mode
2. TEMP. UP button	Increases the set temperature
3. ON/OFF button	Powers the IDU on/off
4. LED (green)	Stays solid green when the unit is powered on and blinks if there is an error
5. Left button/ROOM TEMP button	Checks the room temperature / selects options to the left
6. TIMER button	Open timer settings
7. Right button / SWING button	Sets the swing location and starts automatic swing/selects options to the right
8. FAN	Selects the running mode
9. TEMP. DOWN button	Reduces the set temperature
10. OK button	Confirms selection

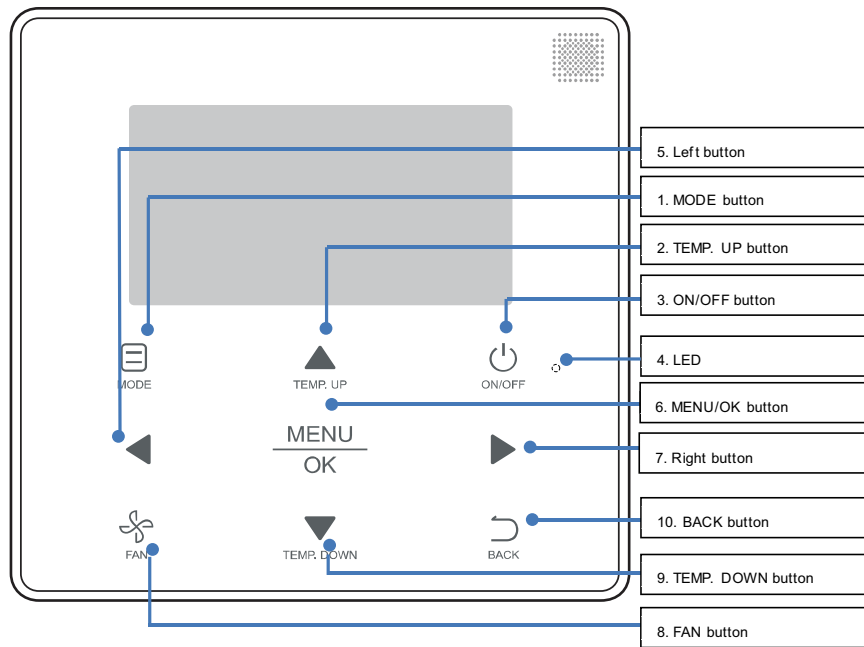


Fig. 41 —Names and Functions—40VM900003, 40VM900013, 40VM910003 (Programmable Controller)

Table 25 —Functional Description

BUTTON	DESCRIPTION
1. MODE	Selects the running mode
2. TEMP. UP button	Increases the set temperature
3. ON/OFF button	Powers the IDU on/off
4. LED (green)	Stays solid green when the unit is powered on and blinks if there is an error
5. Left button	Selects options to the left
6. MENU/OK button	Enters the menu/sub-menu; Confirms selection
7. Right button	Selects options to the right
8. FAN	Selects fan running speed
9. TEMP. DOWN button	Reduces the set temperature
10. BACK button	Returns to the previous level

Table 26 —Main Functions

MAIN MENU	SERVICE SETTINGS MENU
Louver	Room temperature sensor location
Schedule	Room temperature sensor offset
Date and time	Set point limit
Daylight saving time	Thermal sensitivity adjustment
Display configuration	Changeover time
Room temp	Anti-cold blow
Lock	Terminal fan configuration
Operation lamp	Thermo-off fan speed setting
Touch tone	Static pressure
Advanced information	Occupancy sensor, Dry contact, IDU addressing

ADDRESS SETTING

Non-Programmable Controller (40VM900002, 40VM900012, 40VM910002)

NOTE: You can only connect one wired controller to an indoor unit.

1. Press ROOM TEMP and SWING together for three seconds.

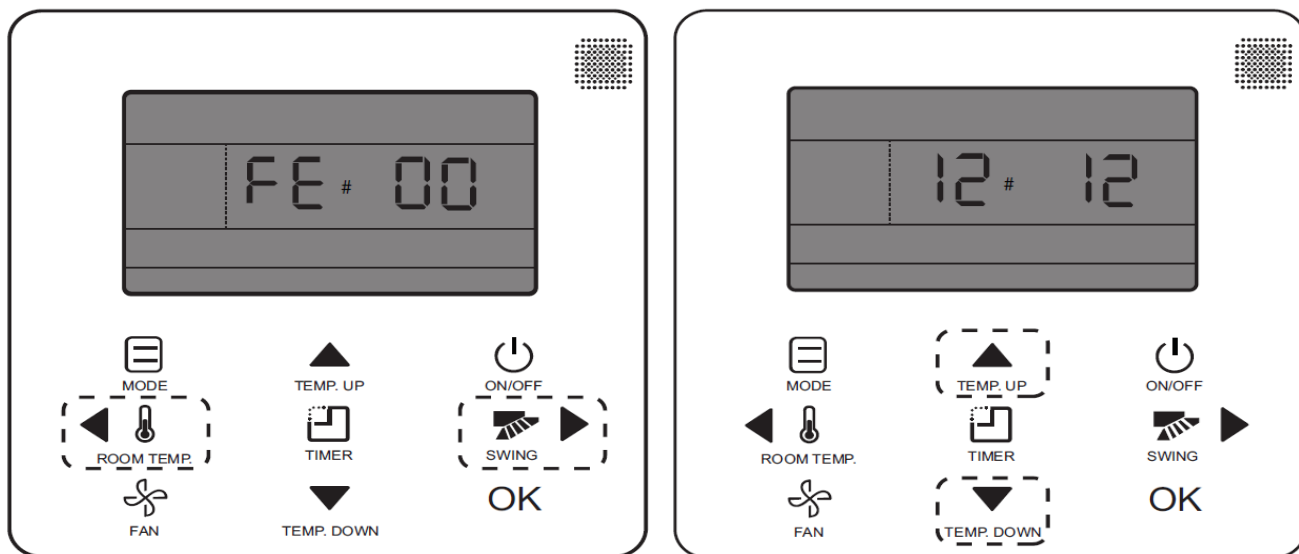


Fig. 42 —Non-Programmable Controller (40VM900002, 40VM900012, 40VM910002)

It displays FE# 00 if there is no address for this IDU. Otherwise, it displays the current address of the indoor unit.

2. Click **TEMP.UP** or **TEMP.DOWN** to change 00 to address number you want to set.

Programmable Controller (40VM900003, 40VM900013, 40VM910003)

NOTE: The address can only be set when the wired controller is connected to one indoor unit.

1. Press FAN and BACK simultaneously for five seconds to enter the interface for parameter settings.

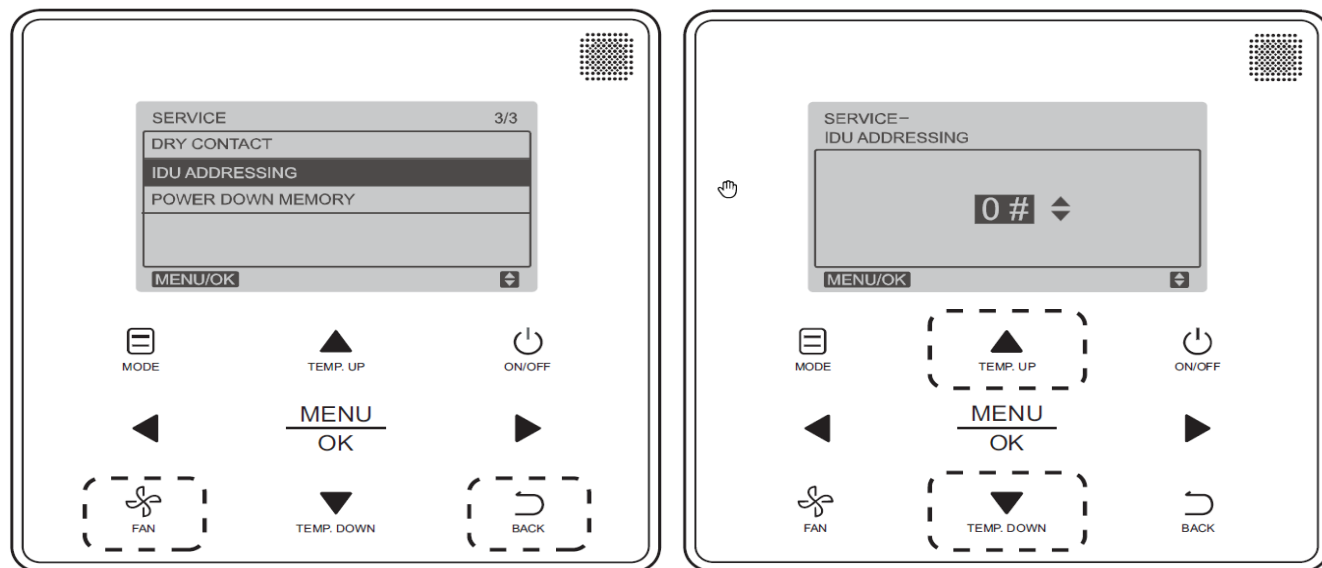


Fig. 43 —Programmable Controller (40VM900003, 40VM900013, 40VM910003)

2. Press TEMP.UP or TEMP.DOWN to move the cursor down, and choose IDU ADDRESSING.
3. Select MENU/OK to enter this setting.
4. Press TEMP.UP or TEMP.DOWN to choose the address number you want to set.
5. Select MENU/OK to send this address to the IDU.
6. Press OK to confirm and exit the setting interface.
7. Press BACK twice, or wait 30 seconds to automatically exit the parameter settings menu.

Touch Screen Controller (40VM900005)

1. Touch  to select the Service interface.

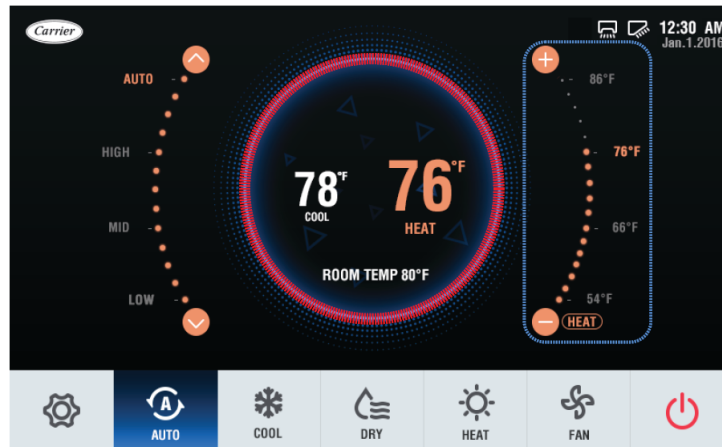


Fig. 44 —Touch Screen Controller (40VM900005)

2. On the “Service” menu, input the password to access the Service setting.
The initial password is “0000,” which can be changed.
The administrator code cannot be changed, so contact your local distributor if necessary.

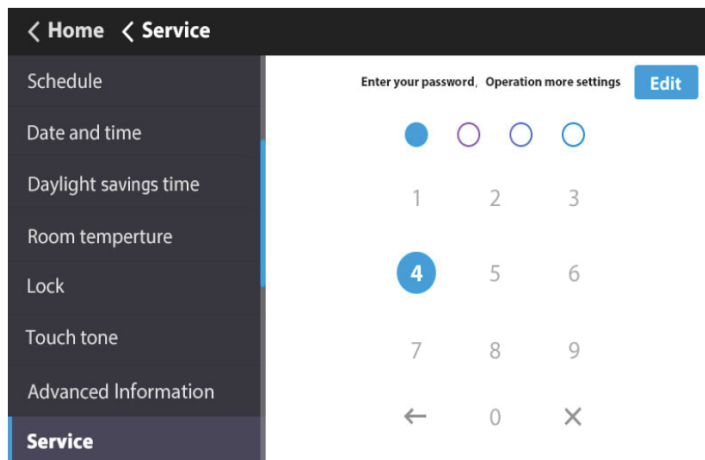


Fig. 45 —Service Menu

3. Select “IDU addressing”

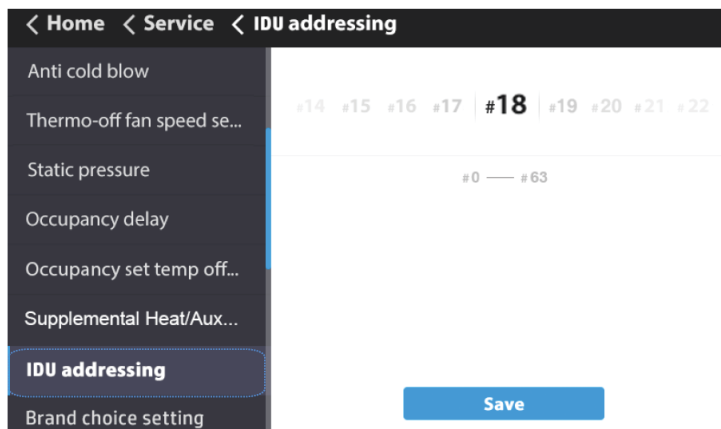


Fig. 46 —IDU Addressing

4. Scroll to the address number you want to set for the indoor unit.
5. Touch the Save icon to send current address to the IDU.

SERVICE MODE

Non-Programmable Controller (40VM900002, 40VM900012, 40VM910002)

1. Press and hold MODE and FAN together for five seconds to enter the interface for parameter settings.

Parameter settings are classified into 1G code and 2G code.

1G indicates the parameter category, and 2G indicates parameter content.

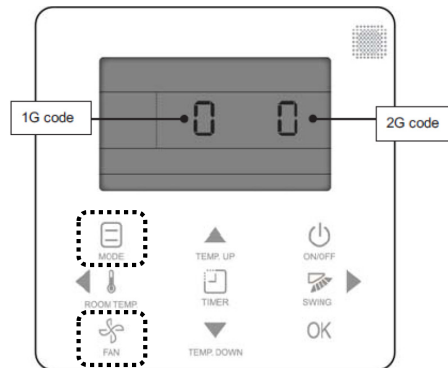


Fig. 47 —Non-Programmable Controller (40VM900002, 40VM900012, 40VM910002)

2. To select the 1G code, press the Left (Room Temp) and Right (Swing) buttons.
3. To select the 2G code, press TEMP. UP and TEMP. DOWN buttons.

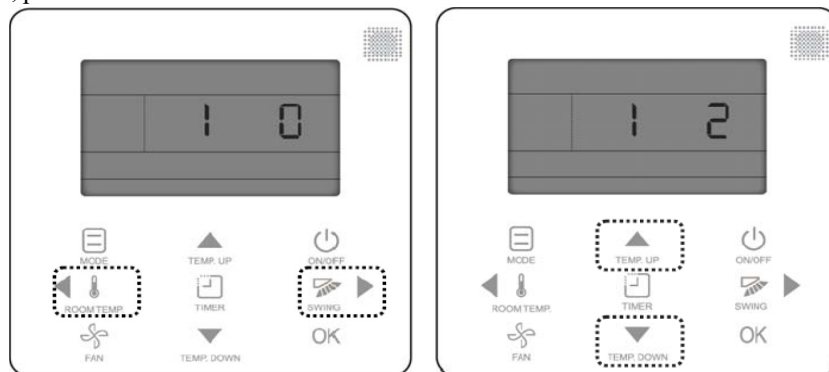


Fig. 48 —Temperature Settings

4. Press OK or wait 15 seconds to confirm the setting automatically and exit parameter settings.

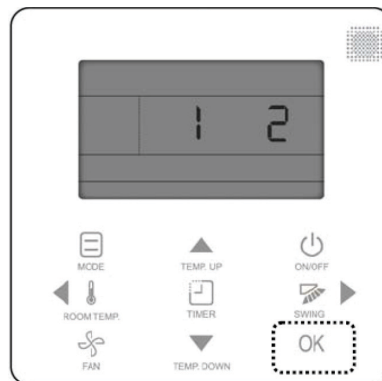


Fig. 49 —Confirm Settings

Table 27 —1G and 2G Code Descriptions

1G CODE	PARAMETER CATEGORY	2G CODE	DESCRIPTION
0	Selection room temperature sensor	0	Uses room temperature sensor on the IDU
		1 (default)	Uses the room temperature sensor on the wired controller
1	Room temperature sensor temperature compensation of wired controller	(0 to 10)	0:-5°F, 1:-4°F, 2:-3°F, 3:-2°F, 4:-1°F, 5:0°F (default), 6:1°F, 7:2°F, 8:3°F, 9:4°F, 10:5°F
2	Setting the upper limit for heating	86°F (default), 85°F, 84°F...	Regulates the upper temperature limit for heating; the low temperature limit for heating is 54°F
3	Setting the lower limit for cooling	62°F (default), 63°F, 64°F...	Regulates the lower temperature limit for cooling; the upper temperature limit for cooling is 86°F
4	Selecting IDU capacity interval	0 (default)	Thermal on (1°F)
		1	Thermal on (2°F)
5	Auto mode delay switching time Δt	0 (default)	Δt = 15 minutes
		1	Δt = 30 minutes
		2	Δt = 60 minutes
		3	Δt = 90 minutes
6	Anti-cold blow setting/set the temperature when the heating fan stops	0 (default)	68°F
		1	50°F
		2	59°F
		3	75°F
		4	82°F
7	Fan off after a delay of Δt when the unit is off (reserved)	0 (default)	Δt = 4 minutes
		1	Δt = 8 minutes
		2	Δt = 12 minutes
		3	Δt = 16 minutes
8	Setting the fan speed in cooling standby mode	0	Turn off the fan
		1	Low
		2	Medium
		3	High
		E (default)	Maintain the current fan speed
9	Setting the fan speed in heating standby mode (Not available for heat pump systems)	0 (default)	Turn off the fan
		1	Low
		2	Medium
		3	High
		E	Maintain the current fan speed

1G CODE	PARAMETER CATEGORY	2G CODE	DESCRIPTION
10	Setting the IDU static pressure	(0 to 25)	0: 0 in WC (default) 1: 0.04 in WC 2: 0.08 in WC 3: 0.12 in WC 4: 0.16 in WC 5: 0.20 in WC 6: 0.24 in WC 7: 0.28 in WC 8: 0.32 in WC 9: 0.36 in WC 10: 0.40 in WC 11: 0.44 in WC 12: 0.48 in WC 13: 0.52 in WC 14: 0.56 in WC 15: 0.60 in WC 16: 0.64 in WC 17: 0.68 in WC 18: 0.72 in WC 19: 0.76 in WC 20: 0.80 in WC 21: 0.84 in WC 22: 0.88 in WC 23: 0.92 in WC 24: 0.96 in WC 25: 1.0 in WC
11	OCCUPANCY DELAY of Δt when nobody is sensed indoors	0 (default)	$\Delta t = 0$ minutes
		1	$\Delta t = 15$ minutes
		2	$\Delta t = 30$ minutes
		3	$\Delta t = 60$ minutes
12	Setting the opening temperature of dry contact 4; dry contact 4 is opened when the temperature is lower than the set temperature ΔT	0 (default)	$\Delta T = 1^{\circ}\text{F}$
		1	$\Delta T = 2^{\circ}\text{F}$
		2	$\Delta T = 3^{\circ}\text{F}$
		3	$\Delta T = 4^{\circ}\text{F}$
		4	$\Delta T = 5^{\circ}\text{F}$
13	Delayed closing setting of dry contact 4	0 (default)	Closed in 15 minutes
		1	Closed in 30 minutes
		2	Closed in 45 minutes
14	Whether the IDU is connected to a aux. heat source	0 (default)	No third-party heat source connected
		1	A third-party heat source connected
15	Fan control when the aux. heat source starts	0	Not turn on the fan forcedly
		1 (default)	Forcibly turn on the fan
16	Occupancy set temperature offset	0°F	/
		2°F	
		4°F (default)	
		6°F	
		8°F	
17	Occupancy delay function	0 (default)	Invalid
		1	Valid

Programmable Controller (40VM900003, 40VM900013, 40VM910003)

1. Press and hold FAN and BACK for five seconds simultaneously to enter the interface for parameter settings.

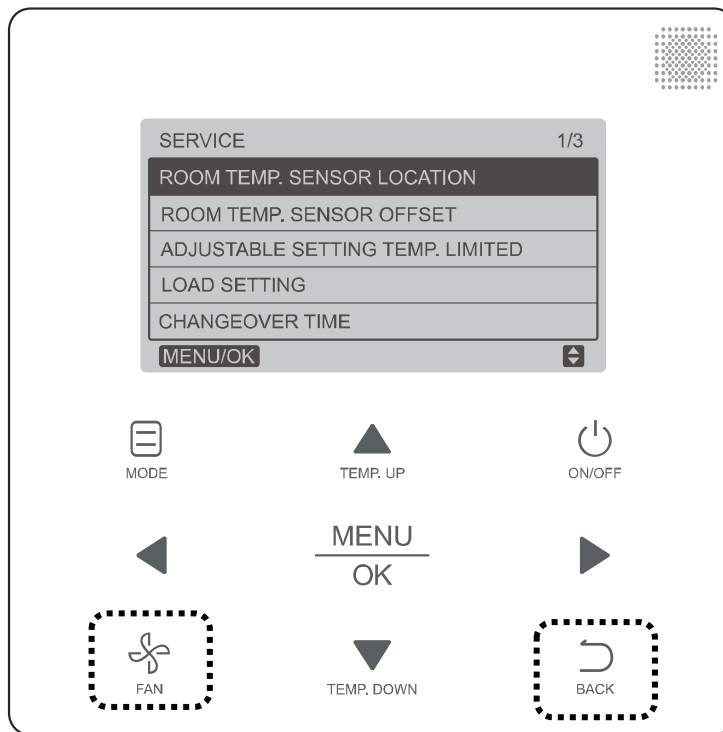


Fig. 50 —Programmable Controller (40VM900003, 40VM900013, 40VM910003)

2. Press TEMP. UP or TEMP. DOWN to move the cursor and select an entry.
3. Press MENU/OK to enter this setting.

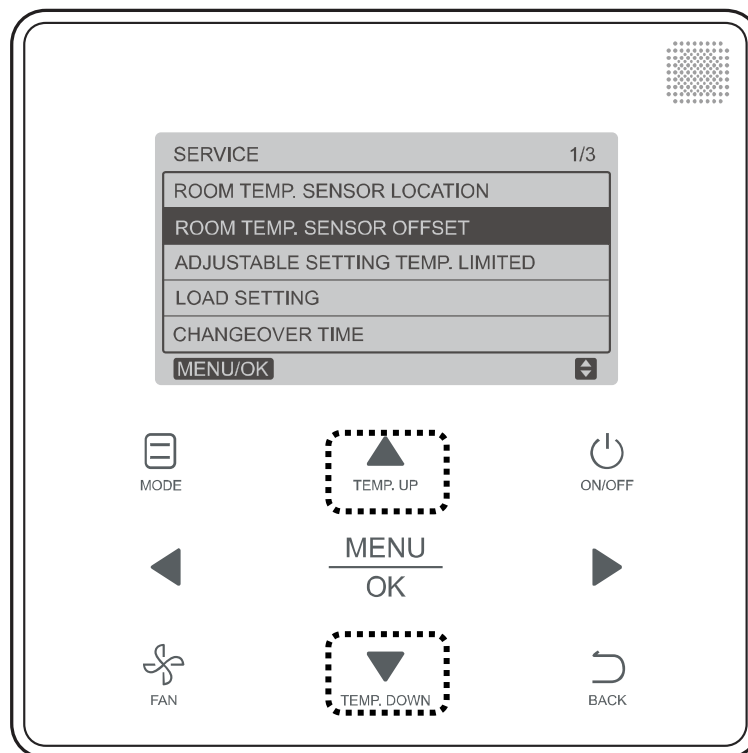


Fig. 51 —Temperature Setting

4. Press TEMP. UP or TEMP. DOWN to adjust the parameter.

5. Press MENU/OK or BACK to confirm the setting and return to the previous row.

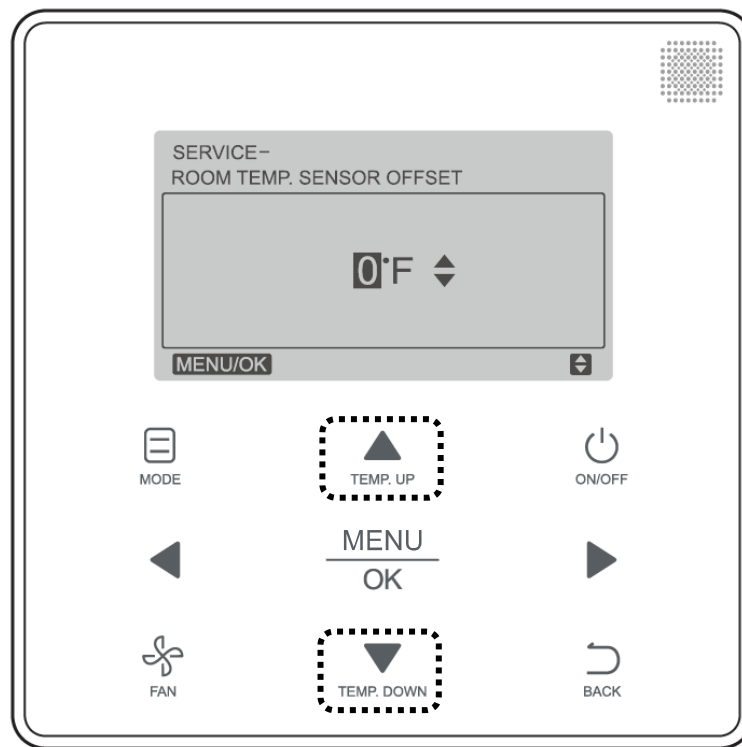


Fig. 52 —Confirm Settings

6. On the parameter settings screen, press BACK once or wait for 30 seconds to automatically exit parameter settings.

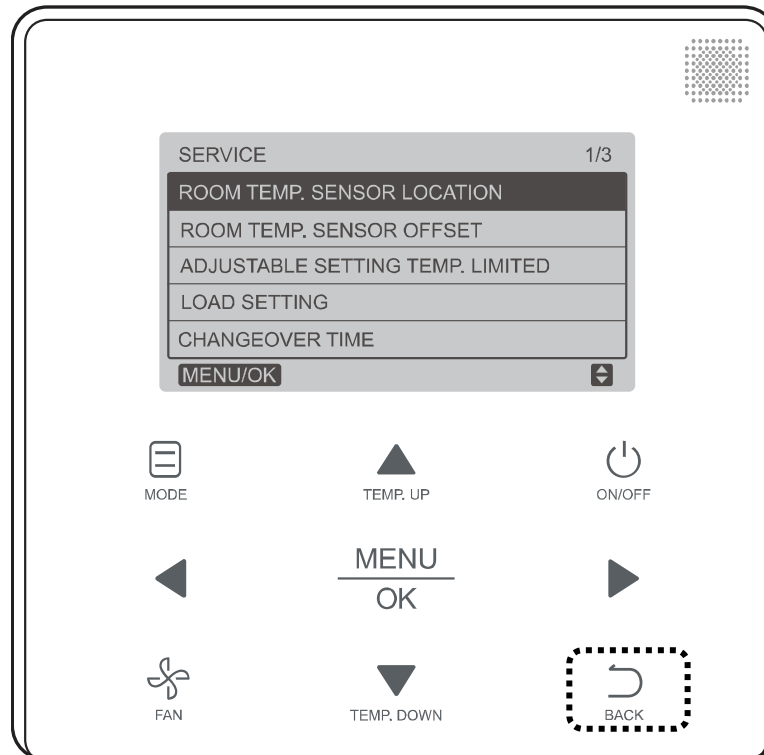


Fig. 53 —Exit Parameter Settings

Table 28 —Exit Parameter Screen Description

NO.	SERVICE MENU		DESCRIPTION	SET PARAMETER
1	ROOM TEMP. SENSOR LOCATION		Select whether to use the IDU room temperature sensor or the room temperature sensor of the wired controller.	WIRED REMOTE CONTROLLER (Default)
				INDOOR UNIT
2	ROOM TEMP. SENSOR OFFSET		The temperature compensation value for wired controller T1.	-5°F, -4°F, -3°F, -2°F, -1°F, 0°F (default), 1°F, 2°F, 3°F, 4°F, 5°F
3	SETPOINT LIMIT	MAX. HEATING SETPOINT SETTING	Set the upper limit of the temperature range for heating.	86°F (default), 85°F, 84°F...
		MIN. COOLING SETPOINT SETTING	Set the lower limit of the temperature range for cooling.	50°F (default), 51°F, 52°F...
4	THERMAL SENSITIVITY ADJ		Select a capacity interval.	THERMAL ON (1°F) (default), THERMAL ON (2°F)
5	CHANGEOVER TIME		Automatic mode changeover time.	15 minutes (default), 30 minutes, 60 minutes, 90 minutes
6	ANTI COLD BLOW		Set the temperature when the fan is turned off to prevent cold winds.	68°F (default), 50°F, 59°F, 75°F, 82°F
7	TERMINAL FAN CONFIGURATION			4 minutes (default), 8 minutes, 12 minutes, 16 minutes
7	THERMO-OFF FAN SPEED SETTING	COOLING	Set the fan step for cooling thermo off.	OFF, LOW, MIDDLE, HIGH, MAINTAIN (default)
		HEATING	Set the fan step for heating thermo off.	OFF (default), LOW, MIDDLE, HIGH, MAINTAIN
8	STATIC PRESSURE		Set the IDU static pressure of the DC fan.	0: 0 in WC (default) 1: 0.04 in WC 2: 0.08 in WC 3: 0.12 in WC 4: 0.16 in WC 5: 0.20 in WC 6: 0.24 in WC 7: 0.28 in WC 8: 0.32 in WC 9: 0.36 in WC 10: 0.40 in WC 11: 0.44 in WC 12: 0.48 in WC 13: 0.52 in WC 14: 0.56 in WC 15: 0.60 in WC 16: 0.64 in WC 17: 0.68 in WC 18: 0.72 in WC 19: 0.76 in WC 20: 0.80 in WC 21: 0.84 in WC 22: 0.88 in WC 23: 0.92 in WC 24: 0.96 in WC 25: 1.0 in WC
9	OCCUPANCY SENSOR	OCCUPANCY ON/OFF	Set occupancy delay function valid or invalid.	OFF (default), ON
		OCCUPANCY DELAY	Set the time for delayed power-off of the unattended IDU (valid only when the IDU is connected to an infrared sensing controller).	0 minutes (default), 15 minutes, 30 minutes, 60 minutes
		OCCUPANCY SET TEMP OFFSET	/	0°F, 2°F, 4°F (default), 6°F, 8°F
11	DRY CONTACT	DRY CONTACT STATUS	Whether the IDU is connected to an aux. heat source.	Enable, Disable (default)
		DRY CONTACT CONFIGURATION	Set the start and end condition for the aux. heat source and the delayed end time of dry contact.	Starting condition, when the room temperature is lower than the set temperature: 1°F (default), 2°F, 3°F, 4°F, 5°F Delayed closing time of dry contact: 15 minutes (default), 30 minutes, 45 minutes
		INDOOR FAN STATUS	Forcibly turn on the fan when the aux. heat source starts.	ON (default), OFF
12	IDU ADDRESSING		Set the IDU address.	0#–63#

Touch Screen Wired Controller (40VM900005)

- 1. Select “Service” menu.
- 2. Input password to access the service setting menu.

The initial password is “0000,” which can be edited. Use the current password if it has been changed. The administrator code cannot be changed, so contact your local distributor if necessary.

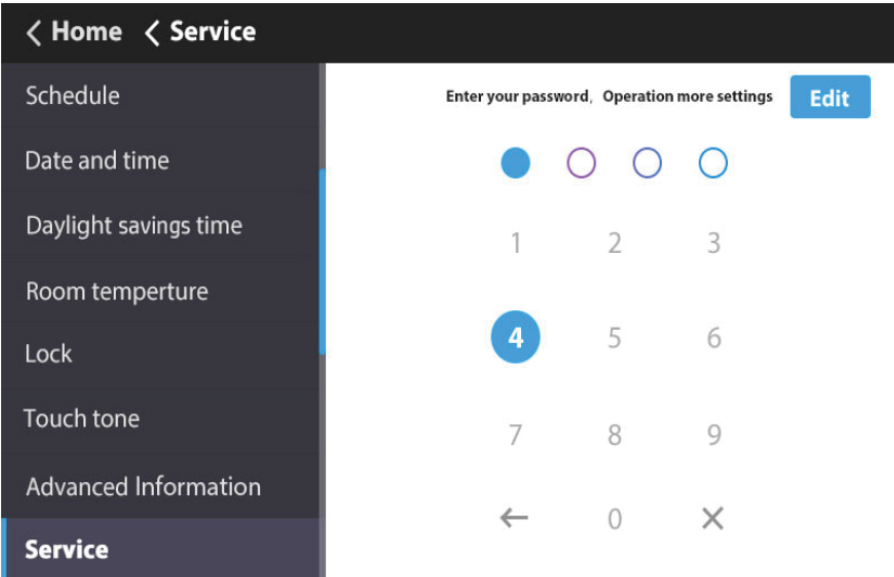


Fig. 54 —Touch Screen Wired Controller (40VM900005)

For example:

Choose “Room temp location” setting on the “Service” interface.

The room temperature location can be set to indoor unit or wired remote control (default) as required. If the location has been chosen for the indoor unit, this IDU will use T1 (T0 for 40VMA) to control.

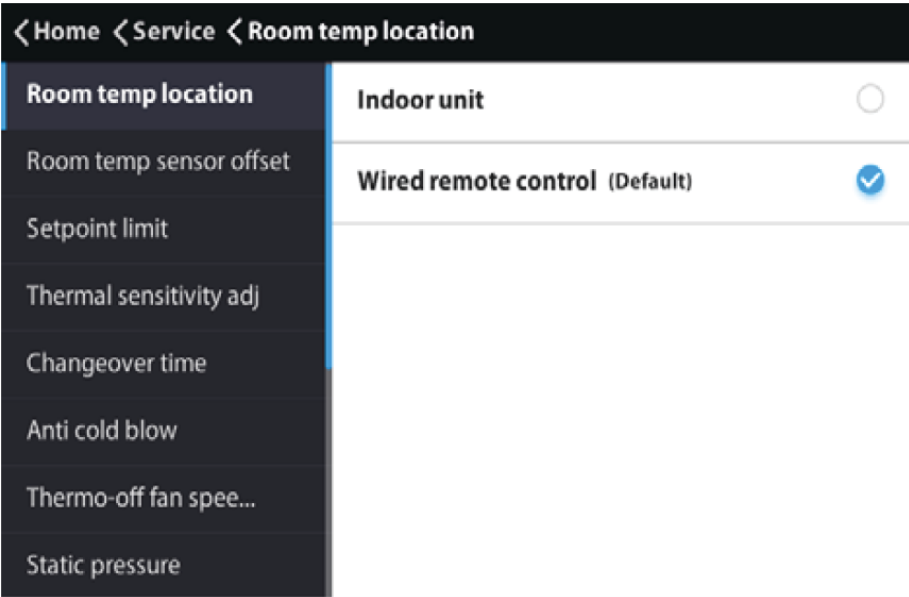


Fig. 55 —Room temp location

Refer to the following table for a detailed service menu list.

Table 29 —Service Menu List

NO.	SERVICE MENU		DESCRIPTION	SET PARAMETER
1	ROOM TEMP SENSOR LOCATION		Select whether to use the IDU room temperature sensor or the room temperature sensor of the wired controller.	INDOOR UNIT
				WIRD REMOTE CONTROL (default)
2	ROOM TEMP SENSOR OFFSET		The temperature compensation value for wired controller T1.	-5°F, -4°F, -3°F, -2°F, -1°F, 0°F (default), 1°F, 2°F, 3°F, 4°F, 5°F
3	SETPOINT LIMIT	MAX. HEATING SETPOINT SETTING	Set the upper limit of the temperature range for heating.	86°F (default), 85°F, 84°F...
		MIN. COOLING SETPOINT SETTING	Set the lower limit of the temperature range for cooling.	50°F (default), 51°F, 52°F...
4	THERMAL SENSITIVITY ADJ		Select a capacity interval.	THERMAL ON (1°F) (default), THERMAL ON (2°F)
5	CHANGEOVER TIME		AUTO mode changeover time.	15 minutes (default), 30 minutes, 60 minutes, 90 minutes
6	ANTI COLD BLOW		Set the temperature when the fan is turned off to prevent cold winds.	68°F (default), 50°F, 59°F, 75°F, 82°F
7	THERMO-OFF FAN SPEED SETTING	COOLING	Set the fan step for cooling thermo off.	OFF, LOW, MEDIUM, HIGH, MAINTAIN (default)
		HEATING	Set the fan step for heating thermo off.	OFF (default), LOW, MEDIUM, HIGH, MAINTAIN
8	STATIC PRESSURE		Set the IDU static pressure of the DC fan.	0: 0 in WC (default) 1: 0.04 in WC 2: 0.08 in WC 3: 0.12 in WC 4: 0.16 in WC 5: 0.20 in WC 6: 0.24 in WC 7: 0.28 in WC 8: 0.32 in WC 9: 0.36 in WC 10: 0.40 in WC 11: 0.44 in WC 12: 0.48 in WC 13: 0.52 in WC 14: 0.56 in WC 15: 0.60 in WC 16: 0.64 in WC 17: 0.68 in WC 18: 0.72 in WC 19: 0.76 in WC 20: 0.80 in WC 21: 0.84 in WC 22: 0.88 in WC 23: 0.92 in WC 24: 0.96 in WC 25: 1.0 in WC

NO.	SERVICE MENU	DESCRIPTION	SET PARAMETER	NO.
9	OCCUPANCY SENSOR	OCCUPANCY ON/OFF	Set occupancy delay function valid or invalid.	OFF (default), ON
		OCCUPANCY DELAY	Set the time for delayed power-off of the unattended IDU (valid only when the IDU is connected to an infrared sensing controller).	0 minutes (default), 15 minutes, 30 minutes, 60 minutes
		OCCUPANCY SET TEMP OFFSET	/	0°F, 2°F, 4°F (default), 6°F, 8°F
10	Supplemental heat or Aux Heat status		Supplemental Heat or Aux Heat status.	OFF (default), ON
			Supplemental Heat or Aux Heat status configuration.	1°F (default), 2°F, 3°F, 4°F, 5°F
			Time delay.	15 minutes (Default), 30 minutes, 45 minutes
			Indoor fan status.	ON (Default), OFF

TROUBLESHOOTING

Error Code List



CAUTION

Turn off power before connecting or disconnecting connector.

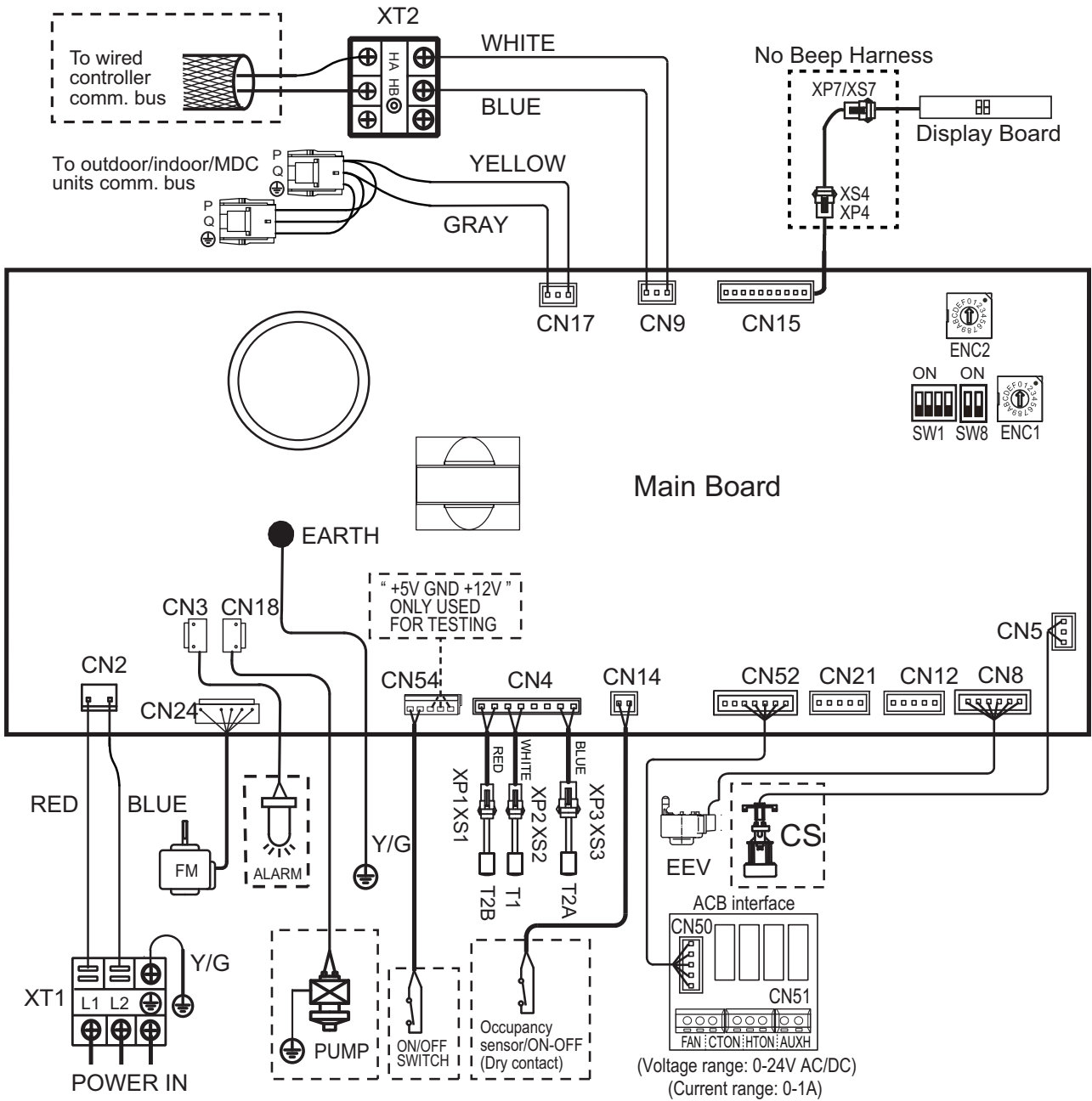
Table 30 —Error Code List for Indoor Unit

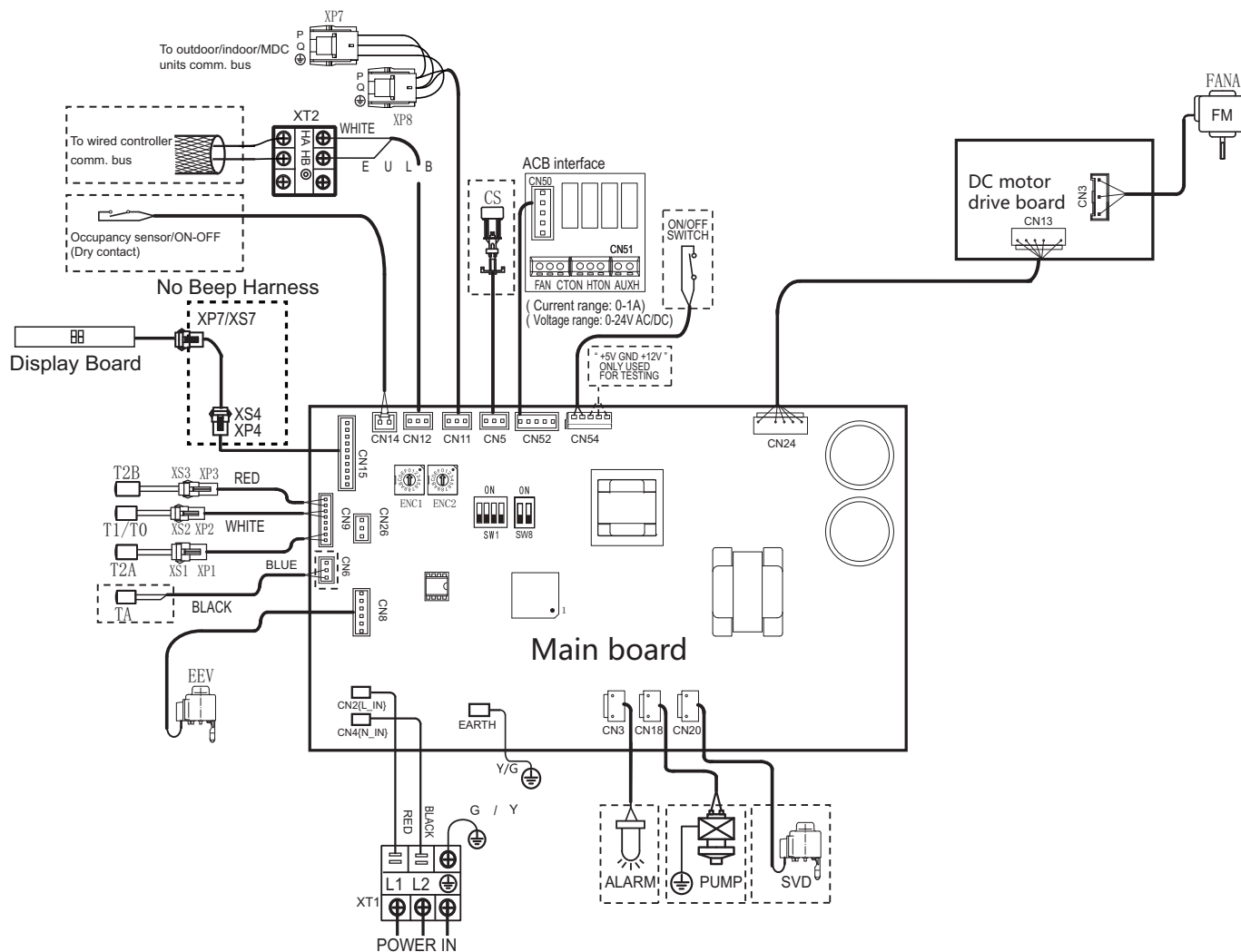
ERROR CODE	DEFINITION
FE	No address when powered on for the first time
dd	Heating/Cooling mode conflict error
E1	Communication error between indoor unit and outdoor unit
E2	Check indoor temperature sensor (T1)
E3	Check room temperature sensor (TA)
E4	Check evaporator outlet temperature sensor (T2B)
E5	Check evaporator temperature sensor (T2A)
E6	DC fan error
E7	EEPROM error
E9	Communication error between indoor unit and wired controller
Eb	Expansion valve error
Ed	Outdoor unit error
EE	Condensate overflow

Table 31 —Error Code List for Remote Controller

ERROR CODE	DEFINITION
-	No display on the wired controller
E9	Communication error between controller and indoor unit
F7	EEPROM error on wired controller
FP	Too many indoor units in group control (maximum 16)

Wiring Diagrams



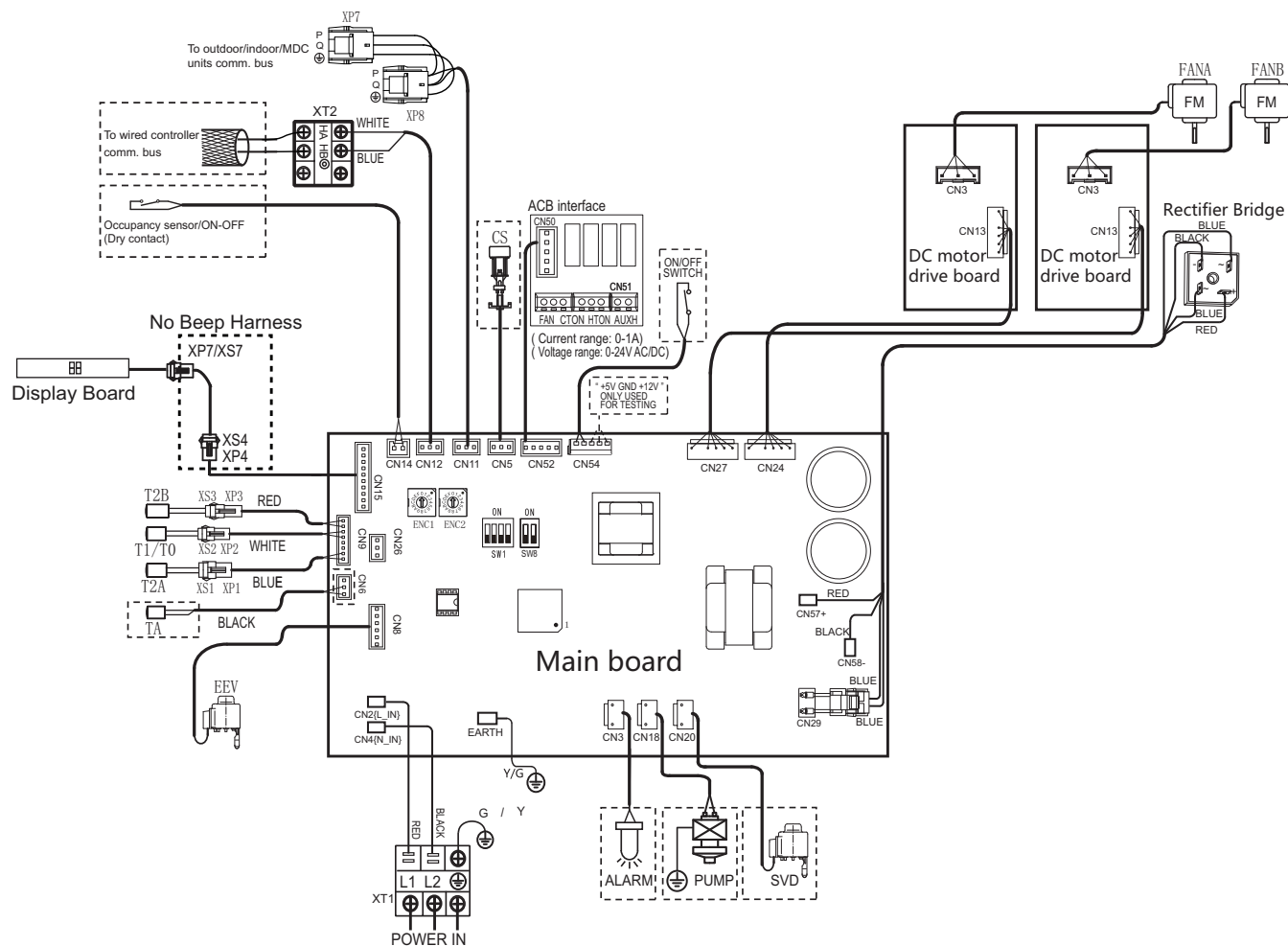


LEGEND

NOTE: Field wiring must use copper conductors only.

ACB	—	Auxiliary Control Board
ALARM	—	Warning Lamp (Optional)
AUXH	—	Output for Auxiliary Heat
CS	—	Condensate Switch (Optional)
CTON	—	Output for Cooling Operation
EEV	—	Electronic Expansion Valve
FAN	—	Output for Fan Operation
FM	—	Indoor Fan Motor
HTON	—	Output for Heating Operation
MDC	—	Multiport Distribution Controller
PUMP	—	Pump Motor (Optional)
T1	—	Room Temp. Sensor
T2A	—	Inlet Pipe Temp. Sensor
T2B	—	Outlet Pipe Temp. Sensor
XP1-4/XS1-6	—	Connectors
XT1-1	—	Terminal Block

Fig. 58 —High Static Duct (40VMH024-054 Series)



LEGEND

NOTE: Field wiring must use copper conductors only.

ACB	— Auxiliary Control Board
ALARM	— Warning Lamp (Optional)
AUXH	— Output for Auxiliary Heat
CS	— Condensate Switch (Optional)
CTON	— Output for Cooling Operation
EEV	— Electronic Expansion Valve
FAN	— Output for Fan Operation
FM	— Indoor Fan Motor
HTON	— Output for Heating Operation
MDC	— Multiport Distribution Controller
PUMP	— Pump Motor (Optional)
T1	— Room Temp. Sensor
T2A	— Inlet Pipe Temp. Sensor
T2B	— Outlet Pipe Temp. Sensor
XP1-4/XS1-6	— Connectors
XT1-1	— Terminal Block

Fig. 59 —High Static Duct (40VMH072-096 Series)

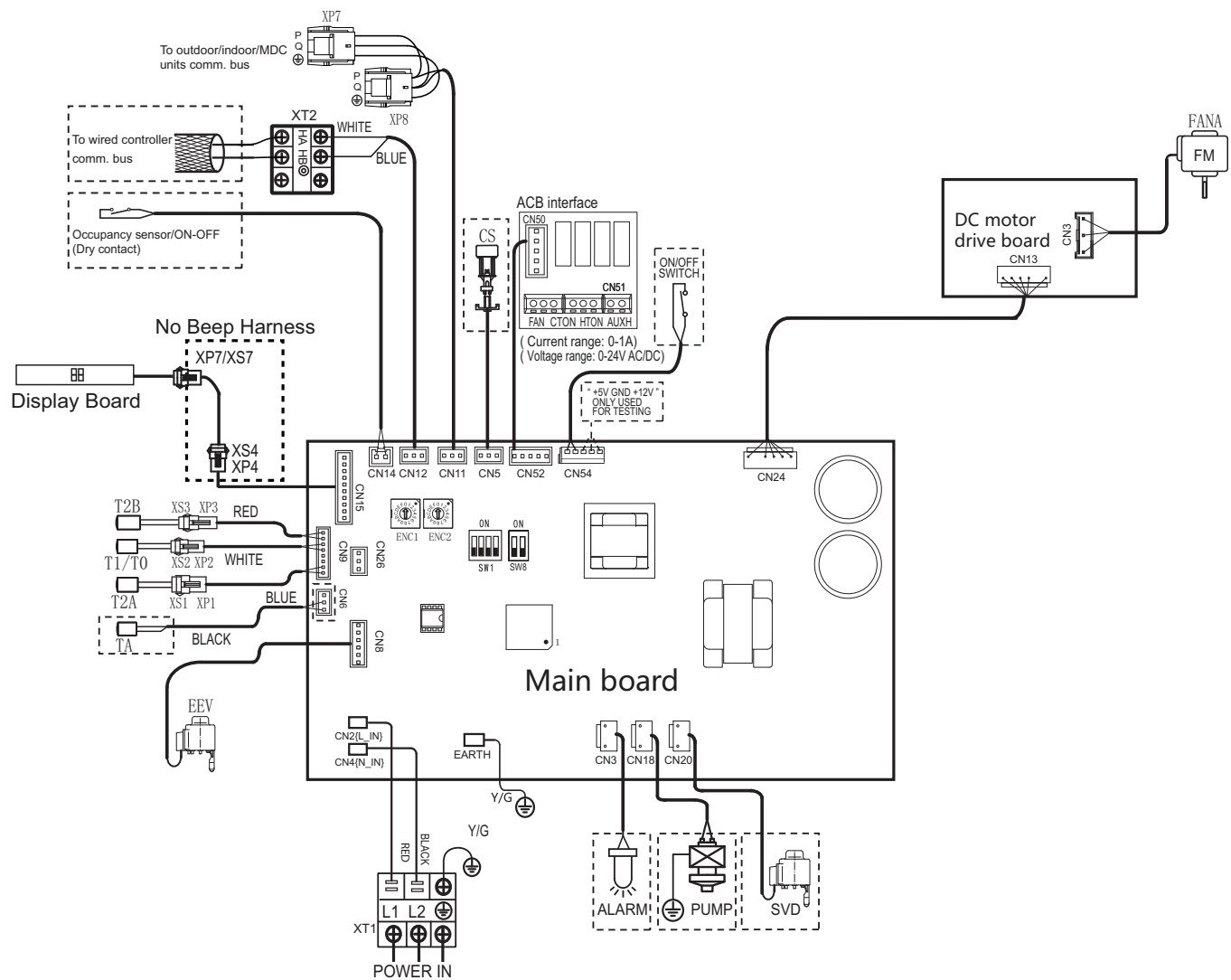
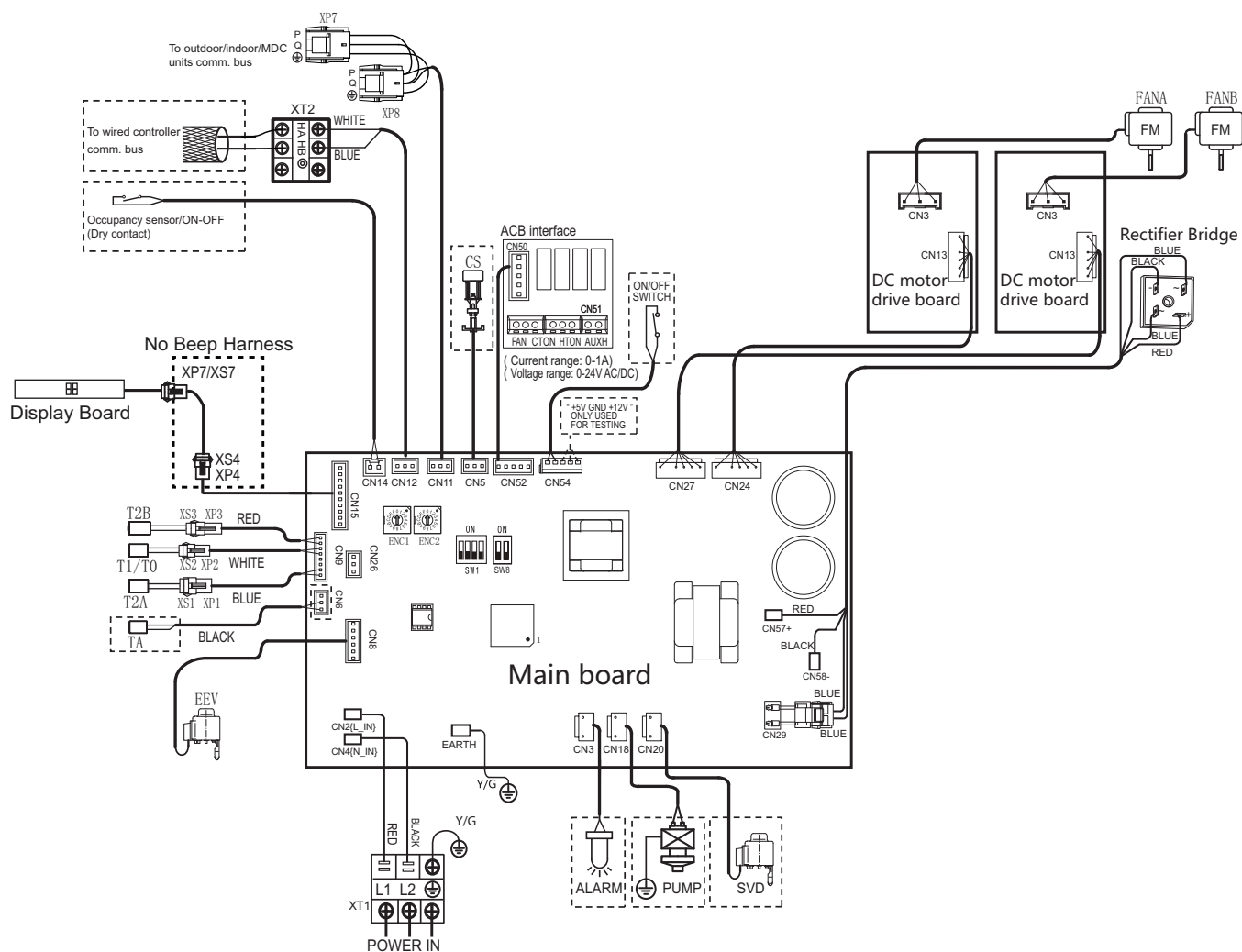


Fig. 60 —Outside Air (40VMA036/048/054---3)



LEGEND

NOTE: Field wiring must use copper conductors only

ACB	—	Auxiliary Control Board
ALARM	—	Warning Lamp
AUXH	—	Output for Auxiliary Heat
CS	—	Condensate Switch
CTON	—	Output for Cooling Operation
EED	—	Electronic Expansion Valve
FAN	—	Output for Fan Operation
FM	—	Indoor Fan Motor
HTON	—	Output for Heating Operation
PUMP	—	Pump Motor
T1/T0	—	Room Temperature Sensor
TA	—	Room Temperature Sensor
T2A	—	Inlet Pipe Temperature Sensor
T2B	—	Outlet Pipe Temperature Sensor
XP1-8	—	Connectors
XS1-4	—	Connector
XT1-2	—	Terminal Block
-----	—	Optional Component or Field Wiring

Fig. 61 —Outside Air (40VMA072/096---3)

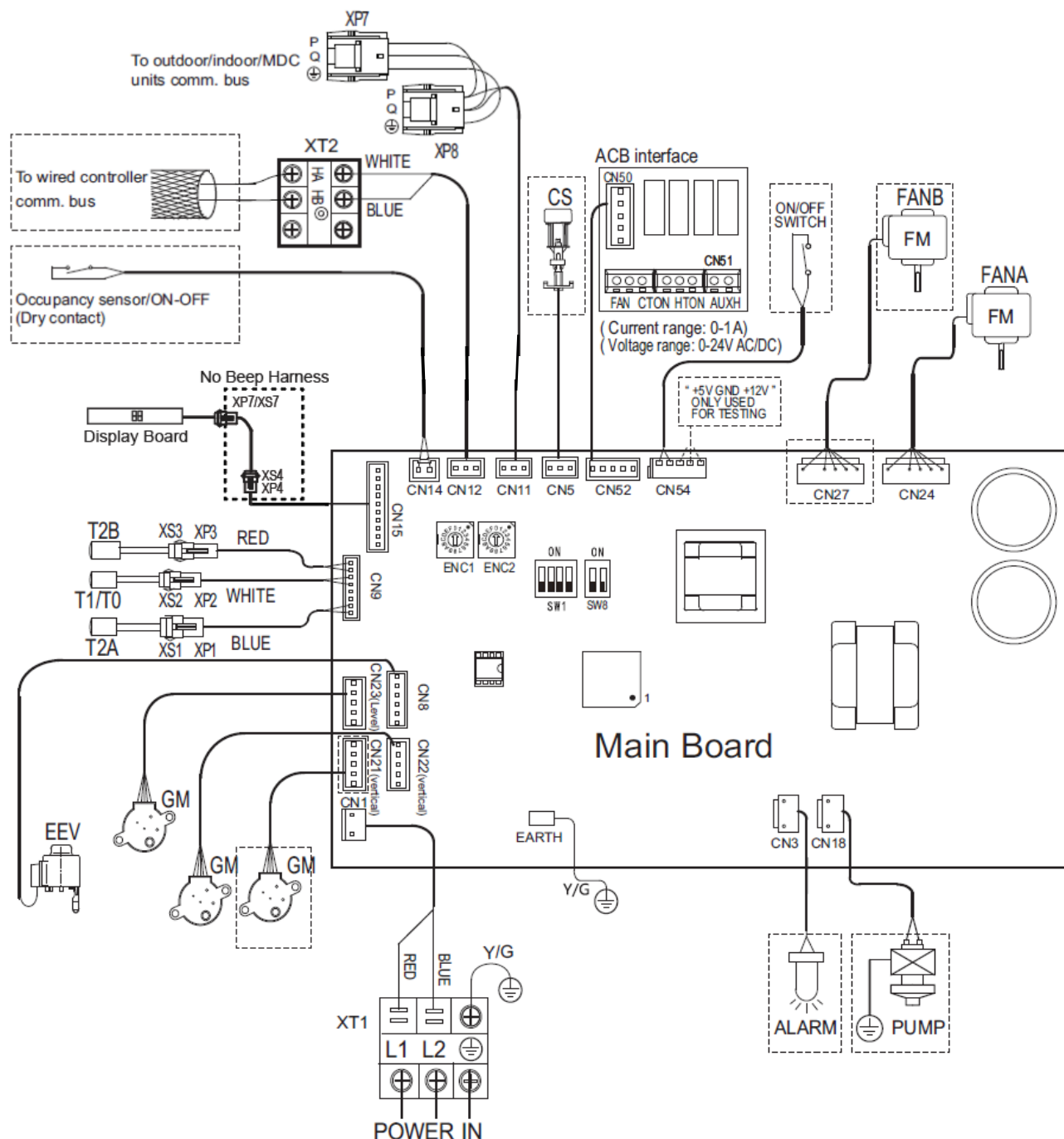


Fig. 62 —Underceiling/Floor (40VMU Series)

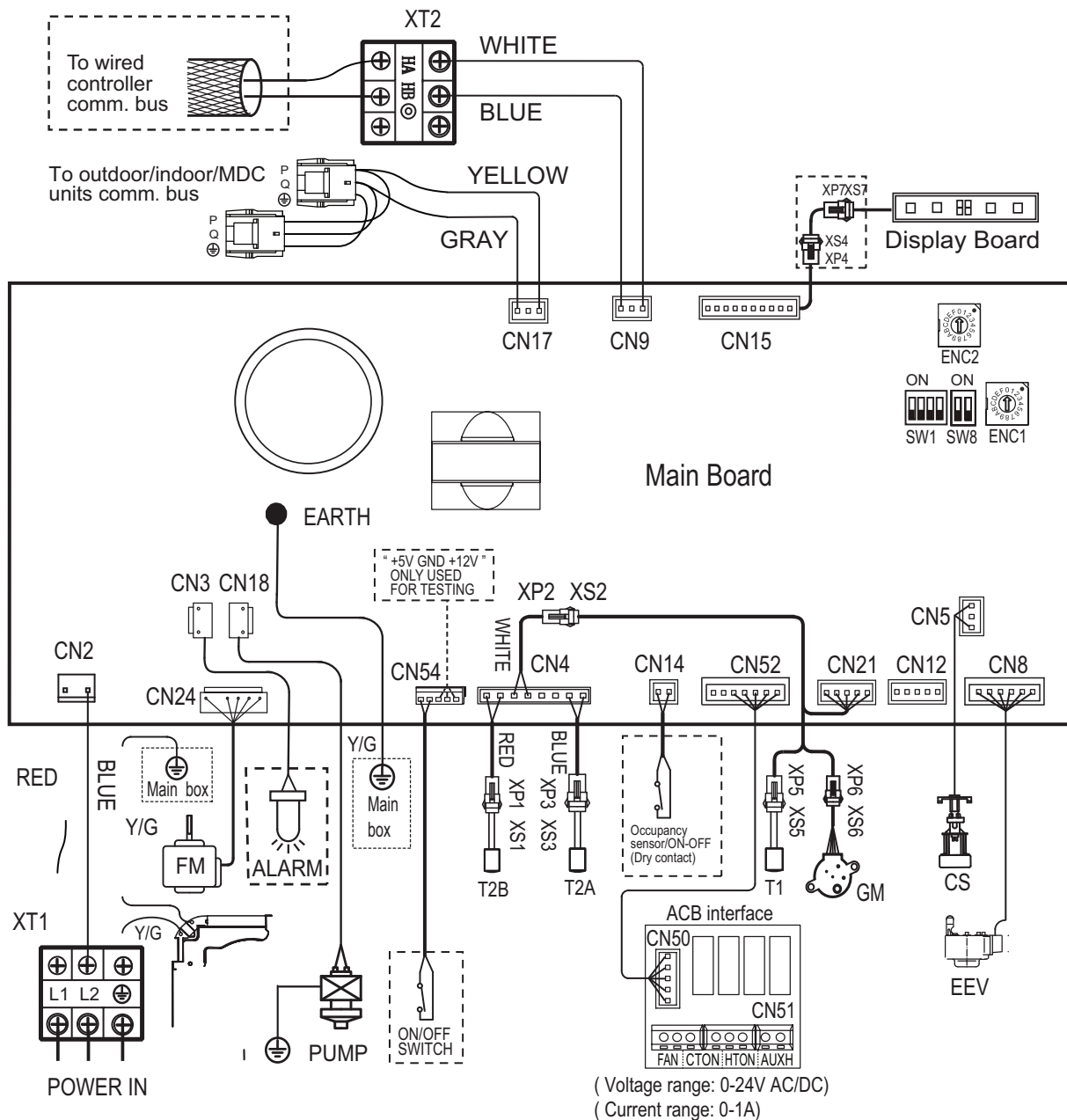
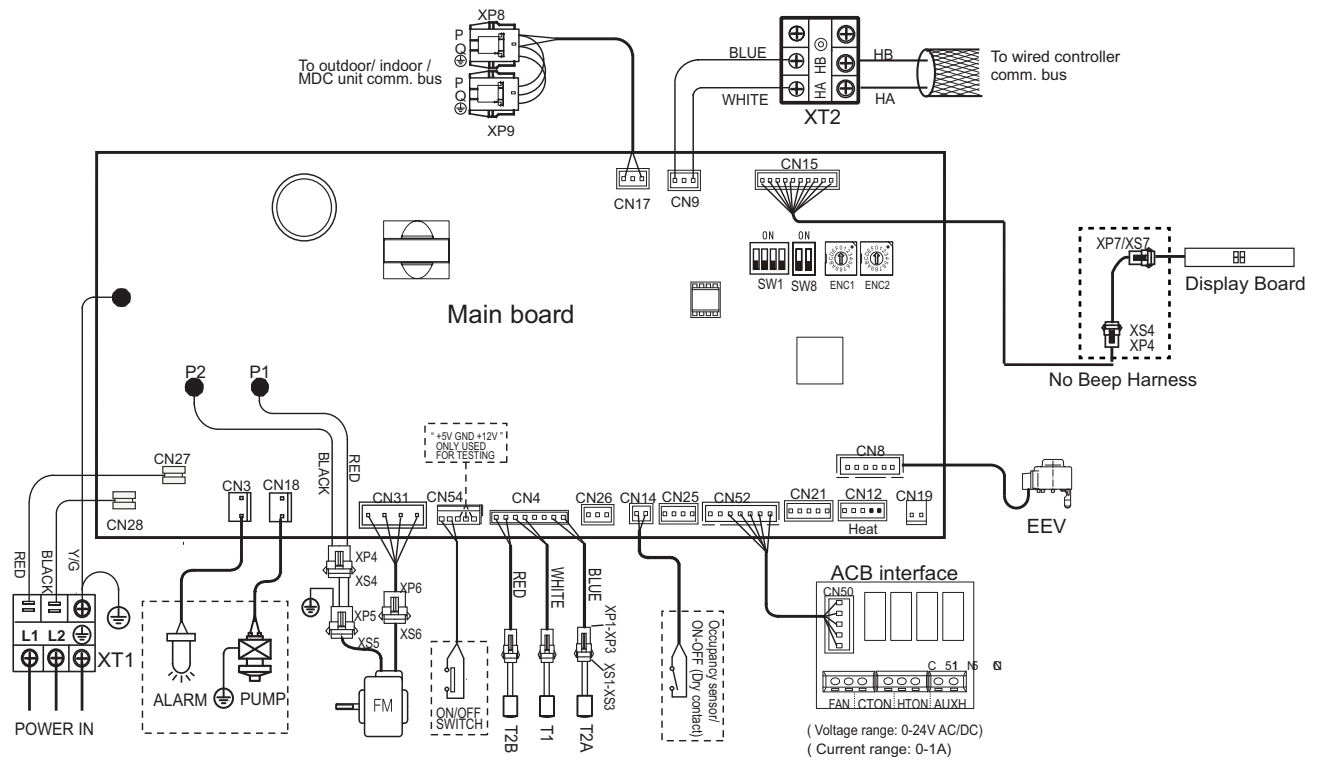


Fig. 63 —Compact 4-Way Cassette (40VMC Series)

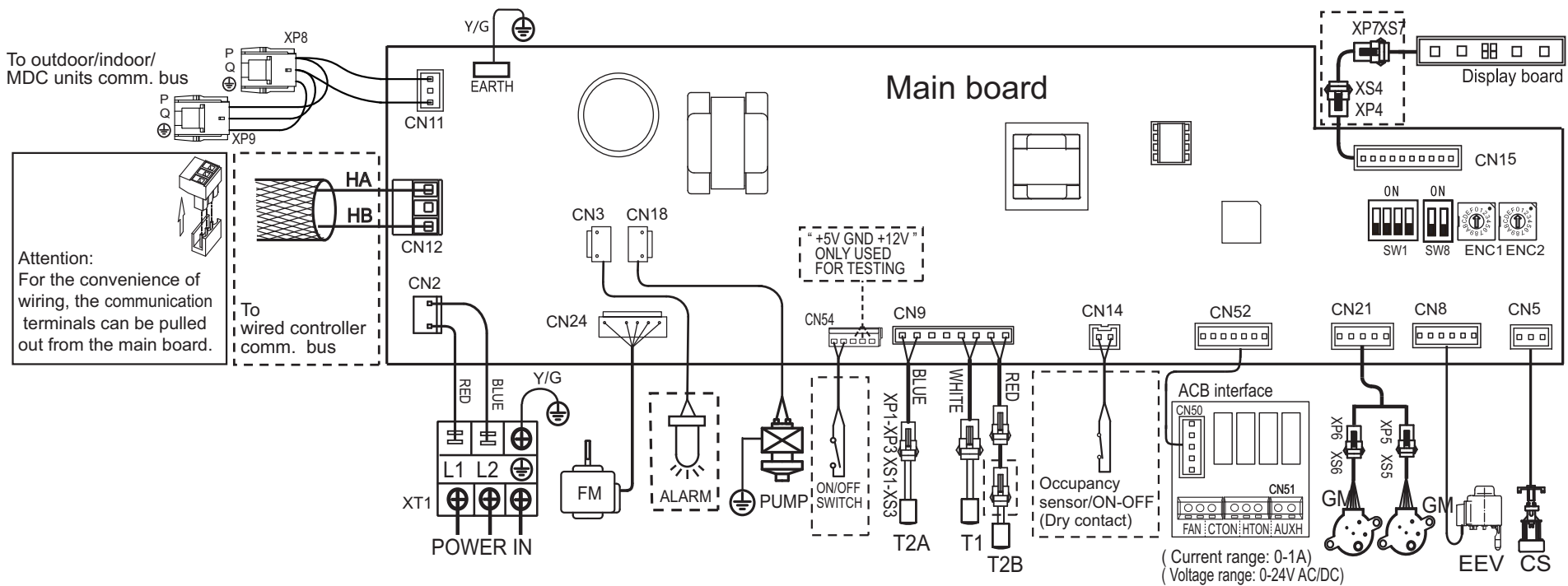


LEGEND

NOTE: Field wiring must use copper conductors only.

ALARM	—	Warning lamp (optional)
AUXH	—	Output for Auxiliary Heat
CTON	—	Output for Cooling Operation
EEV	—	Electronic Expansion Valve
FAN	—	Output for Fan Operation
FM	—	Indoor Fan Motor
HTON	—	Output for Heating Operation
MDC	—	Multiport Distribution Controller
PUMP	—	Pump Motor
T1	—	Room Temperature Sensor
T2A	—	Inlet Pipe Temperature Sensor
T2B	—	Evap. Outlet Temperature in Cooling Mode
XP1-9	—	Connectors
XS1-7	—	Connectors
XT1-2	—	Terminal Block

Fig. 64 —Vertical AHU (40VMV Series)

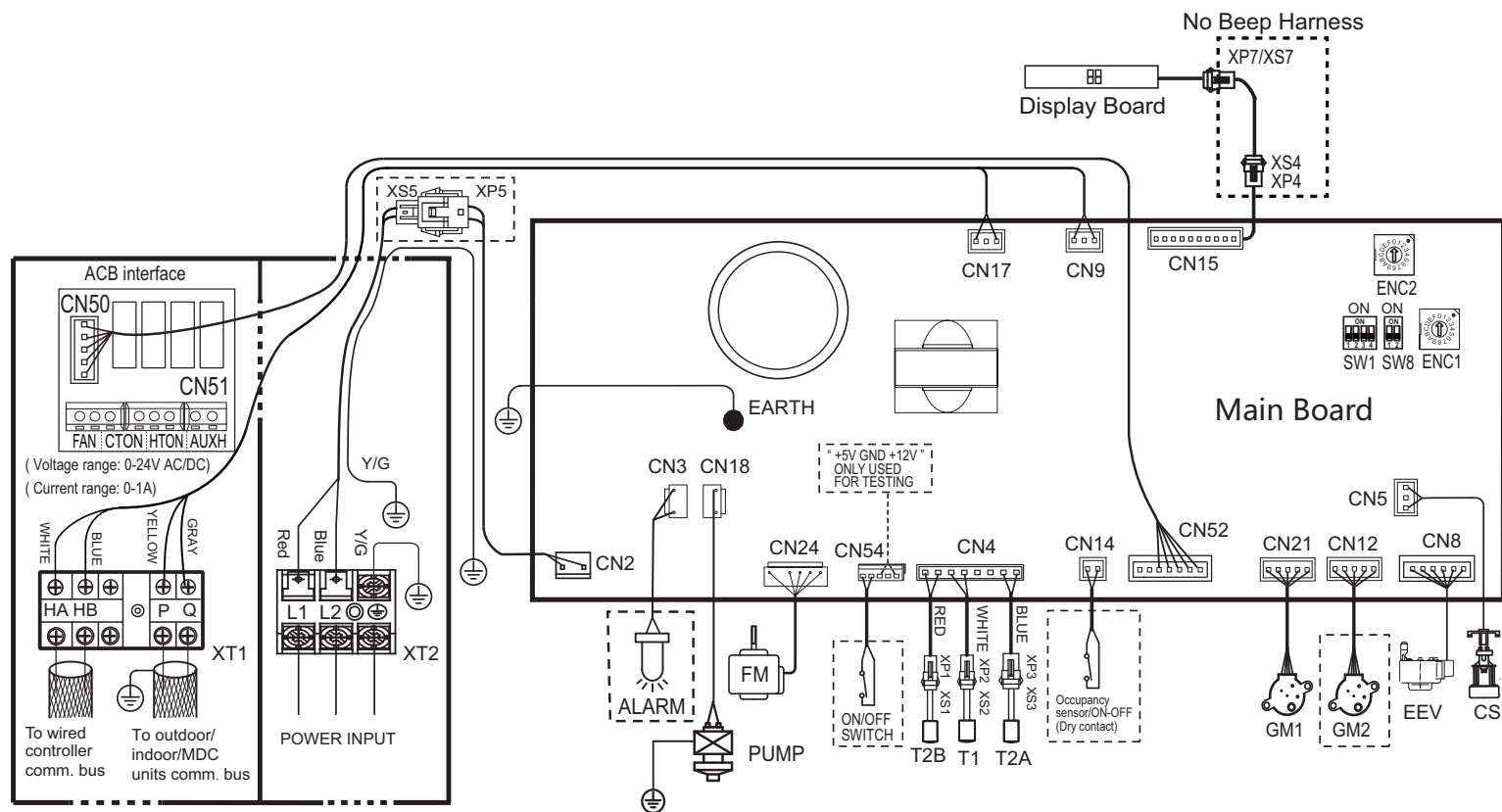


LEGEND

NOTE: Field wiring must use copper conductors only.

ACB	— Auxiliary Control Board
AUXH	— Output For Auxiliary Heat
CS	— Condensate Switch
CTON	— Output for Cooling Operation
EEV	— Electronic Expansion Valve
FAN	— Output for Fan Operation
FM	— Indoor Fan Motor
GM	— Louver Motor
HTON	— Output For Heating Operation
MDC	— Multipoint Distribution Controller
PUMP	— Pump Motor
T1	— Indoor Temperature Sensor
T2A	— Evaporator Temperature Sensor

Fig. 65 —4-Way Cassette (40VMF Series)

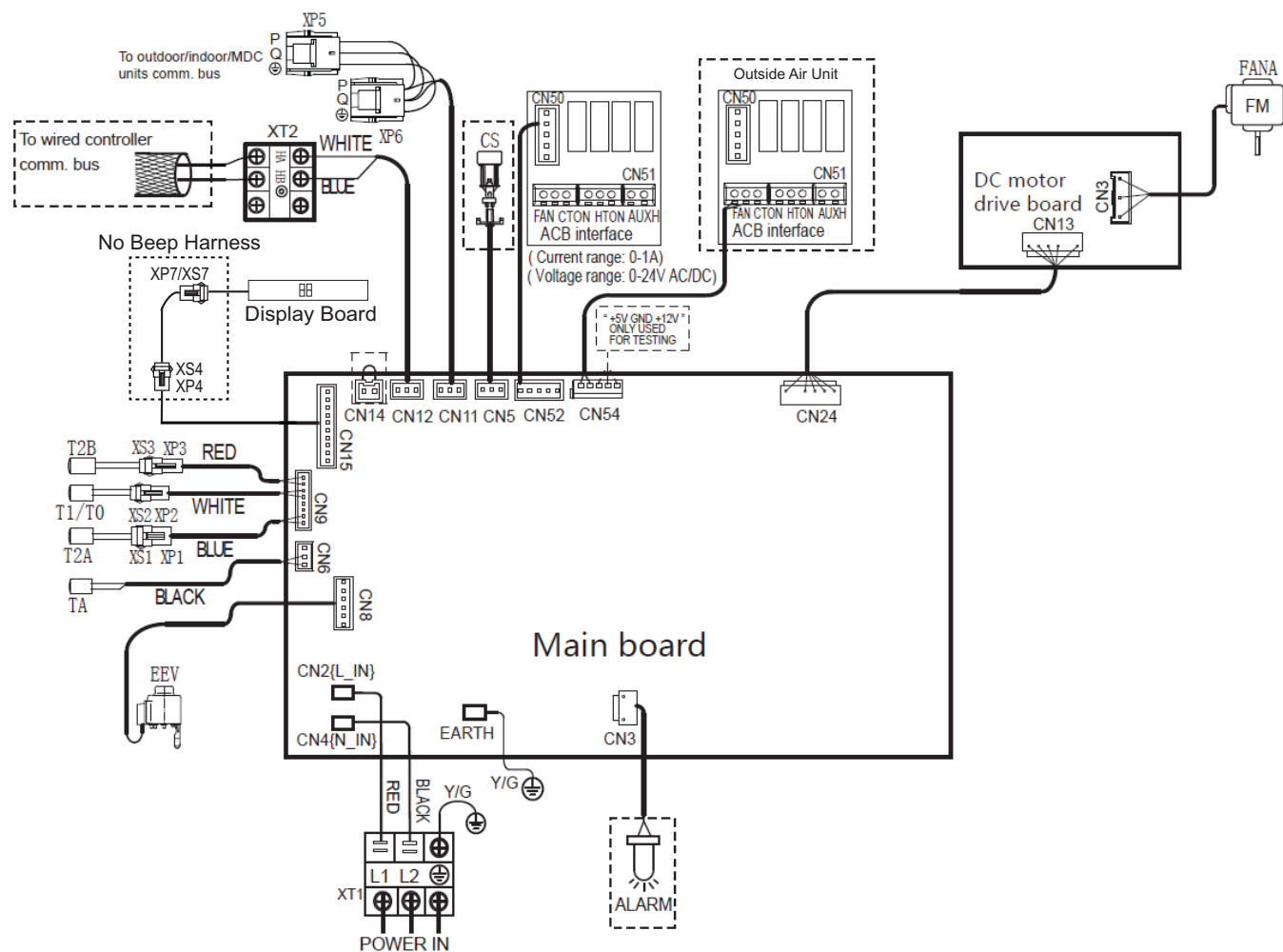


LEGEND

NOTE: Field wiring must use copper conductors only.

FM	— Indoor Fan Motor
T1	— Room Temp. Sensor
T2A	— Inlet Pipe Temp. Sensor
T2B	— Outlet Pipe Temp. Sensor
ALARM	— Warning Lamp
EEV	— Electronic Expansion Valve
XP5	— Connectors
XS5	— Connectors
XP1-5	— Connectors
XS1-5	— Connectors
PUMP	— Pump Motor
CS	— Water Level Switch
GM1-2	— Swing Motor
XT1-2	— Terminal

Fig. 67 —1-Way Cassette (40VMI Series)



LEGEND

NOTE: Field wiring must use copper conductors only.

ACB	—	Auxiliary Control Board
AUXH	—	Output for Auxiliary Heat
CTON	—	Output for Cooling Operation
FAN	—	Output for Fan Operation
HTON	—	Output for Heating Operation
FM	—	Indoor Fan Motor
T0	—	Return Air Temperature Sensor
T2A	—	Evaporator Inlet Temperature Sensor
T2B	—	Evaporator Outlet Temperature Sensor
TA	—	Supply Air Temperature Sensor
ALARM	—	Warning Lamp
EEV	—	Electronic Expansion Valve
CS	—	Condensate Switch
XP1-6	—	Connectors
XS1-4	—	Connectors
XT1-2	—	Terminal Block
-----	—	Optional Component or Field Wiring

Fig. 68 —Reheat Unit (40VMZ Series)

Indoor Electric Control Box Details
LOW PRESSURE DUCT

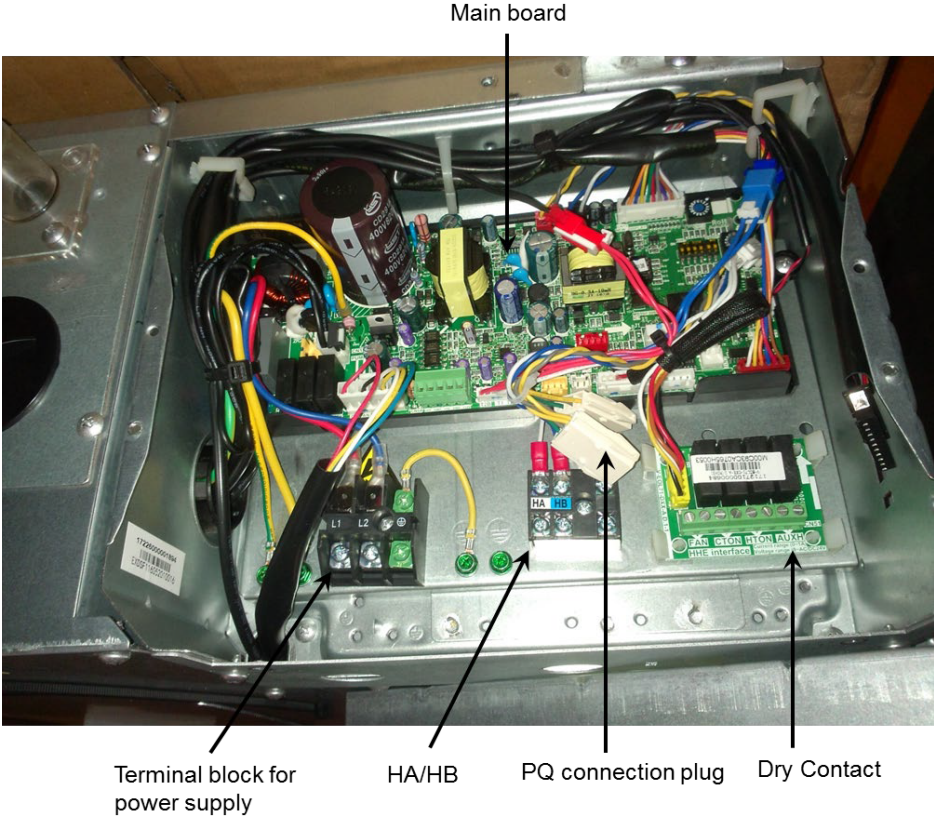


Fig. 69 —Low Pressure Duct (40VML)
UNDERCEILING/FLOOR UNIT (40VMU SERIES)

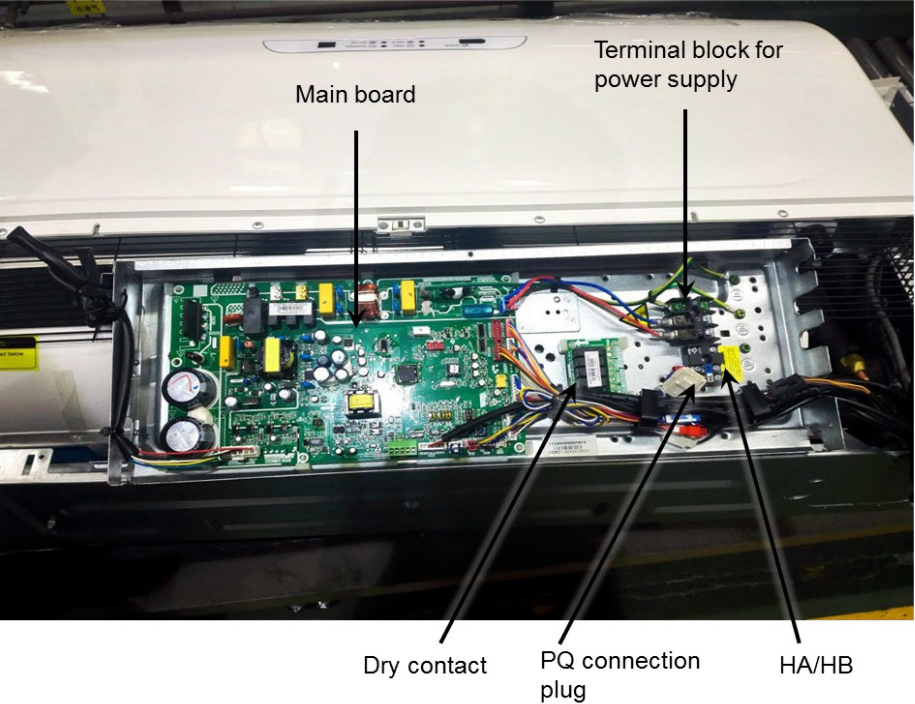


Fig. 70 —Underceiling/Floor (40VMU)

MEDIUM STATIC DUCT (40VMM SERIES)

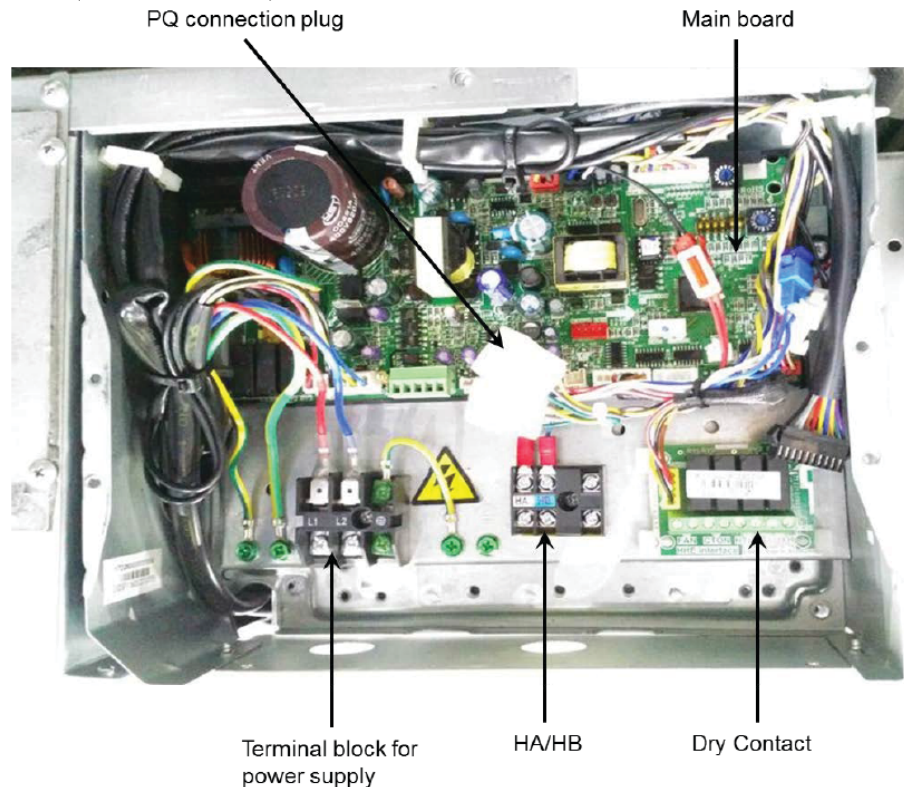


Fig. 71 —Medium Static Duct (40VMM007, 009---3)

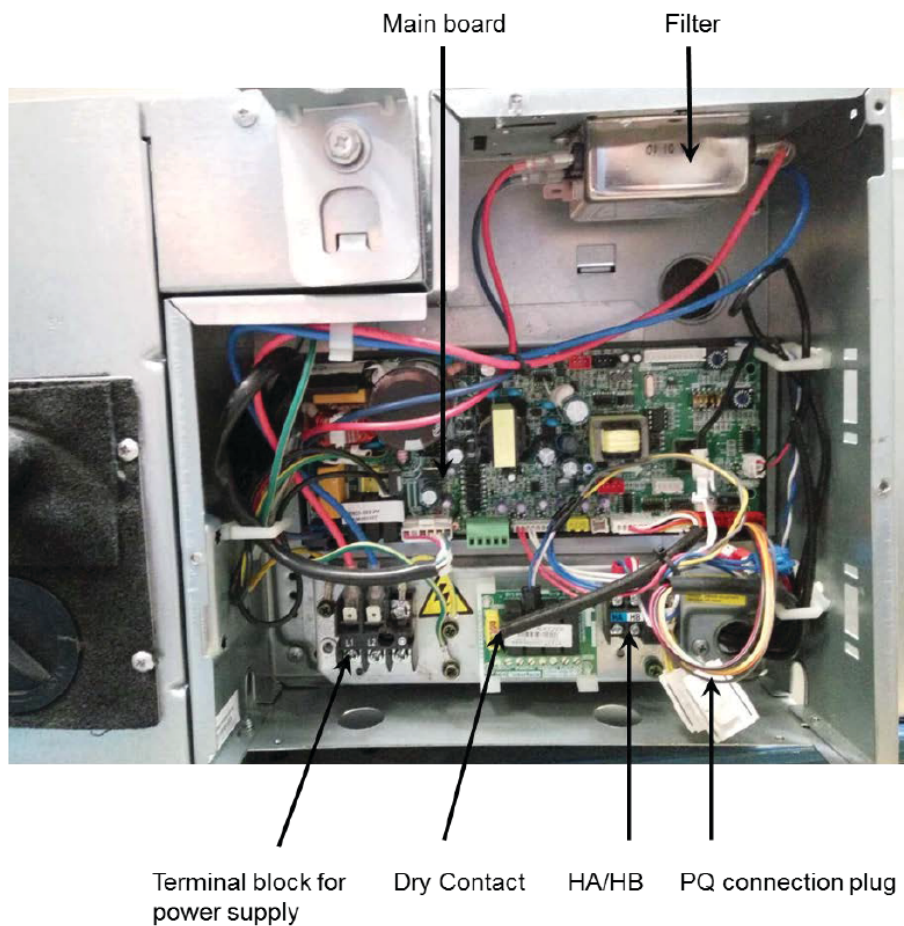


Fig. 72 —Medium Static Duct (40VMM015, 018, 024, 030, 036, 048---3)

HIGH STATIC DUCT (40VMH SERIES)

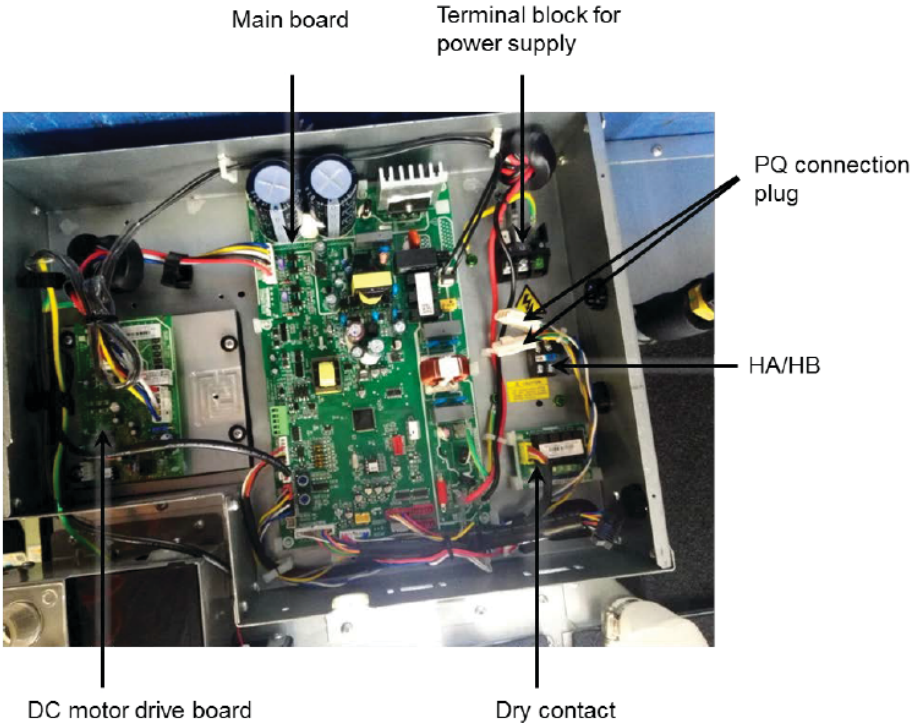


Fig. 73 —High Static Duct (40VMH024, 030, 036, 048, 054---3)

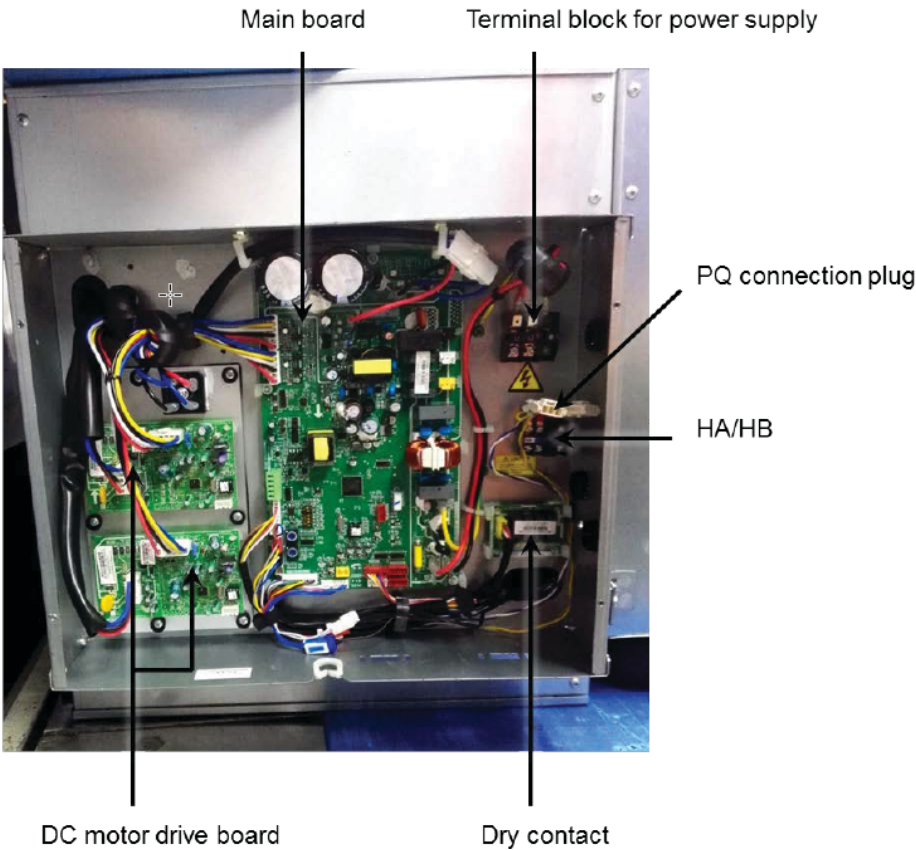


Fig. 74 —High Static Duct (40VMH072, 096---3)

OUTSIDE AIR (40VMA SERIES)

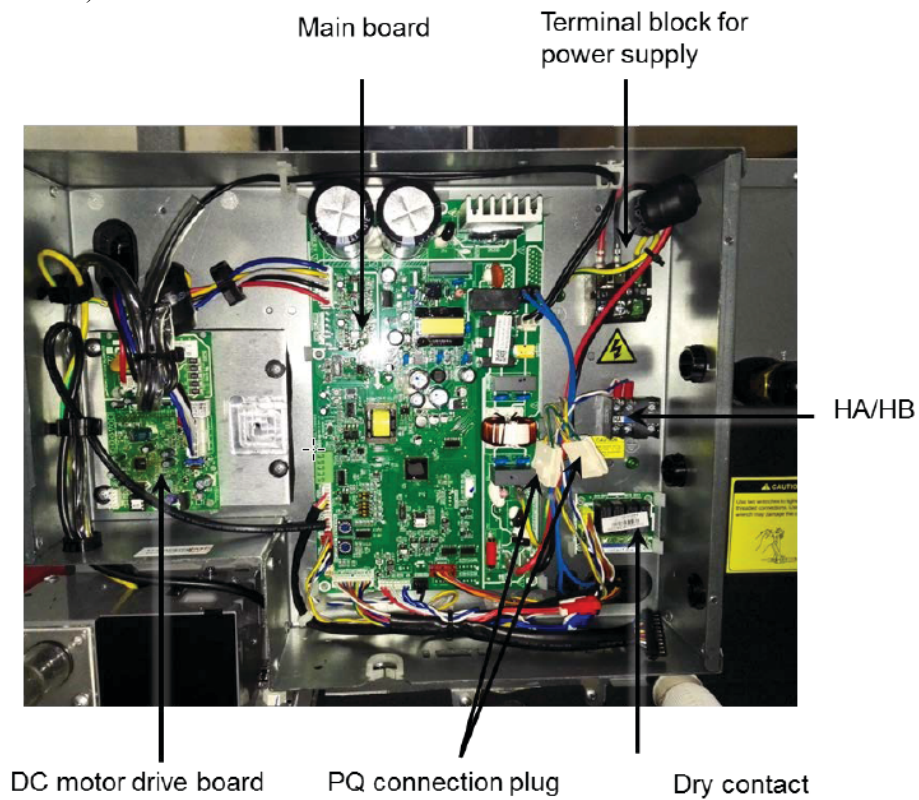


Fig. 75 —Outside Air (40VMA036, 048, 054---3)

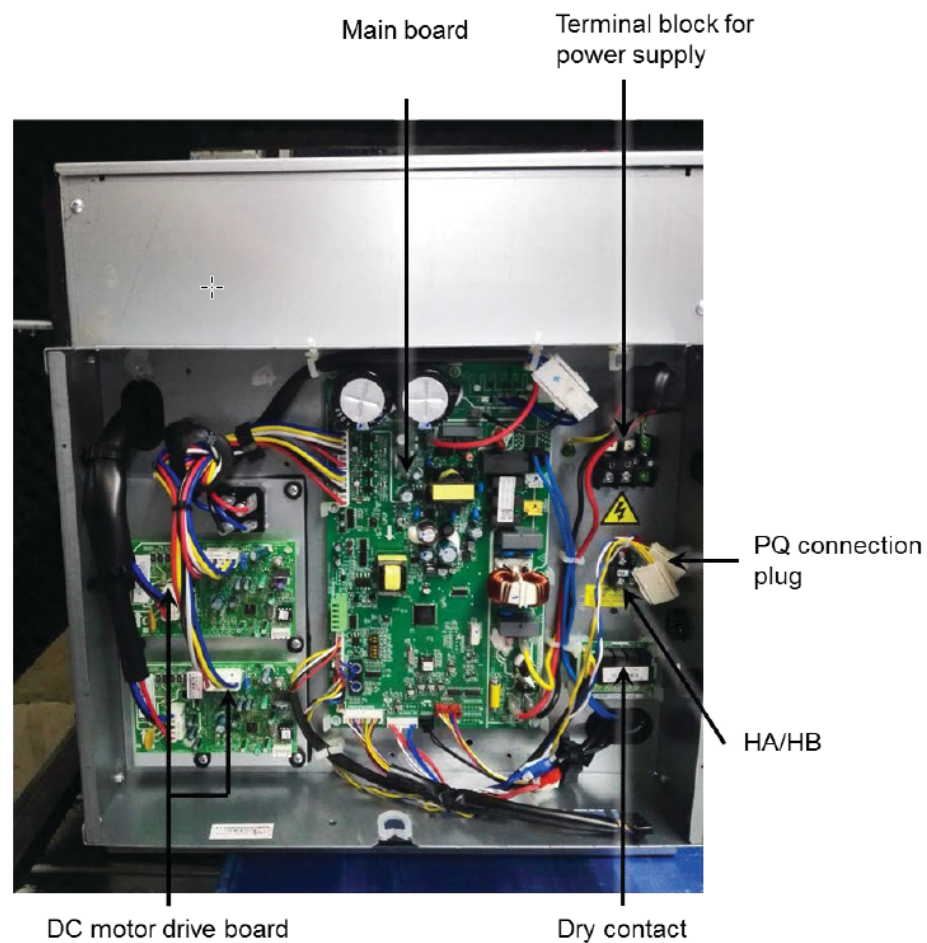


Fig. 76 —Outside Air (40VMA072, 096---3)

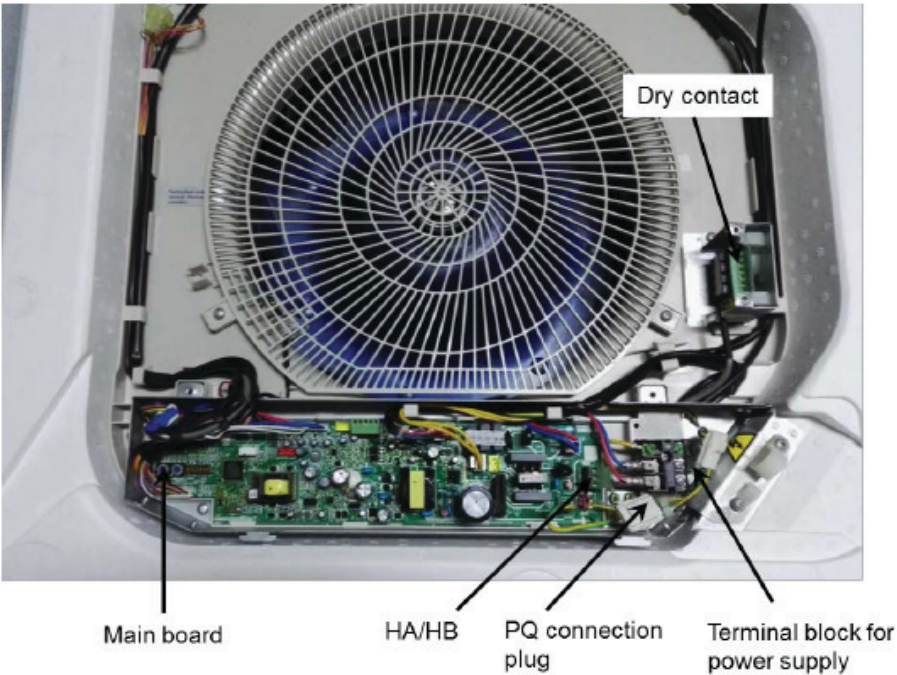


Fig. 77 —4-Way Cassette (40VMF)

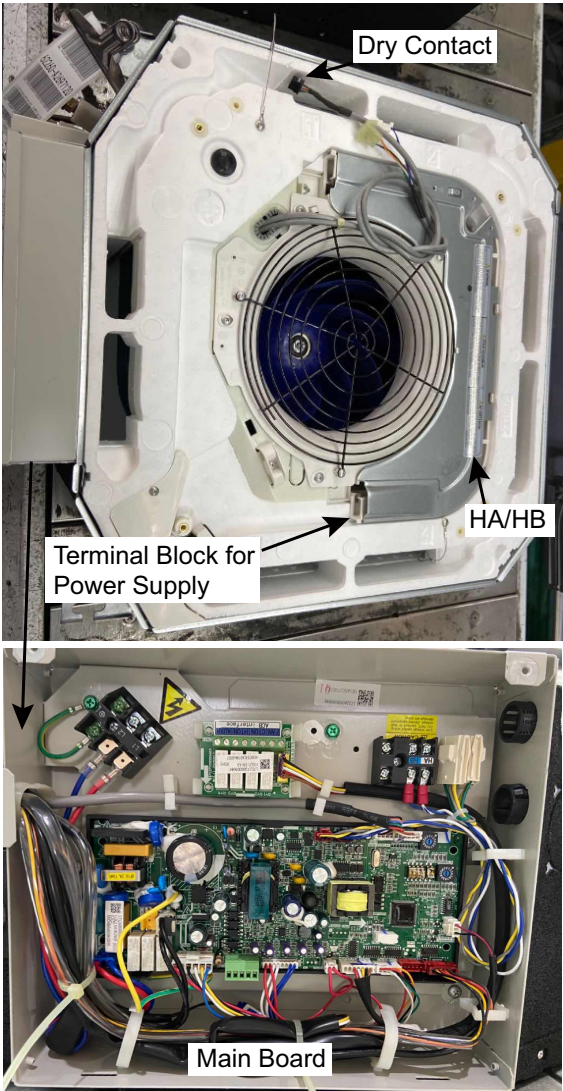


Fig. 78 —Compact 4-Way Cassette (40VMC)

VERTICAL AIR HANDLER (40VMV SERIES)

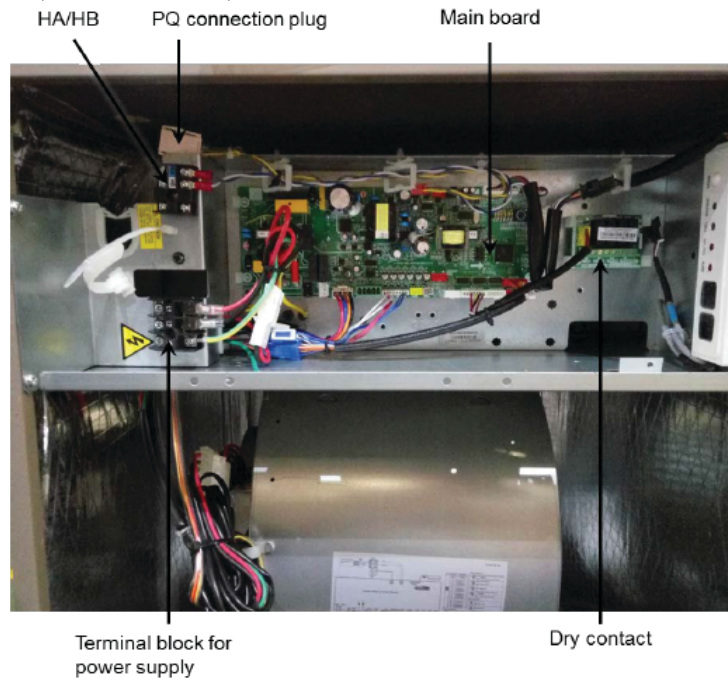


Fig. 79 —Vertical AHU (40VMV)

HIGH WALL (40VMW SERIES)

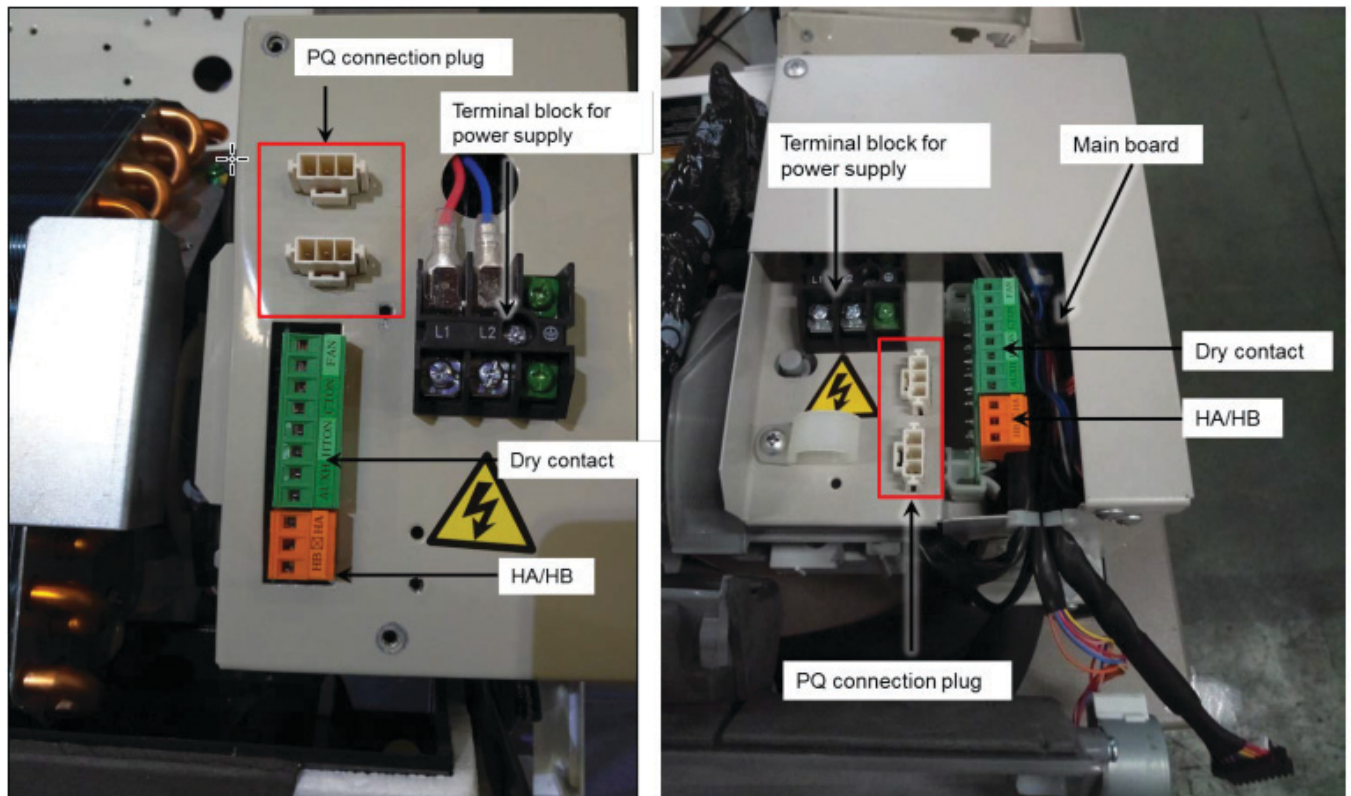


Fig. 80 —High Wall (40VMW005, 007, 009, 012, 015, 018---3)

FLOOR CONSOLE-RECESSED (40VMR SERIES)

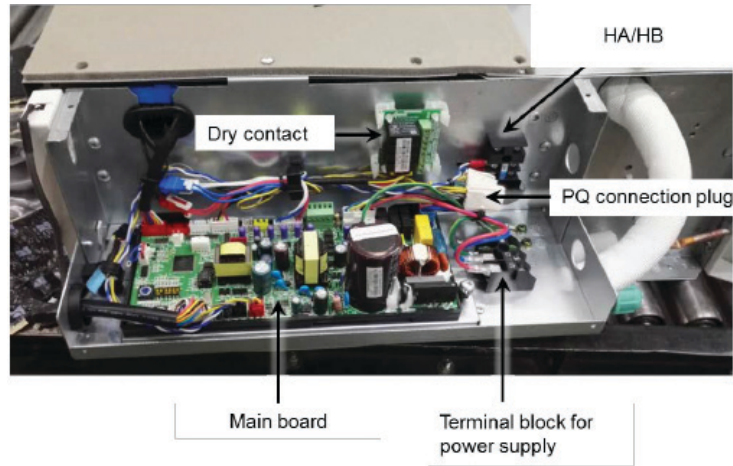


Fig. 79 —Floor Console (40VMR)

1-WAY CASSETTE (40VMI SERIES)

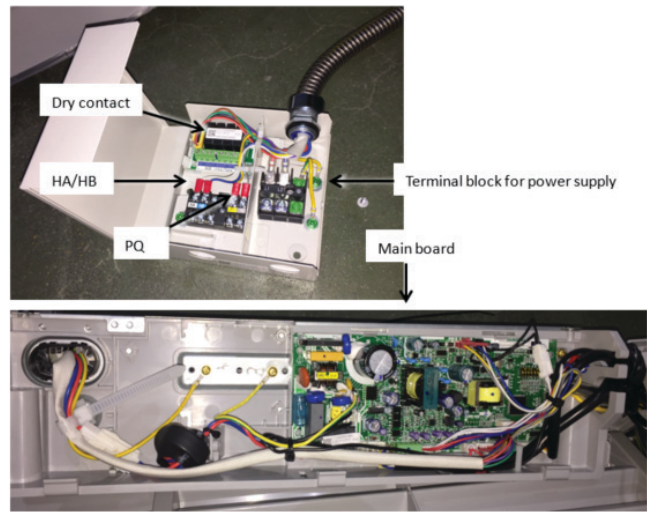


Fig. 80 —1-Way Cassette (40VMI005, 007, 009, 012---3)

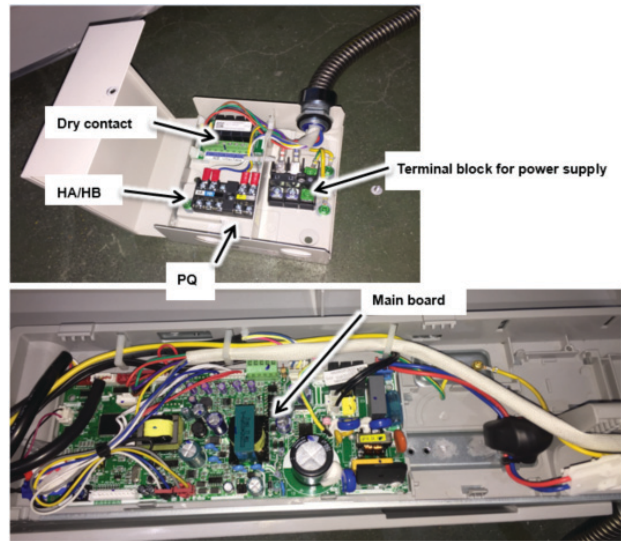


Fig. 81 —1-Way Cassette (40VMI015, 018, 024---3)

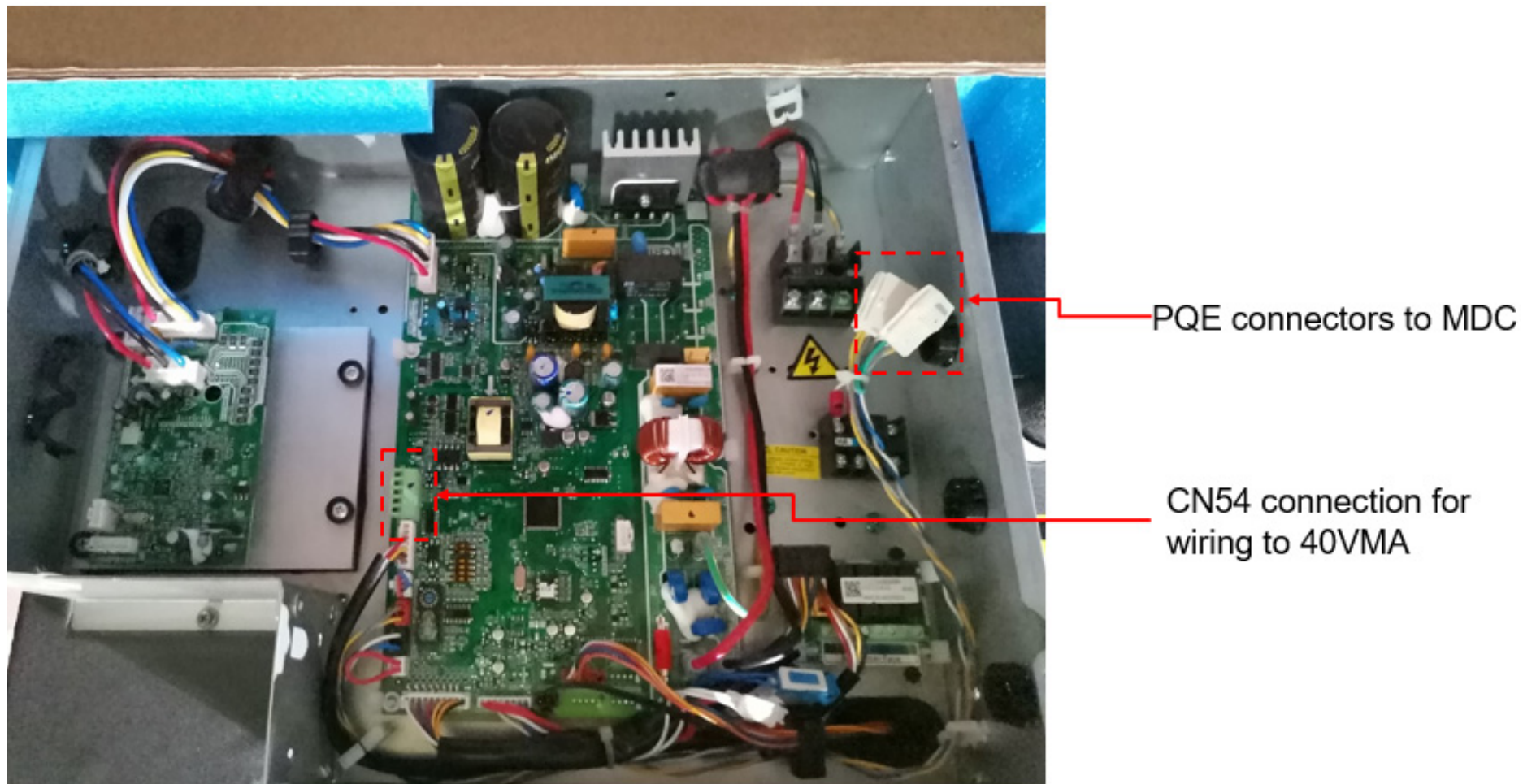


Fig. 82 —Reheat Unit Control Board (40VMZ Series)

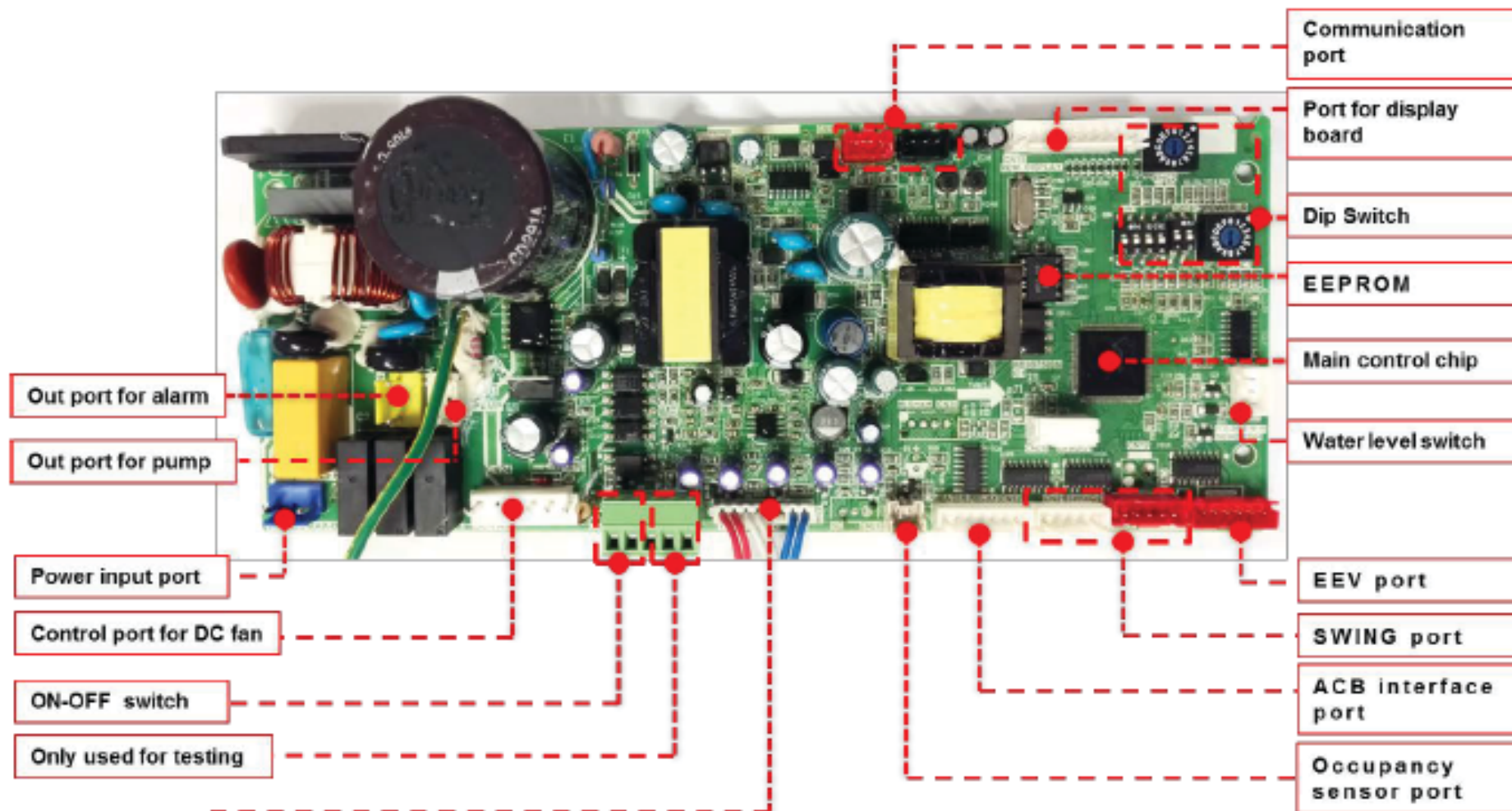


Fig. 83 —Low Pressure and Medium Static Duct (40VML and 40VMM Series), Compact 4-way Cassette (40VMC Series), and Floor Console Recessed (40VMR Series)

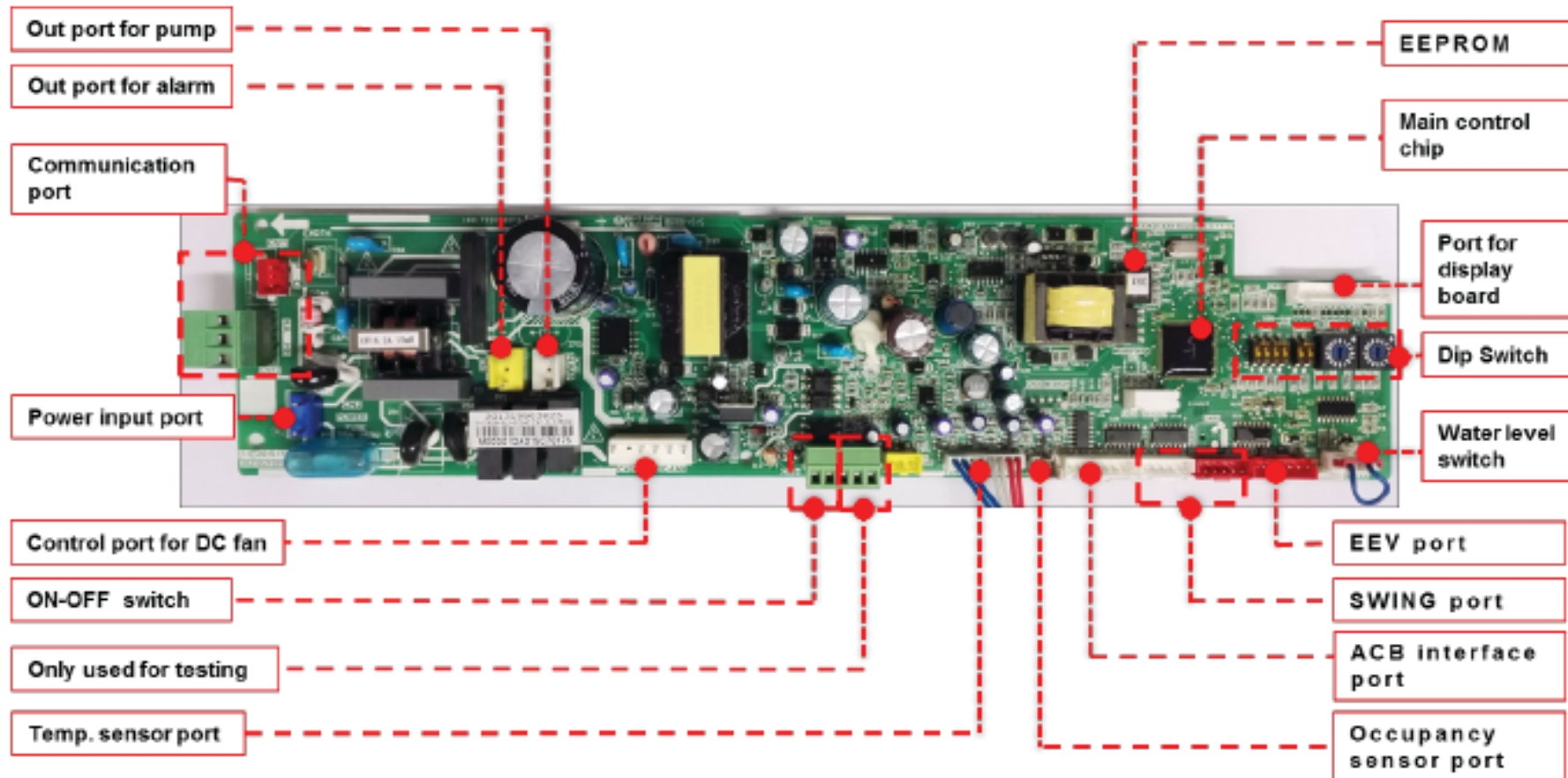


Fig. 84 —4-Way Cassette (40VMF Series)

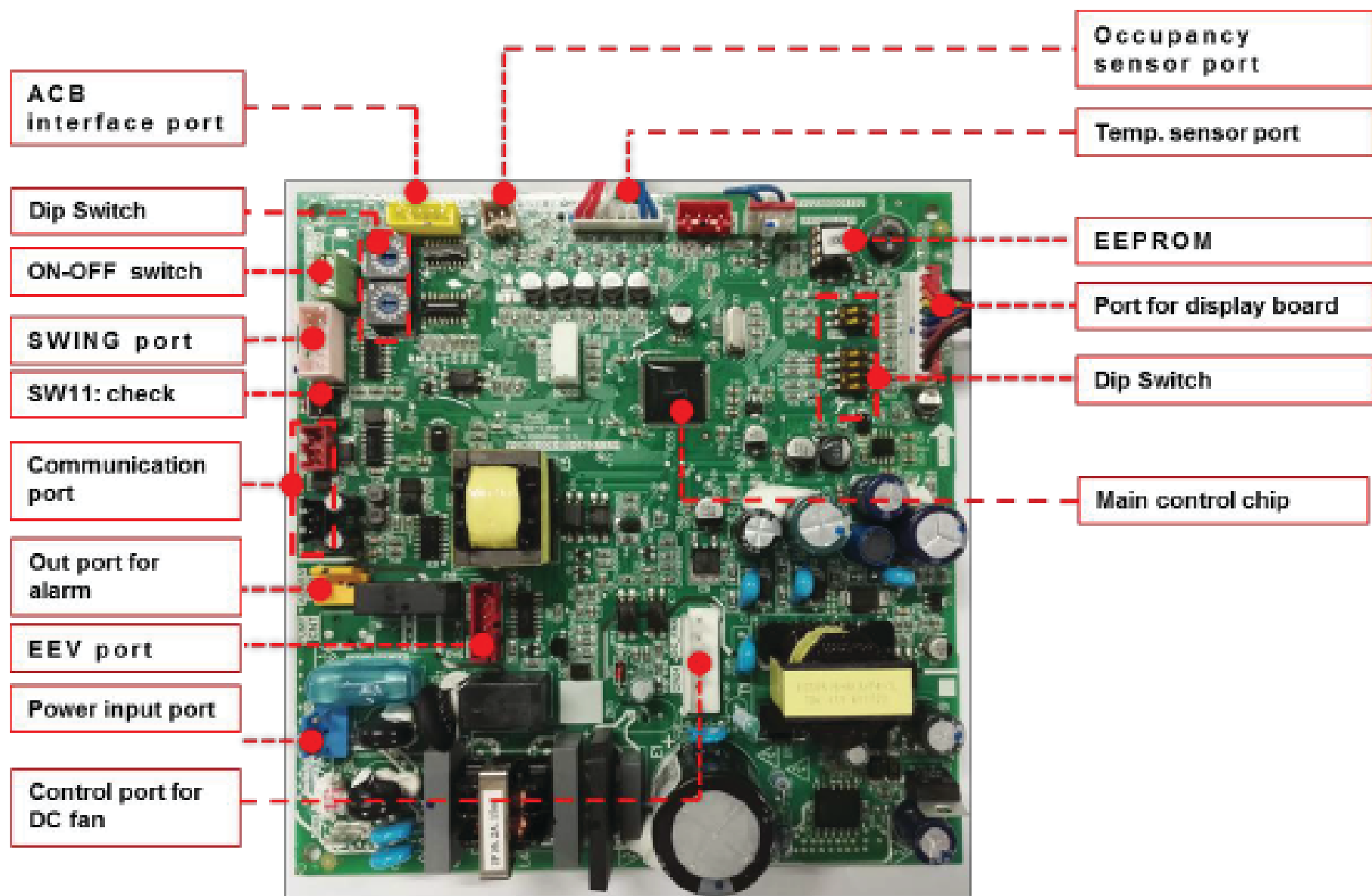


Fig. 85 —High Wall (40VMW Series)

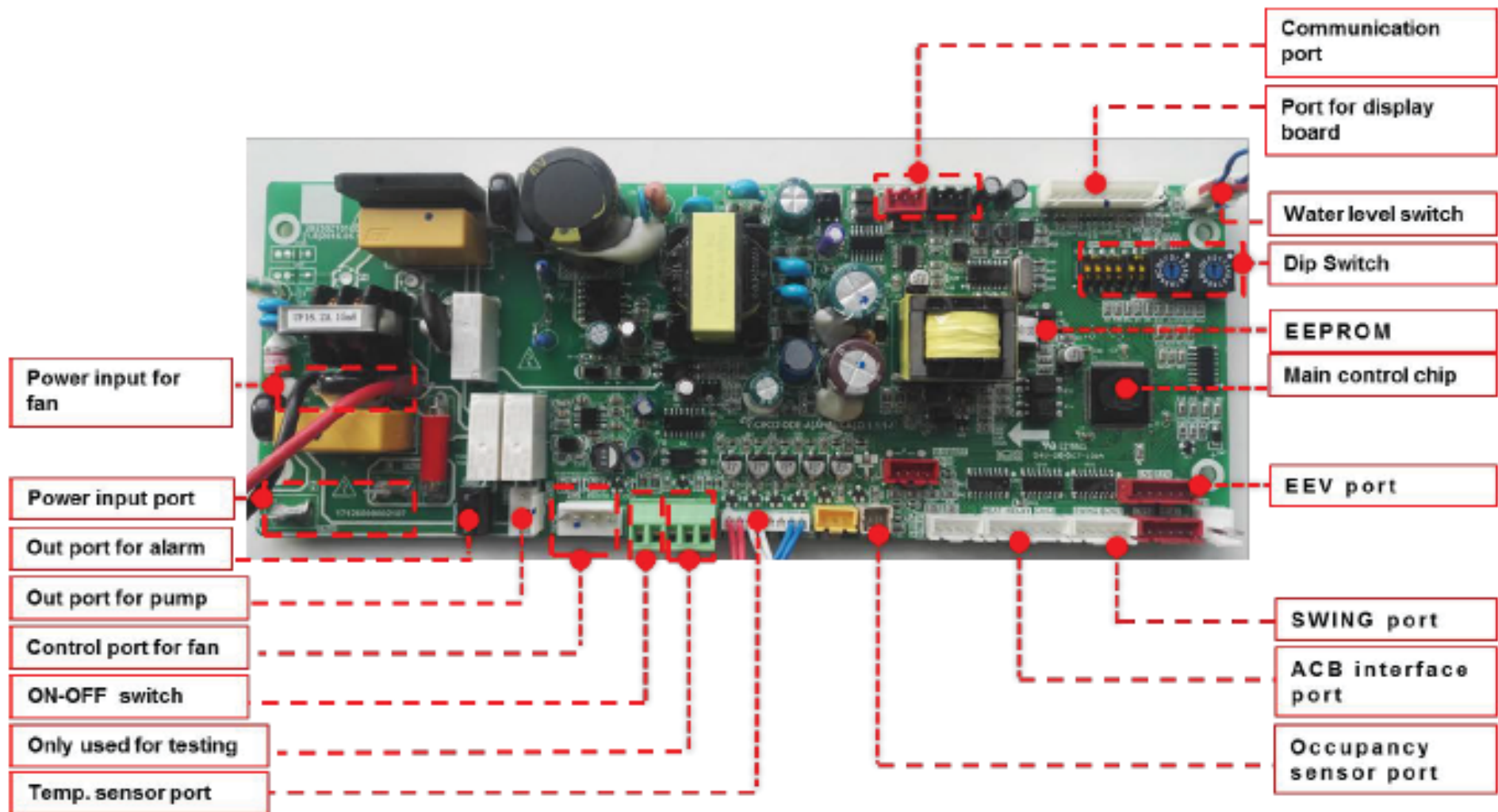


Fig. 86 —Vertical AHU (40VMV Series)

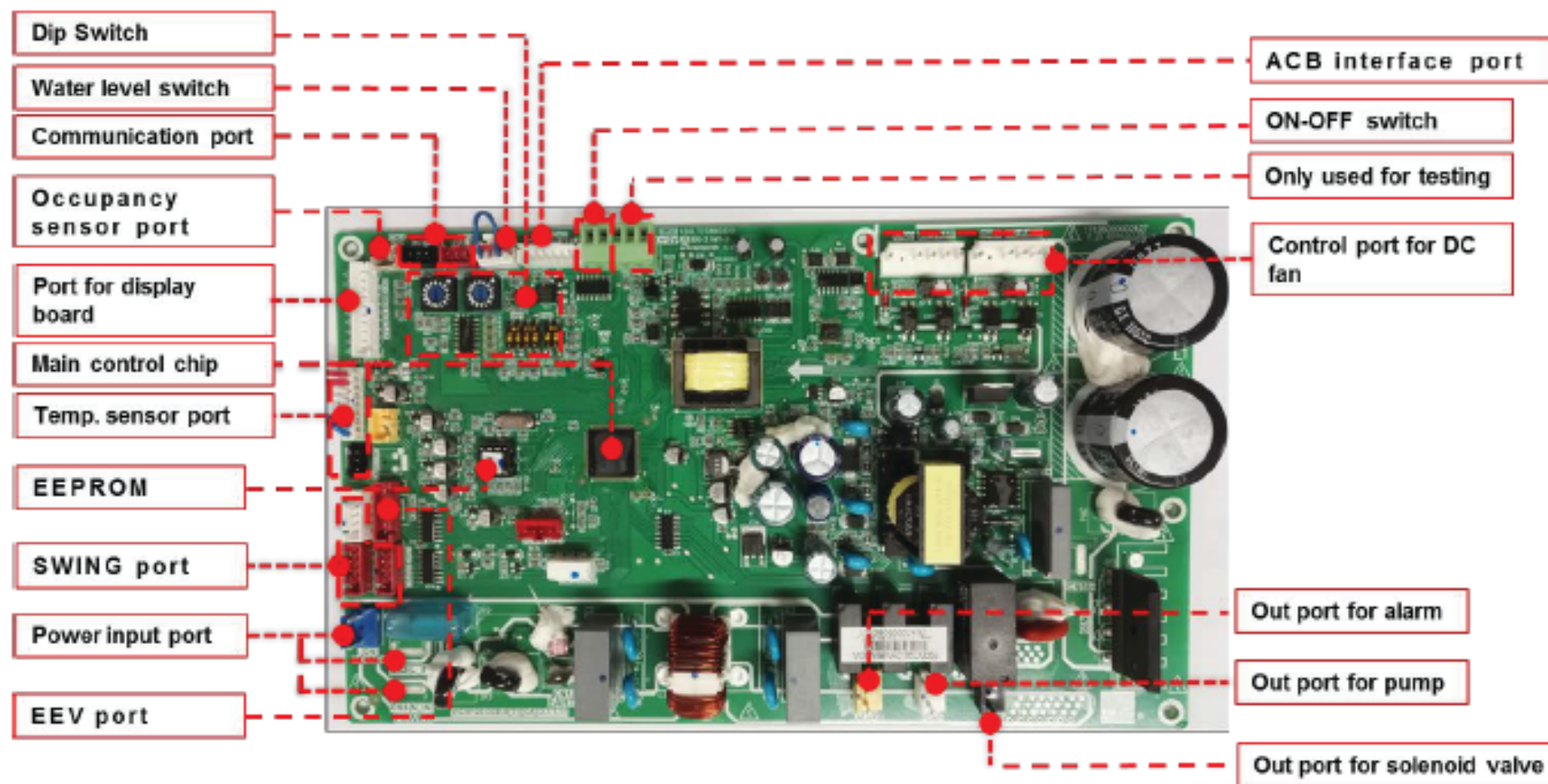


Fig. 87 —Underceiling/Floor Unit (40VMU) - High Static Duct (40VMH) - Outside Air (40VMA)

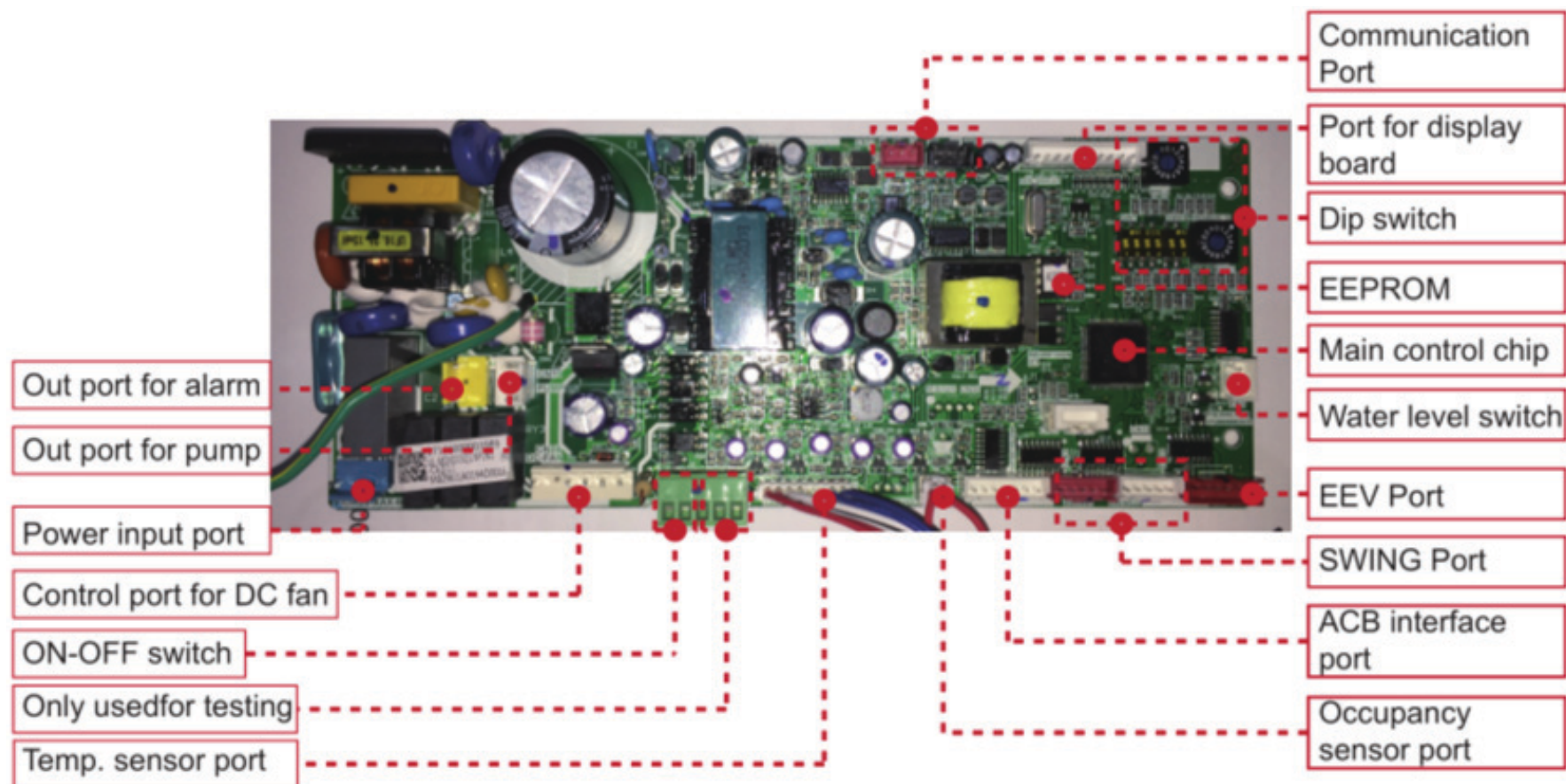


Fig. 88 —1-Way Cassette (40VMI)

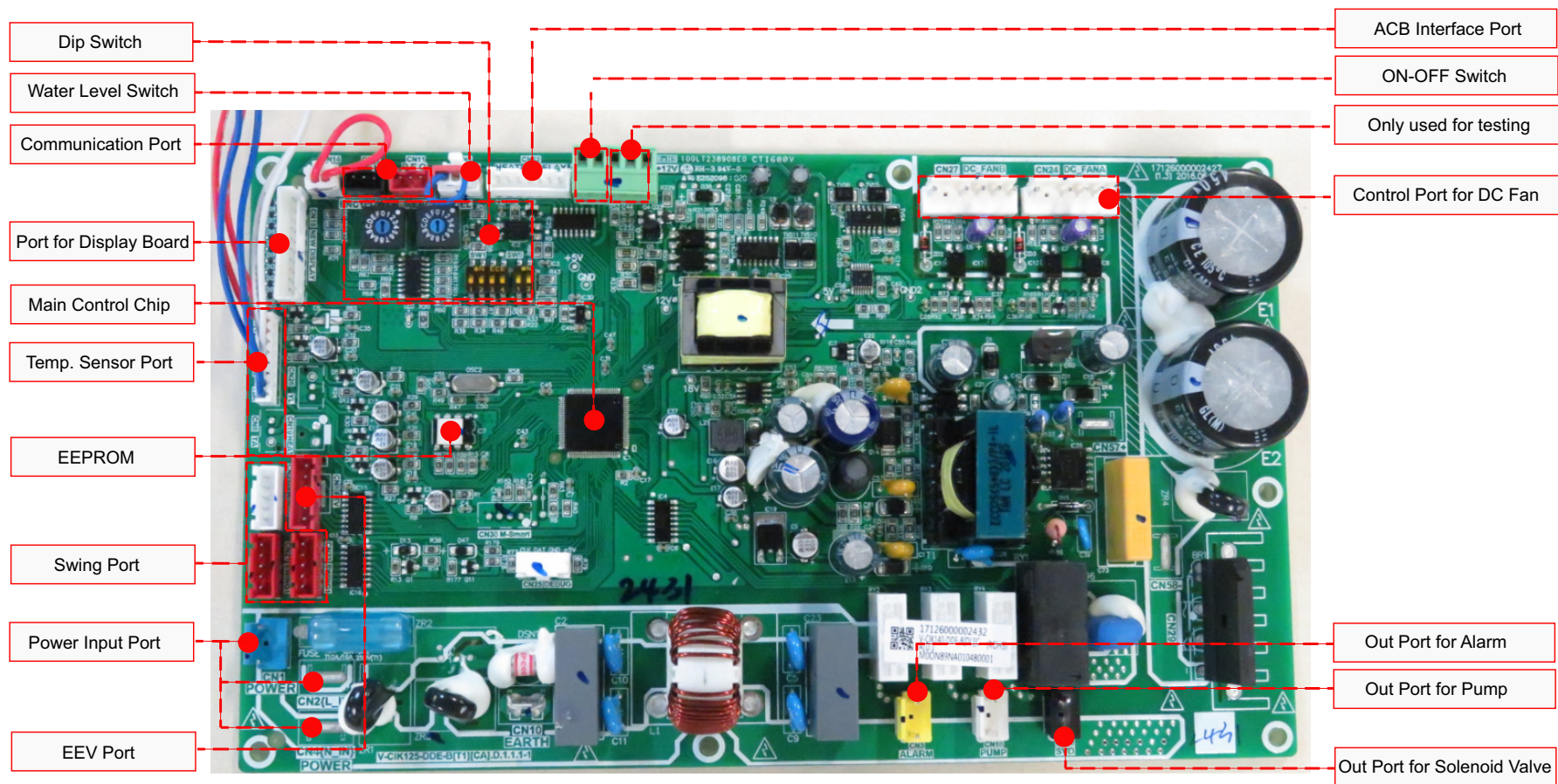
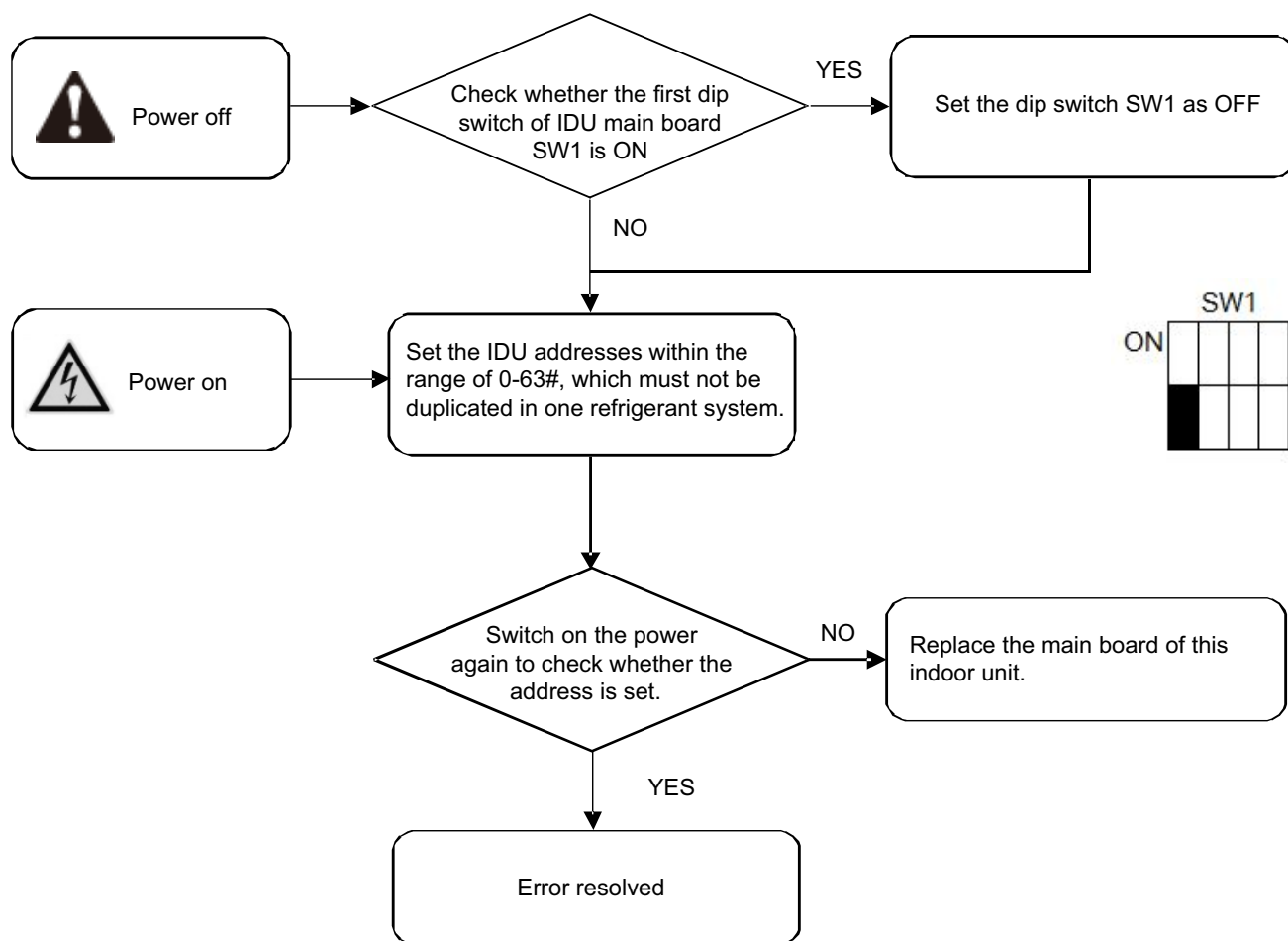


Fig. 89 —Reheat Unit (40VMZ)

Troubleshooting from Indoor Unit

FE: NO ADDRESS WHEN POWERED ON FOR FIRST TIME

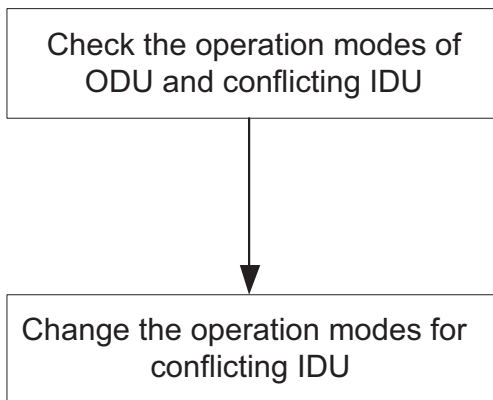
1. Error display:
IDU display: FE
2. Applicable models:
All indoor units
3. Error definition:
No address for IDU
4. Possible causes:
 - IDU set as test mode (Dip switch “SW1_1”)
 - No address for the IDU



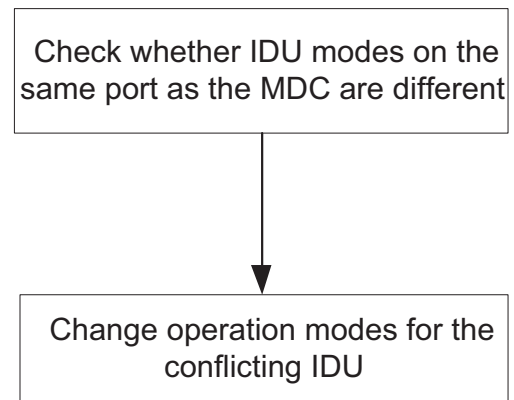
DD: HEATING / COOLING MODE CONFLICT

1. Error display:
IDU display: dd
2. Applicable models:
All indoor units
3. Error definition:
 - Different operating modes for IDU and ODU (Heat Pump or Single Phase VRF)
 - Different operating modes for IDUs sharing one port of MDC (Heat Recovery)
4. Possible causes:
 - For Heat Pump or Single Phase VRF system
 - The ODU is operating in Heating mode; while the IDU is operating in Cooling, Fan, or Dry mode
 - The ODU is operating in Cooling/Dry mode, while the IDU is operating in Heating mode
 - Indoor units sharing the same port in the MDC (for Heat Recovery system)
 - One is operating Heating mode, but the other is operating in Cooling, Fan, or Dry mode
 - One is operating Cooling, Fan, or Dry mode, while the other one is to operate Heating mode. In this case, the one operating in Cooling, Fan, or Dry mode will display “dd”

Heat pump or Mini-VRF system:



Heat Recovery system



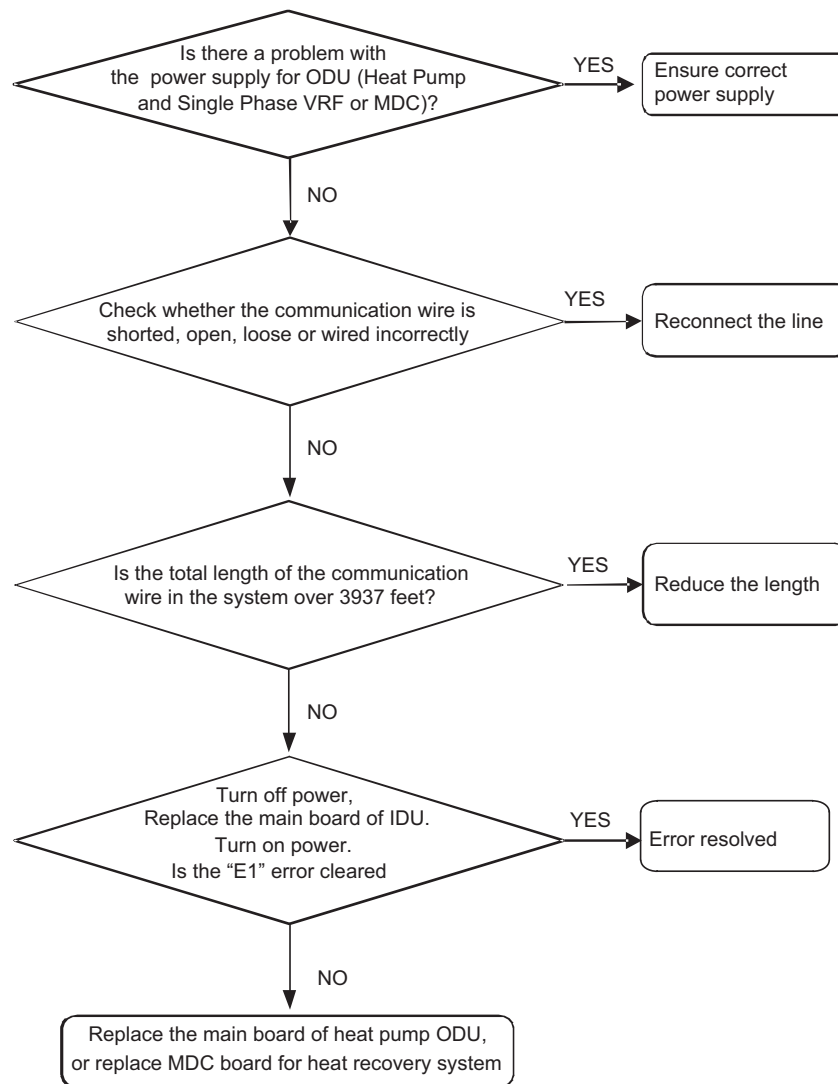
NOTE:

The conflict is between Heating and Cooling modes, Heating and Fan modes, and Heating and Dry modes.

The Cooling, Fan, and Dry modes are not in conflict with each other.

E1: COMMUNICATION ERROR BETWEEN IDU AND ODU

1. Error display:
IDU display: E1
2. Applicable models:
All indoor units
3. Error definition:
 - Communication error between IDU and ODU (Heat Pump or Single Phase VRF)
 - Communication error between IDU and MDC (Heat Recovery)
4. Possible causes:
 - Abnormal power supply for ODU (Heat Pump or Single Phase VRF) or MDC (Heat Recovery)
 - Communication wire is loose, shorted, opened, or improperly connected
 - Damaged main board of IDU
 - Damaged main board of ODU (Heat Pump or Single Phase VRF) or MDC (Heat Recovery)
 - Communication cable is too long



E2~E5: CHECK TEMPERATURE SENSOR

1. Error display:

IDU display: E2 (T1 sensor)

E3 (TA sensor)

E4 (T2B sensor)

E5 (T2A sensor)

2. Applicable models:

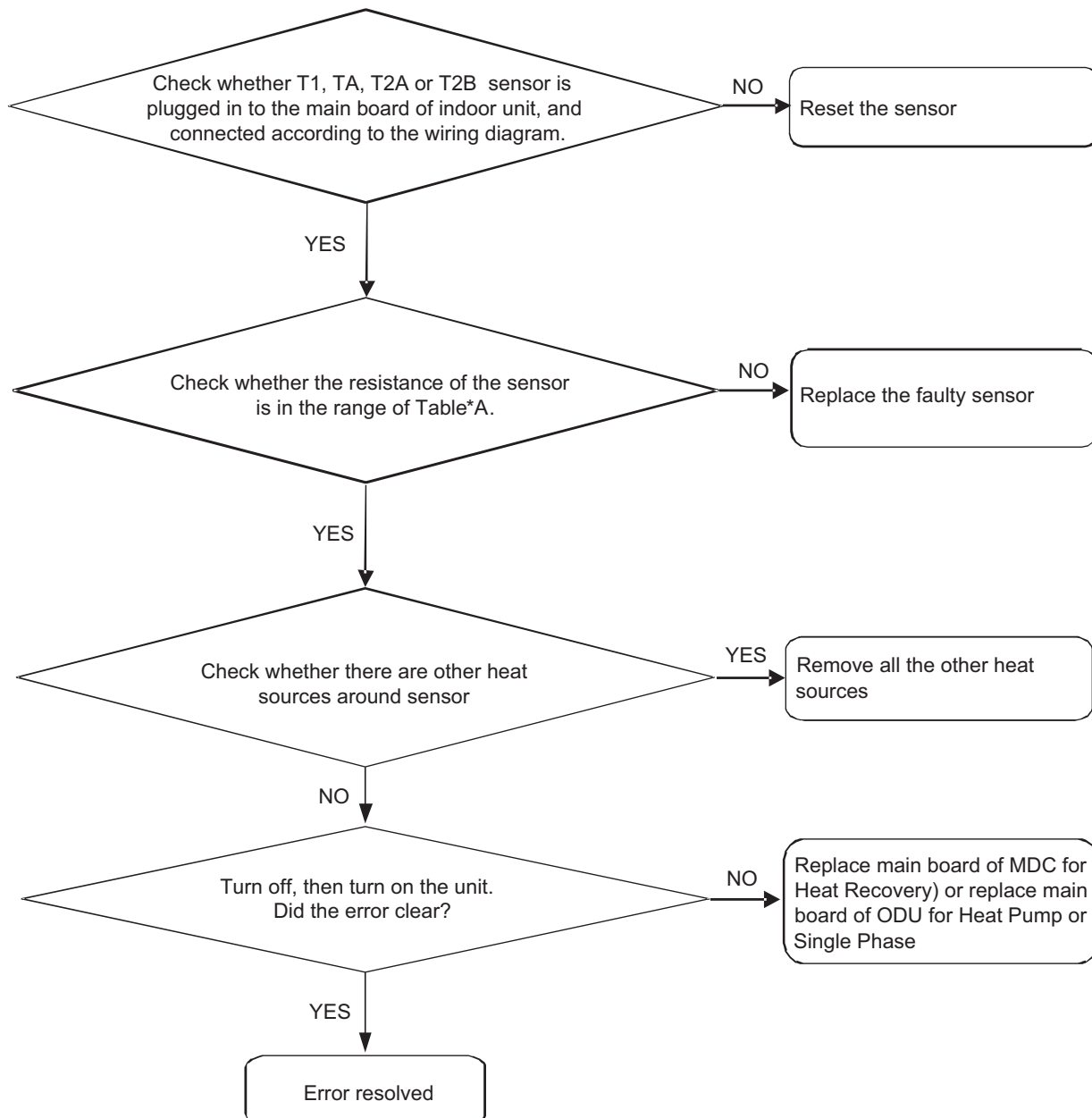
All indoor units

3. Definition:

- Temperature sensor (T1, TA, T2A, or T2B) on main board of indoor unit have an open or short circuit.
- The detected voltage $> 4.95\text{V}$ or $< 0.05\text{V}$.

4. Possible causes:

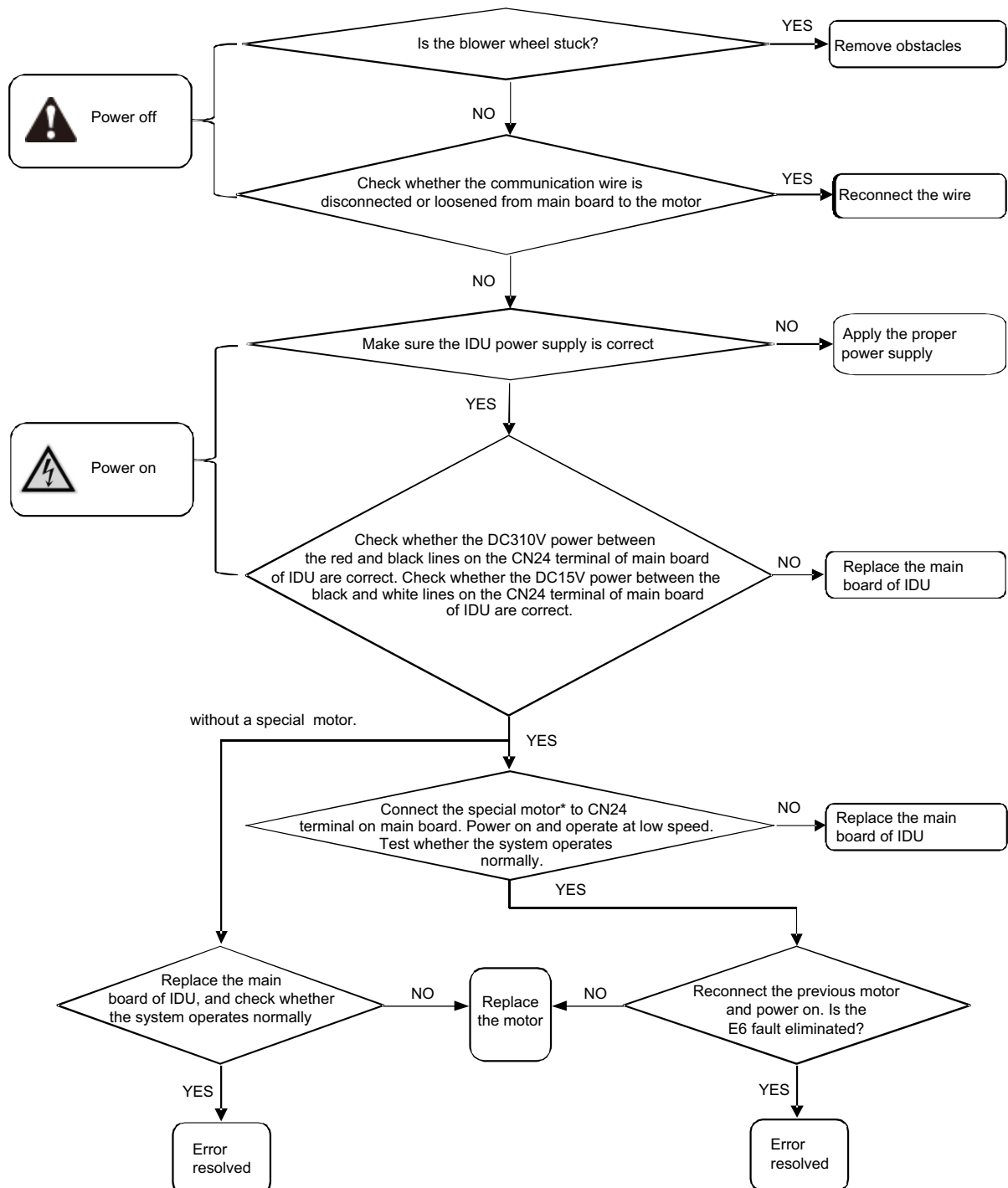
- Bad connection between the temperature sensor and main board of IDU
- Damaged temperature sensor
- Damaged main board of IDU
- Interference from other heat source



*A Refer to Resistance table of ambient temperature sensor in Appendix on page 82.

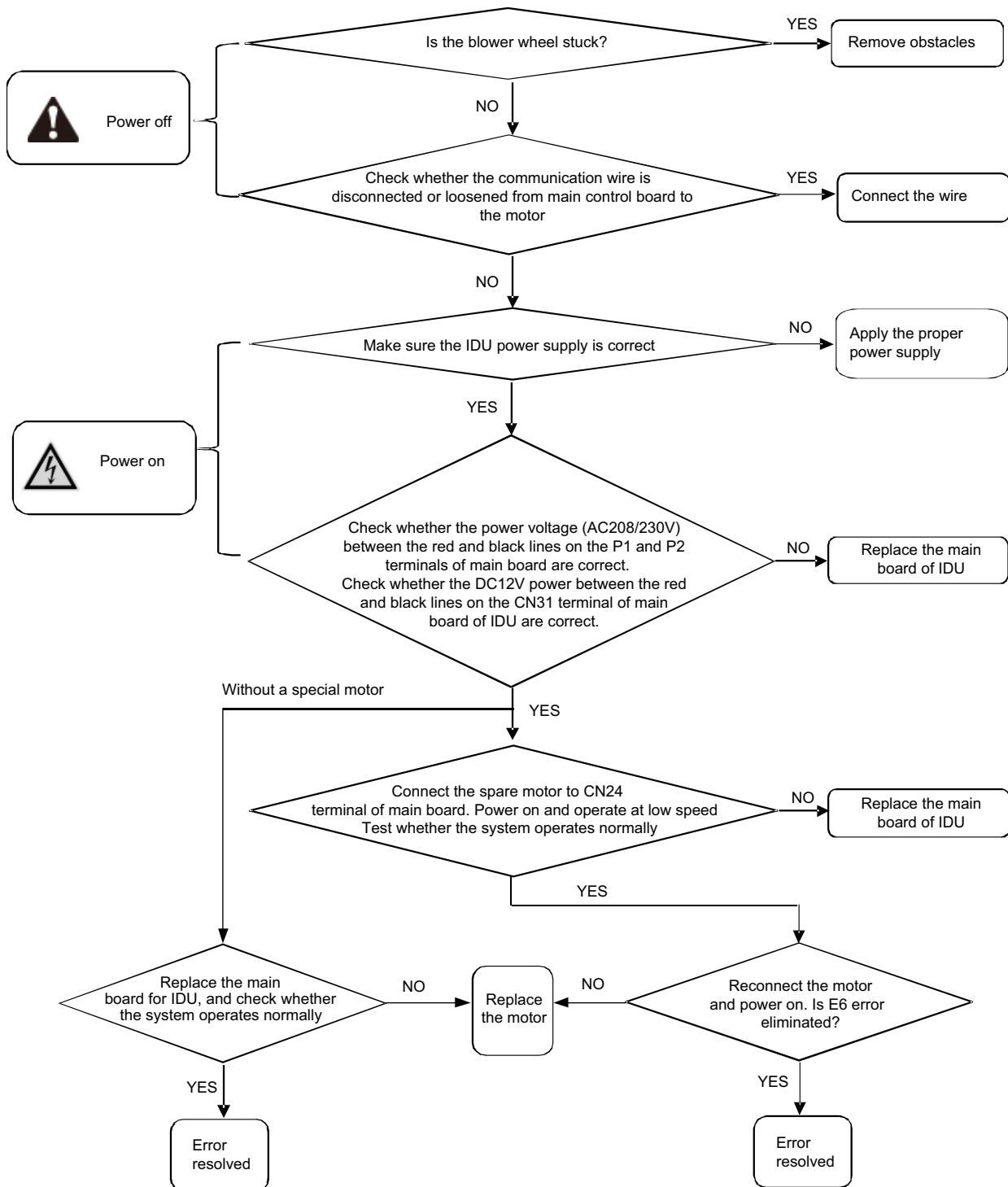
E6: CHECK DC FAN ERROR 1

1. Error display:
IDU display: E6
2. Applicable models:
40VMM, 40VML, 40VMW, 40VMF, 40VMC, 40VMU, 40VMR, 40VMI
3. Error definition:
DC fan error in IDU -- No fan is detected on the main board, and specific speed difference exists between actual speed and target speed.
4. Possible causes:
 - The line from main board to fan motor is loose, disconnected, or improperly connected
 - Damaged fan motor
 - Damaged main board of indoor unit



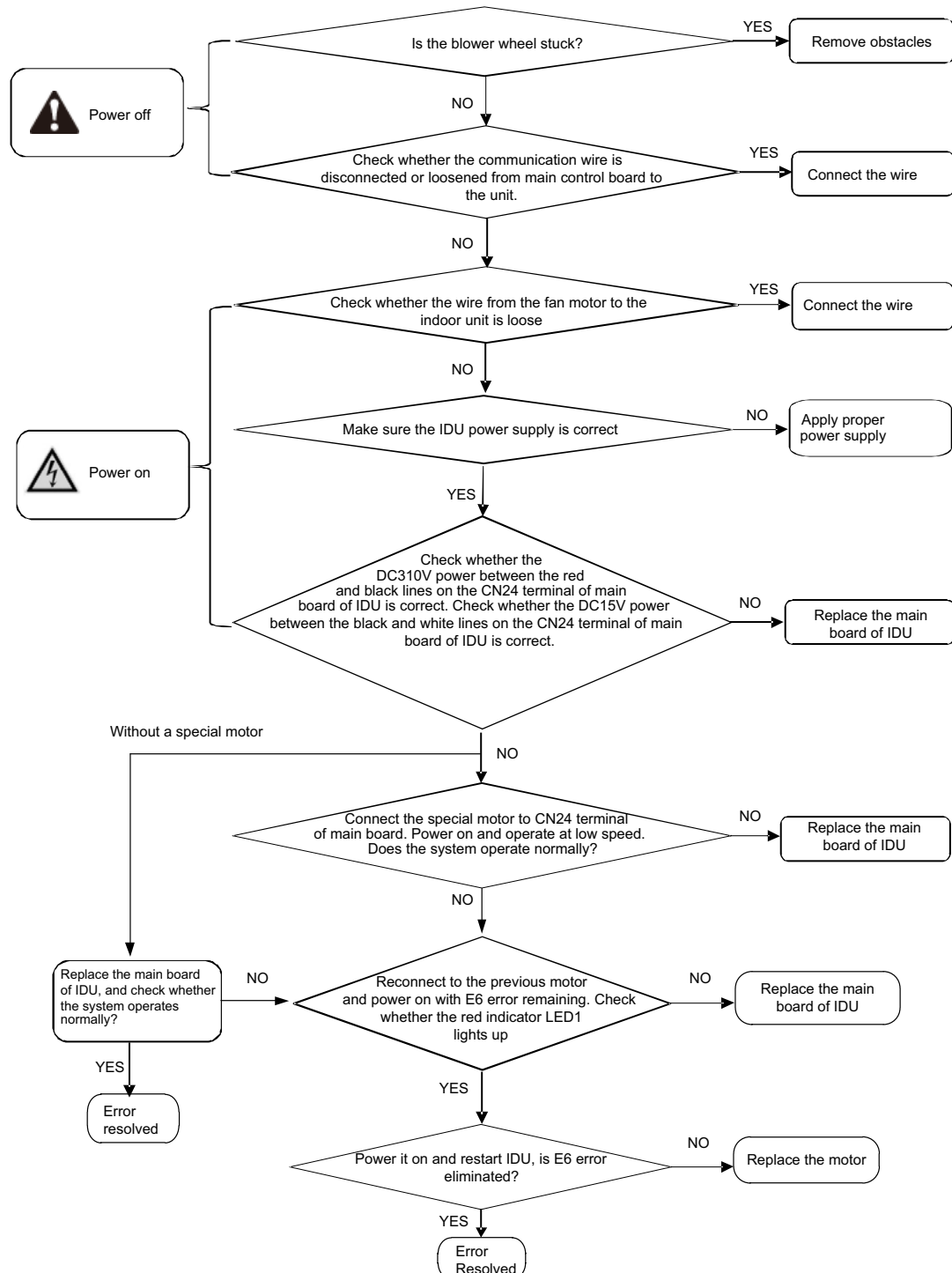
E6: CHECK DC FAN ERROR 2

1. Error display:
IDU display: E6
2. Applicable models:
40VMV (Vertical AHU)
3. Error definition:
DC fan error in IDU -- No fan is detected on the main board
4. Possible causes:
 - The line from main board to fan motor is loose, disconnected, or improperly connected
 - Damaged fan motor
 - Damaged main board of indoor unit



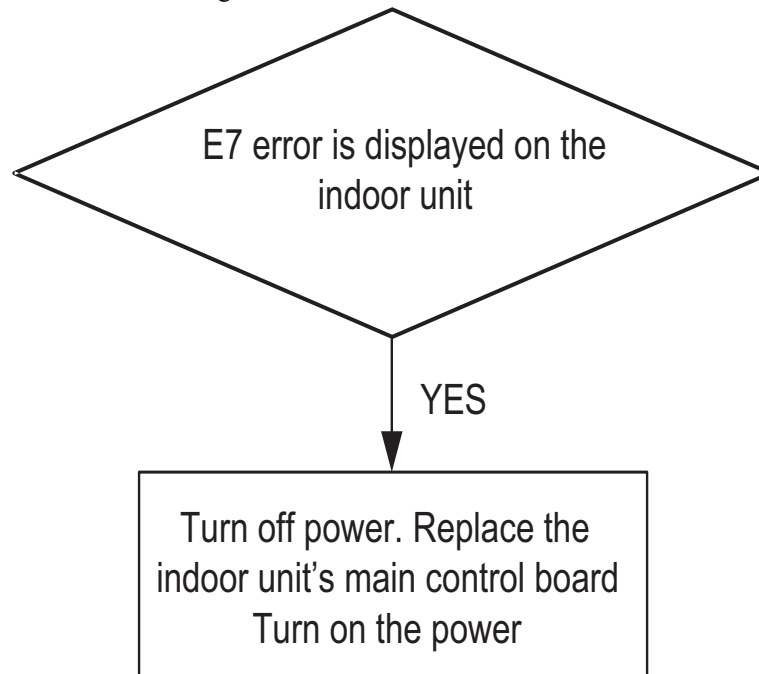
E6: CHECK DC FAN ERROR 3

1. Error display:
IDU display: E6
2. Applicable models:
40VMH, 40VMA (high static pressure and outside air unit)
3. Error definition:
DC fan error in IDU -- No fan is detected on the main board, and specific speed difference exists between actual speed and target speed.
4. Possible causes:
 - The line from the main board to the fan motor is loose, disconnected, or improperly connected
 - Damaged fan motor
 - Damaged main board of indoor unit



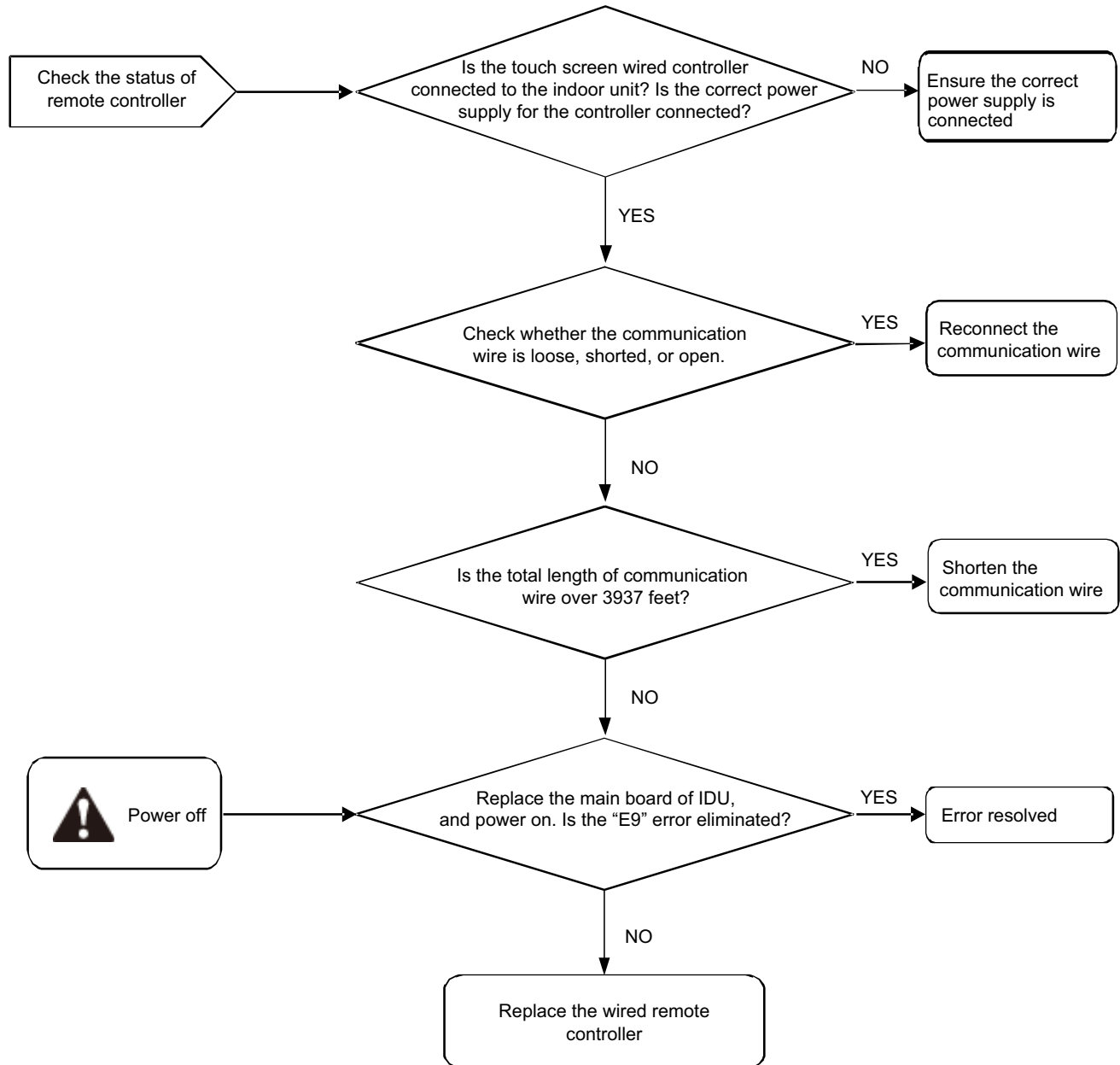
E7: EEPROM ERROR (DATA STORAGE)

1. Error display:
IDU display: E7
2. Applicable models:
All indoor units
3. Error definition:
EEPROM error
4. Possible causes:
IC7 (Chip) on the main board with a damaged connection



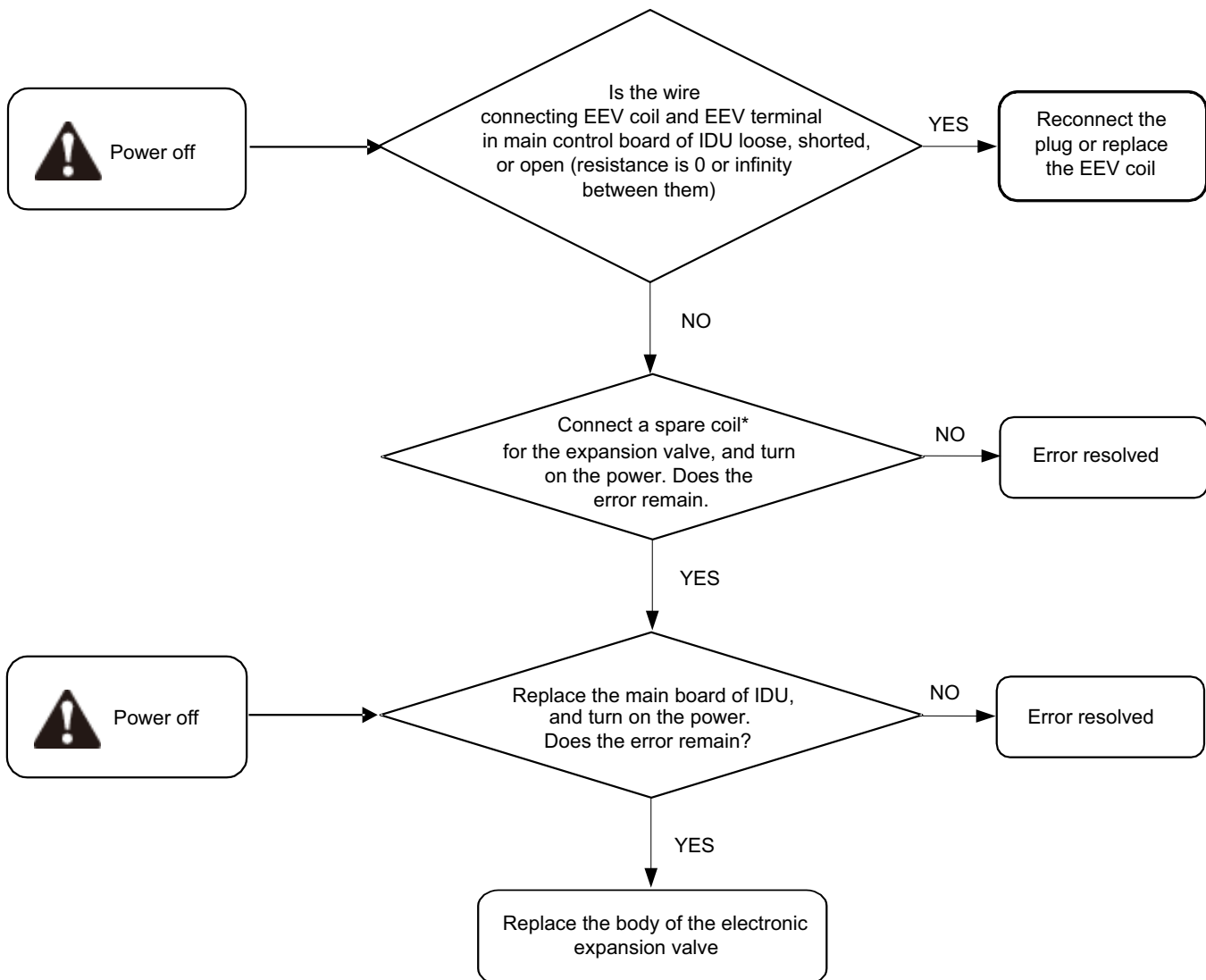
E9: COMMUNICATION ERROR BETWEEN IDU AND WIRED REMOTE CONTROLLER

1. Error display:
IDU display: E9
2. Applicable models:
All indoor units
3. Error definition:
Communication error between IDU and wired remote controller normal operation
4. Possible causes:
 - Abnormal power supply for the wired remote controller (Only 40VM900005)
 - Communication wire is loose, shorted, or open circuit
 - Damaged main board of IDU
 - The wired remote controller is damaged
 - The communication wire between the remote controller and indoor unit is too long



EB: EEV ERROR (SHORT OR STUCK)

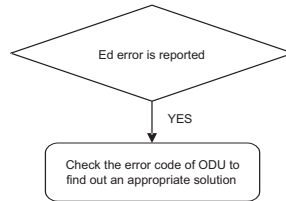
1. Error display:
IDU display: Eb
2. Applicable models:
All indoor units
3. Error definition:
EXV is stuck or shorted
4. Possible causes:
 - Wire that connects to the EEV terminal is loose or broken
 - The electronic expansion valve is stuck
 - Main board of IDU is damaged



* Spare EEV coil for the expansion valve can be ordered through Replacement Component Division (RDC).

ED: ODU ERROR

1. Error display:
IDU display: Ed
2. Applicable models:
All indoor units
3. Error definition:
ODU error lasts ten minutes
4. Possible causes:
ODU is not in operation

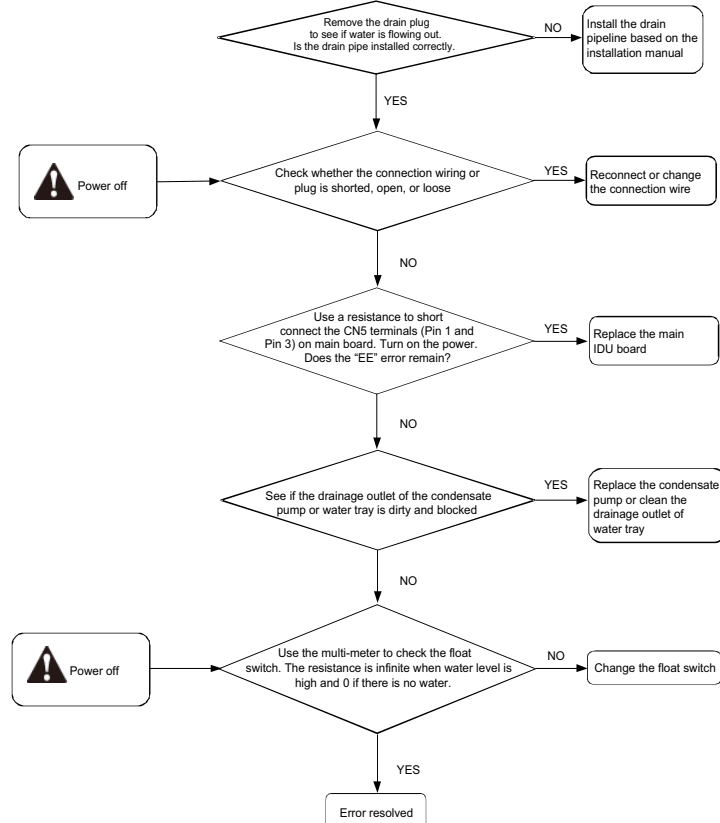


NOTE: For Heat Recovery systems, check the MDC status because it can cause errors in the ODU.

EE: CONDENSATE OVERFLOW

1. Error display:
IDU display: EE
2. Applicable models:
 - With condensate pump: 40VMF, 40VMM, 40VML, 40VMH (24~54K), 40VMA, 40VMC, and 40VMI
 - Without condensate pump: 40VMW, 40VMV, 40VMR, 40VMU, 40VMH (72K and 96K)
3. Error definition:
Condensate overflow -- check whether the float switch is open or closed
4. Possible causes:
 - Wiring to the float switch is loose or disconnected
 - The float switch to detect water level is stuck
 - The water tray of the IDU has poor drainage, or the pump is damaged
 - Damaged main board of IDU

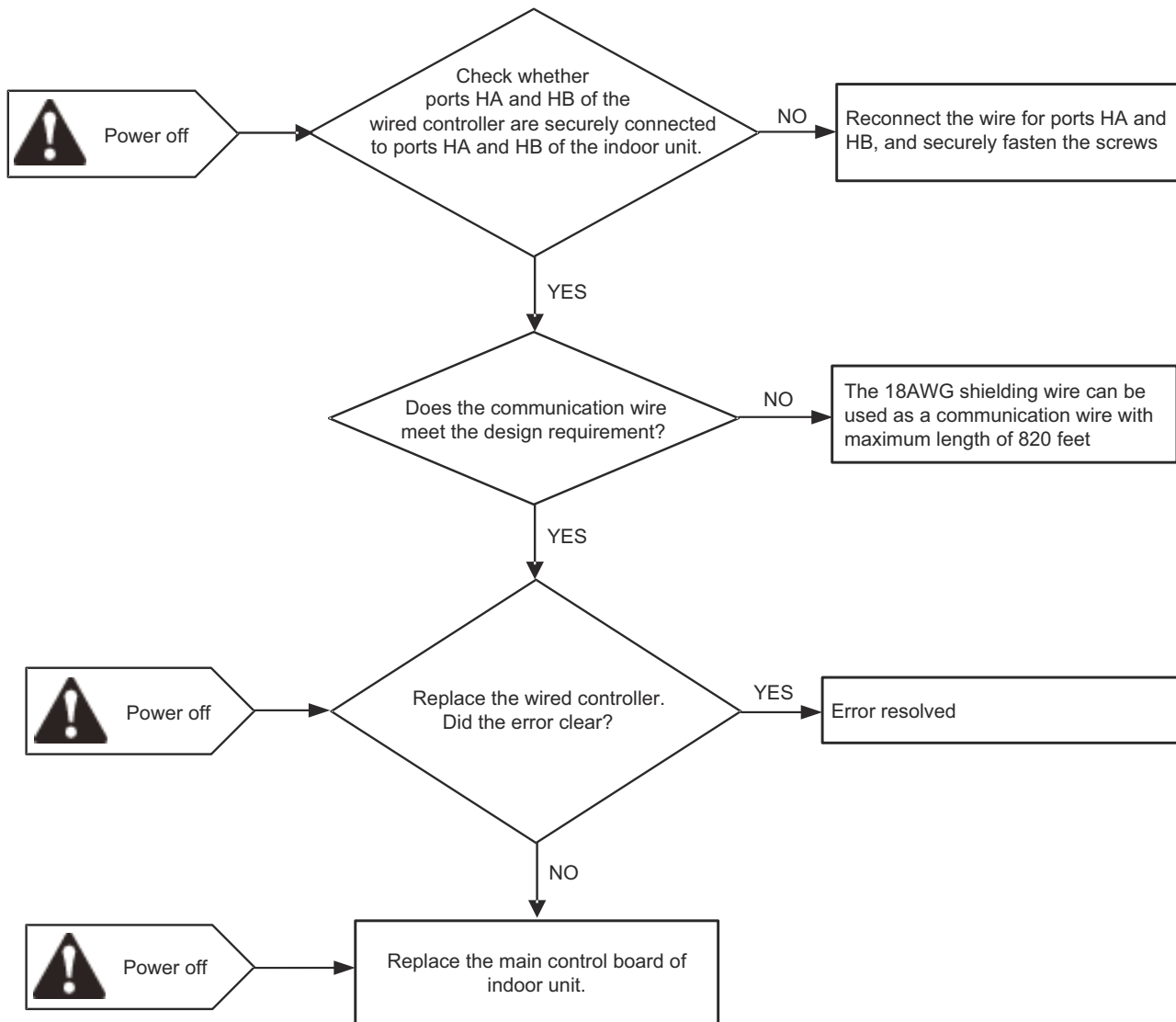
NOTE: When a single indoor unit reports an EE error code, that unit will shut down. The rest of the system will stay in operation.



Troubleshooting from Remote Controller

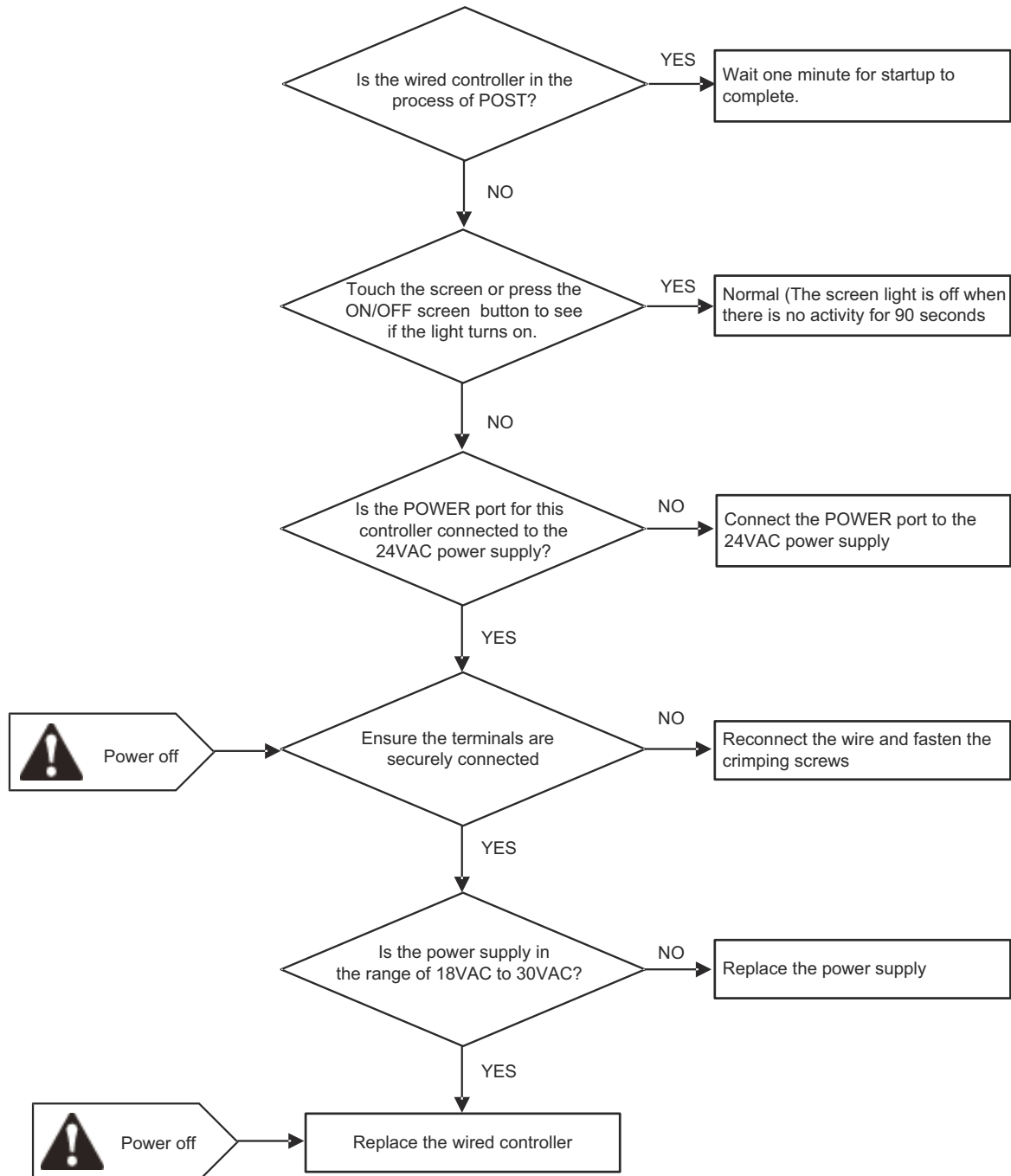
NO DISPLAY ON WIRED CONTROLLER (PROGRAMMABLE AND NON-PROGRAMMABLE)

1. Error display:
No display (the screen does not light on)
2. Applicable models:
 - Non-programmable controller: 40VM900002, 40VM900012, 40VM910002
 - Programmable controller: 40VM900003, 40VM900013, 40VM910003
3. Error definition:
No display on wired controller
Check wiring between IDU and controller
4. Possible causes:
 - Incorrect wiring between IDU and controller
 - Wiring of wired controller does not meet the design requirements
 - The wired controller is damaged
 - The main board of IDU is damaged



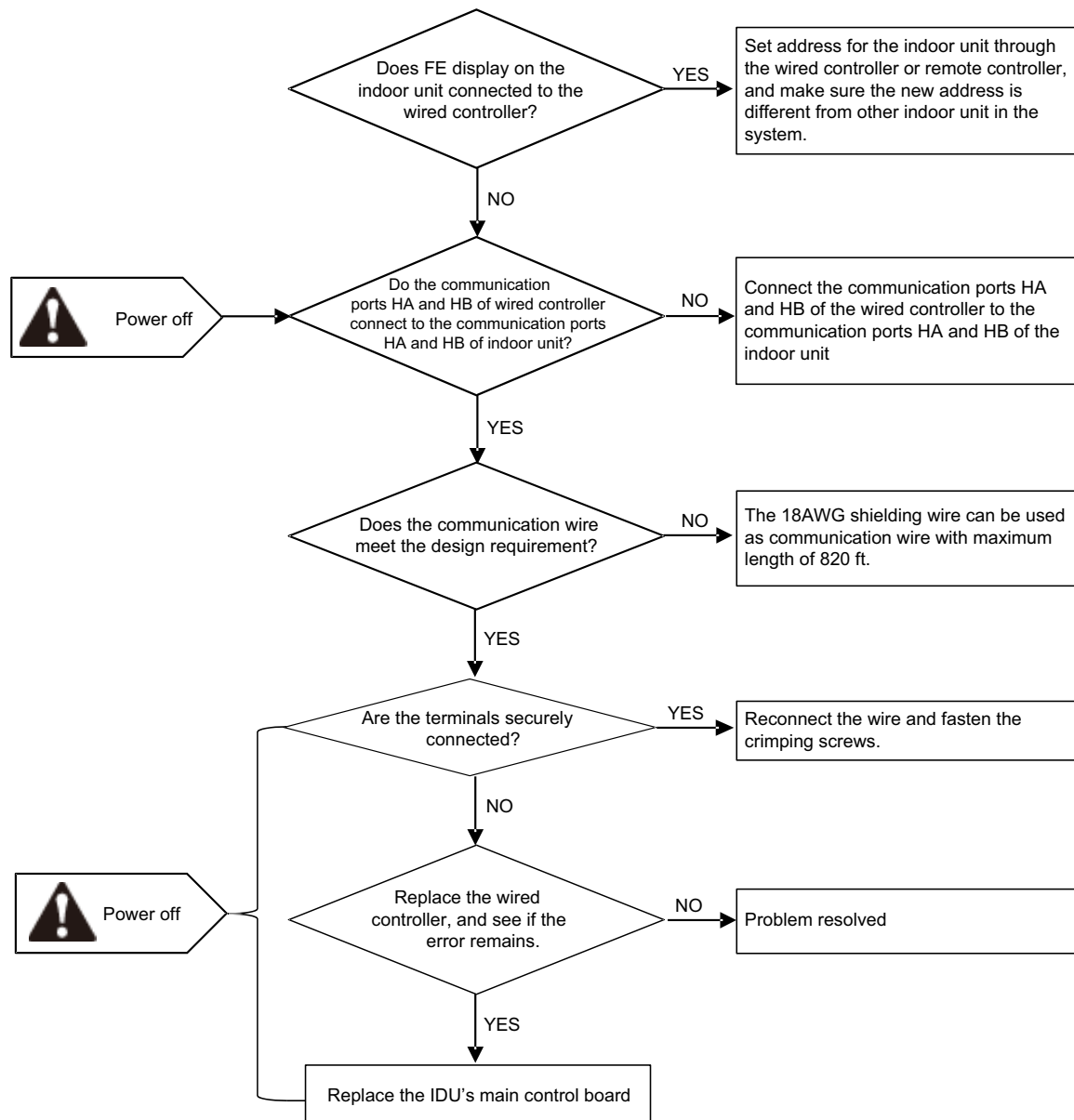
NO DISPLAY ON WIRED CONTROLLER (TOUCH SCREEN CONTROLLER)

1. Error display:
No display (the screen does not light)
2. Applicable models:
Touch screen controller: 40VM900005
3. Error definition:
No display on wired controller
Check the power supply of wired controller
4. Possible causes:
 - The wired controller is in the process of POST (self-check when power on) and has not started
 - The wired controller is in sleep, and its screen dims out (normal condition)
 - Abnormal power supply to the wired remote controller
 - Wiring of wired controller does not meet the design requirements
 - The wired controller is damaged
 - The external power supply is damaged



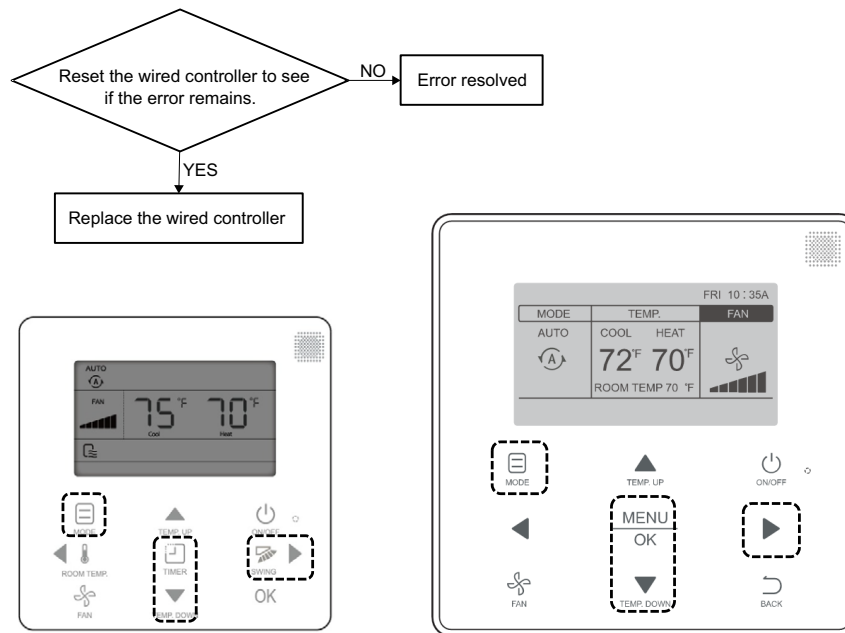
E9: COMMUNICATION ERROR BETWEEN IDU AND CONTROLLER

1. Error display:
Display on wired controller: E9
2. Applicable models:
 - Non-programmable controller: 40VM900002, 40VM900012, 40VM910002
 - Programmable controller: 40VM900003, 40VM900013, 40VM910003
 - Touch screen controller: 40VM900005
3. Error definition:
 - Communication error between the wired controller and IDU
 - Check the communication between the wired controller and the IDU
4. Possible causes:
 - No address is set for the IDU
 - The wired controller is not connected to the communication port of IDU
 - Wiring of wired controller does not meet the design requirements
 - The wired controller is damaged
 - Main board of IDU is damaged



F7: EEPROM ERROR ON WIRED REMOTE CONTROLLER

1. Error display:
Display on wired remote controller: F7
2. Applicable models:
 - Non-programmable controller: 40VM900002, 40VM900012, 40VM910002
 - Programmable controller: 40VM900003, 40VM900013, 40VM910003
3. Error definition:
EEPROM error on wired controller
Reset the wired controller
4. Possible causes:
 - Data error
 - The wired controller is damaged

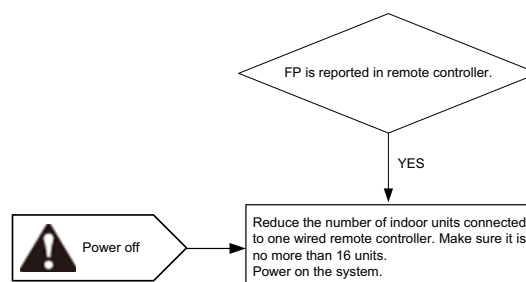


Reset the Wired Controller

- For 40VM900002, 40VM900012, 40VM910002:
Press "MODE" + "TIMER" + "TEMP. DOWN" + "Right mouse button" at the same time.
- For 40VM900003, 40VM900013, 40VM910003:
Press "MODE" + "MENU/OK" + "TEMP. DOWN" + "Right mouse button" at the same time.

FP: TOO MANY IDUS IN ONE GROUP

1. Error display:
Display on wired controller: FP
2. Applicable models:
 - Non-programmable controller: 40VM900002, 40VM900012, 40VM910002
 - Programmable controller: 40VM900003, 40VM900013, 40VM910003
 - Touch screen controller: 40VM900005
3. Error definition:
Check the total number of IDUs connected to the wired controller, and make sure it is not more than 16.
4. Possible causes:
Total number of IDUs connected to the wired controller is over 16.



APPENDIX

Table 32 —Resistance of Temperature Sensor A*

TEMP. (°F)	RESISTANCE (KΩ)	VOLTAGE (V)	TEMP. (°F)	RESISTANCE (KΩ)	VOLTAGE (V)	TEMP. (°F)	RESISTANCE (KΩ)	VOLTAGE (V)
-38.2	387.13	0.10	51.8	19.62	1.46	141.8	2.27	3.90
-36.4	360.98	0.11	53.6	18.66	1.51	143.6	2.19	3.93
-34.6	336.73	0.12	55.4	17.75	1.56	145.4	2.11	3.96
-32.8	314.24	0.12	57.2	16.89	1.61	147.2	2.04	3.99
-31.0	293.38	0.13	59.0	16.08	1.67	149.0	1.97	4.02
-29.2	274.01	0.14	60.8	15.31	1.72	150.8	1.90	4.05
-27.4	256.05	0.15	62.6	14.59	1.78	152.6	1.83	4.07
-25.6	239.36	0.16	64.4	13.90	1.83	154.4	1.77	4.10
-23.8	223.87	0.17	66.2	13.25	1.89	156.2	1.71	4.13
-22.0	209.48	0.18	68.0	12.63	1.95	158.0	1.65	4.15
-20.2	196.11	0.20	69.8	12.05	2.00	159.8	1.59	4.17
-18.4	183.68	0.21	71.6	11.49	2.06	161.6	1.54	4.20
-16.6	172.12	0.22	73.4	10.97	2.12	163.4	1.49	4.22
-14.8	161.36	0.24	75.2	10.47	2.17	165.2	1.44	4.24
-13.0	151.34	0.25	77.0	10.00	2.23	167.0	1.39	4.26
-11.2	142.02	0.27	78.8	9.55	2.29	168.8	1.34	4.28
-9.4	133.32	0.28	80.6	9.13	2.34	170.6	1.30	4.30
-7.6	125.22	0.30	82.4	8.72	2.40	172.4	1.26	4.32
-5.8	117.66	0.32	84.2	8.34	2.46	174.2	1.22	4.34
-4.0	110.60	0.34	86.0	7.97	2.51	176.0	1.18	4.36
-2.2	104.02	0.36	87.8	7.63	2.57	177.8	1.14	4.38
-0.4	97.86	0.38	89.6	7.30	2.62	179.6	1.10	4.40
1.4	92.11	0.40	91.4	6.98	2.68	181.4	1.07	4.41
3.2	86.73	0.42	93.2	6.69	2.73	183.2	1.03	4.43
5.0	81.69	0.45	95.0	6.40	2.79	185.0	1.00	4.45
6.8	76.98	0.47	96.8	6.13	2.84	186.8	0.97	4.46
8.6	72.57	0.50	98.6	5.88	2.89	188.6	0.94	4.48
10.4	68.44	0.53	100.4	5.63	2.94	190.4	0.91	4.49
12.2	64.56	0.55	102.2	5.40	2.99	192.2	0.88	4.51
14.0	60.93	0.58	104.0	5.18	3.04	194.0	0.86	4.52
15.8	57.53	0.61	105.8	4.97	3.09	195.8	0.83	4.53
17.6	54.33	0.64	107.6	4.76	3.14	197.6	0.80	4.54
19.4	51.33	0.68	109.4	4.57	3.19	199.4	0.78	4.56
21.2	48.51	0.71	111.2	4.39	3.24	201.2	0.76	4.57
23.0	45.87	0.75	113.0	4.21	3.28	203.0	0.73	4.58
24.8	43.38	0.78	114.8	4.05	3.33	204.8	0.71	4.59
26.6	41.05	0.82	116.6	3.89	3.38	206.6	0.69	4.60
28.4	38.85	0.86	118.4	3.73	3.42	208.4	0.67	4.61
30.2	36.78	0.90	120.2	3.59	3.46	210.2	0.65	4.62
32.0	34.84	0.94	122.0	3.45	3.50	212.0	0.63	4.63
33.8	33.01	0.98	123.8	3.32	3.54	213.8	0.61	4.64
35.6	31.29	1.02	125.6	3.19	3.58	215.6	0.60	4.65
37.4	29.67	1.07	127.4	3.07	3.62	217.4	0.58	4.66
39.2	28.14	1.11	129.2	2.95	3.66	219.2	0.56	4.67
41.0	26.70	1.16	131.0	2.84	3.69	221.0	0.55	4.68
42.8	25.34	1.21	132.8	2.74	3.73			
44.6	24.06	1.25	134.6	2.64	3.77			
46.4	22.85	1.30	136.4	2.54	3.80			
48.2	21.71	1.35	138.2	2.45	3.83			
50.0	20.63	1.40	140.0	2.36	3.87			

* Indoor unit: T1, TA, T2A, and T2B

The Resistance of 25°C (77°F) is 10 KΩ ± 1%. The relation between voltage and resistance is: $V = \frac{8.06}{8.06 + R} * 5$