MINI-SPLIT SYSTEMS SERVICE MANUAL
Indoor and Outdoor Unit Error Codes and Component Diagnostic

100030
4/2022

MCFA and MCFB

MFMA

MPC, 3PC, and MLB Single Zone

MLB and MPC Multi-Zone

MMDB

MWMC and 3WMC036

M22A and M33C

Table of Contents

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.

Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or service agency

1. Alert Codes Quick Reference

1.1. 3WMC Indoor Units

Table 1. 3WMC Unit Error and Status Code Display

Display	Type	Information
dF	Status	Defrost
CL	Status	Filter cleaning reminder(power on display for 15 seconds).
CL	Status	Active clean
F	Status	Filter replacement reminder(power on display for 15 seconds).
FP	Status	Heating in room temperature under 8°C.
FC	Status	Forced cooling.
CP	Status	Remote switched off.
EC 07	Error	The outdoor fan speed is operating outside of the normal range.
EC 51	Error	Outdoor unit EEPROM parameter error.
EC 52	Error	Condenser coil temperature sensor T3 is in open circuit or has short circuited.
EC 53	Error	Outdoor ambient temperature sensor T4 is in open circuit or has short circuited.
EC 54	Error	Compressor discharge temperature sensor TP is in open circuit or has short circuited.
EC 56	Error	Evaporator coil outlet temperature sensor (T2B multi-zone) is in open circuit or has short circuited (for free-match indoor units).
EH 00 EH 0A	Error	Indoor unit EEPROM parameter error.
EH 03	Error	The indoor fan speed is operating outside of the normal range.
EH 06	Error	Communication error between main control board and display board.
EH 60	Error	Indoor room temperature sensor T1 is in open circuit or has short circuited.
EH 61	Error	Evaporator coil middle temperature sensor T2 is in open circuit or has short circuited.
EL 0C	Error	Refrigerant leakage detection.
PC 00	Error	Inverter module IPM error.

Table 1. 3WMC Unit Error and Status Code Display

Display	Type	Information
PC 01	Error	High or Low voltage protection.
PC 02	Error	High temperature sensed at compressor top.
PC 03	Error	Low or High pressure protection.
PC 04	Error	Inverter compressor drive error.
PC 08	Error	Current overload protection.
PC 0L	Error	Outdoor low ambient temperature protection.
--	Error	Indoor units mode conflict (match with multi outdoor unit).

1.2. MMWC Indoor Units

Table 2. MWMC Unit Error and Status Code Display

Display	Type	Information
dF	Status	Defrost
CL	Status	Filter cleaning reminder(power on display for 15 seconds).
CL	Status	Active clean
CP	Status	Remote switched off.
FC	Status	Forced cooling.
FP	Status	Heating in room temperature under 8°C.
nF	Status	Filter replacement reminder (power on display for 15 seconds).
EC 07	Error	The outdoor fan speed is operating outside of the normal range.
EC 51	Error	Outdoor unit EEPROM parameter error.
EC 52	Error	Condenser coil temperature sensor T3 is in open circuit or has short circuited.
EC 53	Error	Outdoor ambient temperature sensor T4 is in open circuit or has short circuited.
EC 54	Error	Compressor discharge temperature sensor TP is in open circuit or has short circuited.
EC 56	Error	Evaporator coil outlet temperature sensor (T2B multi-zone) is in open circuit or has short circuited (for free-match indoor units).
EH 00 EH 0A	Error	Indoor unit EEPROM parameter error.
EH 03	Error	The indoor fan speed is operating outside of the normal range.
EH 06	Error	Communication error between main control board and display board.
EH 60	Error	Indoor room temperature sensor T1 is in open circuit or has short circuited.

Table 2. MWMC Unit Error and Status Code Display

Display	Type	Information
EH 61	Error	Evaporator coil middle temperature sensor T2 is in open circuit or has short circuited.
EL 0C	Error	Refrigerant leakage detection.
PC 00	Error	Inverter module IPM error.
PC 01	Error	High or Low voltage protection.
PC 02	Error	High temperature sensed at compressor top.
PC 03	Error	Low or High pressure protection.
PC 04	Error	Inverter compressor drive error.
PC 08	Error	Current overload protection.
PC 0L	Error	Outdoor low ambient temperature protection.
--	Error	Indoor units mode conflict (match with multi outdoor unit).

1.3. M22A and M33C Indoor Units

Table 3. M22A and M33C System Status and Troubleshooting Error Codes

Type	Indoor Unit Display		Indoor Unit Error Codes Description
	M22A	M33C	
Status	dF	dF	Defrost
Status	CL	CL	Filter cleaning reminder(power on display for 15 seconds).
Status	CL	CL	Active clean
Status	CP	CP	Remote switched off.
Status	FC	FC	Forced cooling.
Status	FP	FP	Heating in room temperature under 8°C (46.4°F).
Status	nF	nF	Filter replacement reminder (power on display for 15 seconds).
Error	--	--	Mode conflict for multi-zone systems
Error	E0	EH 00	Indoor unit EEPROM error
Error	E1	EL 01	Communication error between indoor unit and outdoor units
Error	E3	EH 03	Indoor fan speed error (DC motor)
Error	E4	EH 60	Indoor room temperature sensor error (T1)
Error	E5	EH 61	Indoor coil temperature sensor error (T2)
Error	EC	EL 0C	Refrigerant leakage detection (Cooling mode only)
Error	EE		High water level alarm
Error	F0	PC 08	Outdoor current overload protection

Table 3. M22A and M33C System Status and Troubleshooting Error Codes

Type	Indoor Unit Display		Indoor Unit Error Codes Description
	M22A	M33C	
	F1	EC 53	Outdoor ambient temperature sensor error (T4)
Error	F2	EC 52	Outdoor coil temperature sensor error (T3)
Error	F3	EC 54	Compressor discharge temperature sensor error (T5)
Error	F4	EC 51	Outdoor unit EEPROM error
Error	F5	EC 07	Outdoor unit fan speed error (DC fan motor)
Error	F6		Indoor coil outlet temperature sensor error (T2B)
Error		EC 56	Indoor unit #1 coil outlet temperature sensor error (T2B for multi-zone)
			Indoor unit #2 coil outlet temperature sensor error (T2B for multi-zone)
			Indoor unit #3 coil outlet temperature sensor error (T2B for multi-zone)
			Indoor unit #4 coil outlet temperature sensor error (T2B for multi-zone)
			Indoor unit #5 coil outlet temperature sensor error (T2B for multi-zone)
			Indoor unit #6 coil outlet temperature sensor error (T2B for multi-zone)
Error		EH 0A	Indoor unit EEPROM parameter error
Error		EH 0b	Communication error between main control board and display board
Error	P0	PC 00	Inverter module IPM error
Error	P1	PC 01	High or Low voltage protection
Error	P2	PC 02	High temperature sensed at compressor top
Error	P3	PC 0L	Outdoor low ambient temperature protection
Error	P4	PC 04	Compressor drive error
Error	P6	PC 03	High pressure switch open
Error	P6		Low pressure switch open
Error	P7		Outdoor IGBT temperature sensor error

1.4. MCFB Indoor Units

Table 4. MCFB Unit Troubleshooting Codes

Display	Description
E0	Indoor unit EEPROM error
E1	Communication error between indoor and outdoor units
E3	Indoor fan speed error
E4	Indoor return air temperature sensor error
E5	Indoor coil temperature sensor error
EC	Low refrigerant
EE	High water level alarm (for ducted units only)
F0	Outdoor current overload sensed
F1	Outdoor ambient temperature sensor error (T4 malfunction)

Table 4. MCFB Unit Troubleshooting Codes

Display	Description
F2	Outdoor coil temperature sensor error (T3) Malfunction
F3	Compressor discharge temperature sensor error (T5) Malfunction
F4	Outdoor unit EEPROM error
F5	Outdoor unit fan speed error
F6	Indoor coil outlet temperature sensor error (T2B)
P0	Inverter module IPM error
P1	High or low voltage protection
P2	High temperature sensed at compressor top
P3	Outdoor low ambient temperature protection
P4	Compressor drive error
P6	High or low pressure switch open
P7	Outdoor IGBT temperature sensor error

1.5. MFMA Indoor Units

Table 5. Indoor Unit Troubleshooting Codes

Display	Description
E0	Indoor unit EEPROM error
E1	Communication error between indoor and outdoor units
E3	Indoor fan speed error
E4	Indoor return air temperature sensor error
E5	Indoor coil temperature sensor error
EC	Low refrigerant
EE	High water level alarm (for ducted units only)
F0	Outdoor current overload sensed
F1	Outdoor ambient temperature sensor error (T4 malfunction)
F2	Outdoor coil temperature sensor error (T3) Malfunction
F3	Compressor discharge temperature sensor error (T5) Malfunction
F4	Outdoor unit EEPROM error
F5	Outdoor unit fan speed error
F6	Indoor coil outlet temperature sensor error (T2B)
P0	Inverter module IPM error
P1	High or low voltage protection
P2	High temperature sensed at compressor top
P3	Outdoor low ambient temperature protection
P4	Compressor drive error
P6	High or low pressure switch open
P7	Outdoor IGBT temperature sensor error

1.6. MMDB Indoor Units

Table 6. Indoor Unit Troubleshooting Codes

Display	Wired Remote Display	Description
E0	E7	Indoor unit EEPROM error
E1	E1	Communication error between indoor and outdoor units
E3	E8	Indoor fan speed error

Table 6. Indoor Unit Troubleshooting Codes

Display	Wired Remote Display	Description
E4	E2	Indoor return air temperature sensor error
E5	E3	Indoor coil temperature sensor error
EC	EF	Low refrigerant
EE	EE	High water level alarm (for ducted units only)
F0	ER	Outdoor current overload sensed
F1	E5	Outdoor ambient temperature sensor error (T4 malfunction)
F2	E5	Outdoor coil temperature sensor error (T3) Malfunction
F3	E5	Compressor discharge temperature sensor error (T5) Malfunction
F4	Ed	Outdoor unit EEPROM error
F5	Ed	Outdoor unit fan speed error
F6	E4	Indoor coil outlet temperature sensor error (T2B)
P0	Eb	Inverter module IPM error
	F0	Communication error between wired controller and indoor unit
	F1	The cassette panel is abnormal
P1		High or low voltage protection
P2		High temperature sensed at compressor top
P3		Outdoor low ambient temperature protection
P4		Compressor drive error
P6		High or low pressure switch open
P7	EF	Outdoor IGBT temperature sensor error

1.7. 3PC Single Zone Outdoor Units

Table 7. 3PC Single Zone Outdoor Unit Error Codes

Display	Malfunction and Protection Indication
EL01	Communication malfunction between indoor and outdoor units.
FL14	Capability mismatch between indoor unit and outdoor unit
EC50	Outdoor temperature sensor error.
EC51	Outdoor EEPROM error.
EC52	Condenser coil temperature sensor (T3) malfunction.
EC53	Outdoor ambient temperature sensor (T4) malfunction.
EC54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
EC55	Outdoor IPM module temperature sensor malfunction
EC56	Outdoor T2B sensor error.
EC57	Refrigerant pipe temperature sensor error.
EC07	Outdoor DC fan motor malfunction/fan speed out of control.
EC71	Over current failure of outdoor DC fan motor.
EC72	Lack phase failure of outdoor DC fan motor.

Table 7. 3PC Single Zone Outdoor Unit Error Codes

Display	Malfunction and Protection Indication
PC00	Inverter module (IPM) protection.
PC02	Top temperature protection of compressor.
PC06	Discharge temperature protection of compressor.
PC08	Outdoor over-current protection.
PC0A	High temperature protection of condenser.
PC0F	PFC module protection.
PC0L	Low temperature protection of outdoor unit.
PC10	Outdoor unit low AC voltage protection.
PC11	Outdoor unit main control board DC bus high voltage protection.
PC12	Outdoor unit main control board DC bus high voltage protection / 341 Machine Check Error (MCE) error.
PC30	System high pressure protection
PC31	System low pressure protection
PC40	Communication error between outdoor main chip and compressor driven chip
PC42	Compressor start failure of outdoor unit
PC43	Outdoor compressor lack phase protection
PC44	Outdoor unit zero speed protection
PC45	Outdoor unit IR chip drive failure
PC46	Compressor speed has been out of control
PC49	Compressor over-current failure
PCA1	Condensation protection of refrigerant pipe
PH90	High temperature protection of Evaporator
PH91	Low temperature protection of Evaporator
LC06	High temperature protection of Inverter module (IPM)

1.8. MPC036, MPC048, MLB036 and MLB048 Single Zone Outdoor Units

NOTE: *Smaller size outdoor single zone units do not have a display.*

Table 8. MLB and MPC Single-Zone Outdoor Unit Error Codes

Display	Malfunction and Protection Indication
EL01	Communication malfunction between indoor and outdoor units.
FL14	Capability mismatch between indoor unit and outdoor unit
EC50	Outdoor temperature sensor error.

Table 8. MLB and MPC Single-Zone Outdoor Unit Error Codes

Display	Malfunction and Protection Indication
EC51	Outdoor EEPROM error.
EC52	Condenser coil temperature sensor (T3) malfunction.
EC53	Outdoor ambient temperature sensor (T4) malfunction.
EC54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
EC55	Outdoor IPM module temperature sensor malfunction
EC56	Outdoor T2B sensor error.
EC57	Refrigerant pipe temperature sensor error.
EC07	Outdoor DC fan motor malfunction/fan speed out of control.
EC71	Over current failure of outdoor DC fan motor.
EC72	Lack phase failure of outdoor DC fan motor.
PC00	Inverter module (IPM) protection.
PC02	Top temperature protection of compressor.
PC06	Discharge temperature protection of compressor.
PC08	Outdoor over-current protection.
PC0A	High temperature protection of condenser.
PC0F	PFC module protection.
PC0L	Low temperature protection of outdoor unit.
PC10	Outdoor unit low AC voltage protection.
PC11	Outdoor unit main control board DC bus high voltage protection.
PC12	Outdoor unit main control board DC bus high voltage protection / 341 Machine Check Error (MCE) error.
PC30	System high pressure protection
PC31	System low pressure protection
PC40	Communication error between outdoor main chip and compressor driven chip
PC42	Compressor start failure of outdoor unit
PC43	Outdoor compressor lack phase protection
PC44	Outdoor unit zero speed protection
PC45	Outdoor unit IR chip drive failure
PC46	Compressor speed has been out of control
PC49	Compressor over-current failure
PCA1	Condensation protection of refrigerant pipe
PH90	High temperature protection of Evaporator

Table 8. MLB and MPC Single-Zone Outdoor Unit Error Codes

Display	Malfunction and Protection Indication
PH91	Low temperature protection of Evaporator
LC06	High temperature protection of Inverter module (IPM)

1.9. All MLB and MPC Multi-Zone Outdoor Units

The error code display is located on the main controller board of all multi-zone outdoor units.

Table 9. MLB and MPC Multi-Zone Outdoor Unit Error Codes

Display	Malfunction and Protection Indication
EL01	Communication malfunction between indoor and outdoor units.
FL14	Capability mismatch between indoor unit and outdoor unit
EC50	Outdoor temperature sensor error.
EC51	Outdoor EEPROM error.
EC52	Condenser coil temperature sensor (T3) malfunction.
EC53	Outdoor ambient temperature sensor (T4) malfunction.
EC54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
EC55	Outdoor IPM module temperature sensor malfunction
EC56	Outdoor T2B sensor error.
EC57	Refrigerant pipe temperature sensor error.
EC07	Outdoor DC fan motor malfunction/fan speed out of control.
EC71	Over current failure of outdoor DC fan motor.
EC72	Lack phase failure of outdoor DC fan motor.
PC00	Inverter module (IPM) protection.
PC02	Top temperature protection of compressor.
PC06	Discharge temperature protection of compressor.
PC08	Outdoor over-current protection.
PC0A	High temperature protection of condenser.
PC0F	PFC module protection.
PC0L	Low temperature protection of outdoor unit.

Table 9. MLB and MPC Multi-Zone Outdoor Unit Error Codes

Display	Malfunction and Protection Indication
PC10	Outdoor unit low AC voltage protection.
PC11	Outdoor unit main control board DC bus high voltage protection.
PC12	Outdoor unit main control board DC bus high voltage protection / 341 Machine Check Error (MCE) error.
PC30	System high pressure protection
PC31	System low pressure protection
PC40	Communication error between outdoor main chip and compressor driven chip
PC42	Compressor start failure of outdoor unit
PC43	Outdoor compressor lack phase protection
PC44	Outdoor unit zero speed protection
PC45	Outdoor unit IR chip drive failure
PC46	Compressor speed has been out of control
PC49	Compressor over-current failure
PCA1	Condensation protection of refrigerant pipe
PH90	High temperature protection of Evaporator
PH91	Low temperature protection of Evaporator
LC06	High temperature protection of Inverter module (IPM)

2. Indoor Control Board Connection Details

2.1. M22A and M33C

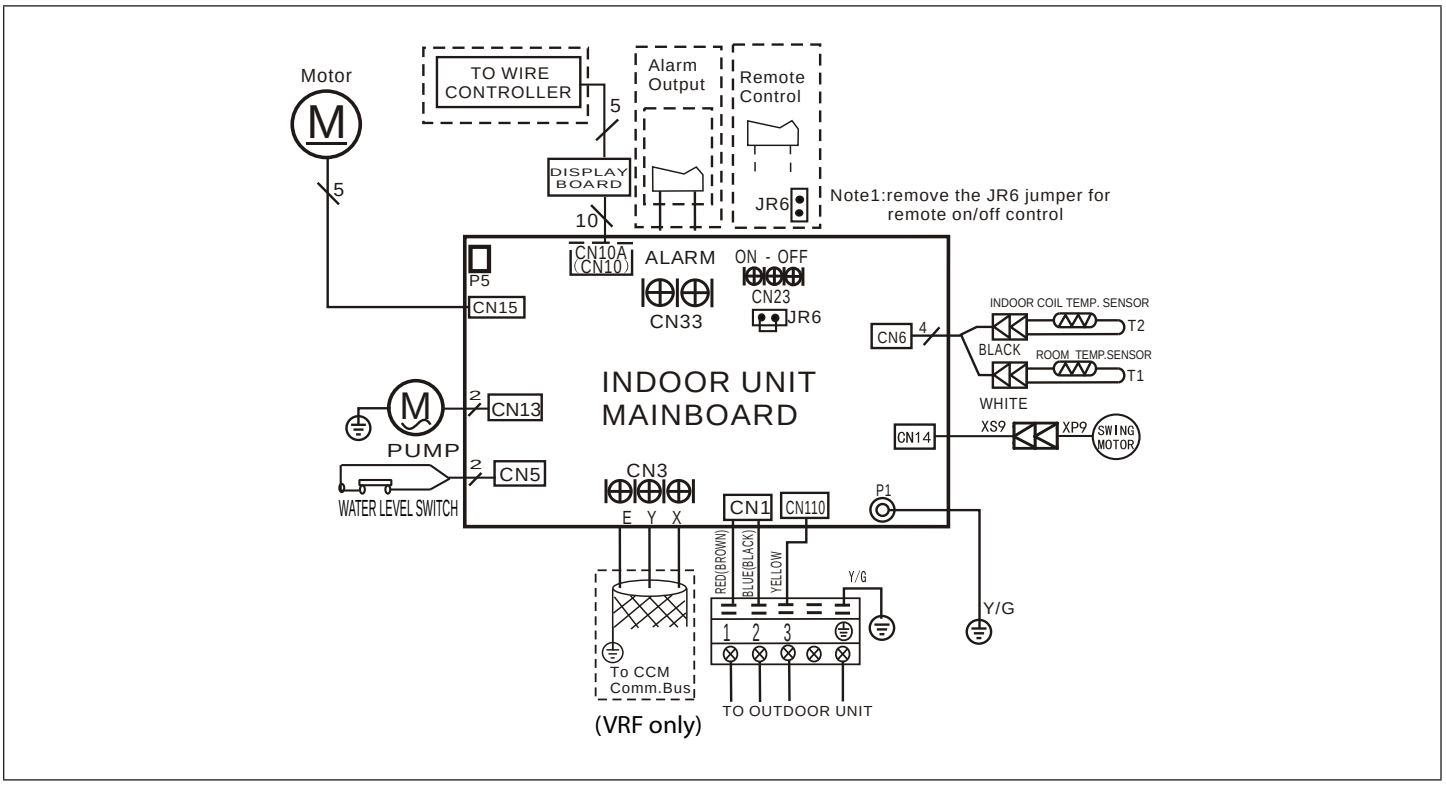


Figure 1. M22A009S4-1P, M22A012S4-1P and M22A018S4-1P Unit Wiring Diagram

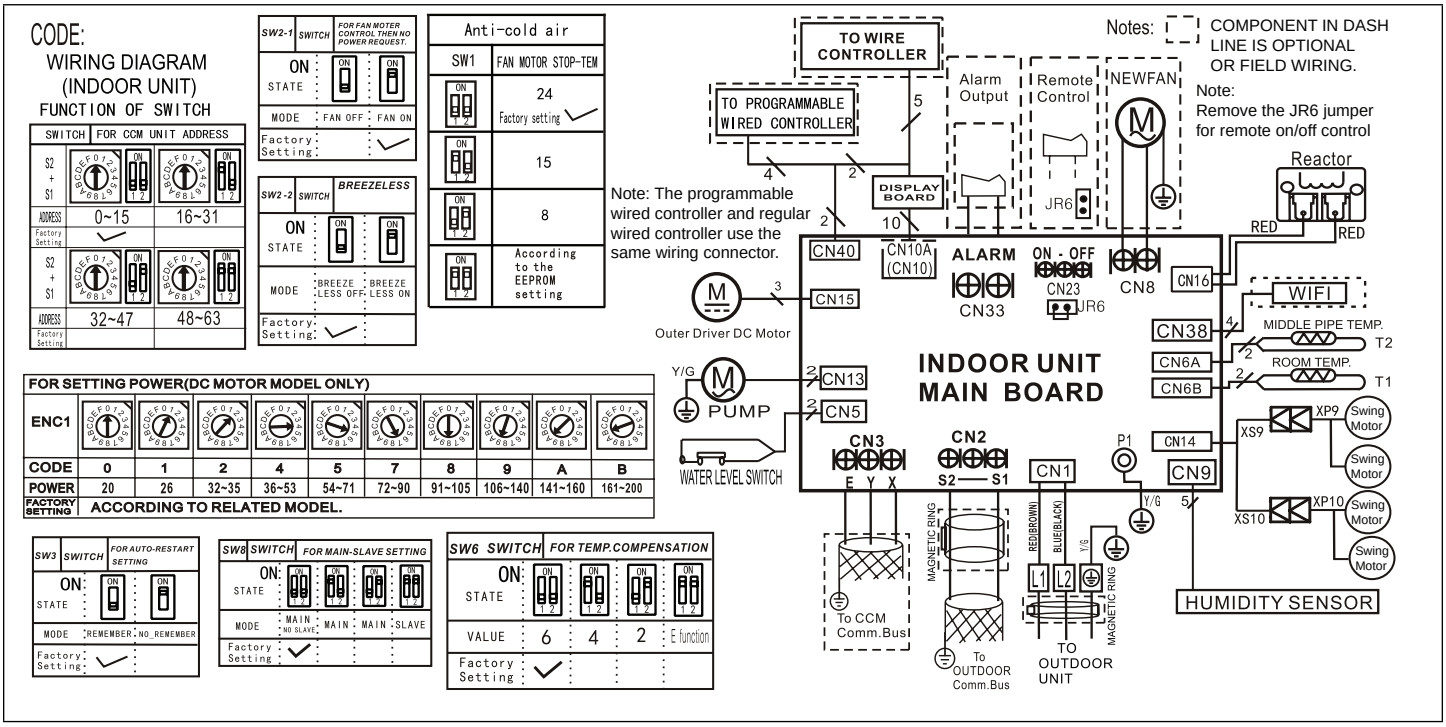


Figure 2. M33C024S4-*P, M33C036S4-*P and M33C048S4-*P Unit Wiring Diagram

2.2. MMDB

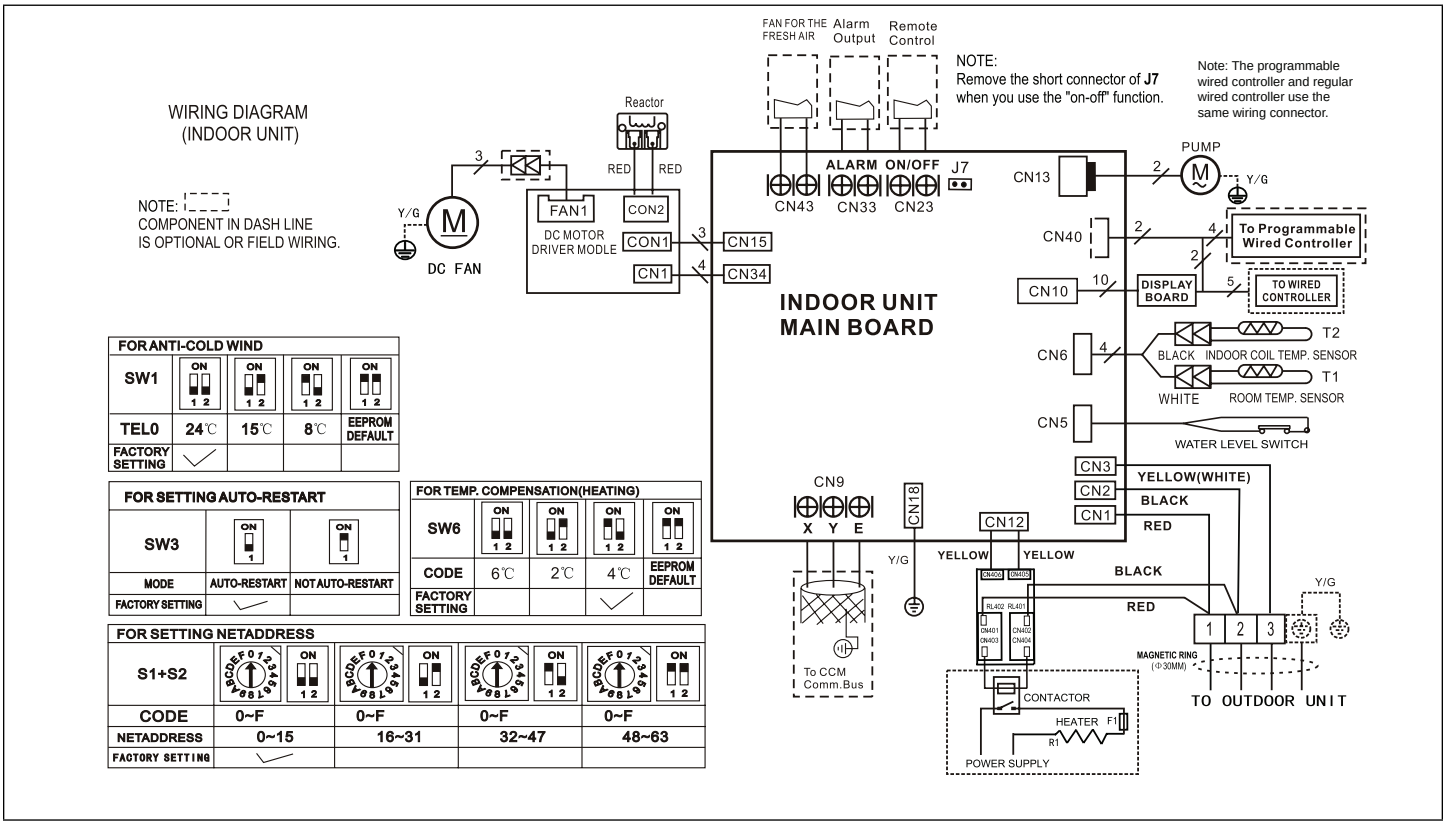


Figure 3. MMDB009S4-*P, MMDB012S4-*P, MMDB018S4-*P and MMDB024S4-*P Ducted Units Wiring Diagram

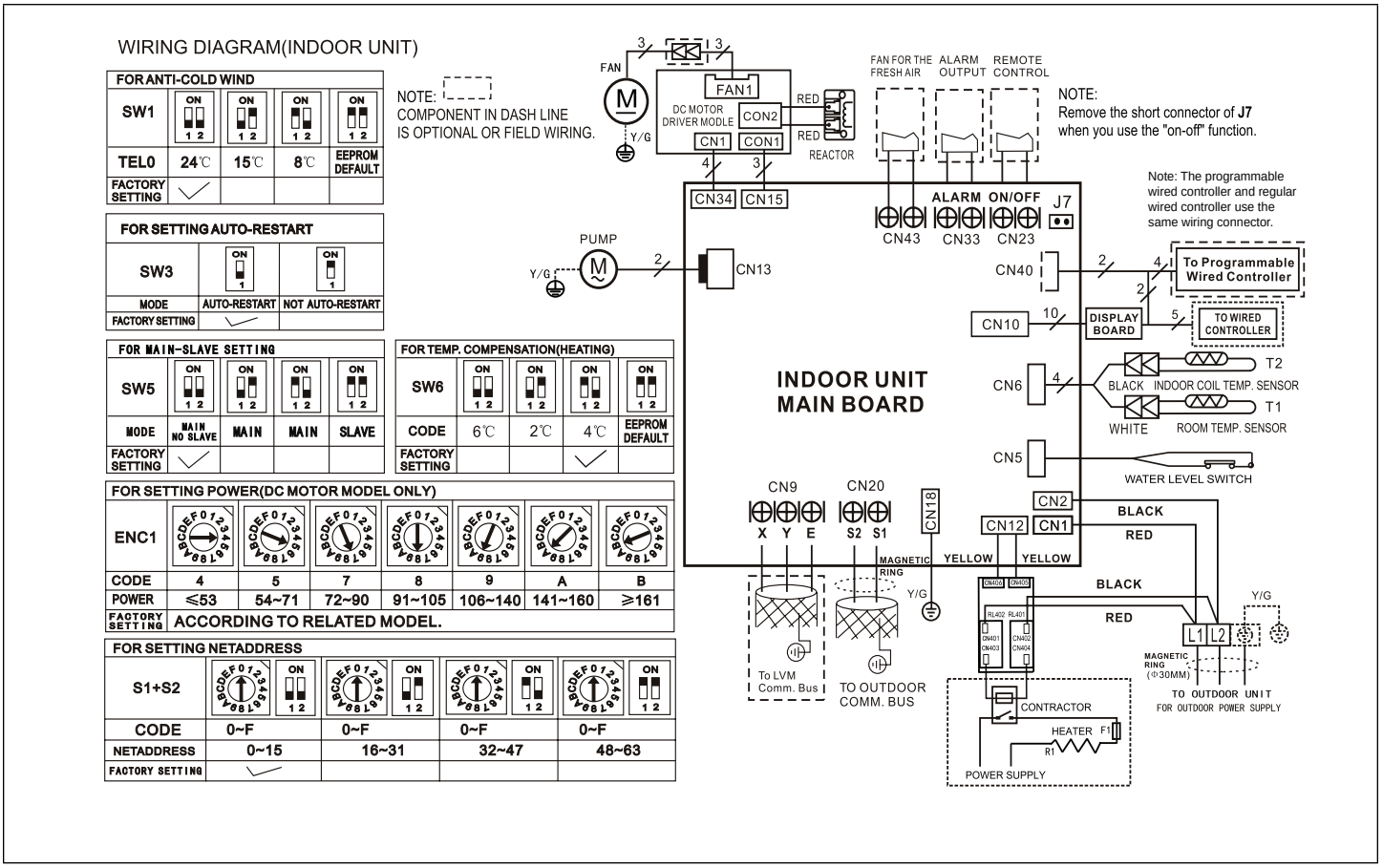


Figure 4. MMDB036S4-*P and MMDB048S4-*P Ducted Units Wiring Diagram

2.3. MWMC and 3WMC

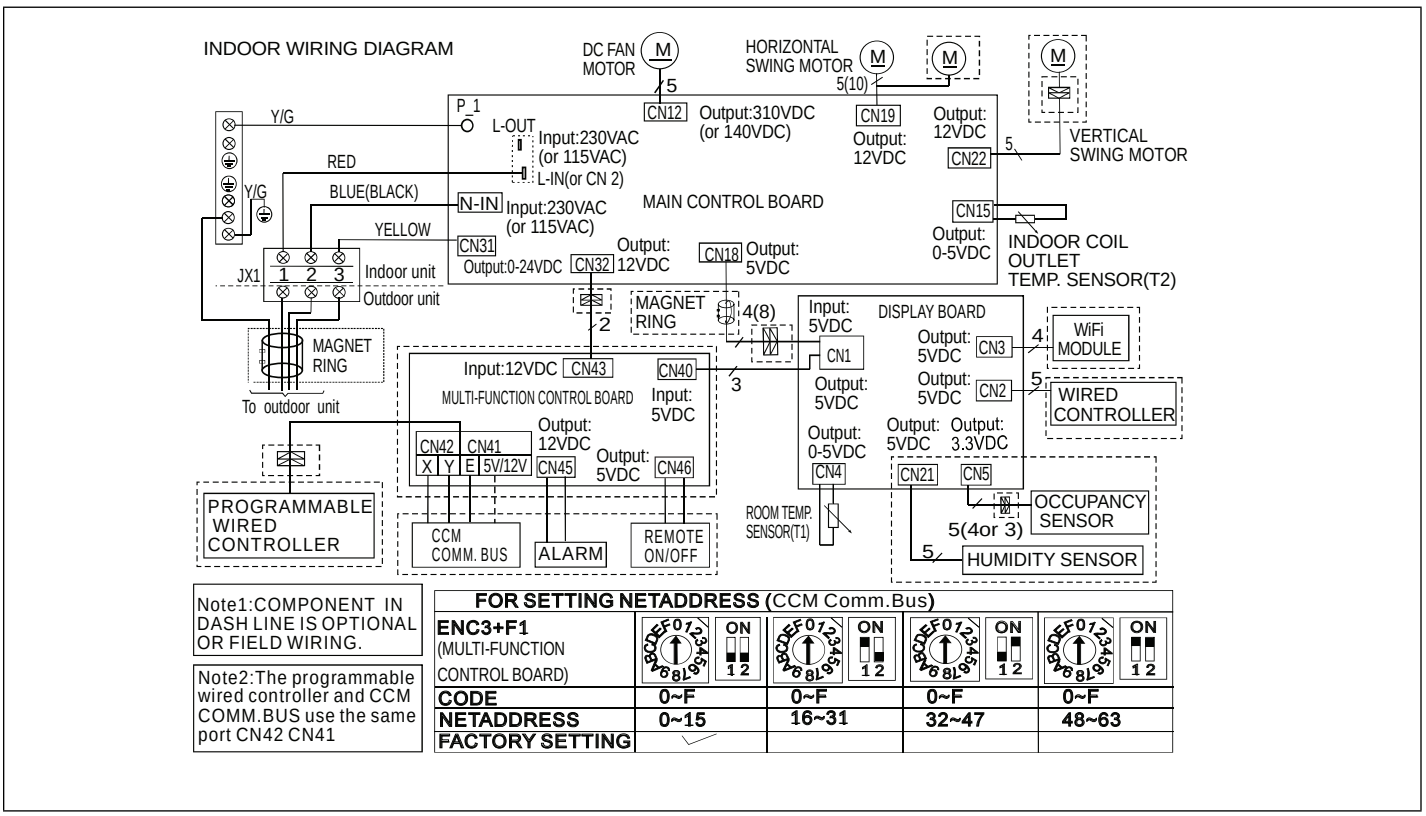


Figure 5. MWMC and 3WMC036S4 Unit Wiring Diagrams

2.4. MCFA and MCFB

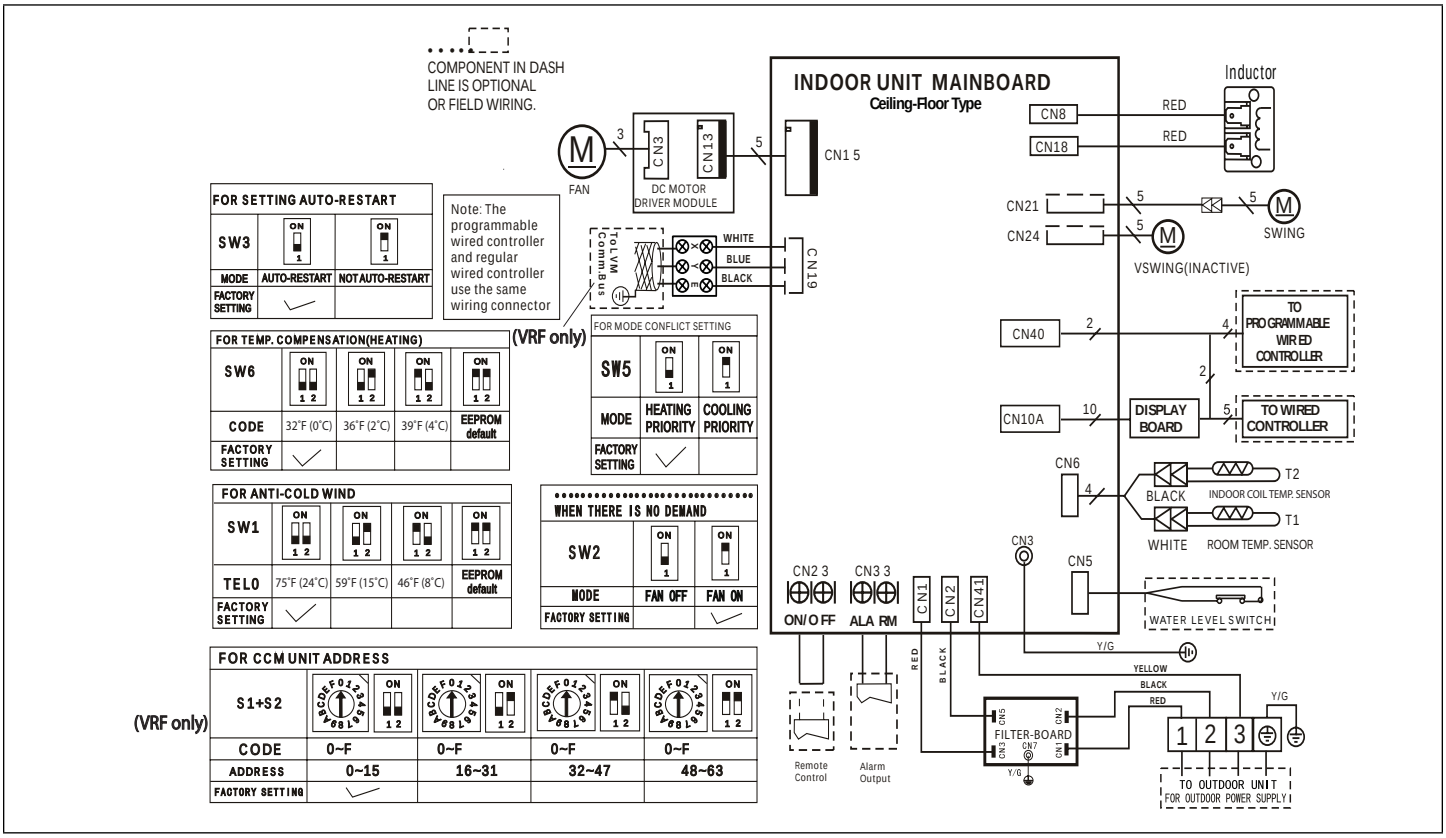


Figure 6. MCFB018S4-*P Unit Wiring Diagram

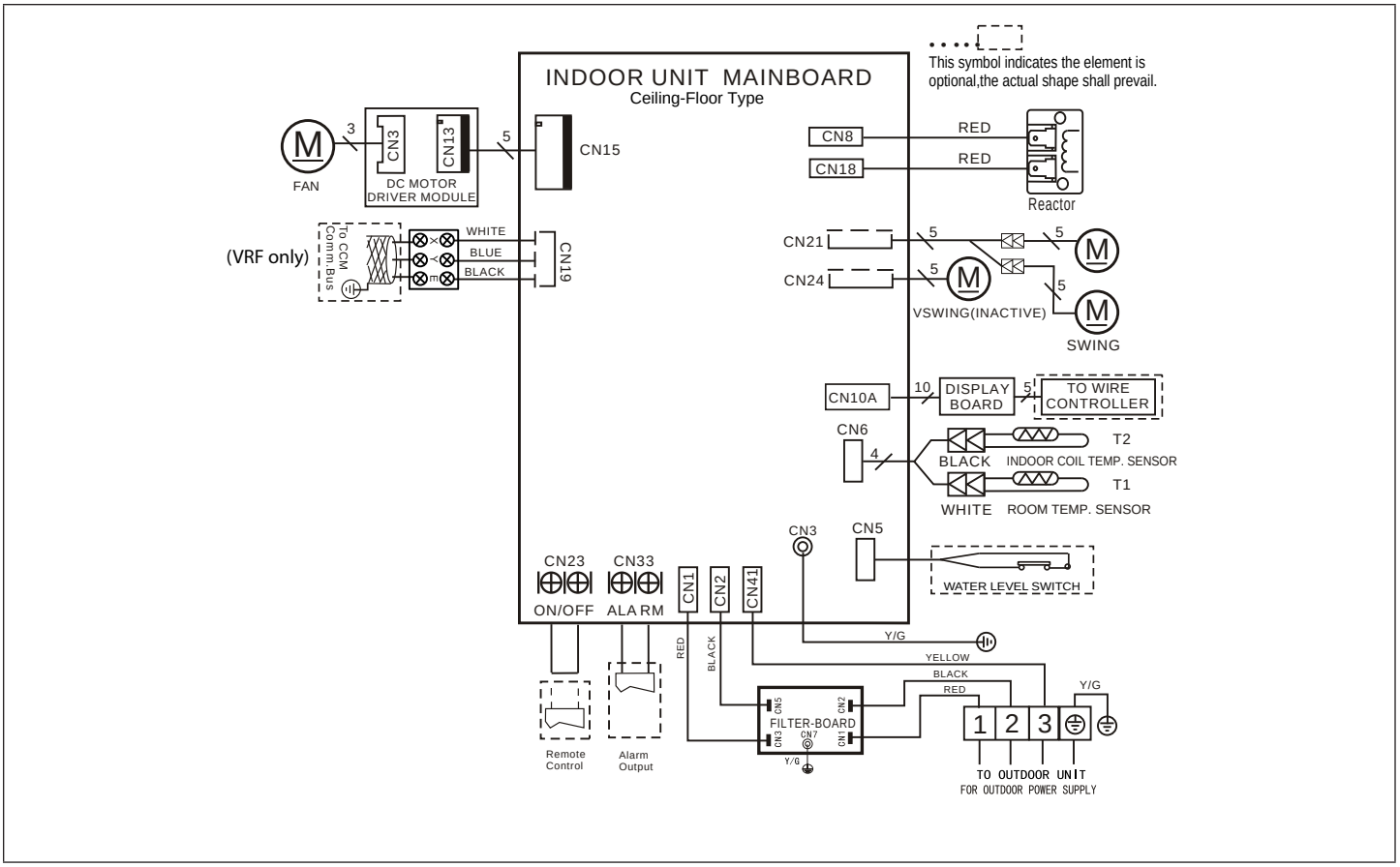


Figure 7. MCFA024S4-1P Unit Wiring Diagram

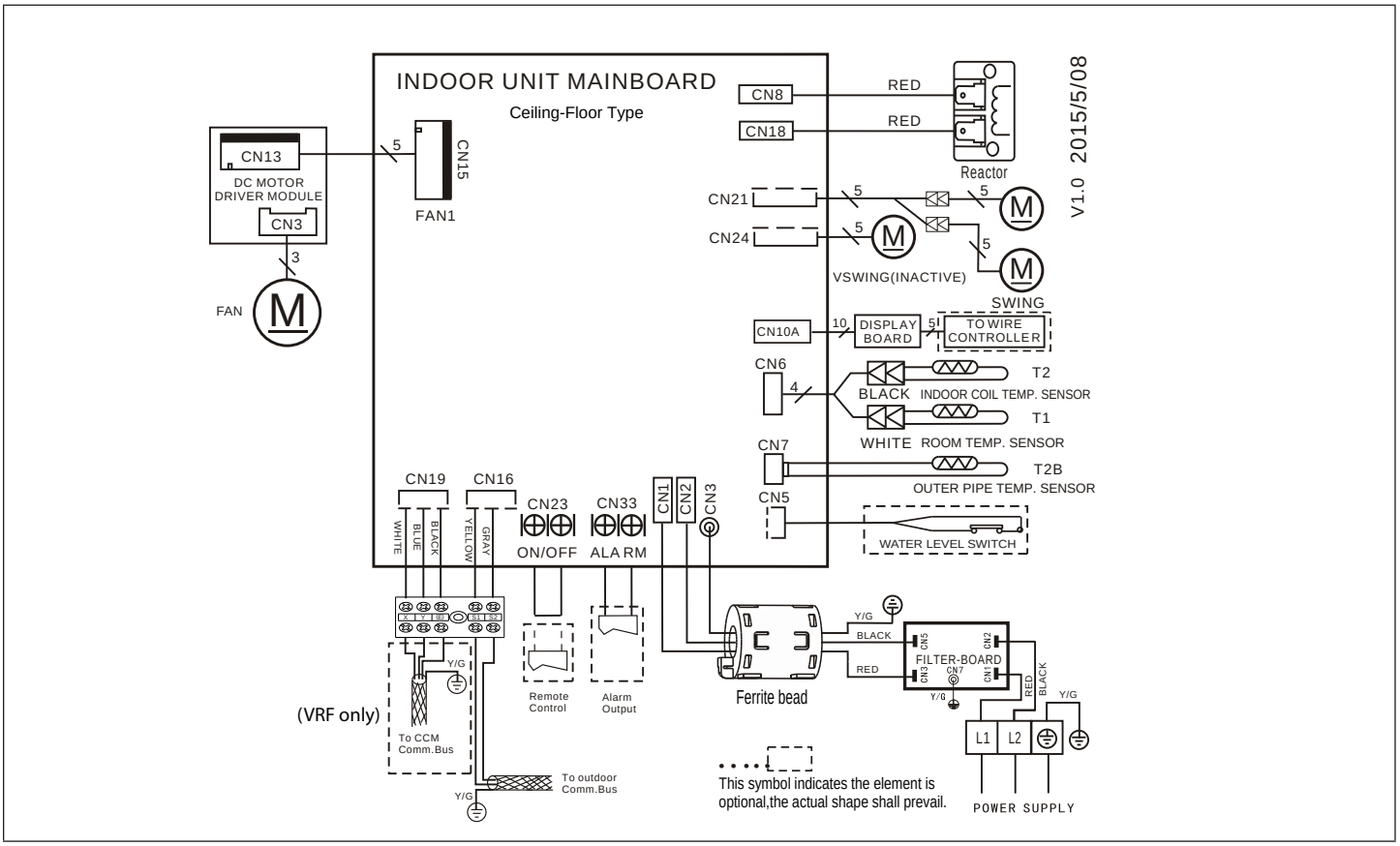


Figure 8. MCFA036S4-1P Unit Wiring Diagram

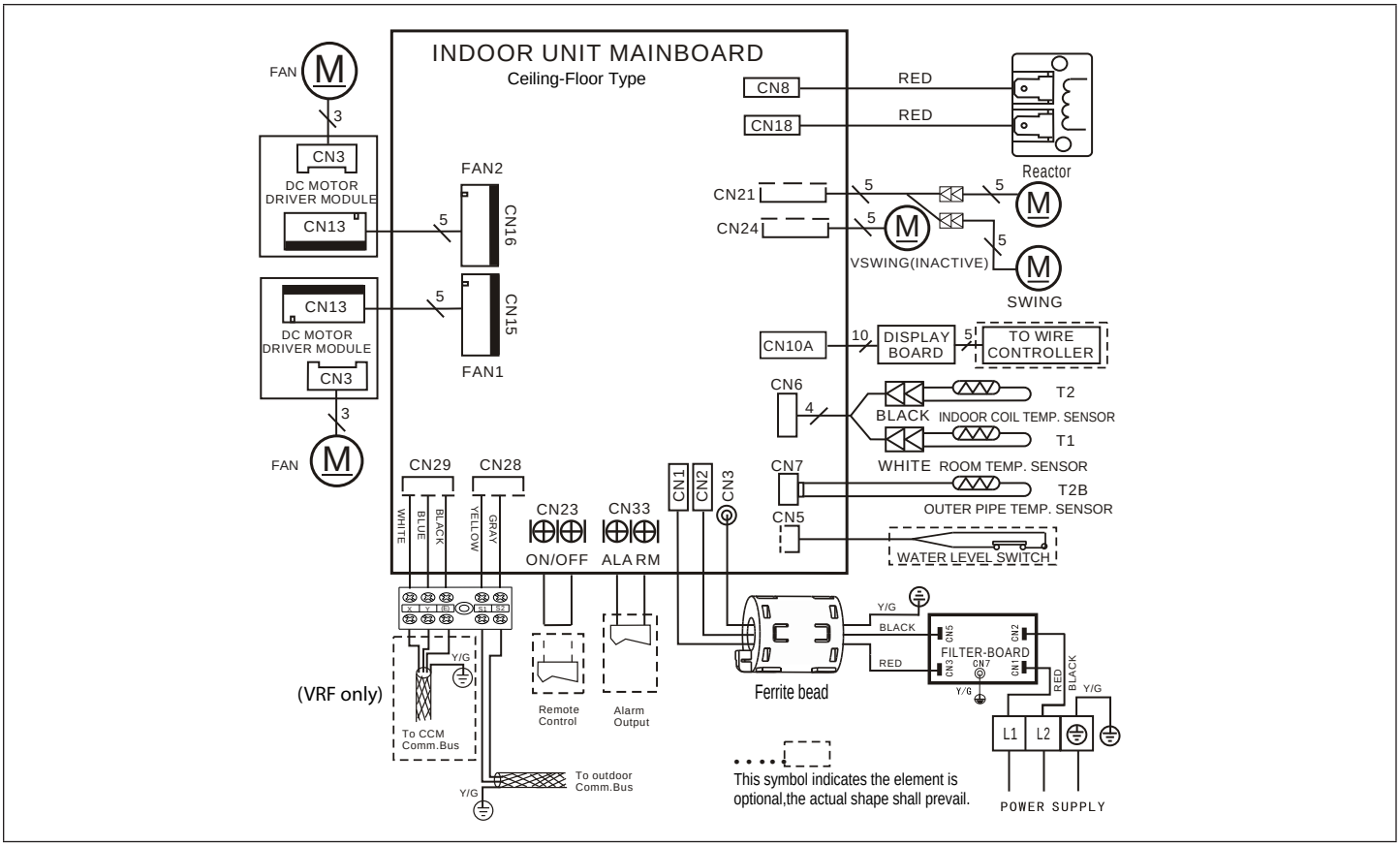


Figure 9. MCFA048S4-1P Unit Wiring Diagram

2.5. MFMA

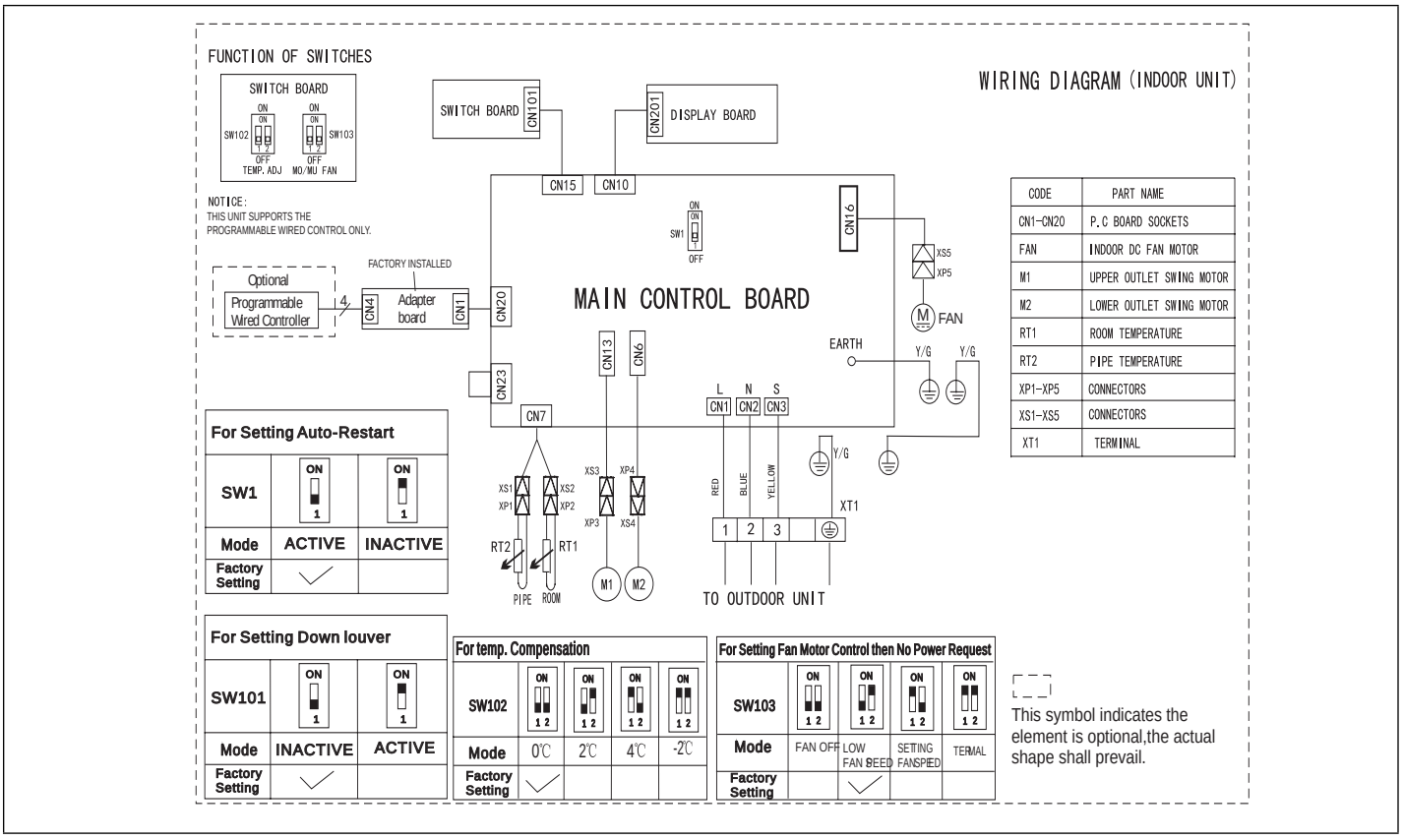
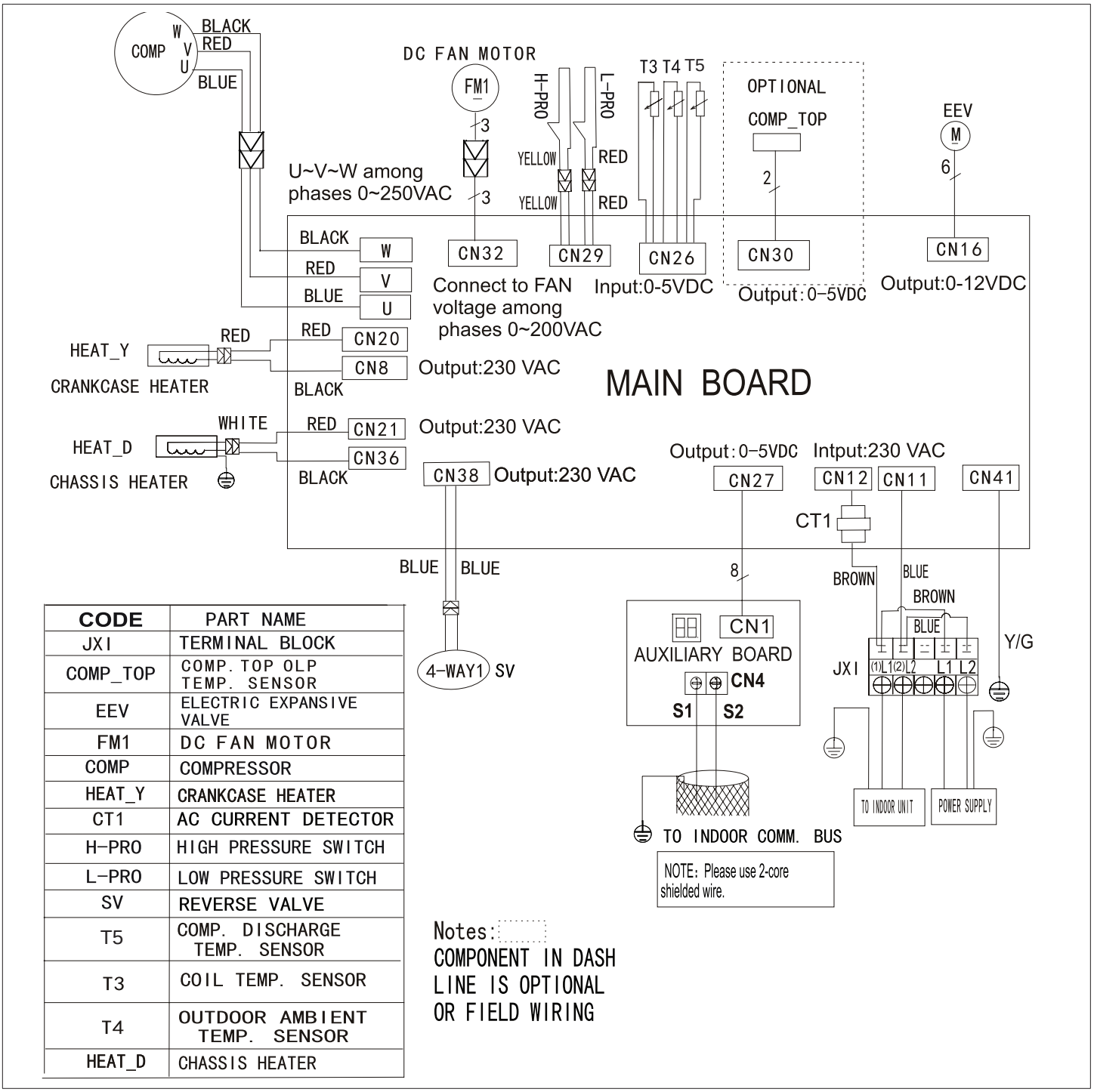


Figure 10. MFMA012-S4-2P Unit Wiring Diagram

3. Single Zone Outdoor Control Board Connection Details

3.1. 3PC036S4S



CODE	PART NAME
JXI	TERMINAL BLOCK
COMP_TOP	COMP. TOP OLP TEMP. SENSOR
EEV	ELECTRIC EXPANSIVE VALVE
FM1	DC FAN MOTOR
COMP	COMPRESSOR
HEAT_Y	CRANKCASE HEATER
CT1	AC CURRENT DETECTOR
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSE VALVE
T5	COMP. DISCHARGE TEMP. SENSOR
T3	COIL TEMP. SENSOR
T4	OUTDOOR AMBIENT TEMP. SENSOR
HEAT_D	CHASSIS HEATER

Figure 11. 208/230V 3PC036S4S Outdoor Unit Wiring Diagram

3.2. MPC009S4S and MPC012S4S

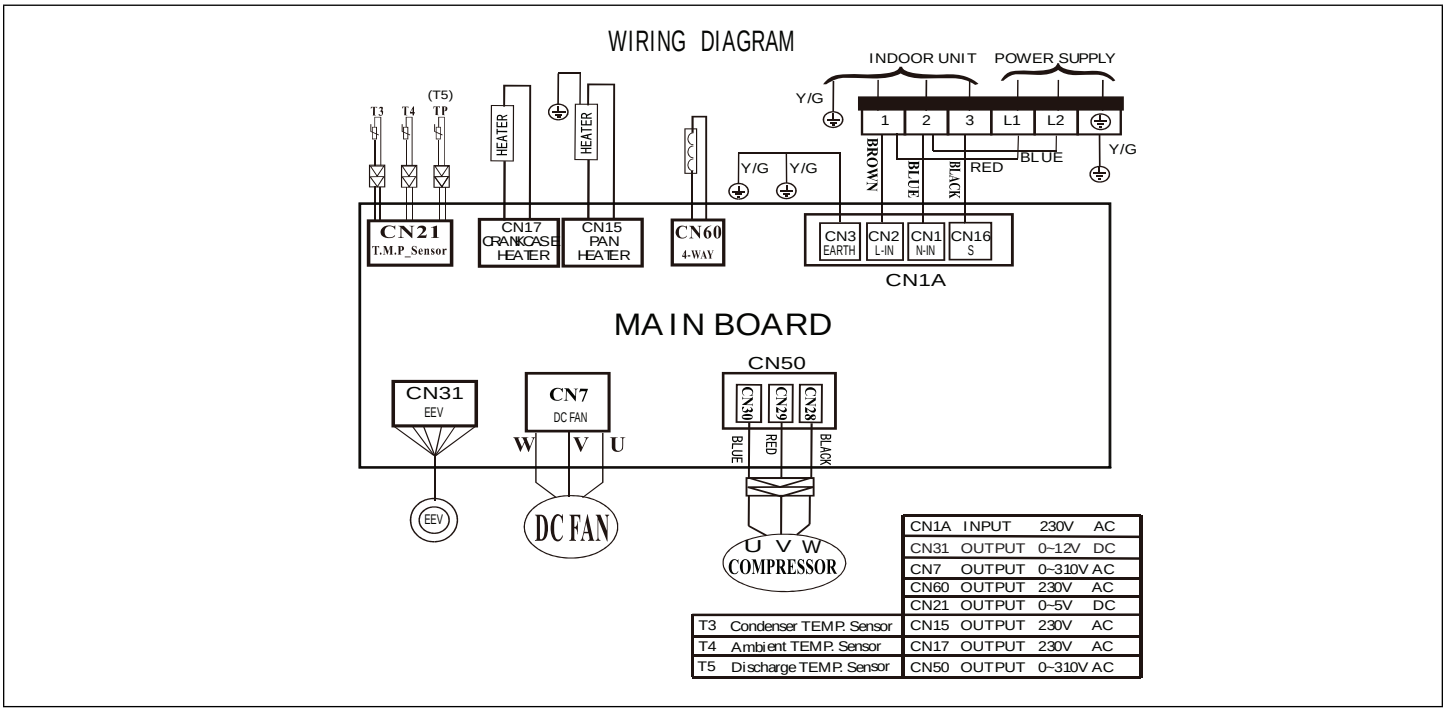


Figure 12. 208/230V MPC009S4S-*P and MPC012S4S-*P Outdoor Unit Wiring Diagram

3.3. MPC018S4S

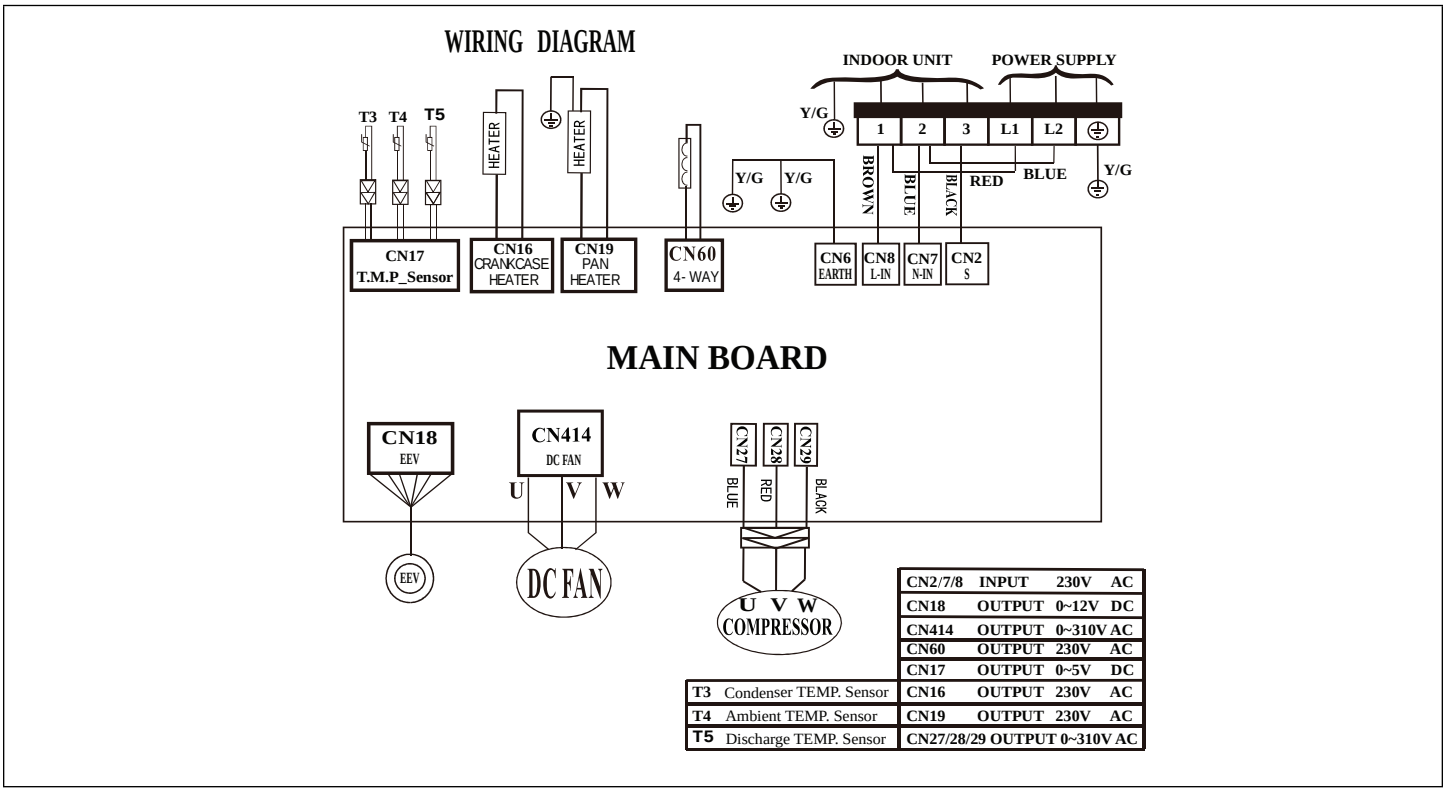


Figure 13. 208/230V MPC018S4S-*P Outdoor Unit Wiring Diagram

3.4. MPC024S4S

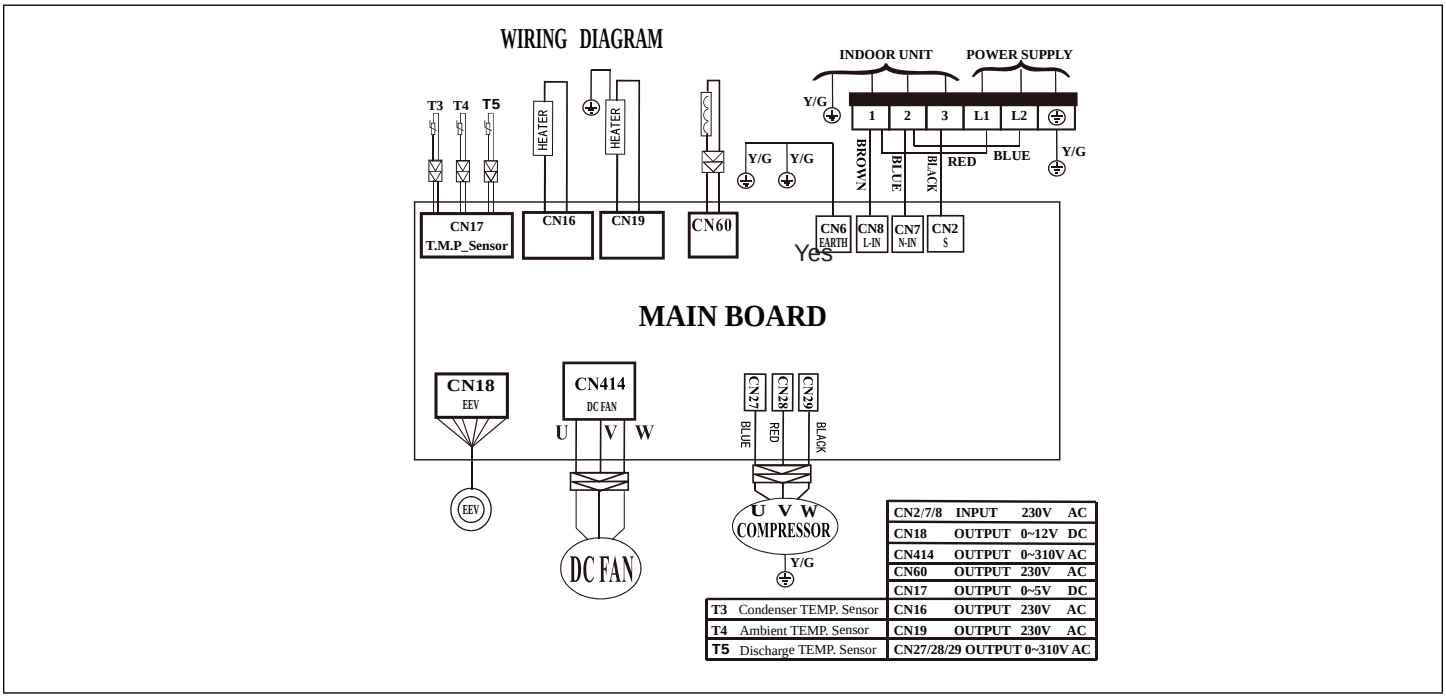
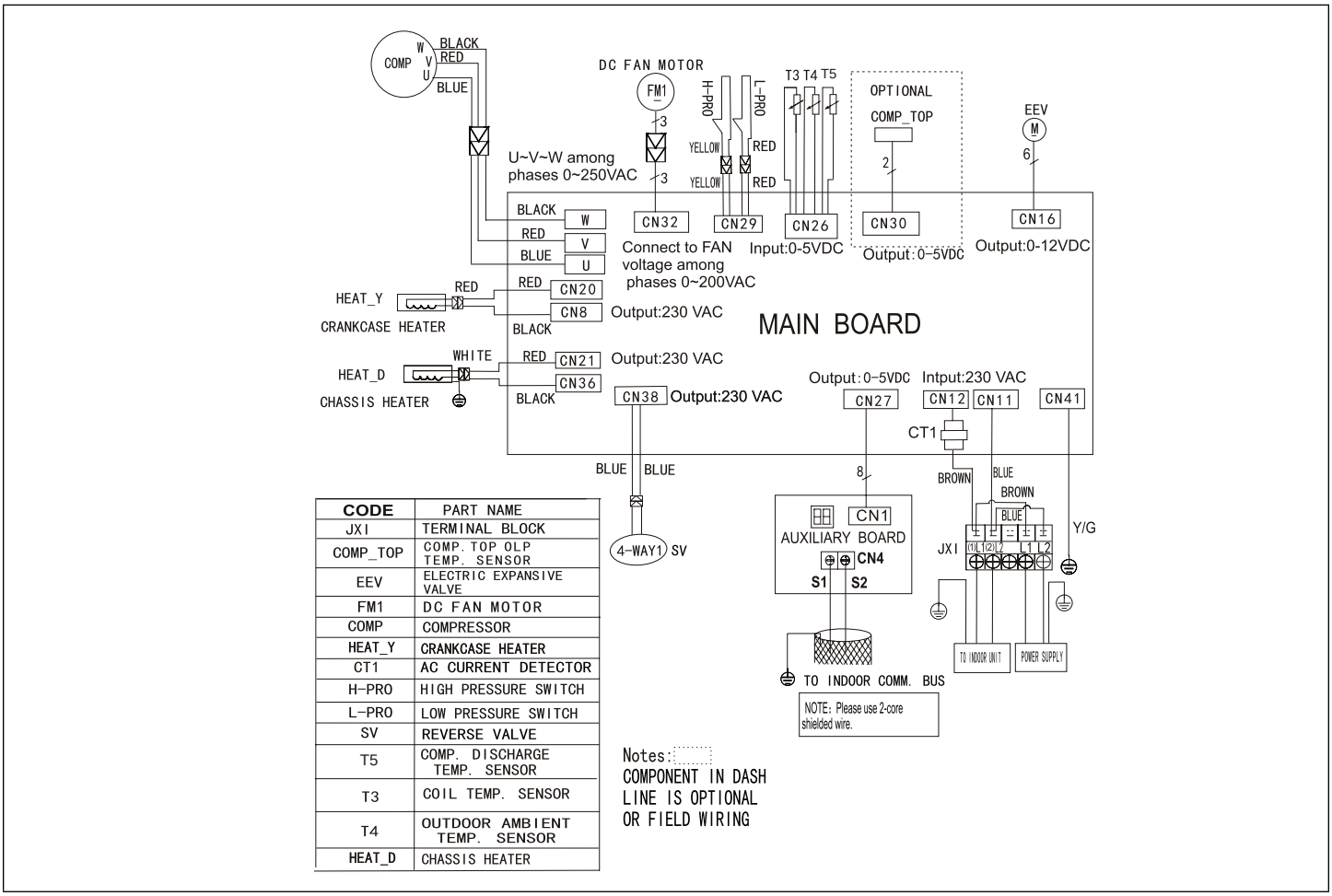


Figure 14. 208/230V MPC024S4S-*P Outdoor Unit Wiring Diagram

3.5. MPC036S4S



CODE	PART NAME
JXI	TERMINAL BLOCK
COMP_TOP	COMP. TOP OLP TEMP. SENSOR
EEV	ELECTRIC EXPANSIVE VALVE
FM1	DC FAN MOTOR
COMP	COMPRESSOR
HEAT_Y	CRANKCASE HEATER
CT1	AC CURRENT DETECTOR
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSE VALVE
T5	COMP. DISCHARGE TEMP. SENSOR
T3	COIL TEMP. SENSOR
T4	OUTDOOR AMBIENT TEMP. SENSOR
HEAT_D	CHASSIS HEATER

Figure 15. 208/230V MPC036S4S-*P Outdoor Unit Wiring Diagram

3.6. MPC048S4S

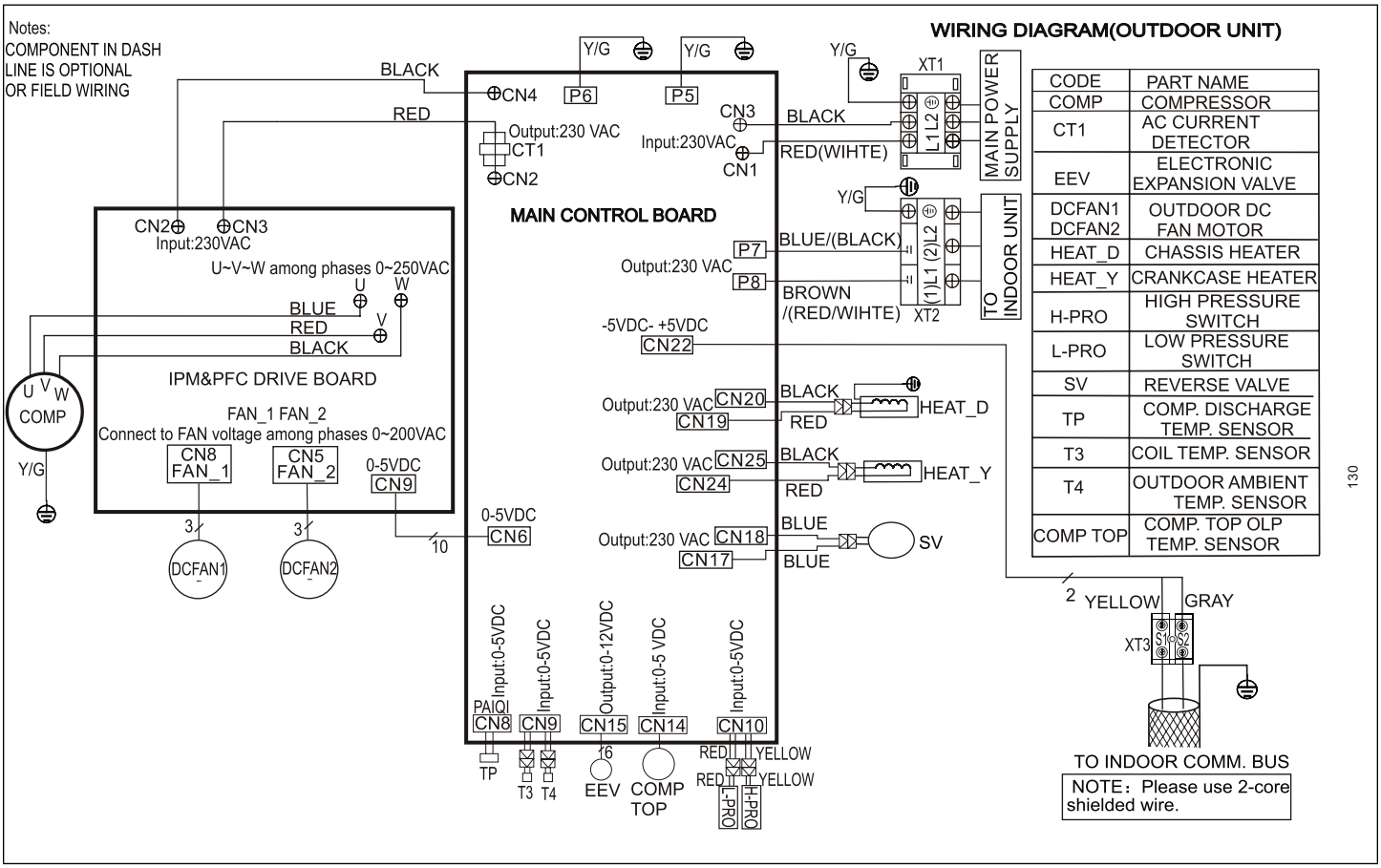


Figure 16. 208/230V MPC048S4S-*P Outdoor Unit Wiring Diagram

3.7. MLB009S4S and MLB012S4S

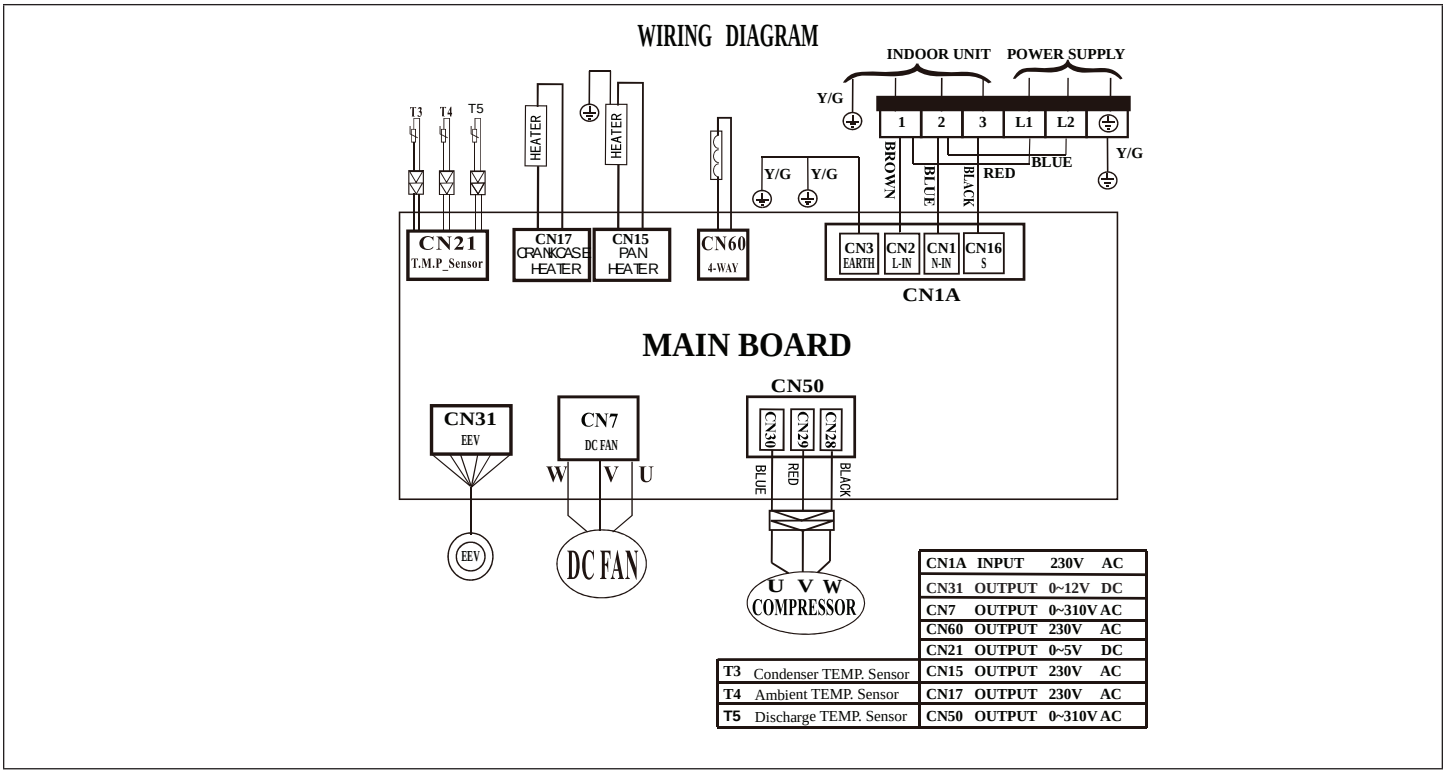
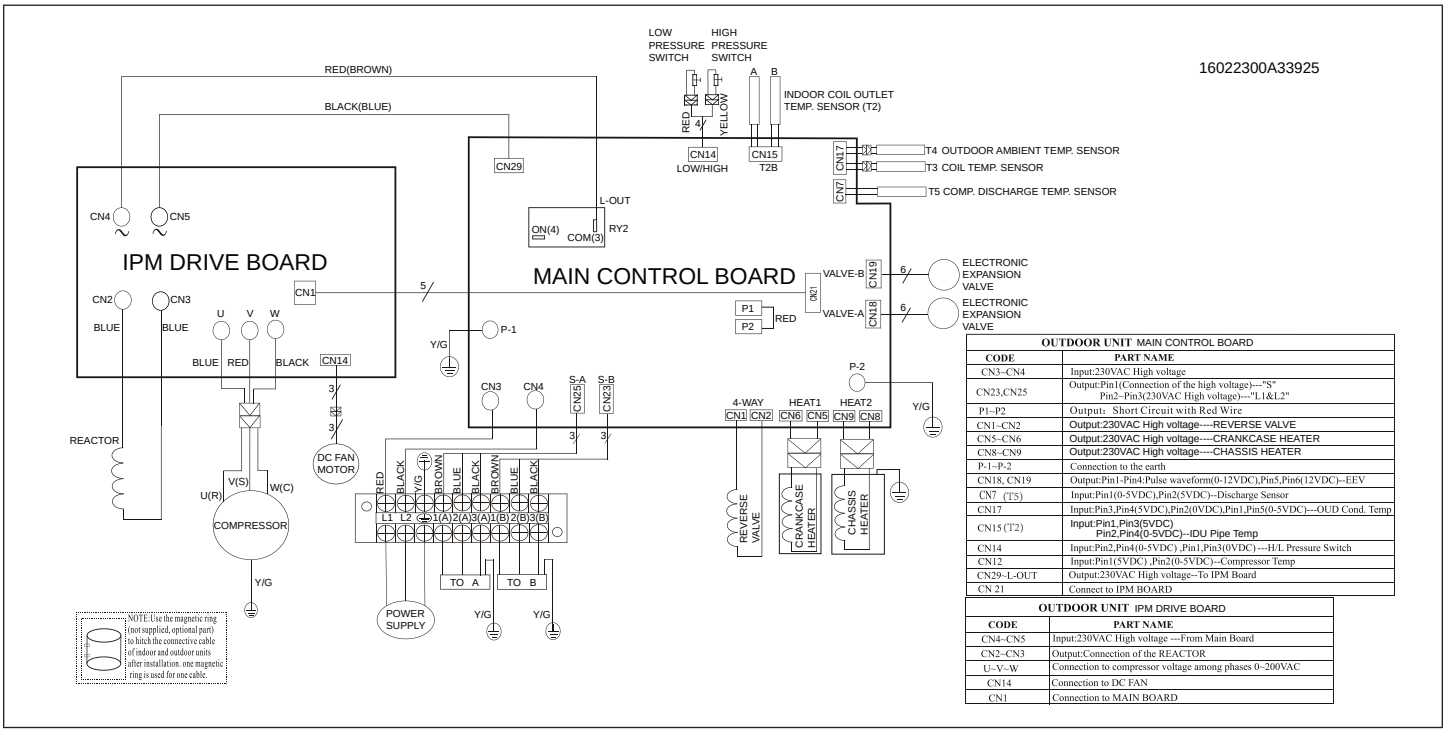


Figure 17. 208/230V MLB009 and MLB012-*P Outdoor Unit Wiring Diagram

3.8. MLB018S4S

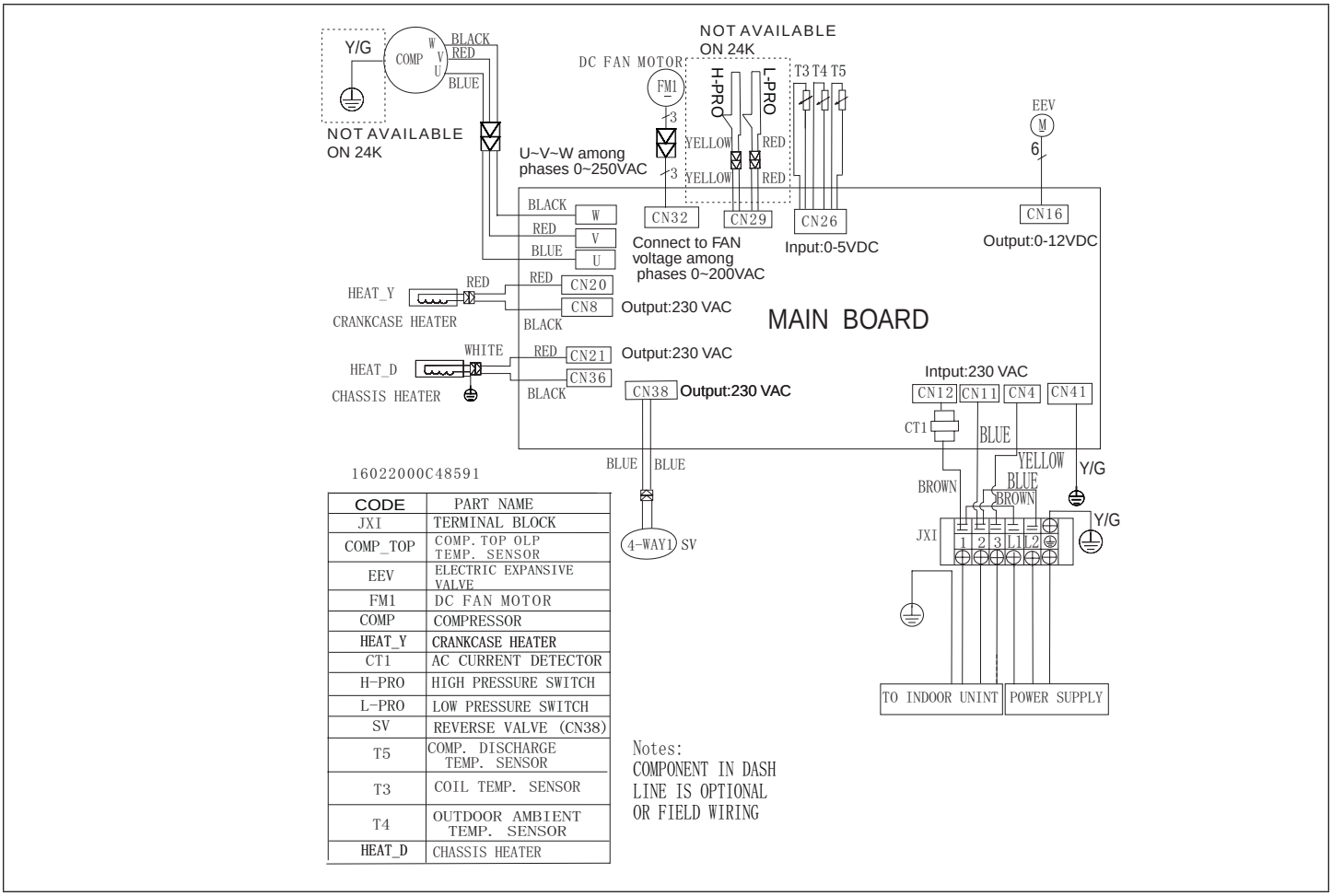


OUTDOOR UNIT MAIN CONTROL BOARD	
CODE	PART NAME
CN3–CN4	Input:230VAC High voltage
CN23,CN25	Output:Pin1(Connection of the high voltage)---"S" Pin2–Pin3(230VAC High voltage)---"L1&L2"
P1–P2	Output：Short Circuit with Red Wire
CN1–CN2	Output:230VAC High voltage----REVERSE VALVE
CN5–CN6	Output:230VAC High voltage----CRANKCASE HEATER
CN8–CN9	Output:230VAC High voltage----CHASSIS HEATER
P-1–P-2	Connection to the earth
CN18, CN19	Output:Pin1-Pin4:Pulse waveform(0-12VDC),Pin5,Pin6(12VDC)--EEV
CN7 (T5)	Input:Pin1(0-5VDC),Pin2(5VDC)--Discharge Sensor
CN17	Input:Pin3,Pin4(5VDC),Pin2(0VDC),Pin1,Pin5(0-5VDC)---OUD Cond. Temp
CN15 (T2)	Input:Pin1,Pin3(5VDC) Pin2,Pin4(0-5VDC)--IDU Pipe Temp
CN14	Input:Pin2,Pin4(0-5VDC) ,Pin1,Pin3(0VDC) ---H/L Pressure Switch
CN12	Input:Pin1(5VDC) ,Pin2(0-5VDC)--Compressor Temp
CN29–L-OUT	Output:230VAC High voltage--To IPM Board
CN 21	Connect to IPM BOARD

OUTDOOR UNIT IPM DRIVE BOARD	
CODE	PART NAME
CN4–CN5	Input:230VAC High voltage ---From Main Board
CN2–CN3	Output:Connection of the REACTOR
U–V–W	Connection to compressor voltage among phases 0~200VAC
CN14	Connection to DC FAN
CN1	Connection to MAIN BOARD

Figure 18. 208/230V MLB018S4S-*P Outdoor Unit Wiring Diagram

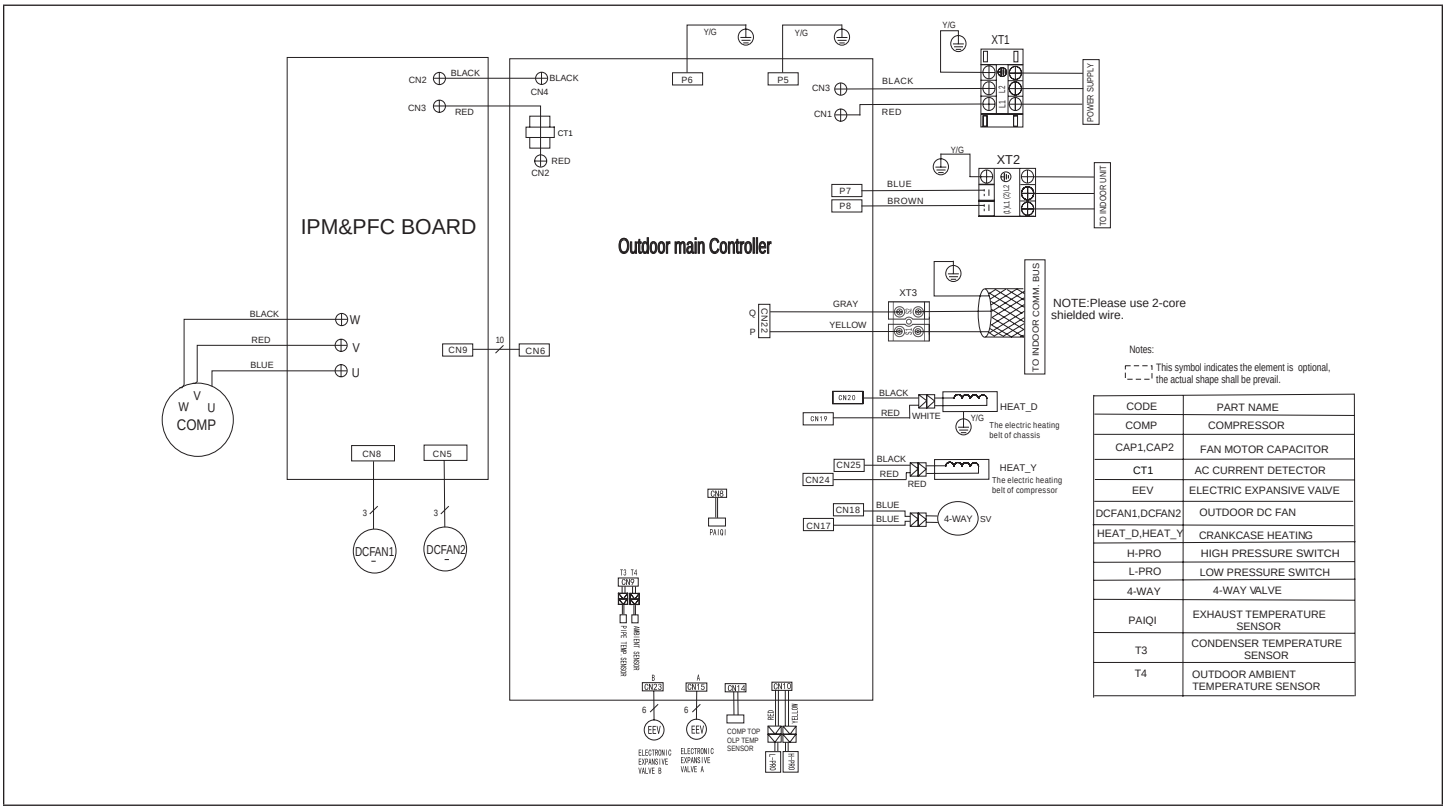
3.9. MLB024S4S



CODE	PART NAME
JX1	TERMINAL BLOCK
COMP_TOP	COMP. TOP OLP TEMP. SENSOR
EEV	ELECTRIC EXPANSIVE VALVE
FM1	DC FAN MOTOR
COMP	COMPRESSOR
HEAT_Y	CRANKCASE HEATER
CT1	AC CURRENT DETECTOR
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSE VALVE (CN38)
T5	COMP. DISCHARGE TEMP. SENSOR
T3	COIL TEMP. SENSOR
T4	OUTDOOR AMBIENT TEMP. SENSOR
HEAT_D	CHASSIS HEATER

Figure 19. 208/230V MLB024S4S-*P Outdoor Unit Wiring Diagram

3.10. MLB036S4S and MLB048S4S

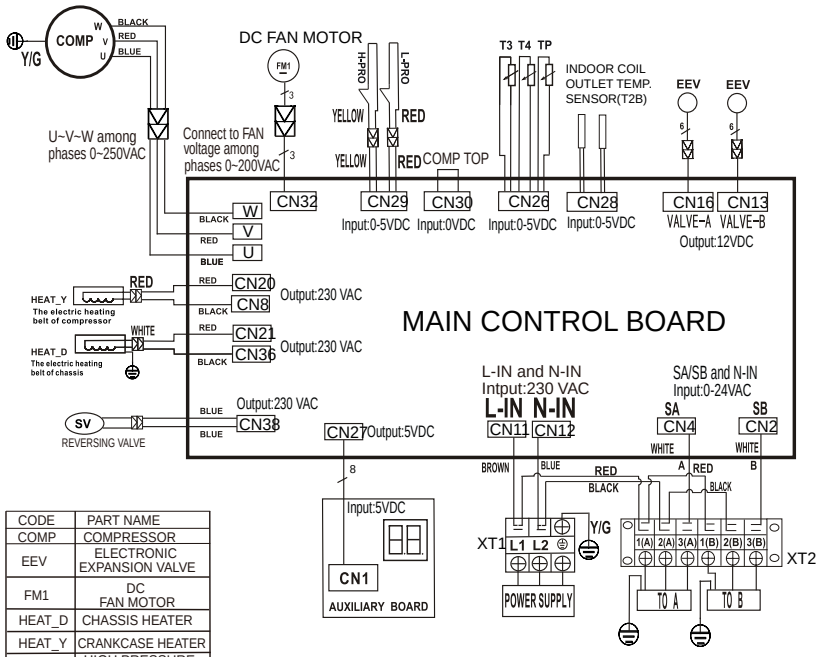


CODE	PART NAME
COMP	COMPRESSOR
CAP1,CAP2	FAN MOTOR CAPACITOR
CT1	AC CURRENT DETECTOR
EEV	ELECTRIC EXPANSIVE VALVE
DCFAN1,DCFAN2	OUTDOOR DC FAN
HEAT_D,HEAT_Y	CRANKCASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
4-WAY	4-WAY VALVE
PAIQI	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR

Figure 20. 208/230V MLB036S4S-*P and MLB048S4S-*P Outdoor Unit Wiring Diagram

4. Multi-Zone Outdoor Control Board Connection Details

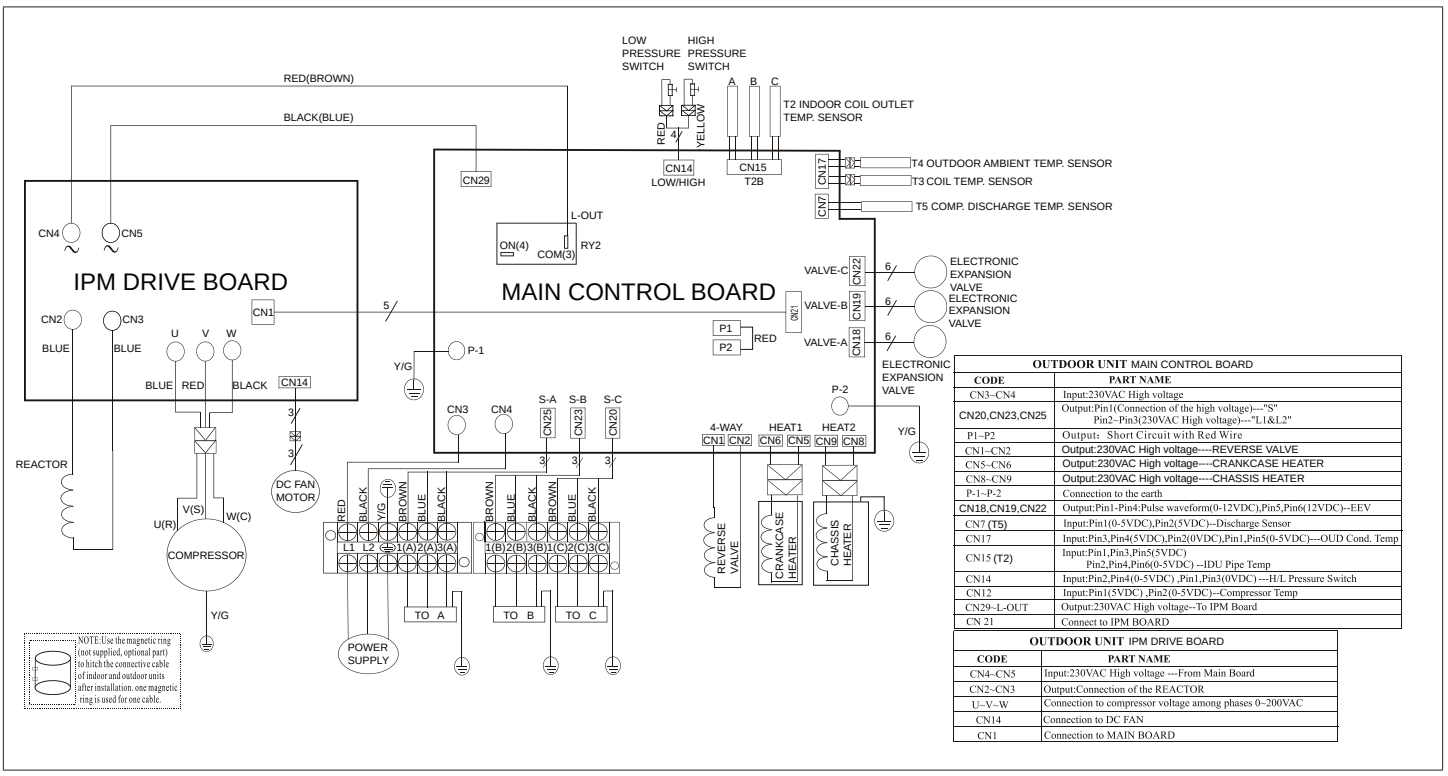
4.1. MPC018S4M



CODE	PART NAME
COMP	COMPRESSOR
EEV	ELECTRONIC EXPANSION VALVE
FM1	DC FAN MOTOR
HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSING VALVE
TP	COMP. DISCHARGE TEMP. SENSOR
T3	OUTDOOR COIL TEMP. SENSOR
T4	OUTDOOR AMBIENT TEMP. SENSOR
COMP TOP	COMP. TOP OLP TEMP. SENSOR

Figure 21. MPC018S4M-*P Outdoor Unit Wiring Diagram

4.2. MPC024S4M

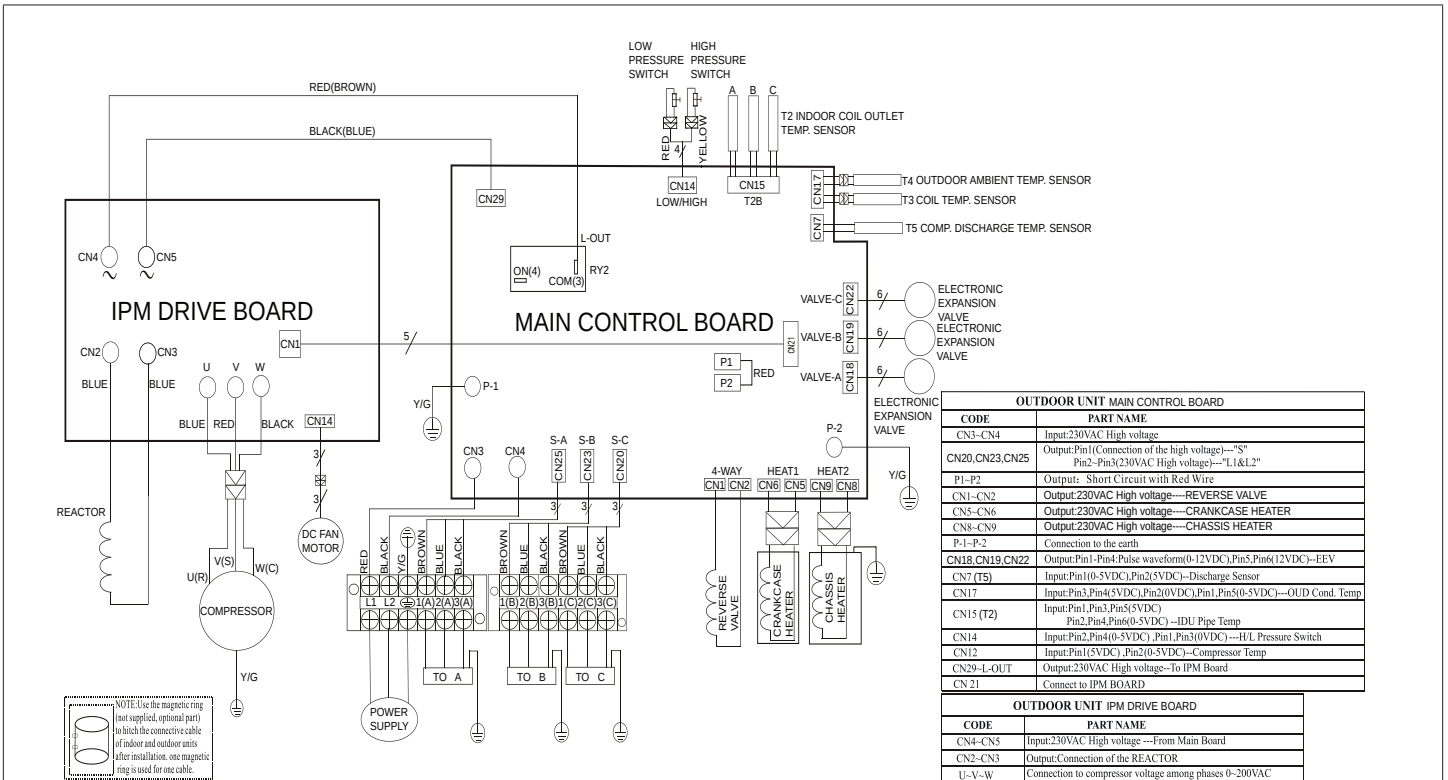


OUTDOOR UNIT MAIN CONTROL BOARD	
CODE	PART NAME
CN3~CN4	Input:230VAC High voltage
CN20,CN23,CN25	Output:Pin1(Connection of the high voltage)---"S" Pin2~Pin3(230VAC High voltage)---"L1&L2"
P1~P2	Output：Short Circuit with Red Wire
CN1~CN2	Output:230VAC High voltage----REVERSE VALVE
CN5~CN6	Output:230VAC High voltage----CRANKCASE HEATER
CN8~CN9	Output:230VAC High voltage----CHASSIS HEATER
P-1~P-2	Connection to the earth
CN18,CN19,CN22	Output:Pin1-Pin4,Pulse waveform(0-12VDC),Pin5,Pin6(12VDC)--EEV
CN7 (T5)	Input:Pin1(0-5VDC),Pin2(5VDC)--Discharge Sensor
CN17	Input:Pin3,Pin4(5VDC),Pin2(0VDC),Pin1,Pin5(0-5VDC)---OUD Cond. Temp
CN15 (T2)	Input:Pin1,Pin3,Pin5(5VDC) Pin2,Pin4,Pin6(0-5VDC) --IDU Pipe Temp
CN14	Input:Pin2,Pin4(0-5VDC) ,Pin1,Pin3(0VDC) ---H/L Pressure Switch
CN12	Input:Pin1(5VDC) ,Pin2(0-5VDC)--Compressor Temp
CN29~L-OUT	Output:230VAC High voltage--To IPM Board
CN 21	Connect to IPM BOARD

OUTDOOR UNIT IPM DRIVE BOARD	
CODE	PART NAME
CN4~CN5	Input:230VAC High voltage ---From Main Board
CN2~CN3	Output:Connection of the REACTOR
U~V~W	Connection to compressor voltage among phases 0~200VAC
CN14	Connection to DC FAN
CN1	Connection to MAIN BOARD

Figure 22. MPC024S4M-*P Outdoor Unit Wiring Diagram

4.3. MPC030S4M

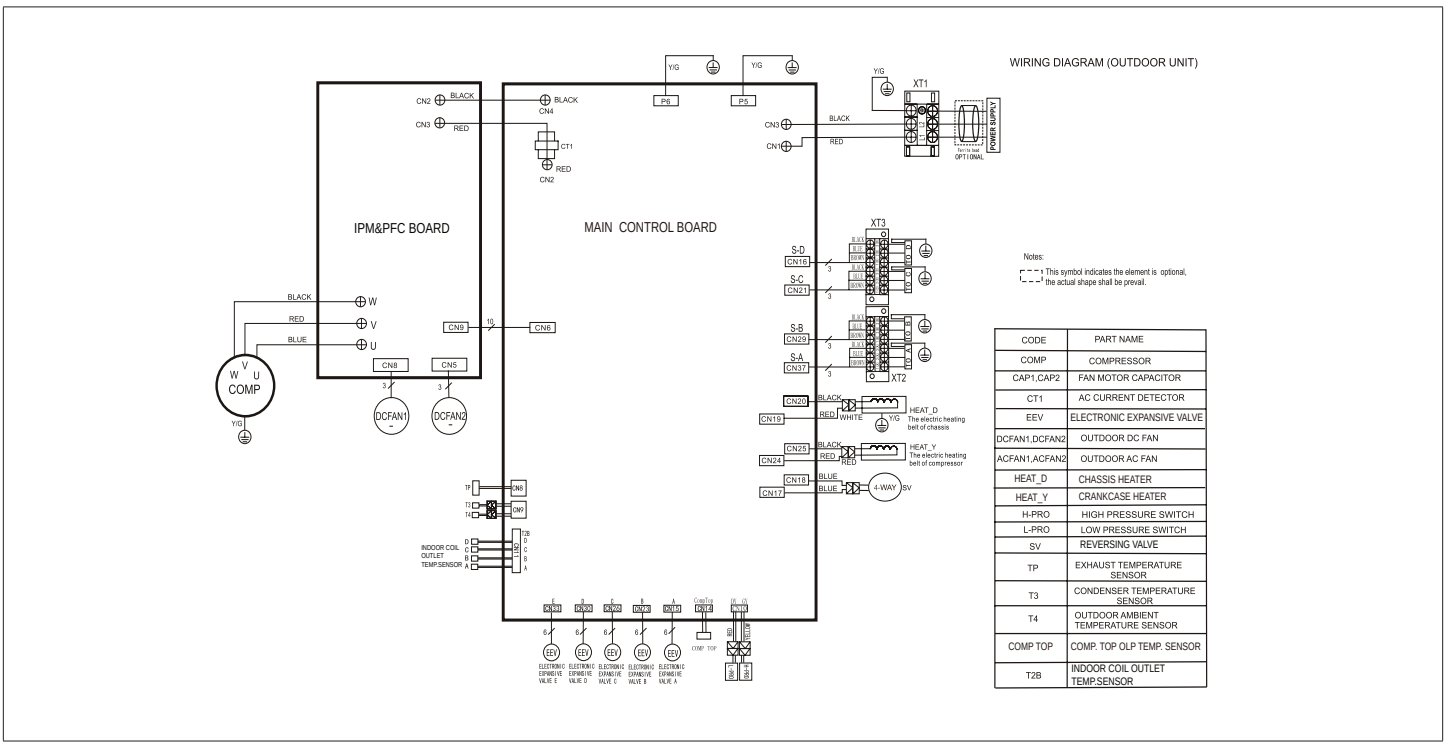


OUTDOOR UNIT MAIN CONTROL BOARD	
CODE	PART NAME
CN3~CN4	Input:230VAC High voltage
CN20,CN23,CN25	Output:Pin1(Connection of the high voltage)---"S" Pin2~Pin3(230VAC High voltage)---"L1&L2"
P1~P2	Output：Short Circuit with Red Wire
CN1~CN2	Output:230VAC High voltage----REVERSE VALVE
CN5~CN6	Output:230VAC High voltage----CRANKCASE HEATER
CN8~CN9	Output:230VAC High voltage----CHASSIS HEATER
P-1~P-2	Connection to the earth
CN18,CN19,CN22	Output:Pin1-Pin4:Pulse waveform(0-12VDC),Pin5,Pin6(12VDC)--EEV
CN7 (T5)	Input:Pin1(0-5VDC),Pin2(5VDC)--Discharge Sensor
CN17	Input:Pin3,Pin4(5VDC),Pin2(0VDC),Pin1,Pin5(0-5VDC)---OUD Cond. Temp
CN15 (T2)	Input:Pin1,Pin3,Pin5(5VDC) Pin2,Pin4,Pin6(0-5VDC) --IDU Pipe Temp
CN14	Input:Pin2,Pin4(0-5VDC) ,Pin1,Pin3(0VDC) ---H/L Pressure Switch
CN12	Input:Pin1(5VDC) ,Pin2(0-5VDC)--Compressor Temp
CN29~L-OUT	Output:230VAC High voltage--To IPM Board
CN 21	Connect to IPM BOARD

OUTDOOR UNIT IPM DRIVE BOARD	
CODE	PART NAME
CN4~CN5	Input:230VAC High voltage ---From Main Board
CN2~CN3	Output:Connection of the REACTOR
U~V~W	Connection to compressor voltage among phases 0~200VAC
CN14	Connection to DC FAN
CN1	Connection to MAIN BOARD

Figure 23. MPC030S4M-*P Outdoor Unit Wiring Diagram

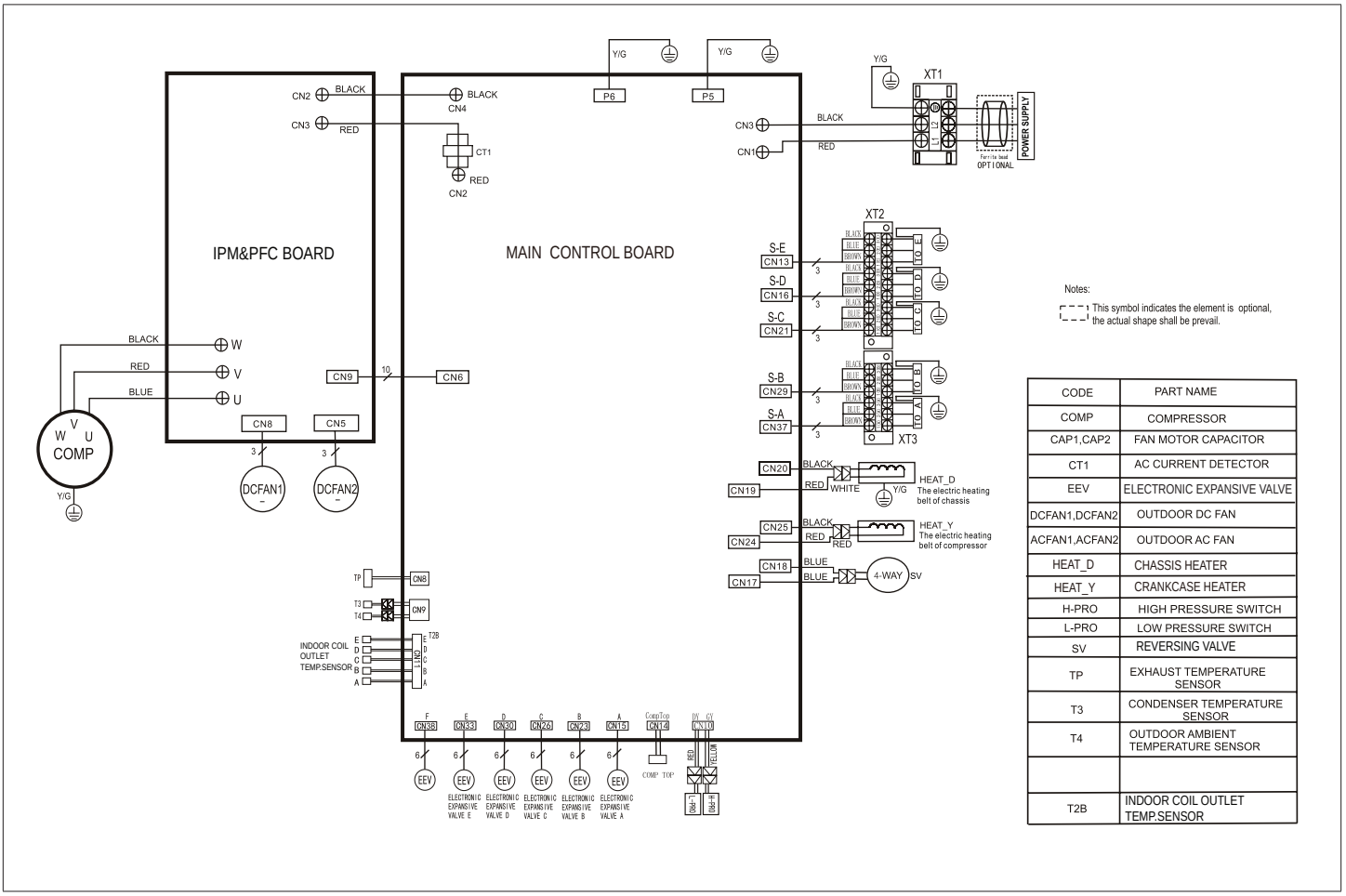
4.4. MPC036S4M



CODE	PART NAME
COMP	COMPRESSOR
CAP1,CAP2	FAN MOTOR CAPACITOR
CT1	AC CURRENT DETECTOR
EEV	ELECTRONIC EXPANSIVE VALVE
DCFAN1,DCFAN2	OUTDOOR DC FAN
ACFAN1,ACFAN2	OUTDOOR AC FAN
HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSING VALVE
TP	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
COMP TOP	COMP. TOP OLP TEMP. SENSOR
T2B	INDOOR COIL OUTLET TEMP.SENSOR

Figure 24. MPC036S4M-*P Outdoor Unit Wiring Diagram

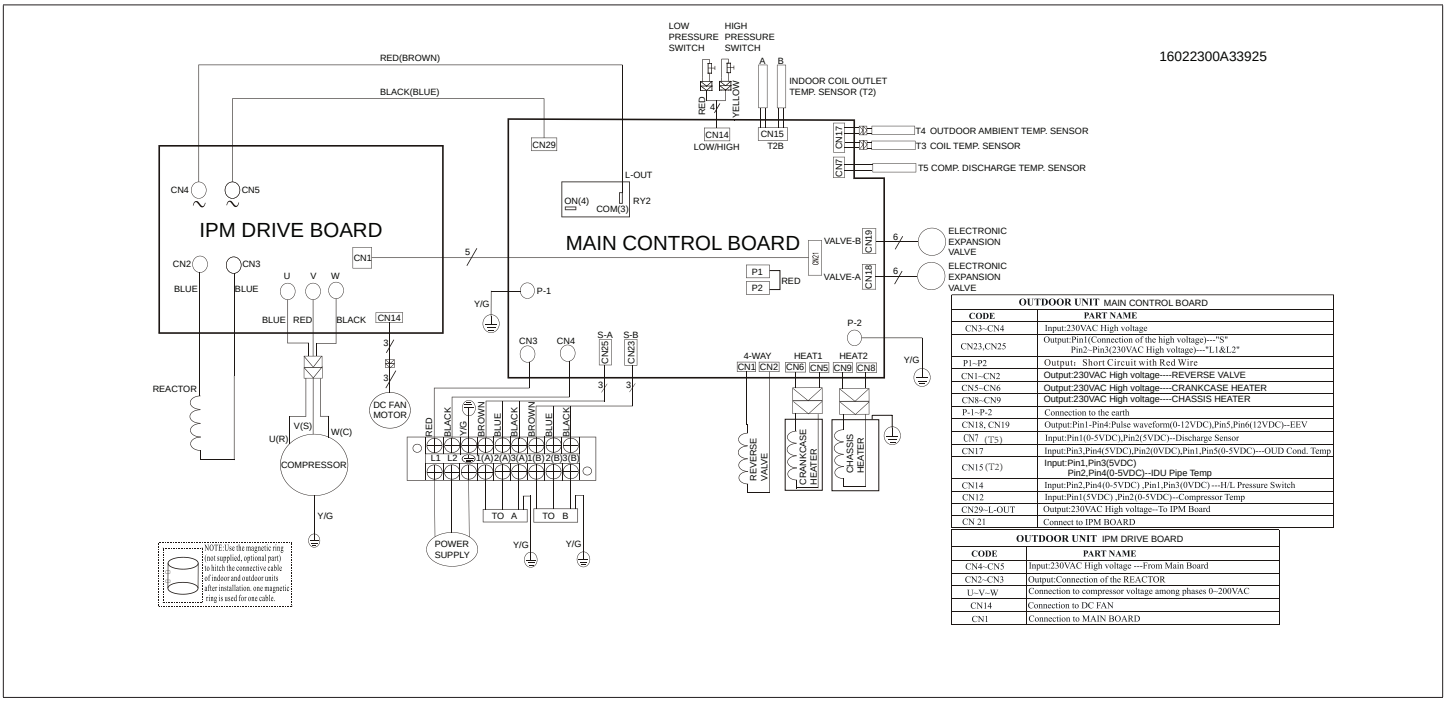
4.5. MPC048S4M



CODE	PART NAME
COMP	COMPRESSOR
CAP1,CAP2	FAN MOTOR CAPACITOR
CT1	AC CURRENT DETECTOR
EEV	ELECTRONIC EXPANSIVE VALVE
DCFAN1,DCFAN2	OUTDOOR DC FAN
ACFAN1,ACFAN2	OUTDOOR AC FAN
HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSING VALVE
TP	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
T2B	INDOOR COIL OUTLET TEMP.SENSOR

Figure 25. MPC048S4M-*P Outdoor Unit Wiring Diagram

4.6. MLB018S4M

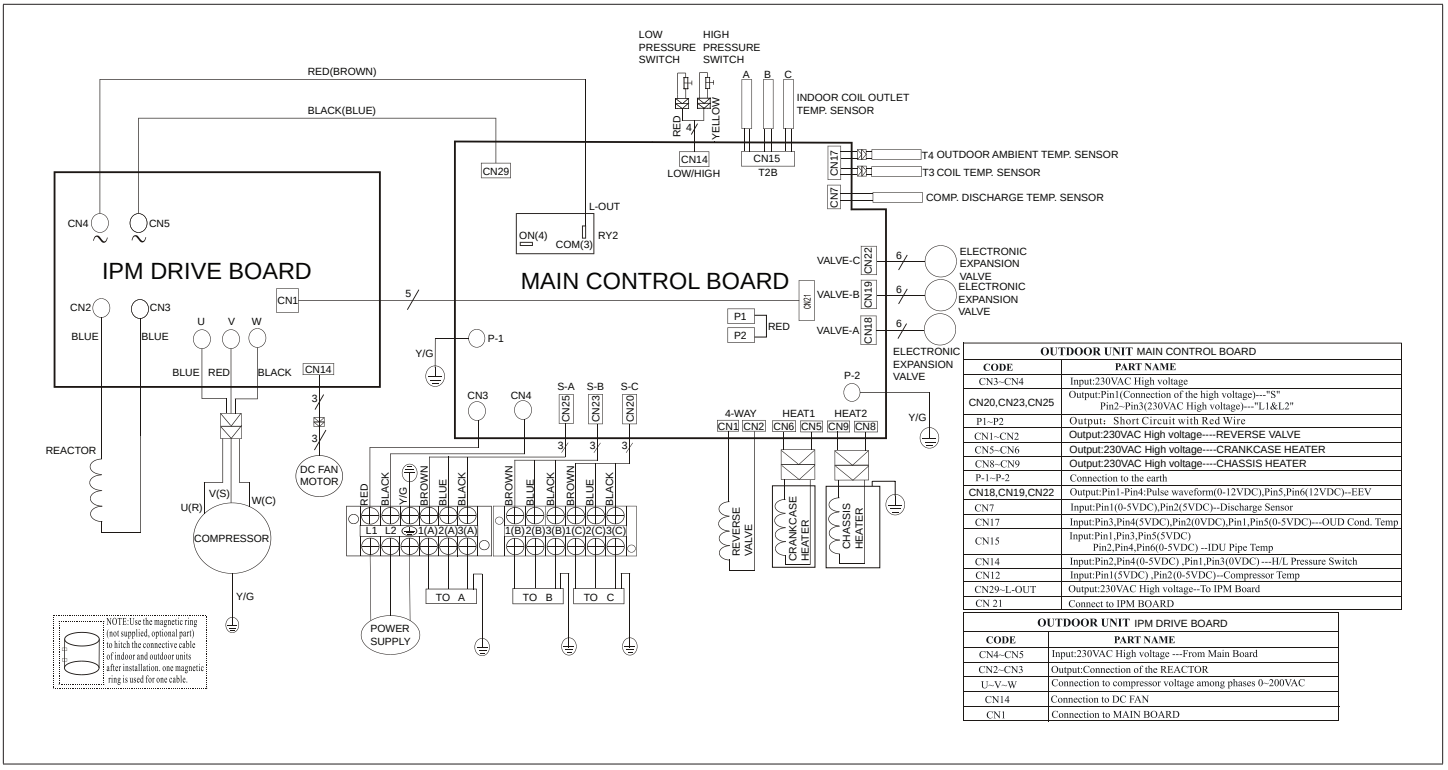


OUTDOOR UNIT MAIN CONTROL BOARD	
CODE	PART NAME
CN3~CN4	Input:230VAC High voltage
CN23,CN25	Output:Pin1(Connection of the high voltage)---"S" Pin2~Pin3(230VAC High voltage)---"L1&L2"
P1~P2	Output：Short Circuit with Red Wire
CN1~CN2	Output:230VAC High voltage----REVERSE VALVE
CN5~CN6	Output:230VAC High voltage----CRANKCASE HEATER
CN8~CN9	Output:230VAC High voltage----CHASSIS HEATER
P-1~P-2	Connection to the earth
CN18, CN19	Output:Pin1-Pin4:Pulse waveform(0-12VDC),Pin5,Pin6(12VDC)--EEV
CN7 (T5)	Input:Pin1(0-5VDC),Pin2(5VDC)--Discharge Sensor
CN17	Input:Pin3,Pin4(5VDC),Pin2(0VDC),Pin1,Pin5(0-5VDC)---OUD Cond. Temp
CN15 (T2)	Input:Pin1,Pin3(5VDC) Pin2,Pin4(0-5VDC)--IDU Pipe Temp
CN14	Input:Pin2,Pin4(0-5VDC) ,Pin1,Pin3(0VDC) ---H/L Pressure Switch
CN12	Input:Pin1(5VDC) ,Pin2(0-5VDC)--Compressor Temp
CN29~L-OUT	Output:230VAC High voltage--To IPM Board
CN 21	Connect to IPM BOARD

OUTDOOR UNIT IPM DRIVE BOARD	
CODE	PART NAME
CN4~CN5	Input:230VAC High voltage ---From Main Board
CN2~CN3	Output:Connection of the REACTOR
U~V~W	Connection to compressor voltage among phases 0~200VAC
CN14	Connection to DC FAN
CN1	Connection to MAIN BOARD

Figure 26. MLB018S4M-*P Outdoor Unit Wiring Diagram

4.7. MLB030S4M

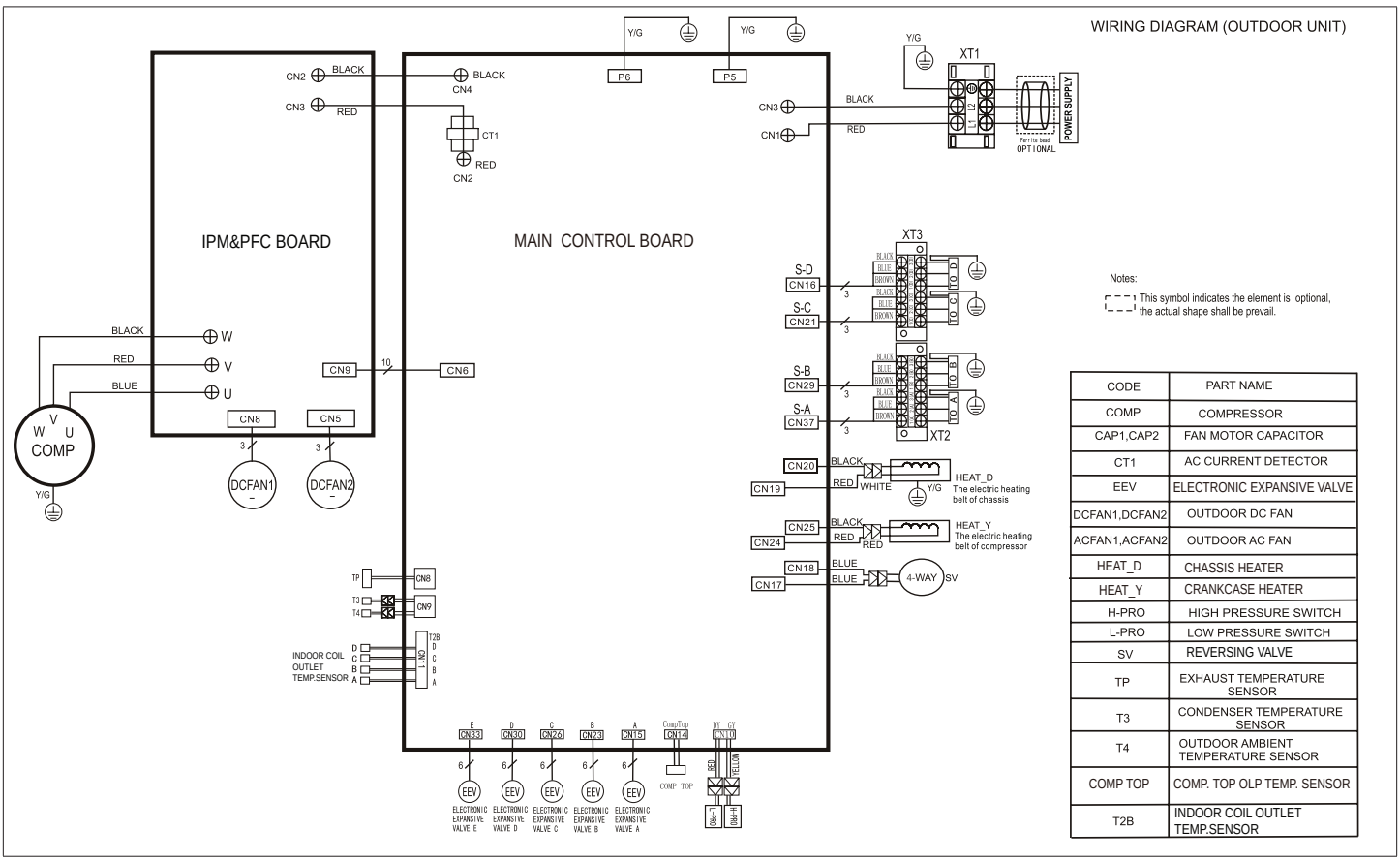


OUTDOOR UNIT MAIN CONTROL BOARD	
CODE	PART NAME
CN3~CN4	Input:230VAC High voltage
CN20,CN23,CN25	Output:Pin1(Connection of the high voltage)---"S" Pin2~Pin3(230VAC High voltage)---"L1&L2"
P1~P2	Output：Short Circuit with Red Wire
CN1~CN2	Output:230VAC High voltage----REVERSE VALVE
CN5~CN6	Output:230VAC High voltage----CRANKCASE HEATER
CN8~CN9	Output:230VAC High voltage----CHASSIS HEATER
P-1~P-2	Connection to the earth
CN18,CN19,CN22	Output:Pin1-Pin4:Pulse waveform(0-12VDC),Pin5,Pin6(12VDC)--EEV
CN7	Input:Pin1(0-5VDC),Pin2(5VDC)--Discharge Sensor
CN17	Input:Pin3,Pin4(5VDC),Pin2(0VDC),Pin1,Pin5(0-5VDC)---OUD Cond. Temp
CN15	Input:Pin1,Pin3,Pin5(5VDC) Pin2,Pin4,Pin6(0-5VDC) --IDU Pipe Temp
CN14	Input:Pin2,Pin4(0-5VDC) ,Pin1,Pin3(0VDC) ---H/L Pressure Switch
CN12	Input:Pin1(5VDC) ,Pin2(0-5VDC)--Compressor Temp
CN29~L-OUT	Output:230VAC High voltage--To IPM Board
CN 21	Connect to IPM BOARD

OUTDOOR UNIT IPM DRIVE BOARD	
CODE	PART NAME
CN4~CN5	Input:230VAC High voltage ---From Main Board
CN2~CN3	Output:Connection of the REACTOR
U~V~W	Connection to compressor voltage among phases 0~200VAC
CN14	Connection to DC FAN
CN1	Connection to MAIN BOARD

Figure 27. MLB030S4M-*P Outdoor Unit Wiring Diagram

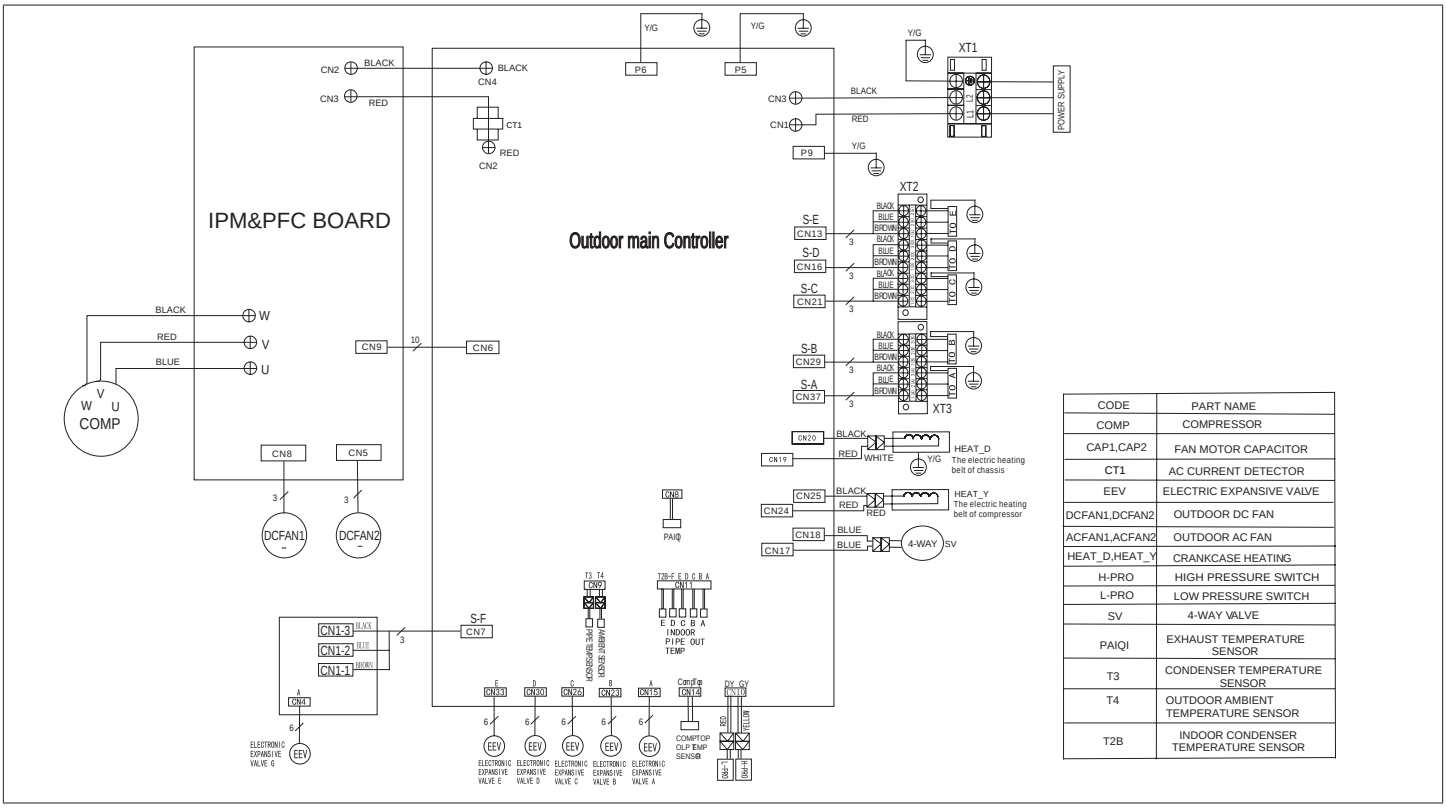
4.8. MLB036S4M



CODE	PART NAME
COMP	COMPRESSOR
CAP1,CAP2	FAN MOTOR CAPACITOR
CT1	AC CURRENT DETECTOR
EEV	ELECTRONIC EXPANSIVE VALVE
DCFAN1,DCFAN2	OUTDOOR DC FAN
ACFAN1,ACFAN2	OUTDOOR AC FAN
HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSING VALVE
TP	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
COMP TOP	COMP. TOP OLP TEMP. SENSOR
T2B	INDOOR COIL OUTLET TEMP.SENSOR

Figure 28. MLB036S4M-*P Outdoor Unit Wiring Diagram

4.9. MLB048S4M



CODE	PART NAME
COMP	COMPRESSOR
CAP1,CAP2	FAN MOTOR CAPACITOR
CT1	AC CURRENT DETECTOR
EEV	ELECTRIC EXPANSIVE VALVE
DCFAN1,DCFAN2	OUTDOOR DC FAN
ACFAN1,ACFAN2	OUTDOOR AC FAN
HEAT_D,HEAT_Y	CRANKCASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	4-WAY VALVE
PAIQI	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
T2B	INDOOR CONDENSER TEMPERATURE SENSOR

Figure 29. MLB048S4M-*P Outdoor Unit Wiring Diagram

4.10. Multi-Zone Outdoor Unit Spot Check Function

There is a check switch on the outdoor control board. Push the switch labelled SW1 to check the status of unit when the unit is running. The two-digit display will provide the following status indicators (see table 1) each time the SW1 switch is pushed.

Table 10. Status Indicators

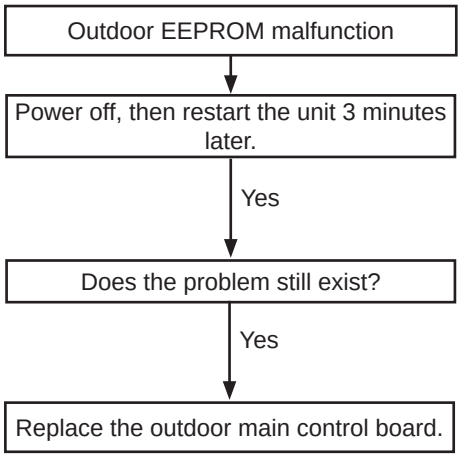
<table>
<tr><th></th><th>Display</th><th colspan="3">Remark</th></tr>
<tr><td>0</td><td>Normal Display</td><td colspan="3">Display running frequency, running state or malfunction code</td></tr>
<tr><td rowspan="7">1</td><td rowspan="7">Number of connected indoor units</td><td colspan="3">Actual data</td></tr>
<tr><td rowspan="6"></td><td>Display</td><td>Number of indoor units</td></tr>
<tr><td>1</td><td>one</td></tr>
<tr><td>2</td><td>two</td></tr>
<tr><td>3</td><td>three</td></tr>
<tr><td>4</td><td>four</td></tr>
<tr><td>5</td><td>five</td></tr>
<tr><td>2</td><td>Outdoor unit running mode</td><td colspan="3">Off: 0, Fan only: 1, Cooling: 2, Heating: 3, Forced cooling: 4</td></tr>
<tr><td>3</td><td>Indoor unit A capacity</td><td colspan="3" rowspan="5">The capacity unit is horsepower.
If the indoor unit is not connected, the digital display tube will show: “——”
(9K:1HP,12K:1.2HP,18K:1.5HP)</td></tr>
<tr><td>4</td><td>Indoor unit B capacity</td></tr>
<tr><td>5</td><td>Indoor unit C capacity</td></tr>
<tr><td>6</td><td>Indoor unit D capacity</td></tr>
<tr><td>7</td><td>Indoor unit E capacity</td></tr>
<tr><td>8</td><td>Indoor unit A capacity demand code</td><td colspan="3" rowspan="5">Norm code*HP
(9K:1HP,12K:1.2HP,18K:1.5HP)</td></tr>
<tr><td>9</td><td>Indoor unit B capacity demand code</td></tr>
<tr><td>10</td><td>Indoor unit C capacity demand code</td></tr>
<tr><td>11</td><td>Indoor unit D capacity demand code</td></tr>
<tr><td>12</td><td>Indoor unit E capacity demand code</td></tr>
<tr><td>13</td><td>Outdoor unit amendatory capacity demand code</td><td colspan="3">Forced cooling:7</td></tr>
<tr><td>14</td><td>The frequency corresponding to the total indoor units amendatory capacity demand</td><td colspan="3"></td></tr>
<tr><td>15</td><td>The frequency after the frequency limit</td><td colspan="3"></td></tr>
<tr><td>16</td><td>The frequency sending to compressor control chip</td><td colspan="3"></td></tr>
<tr><td>17</td><td>Indoor unit A evaporator outlet temp.(T2BA)</td><td colspan="3" rowspan="5">• If the temperature is lower than -9 degrees, the two-digit display will show “-9”.
• If the temperature is higher than 70 degree, the two-digit display will show “70”.
• If the indoor unit is not connected, the two-digit display will show: “——”</td></tr>
<tr><td>18</td><td>Indoor unit B evaporator outlet temp.(T2BB)</td></tr>
<tr><td>19</td><td>Indoor unit C evaporator outlet temp.(T2BC)</td></tr>
<tr><td>20</td><td>Indoor unit D evaporator outlet temp.(T2BD)</td></tr>
<tr><td>21</td><td>Indoor unit E evaporator outlet temp.(T2BE)</td></tr>
<tr><td>22</td><td>Indoor unit A room temp.(T1A)</td><td colspan="3" rowspan="5">• If the temperature is lower than 0 degree, the two-digit display will show “0”.
• If the temperature is higher than 50 degree, the two-digit display will show “50”.
• If the indoor unit is not connected, the two-digit display will show: “——”</td></tr>
<tr><td>23</td><td>Indoor unit B room temp.(T1B)</td></tr>
<tr><td>24</td><td>Indoor unit C room temp.(T1C)</td></tr>
<tr><td>25</td><td>Indoor unit D room temp.(T1D)</td></tr>
<tr><td>26</td><td>Indoor unit E room temp.(T1E)</td></tr>
<tr><td>27</td><td>Indoor unit A evaporator temp.(T2A)</td><td colspan="3" rowspan="7">• If the temperature is lower than -9 degree, the two-digit display will show “-9”.
• If the temperature is higher than 70 degree, the two-digit display will show “70”.
• If the indoor unit is not connected, the digital display tube will show: “——”</td></tr>
<tr><td>28</td><td>Indoor unit B evaporator temp.(T2B)</td></tr>
<tr><td>29</td><td>Indoor unit C evaporator temp.(T2C)</td></tr>
<tr><td>30</td><td>Indoor unit D evaporator temp.(T2D)</td></tr>
<tr><td>31</td><td>Indoor unit E evaporator temp.(T2E)</td></tr>
<tr><td>32</td><td>Condenser pipe temp.(T3)</td></tr>
<tr><td>33</td><td>Outdoor ambient temp.(T4)</td></tr>
</table>

Table 10. Status Indicators

<table>
<tr><th></th><th>Display</th><th colspan="3">Remark</th></tr>
<tr><td>34</td><td>Compressor discharge temp.(TP)</td><td colspan="3">• The display value should be between 30 and 129 degrees.
• If the temperature is lower than 30 degree, the two-digit display will show “30”.
• If the temperature is higher than 99 degree, the two-digit display will show single digit and tens digit.
NOTE: For example, the two-digit display show “0.5”,it means the compressor discharge temp. is 105 degree.)</td></tr>
<tr><td>35</td><td>AD value of current</td><td colspan="3" rowspan="2">The display value is hex number.
NOTE: For example ,the two-digit display show “Cd”, it means AD value is 205.</td></tr>
<tr><td>36</td><td>AD value of voltage</td></tr>
<tr><td>37</td><td>EXV open angle for indoor unit A</td><td colspan="3" rowspan="5">• Actual data/4.
• If the value is higher than 99, the two-digit display will show single digit and tens digit.
NOTE: For example ,the two-digit display show “2.0”,it means the EXV open angle is 120×4=480p.)</td></tr>
<tr><td>38</td><td>EXV open angle for indoor unit B</td></tr>
<tr><td>39</td><td>EXV open angle for indoor unit C</td></tr>
<tr><td>40</td><td>EXV open angle for indoor unit D</td></tr>
<tr><td>41</td><td>EXV open angle for indoor unit E</td></tr>
<tr><td rowspan="8">42</td><td rowspan="8">Frequency limit symbol</td><td>Bit7</td><td>Frequency limit caused by IGBT radiator</td><td rowspan="8">The display value is a hex number.
NOTE: For example, the digital display tube shows 2A,then Bit5=1, Bit3=1, Bit1=1. It means frequency limit caused by T4, T3 and current.</td></tr>
<tr><td>Bit6</td><td>Frequency limit caused by PFC</td></tr>
<tr><td>Bit5</td><td>Frequency limit caused by T4.</td></tr>
<tr><td>Bit4</td><td>Frequency limit caused by T2.</td></tr>
<tr><td>Bit3</td><td>Frequency limit caused by T3.</td></tr>
<tr><td>Bit2</td><td>Frequency limit caused by T5.</td></tr>
<tr><td>Bit1</td><td>Frequency limit caused by current</td></tr>
<tr><td>Bit0</td><td>Frequency limit caused by voltage</td></tr>
<tr><td>43</td><td>Average value of T2</td><td colspan="3">(Sum T2 value of all indoor units)/(number of indoor units in good connection)</td></tr>
<tr><td>44</td><td>Outdoor unit fan motor state</td><td colspan="3">Off:0, High speed:1, Med speed:2, Low speed:3 Breeze:4, Super breeze:5</td></tr>
<tr><td>45</td><td>The last error or protection code</td><td colspan="3">00 means no malfunction and protection</td></tr>
<tr><td>46</td><td>Indoor unit F capacity</td><td colspan="3">Not used</td></tr>
<tr><td>47</td><td>Indoor unit F capacity demand code</td><td colspan="3">Not used</td></tr>
<tr><td>48</td><td>Indoor unit F evaporator outlet temp.(T2BF)</td><td colspan="3">Not used</td></tr>
<tr><td>49</td><td>Indoor unit F room temp.(T1F)</td><td colspan="3">Not used</td></tr>
<tr><td>50</td><td>Indoor unit F evaporator temp.(T2F)</td><td colspan="3">Not used</td></tr>
<tr><td>51</td><td>EXV open angle for F indoor unit</td><td colspan="3">Not used</td></tr>
</table>

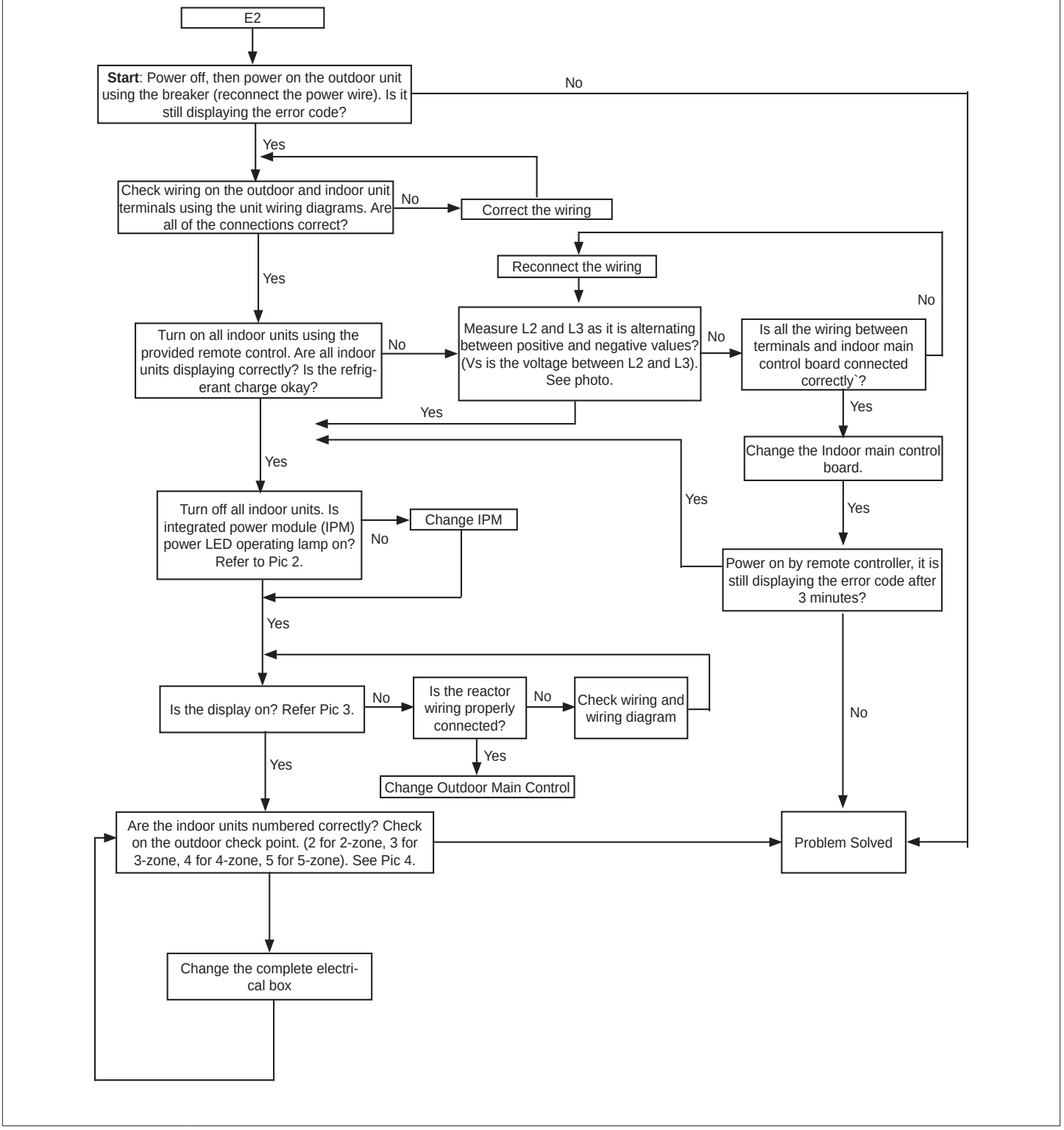
5. Extended Reference Guide - Outdoor Unit Alert Codes

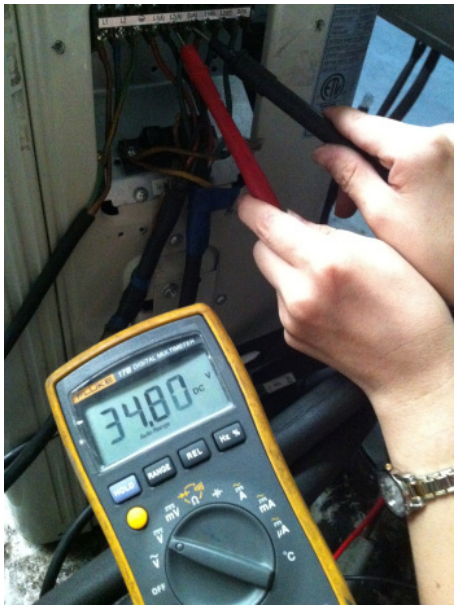
5.1. E0 and EC 51

Description:	Outdoor EEPROM malfunction.
General Note:	Outdoor unit main control board chip is not receiving feedback from EEPROM chip.
	

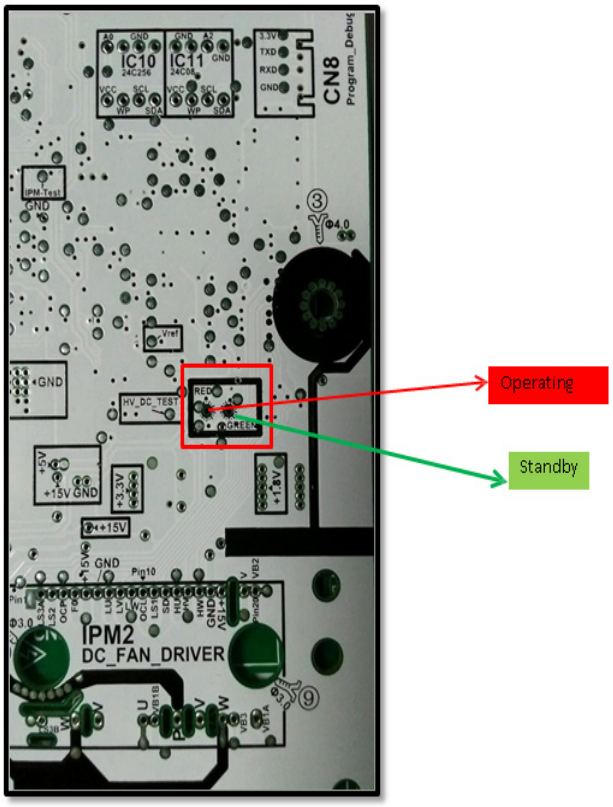
5.2. E2 and EL 01

Description:	Communication malfunction between outdoor unit and all indoor units.
General Note:	Indoor unit is not receiving communication from outdoor unit for 120 seconds, or outdoor unit has not receive communication from any indoor units for 180 seconds.



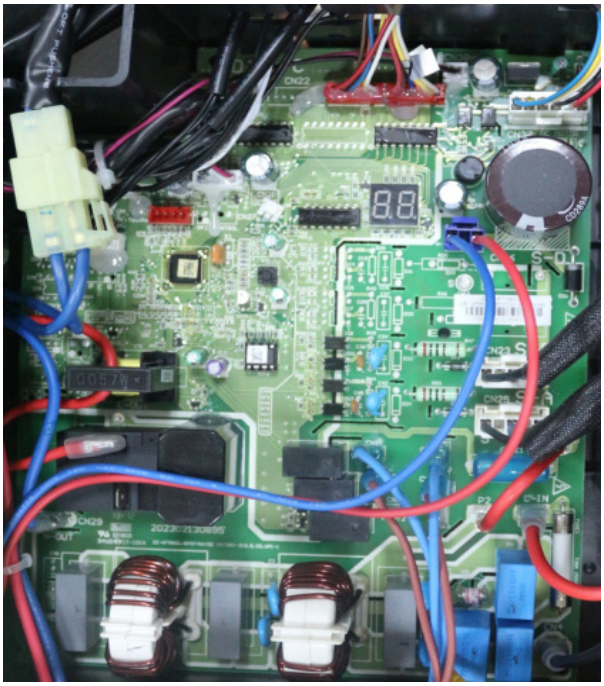


- Use a multimeter to test the DC voltage between L2 and L3 ports of the outdoor unit. The red pin of multimeter connects to the L2 port while the black pin connects to the L3 port.
- If the unit is running normally, the voltage will move alternately between positive and negative values.
- If the voltage is positive then check the outdoor unit main control.
- If the voltage is negative then check indoor unit main control.



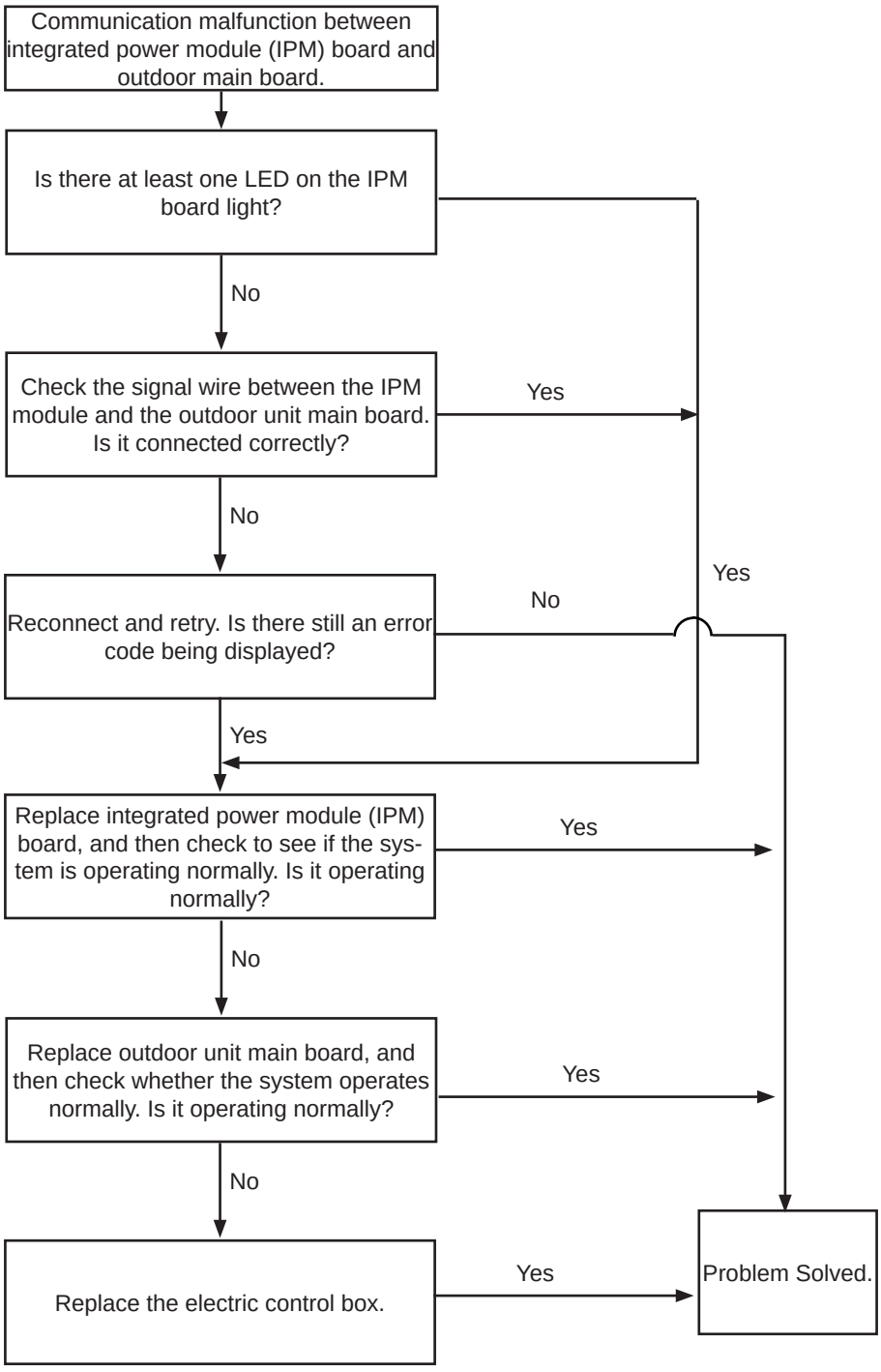
Integrated Power Module (IPM) for 2- and 3-zones units.

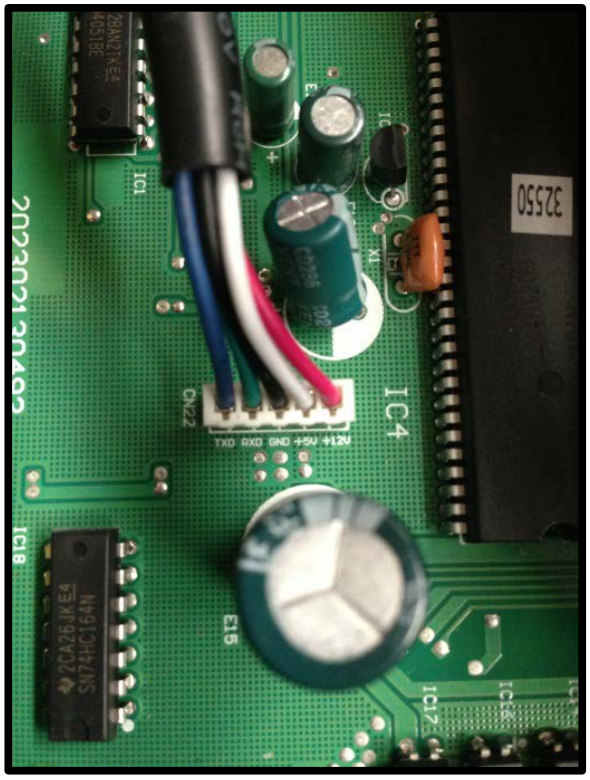
Main board LED when power is on and unit in standby mode with no error codes.

	Check point button, press once to verify the number of indoor units are connected.

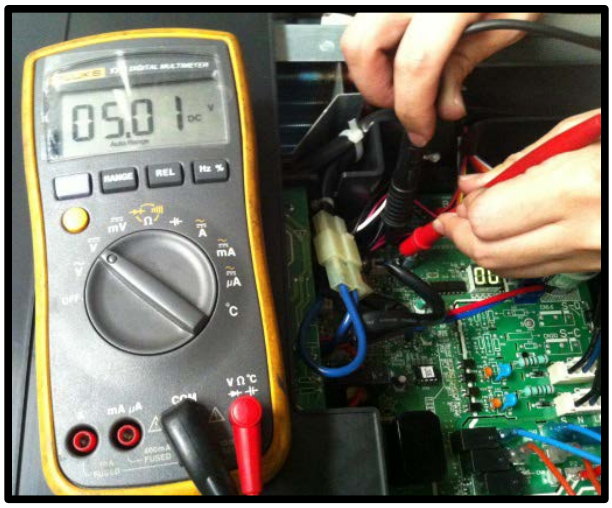
5.3. E3 and PC40

Description:	Communication error between outdoor unit main control and integrated power module (IPM).
General Note:	The main outdoor control board chip is not receiving feedback from integrated power module for a duration of 60 seconds.



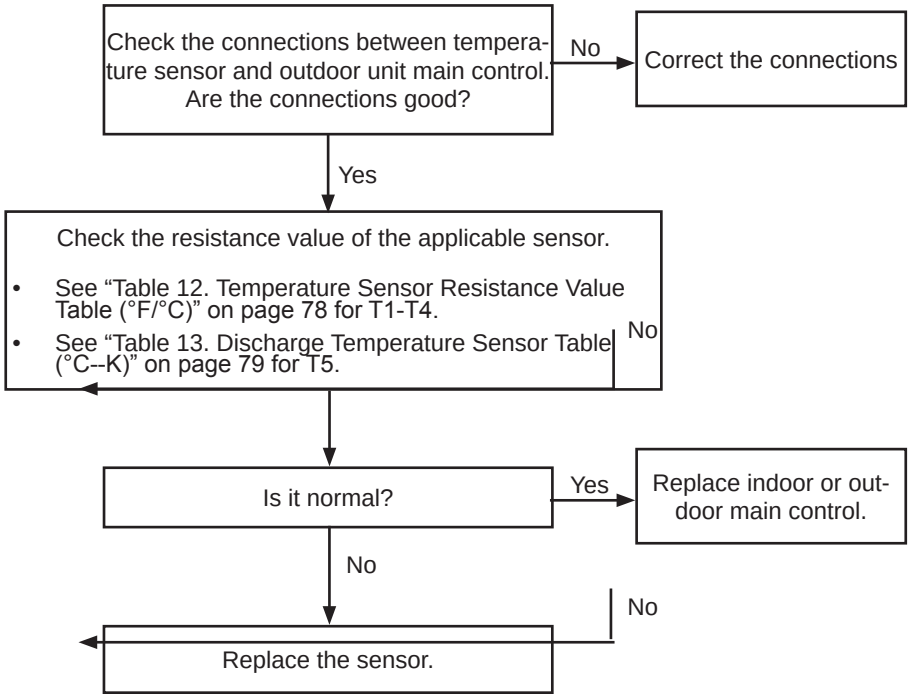


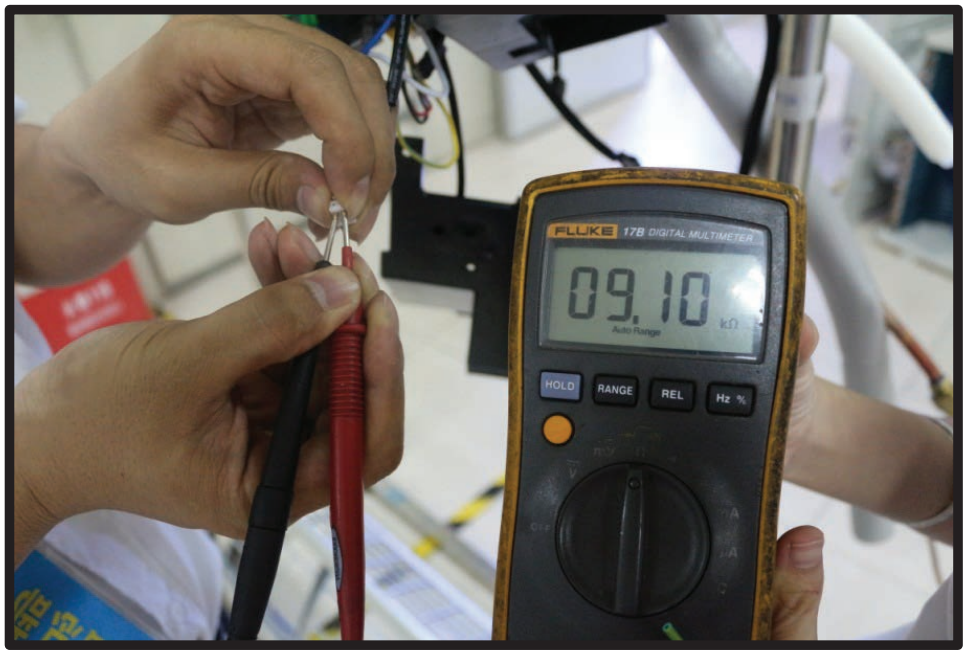
NOTE - Use a multimeter to test the DC voltage between black pin and white pin of signal wire The normal value should be around 5V.
Use a multimeter to test the DC voltage between black pin and red pin of signal wire. The normal value should be around 12V.



5.4. E4, F1, F2, F3, F4, F5, EC 52, EC 53, EC 54, EC 56 and EC 50

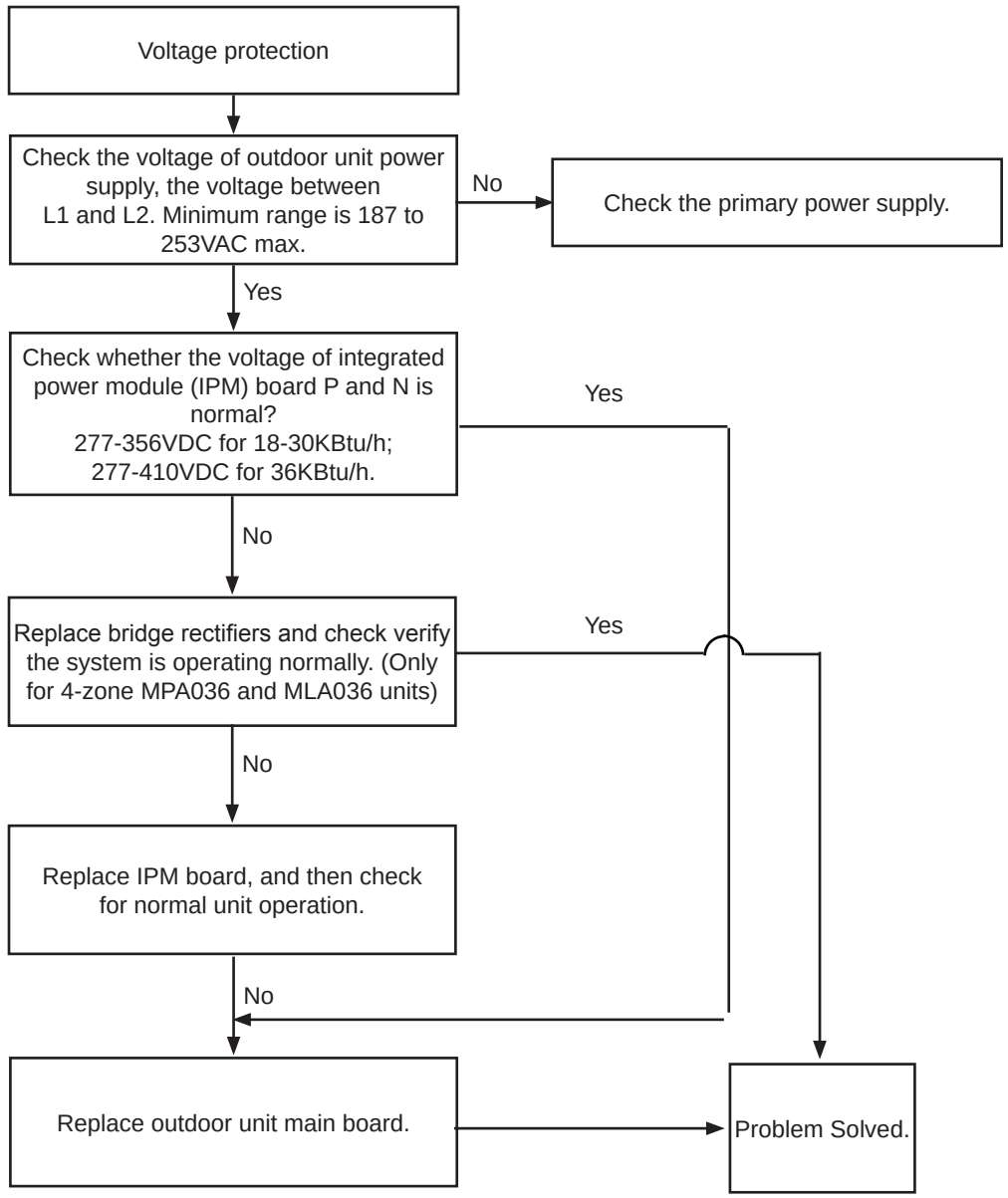
Description:	Temperature sensor error: T2 indoor unit coil outlet temperature sensor T3 outdoor coil sensor T4 outdoor ambient sensor T5 compressor discharge sensor
General Note:	Error displays if voltage is lower than 0.06V or higher than 4.94V.

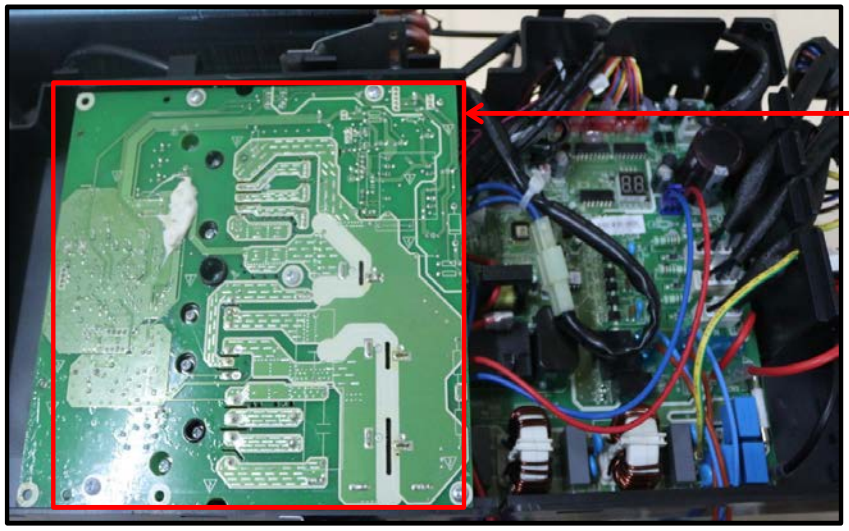




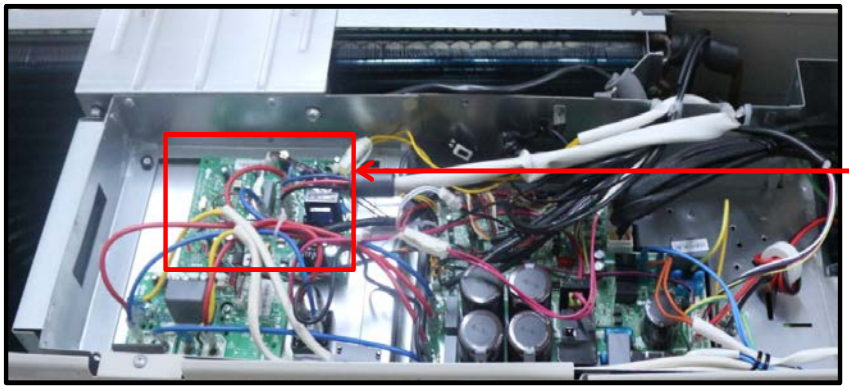
5.5. E5, PC 10, PC 11 and PC 12

Description:	High or low voltage protection active.
General Note:	Either an abnormal voltage rise or drop is detected. Check the specified voltage detection circuit.





IPM (for 2-zone and 3-zone)

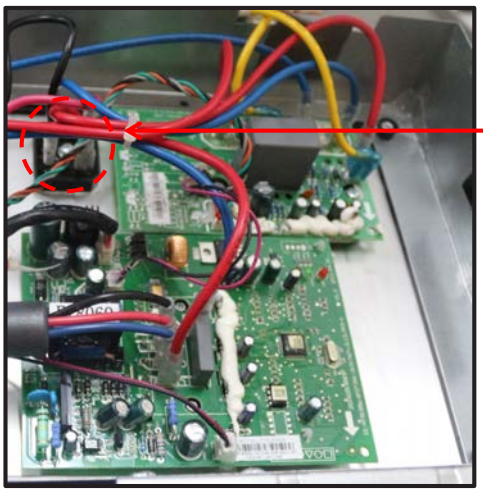


IPM (for 4-zone)

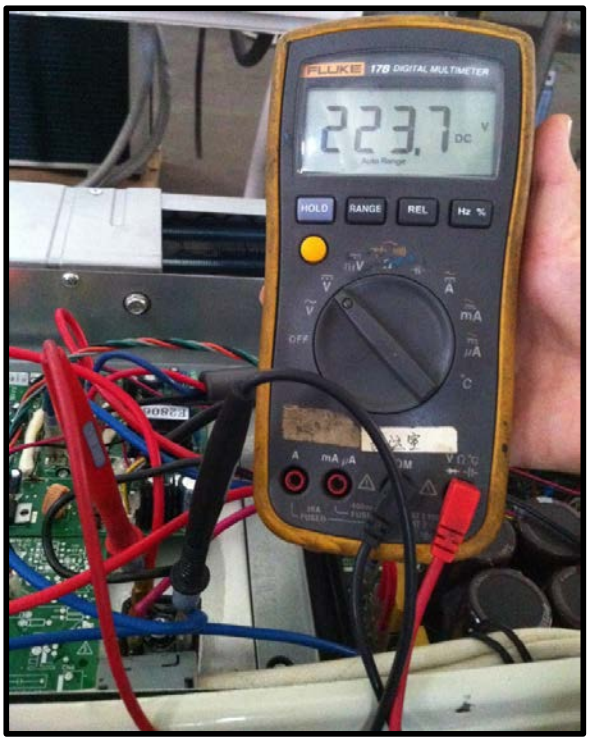
P-N (for 2-zone and 3-zone)

P-N (for 4-zone)

Bridge rectifier for 2-zone and 3-zone



Bridge rectifier for 4-zone



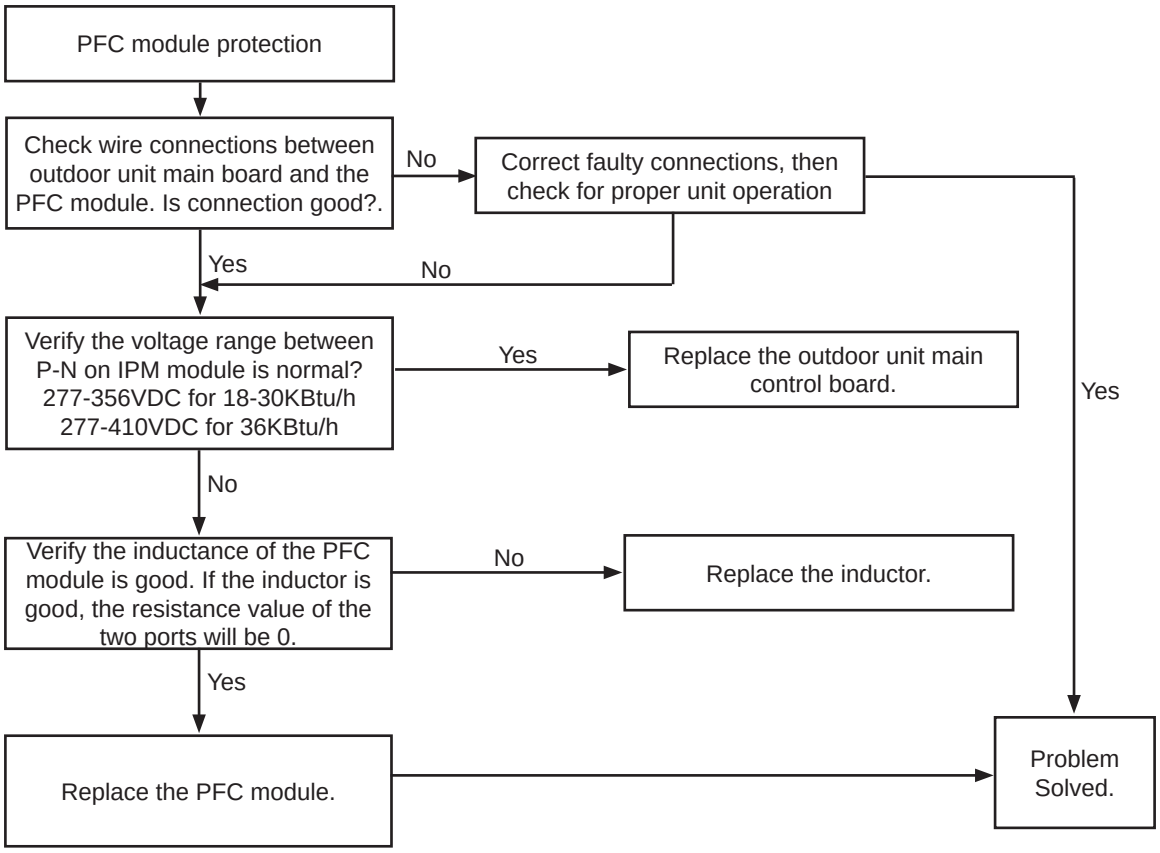
Remark:

Measure the DC voltage between + and - port on the bridge rectifier.

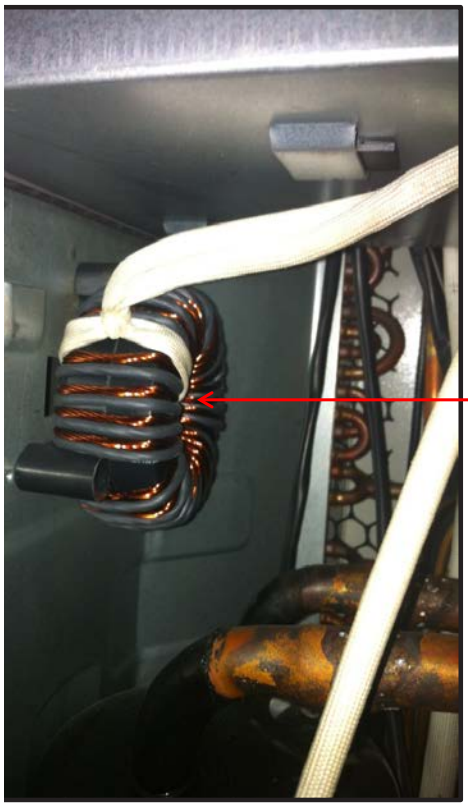
The normal value should be 190V~250V.

5.6. E6, PC 0F

Description:	Power Factor Correction (PFC) module protection (MPA036S4M-1P and MPA048S4M-1P only)
General Note:	When the voltage signal sent by the PFC to the main outdoor unit control board is abnormal, the display LED will show “E6” and unit will turn off.

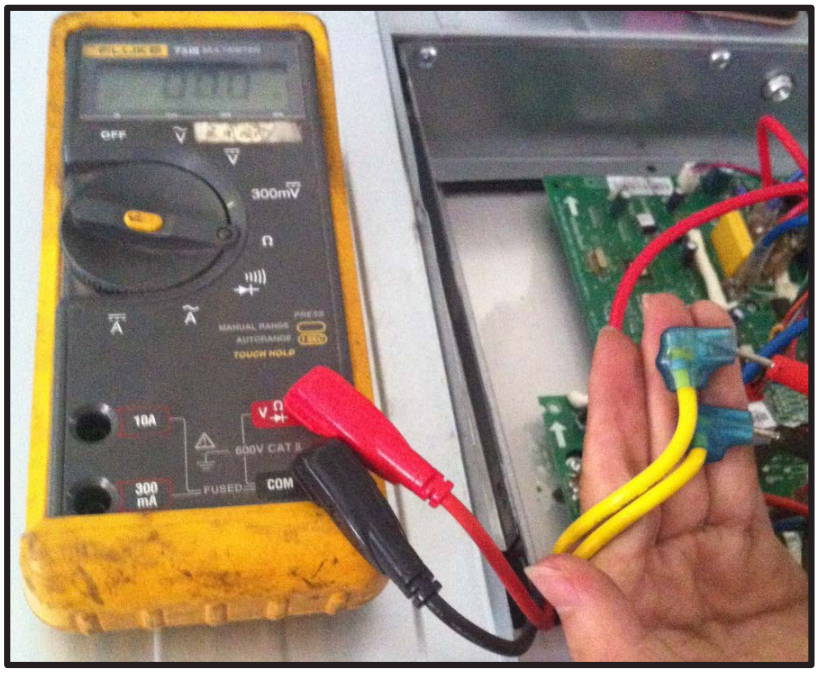


E6 and PC 0F (continued)



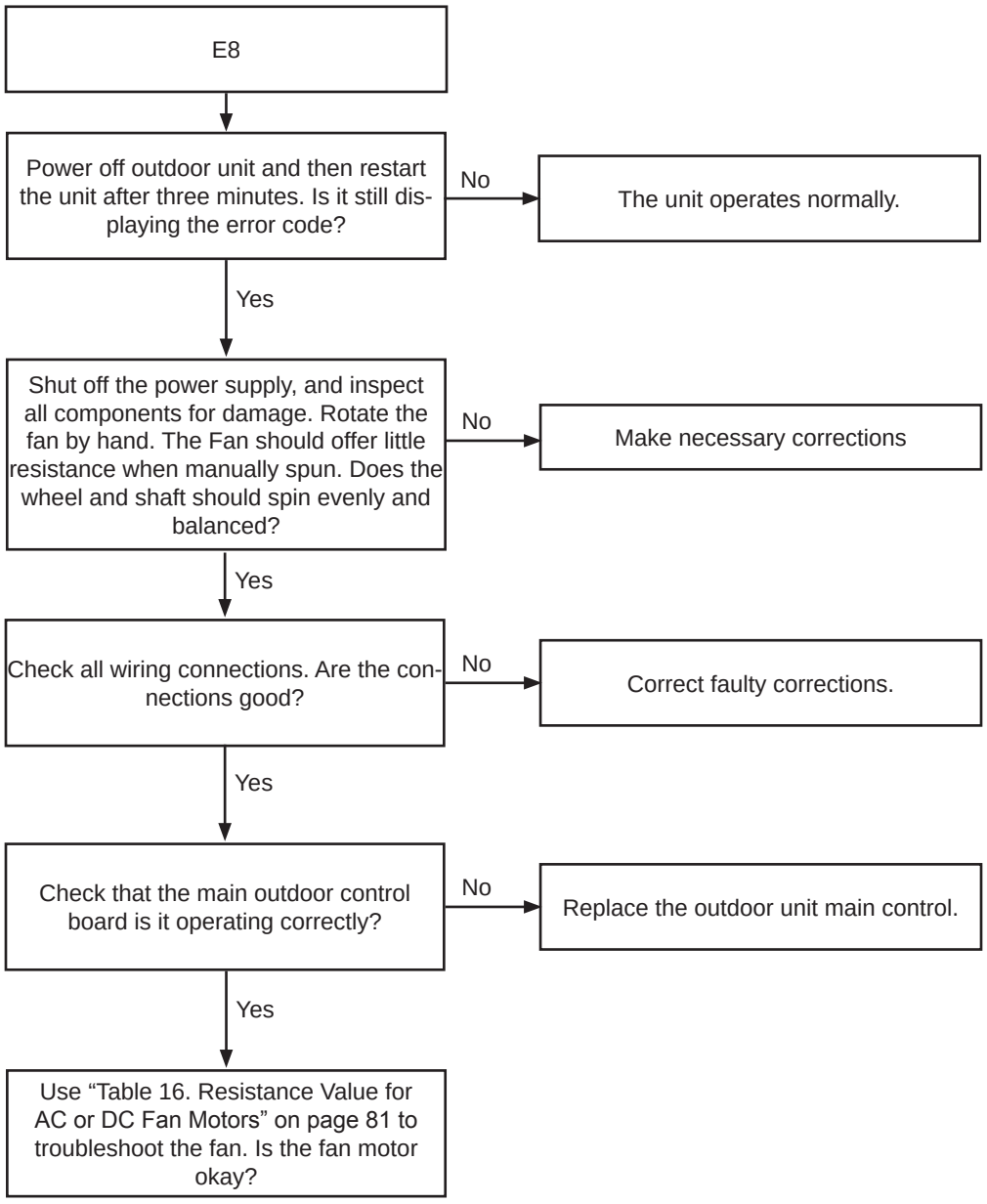
Inductor

Two terminals of the inductor



5.7. E8 and EC 07

Description:	Outdoor DC fan motor speed error.
General Note:	When outdoor fan speed is too low (300 RPM) or too high (2400 RPM) for a specific time duration, the unit will stop and the LED will display the failure.



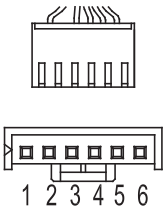
E8 and EC 07 (continued)

NOTE: *DC fan motor(control chip is inside fan motor)*

Power on and while the unit is in standby, measure the voltage between pins 1 and 3. Also measure the voltage between pin 3 and 4 at fan motor connector.

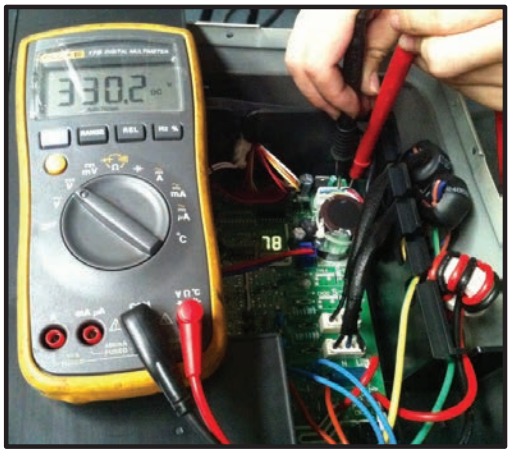
If the value of the voltage is not in the range as shown in the below table, the outdoor unit main control board is faulty and should be replaced.

Table 11. DC Motor Voltage Input and Output

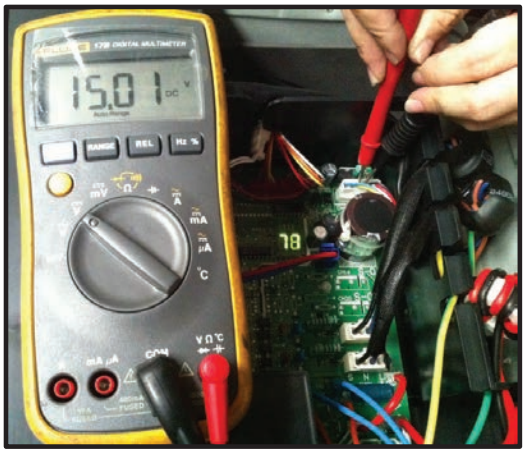


No.	Color	Signal	Voltage
1	Red	Vs/Vm	200~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5~16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5~16.5V

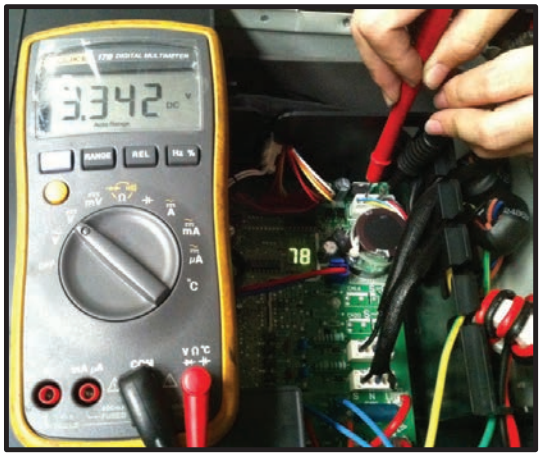
Vs



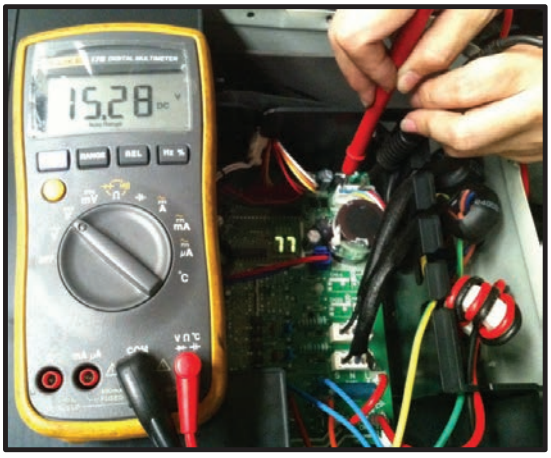
Vcc



Vsp

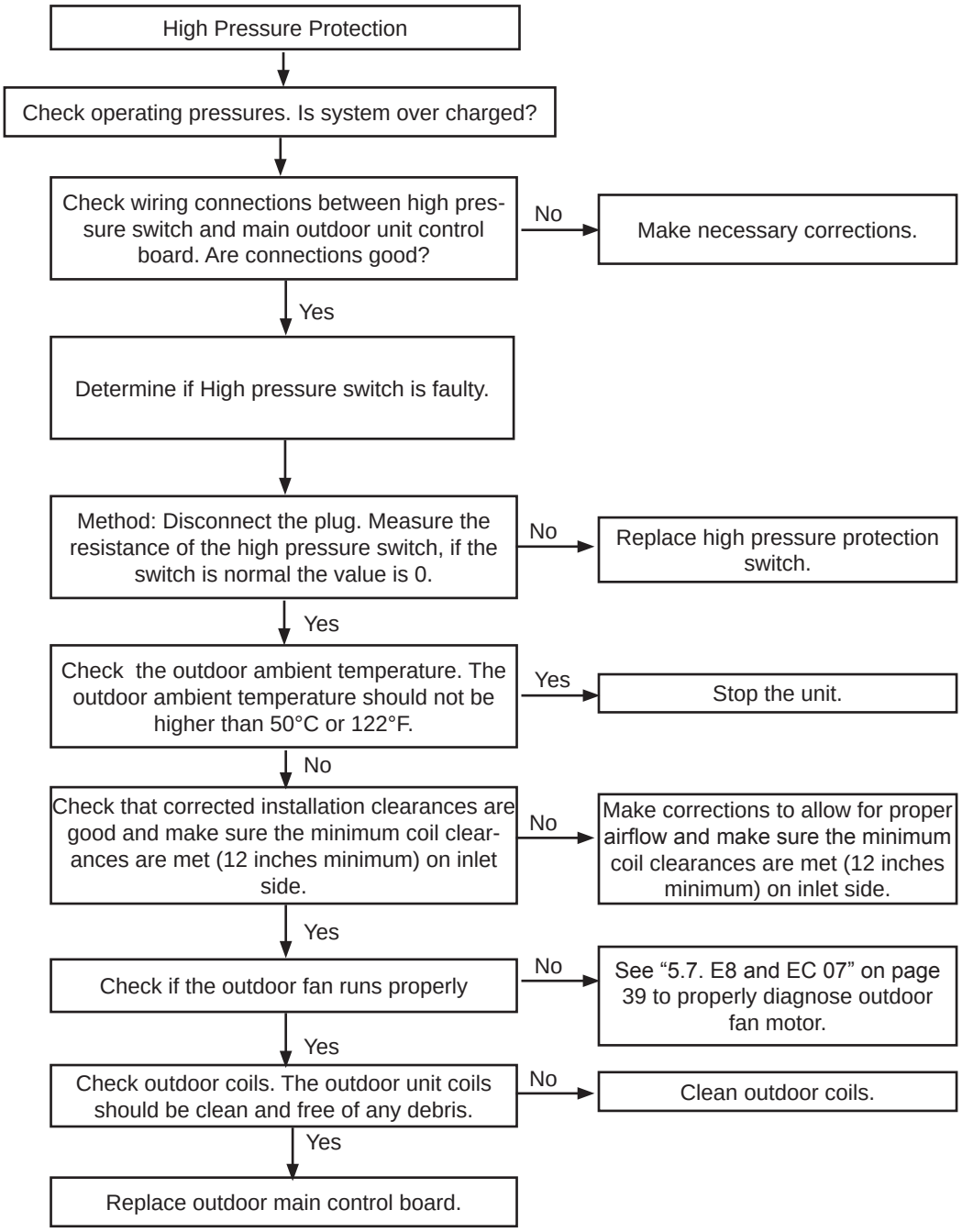


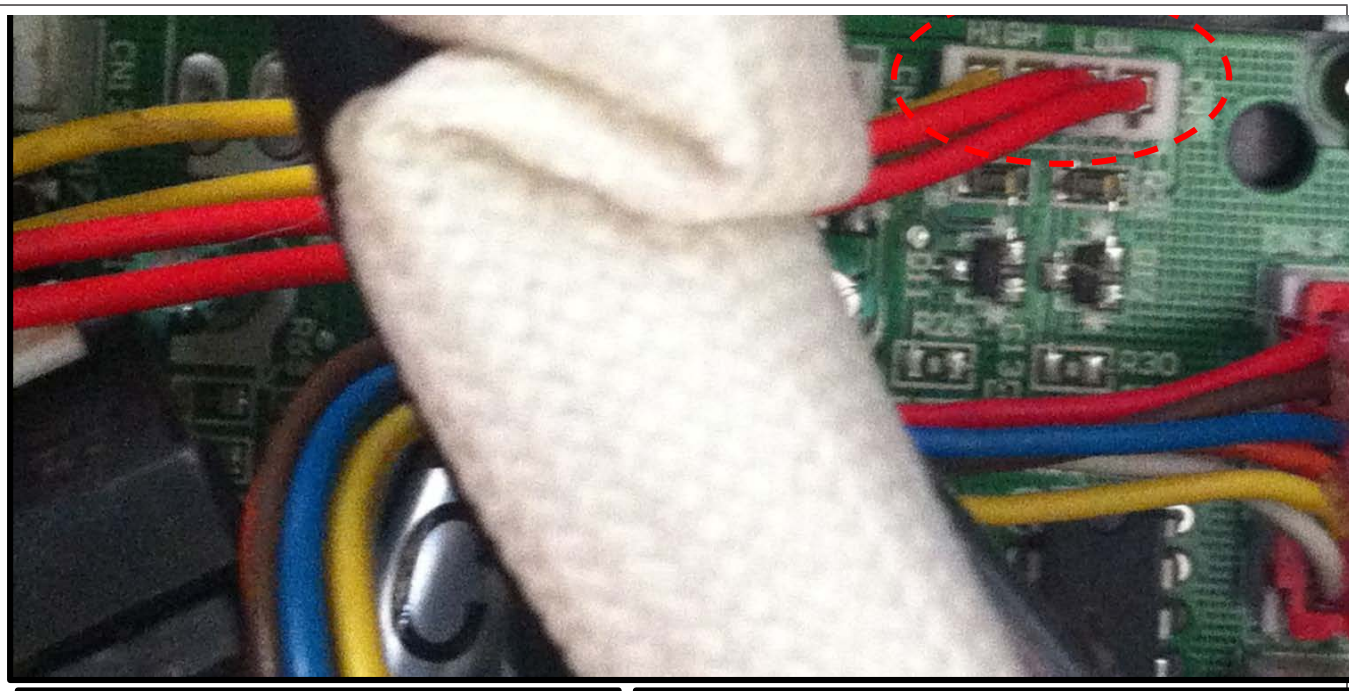
FG

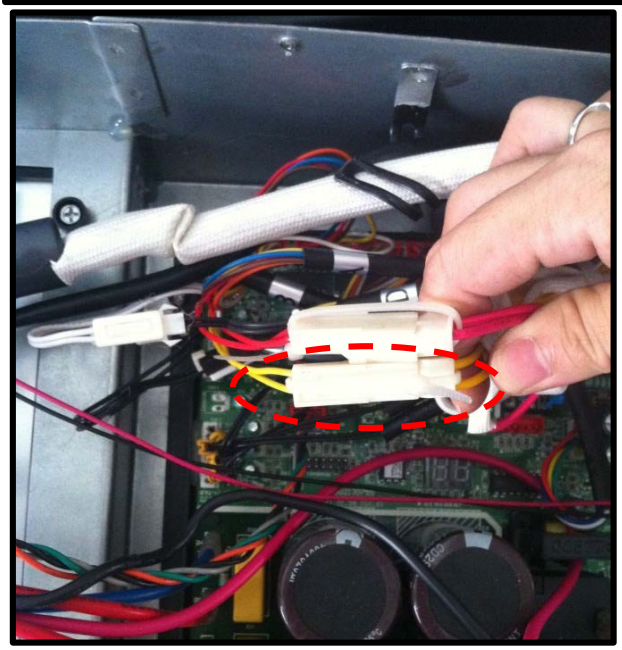


5.8. P1 and PC 30

Description:	High pressure switch open. High pressure switch trips at 639 PSI and resets at 464 PSI.
General Note:	If the sampling voltage is not 5V, the LED will display this failure.



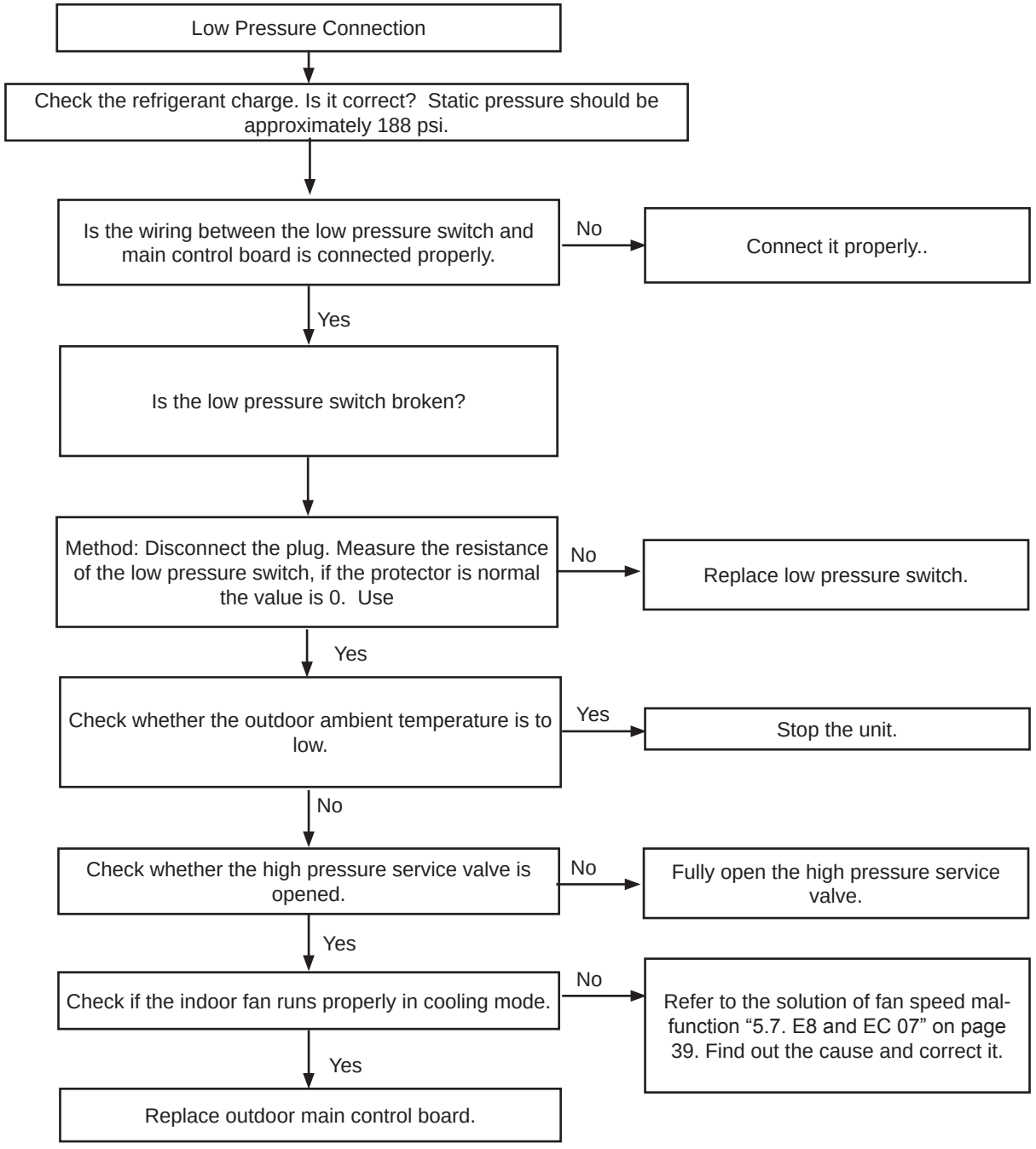


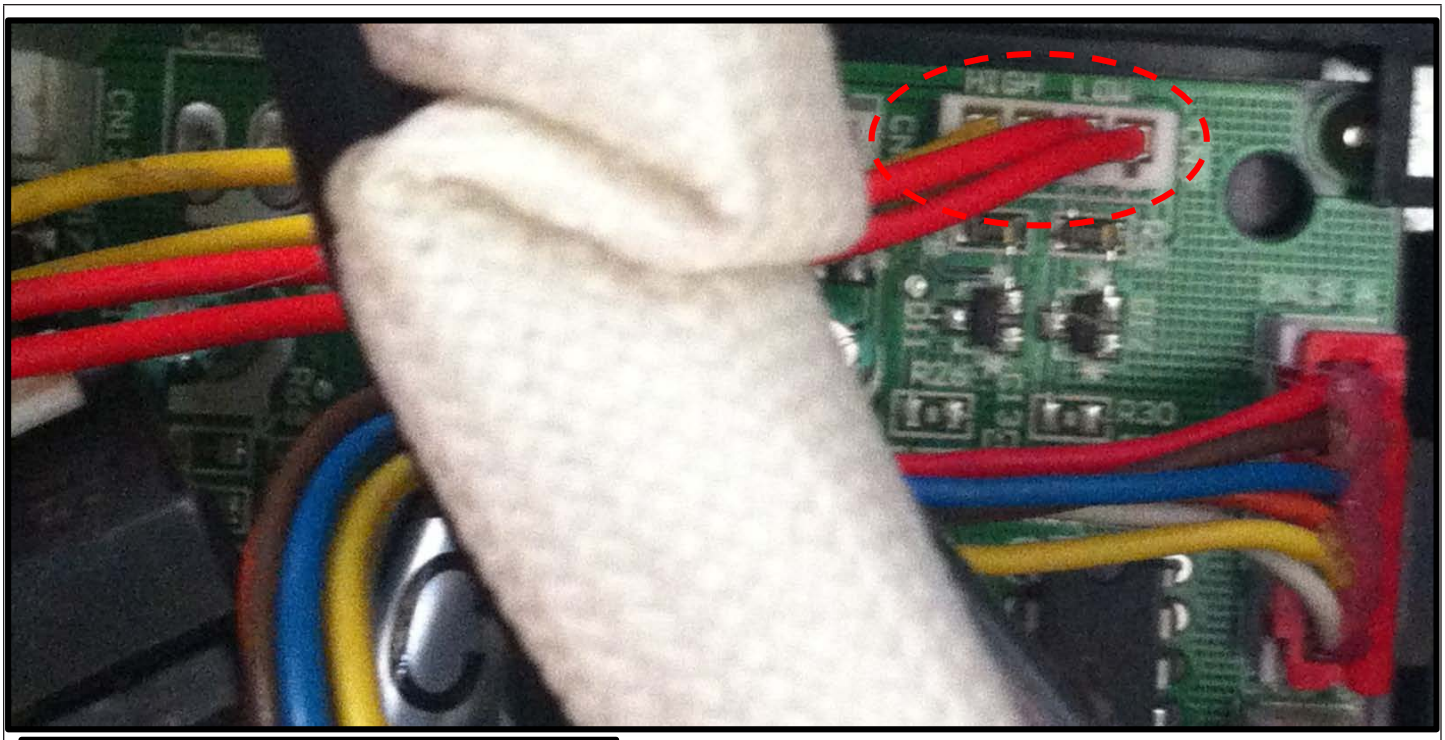


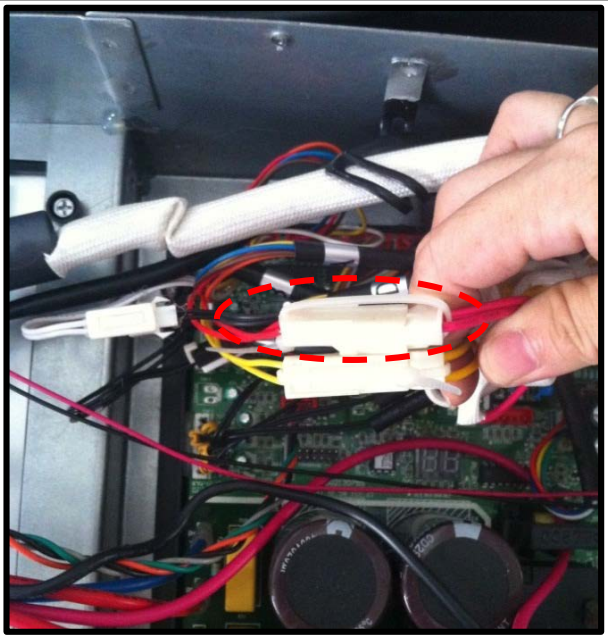

FLUKE 73 III MULTIMETER
OFF
300mV
Ω
10A
COM

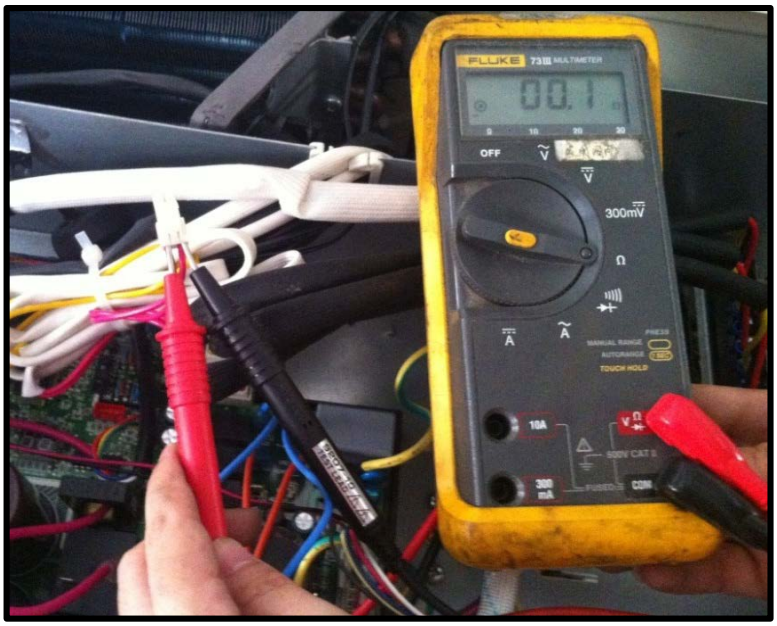
5.9. P2 and PC 31

Description:	Low pressure switch open. P2 Low pressure switch trips at 20 psi and resets at 43 PSI.
General Note:	If the sampling voltage is not 5V, the LED will display this failure.



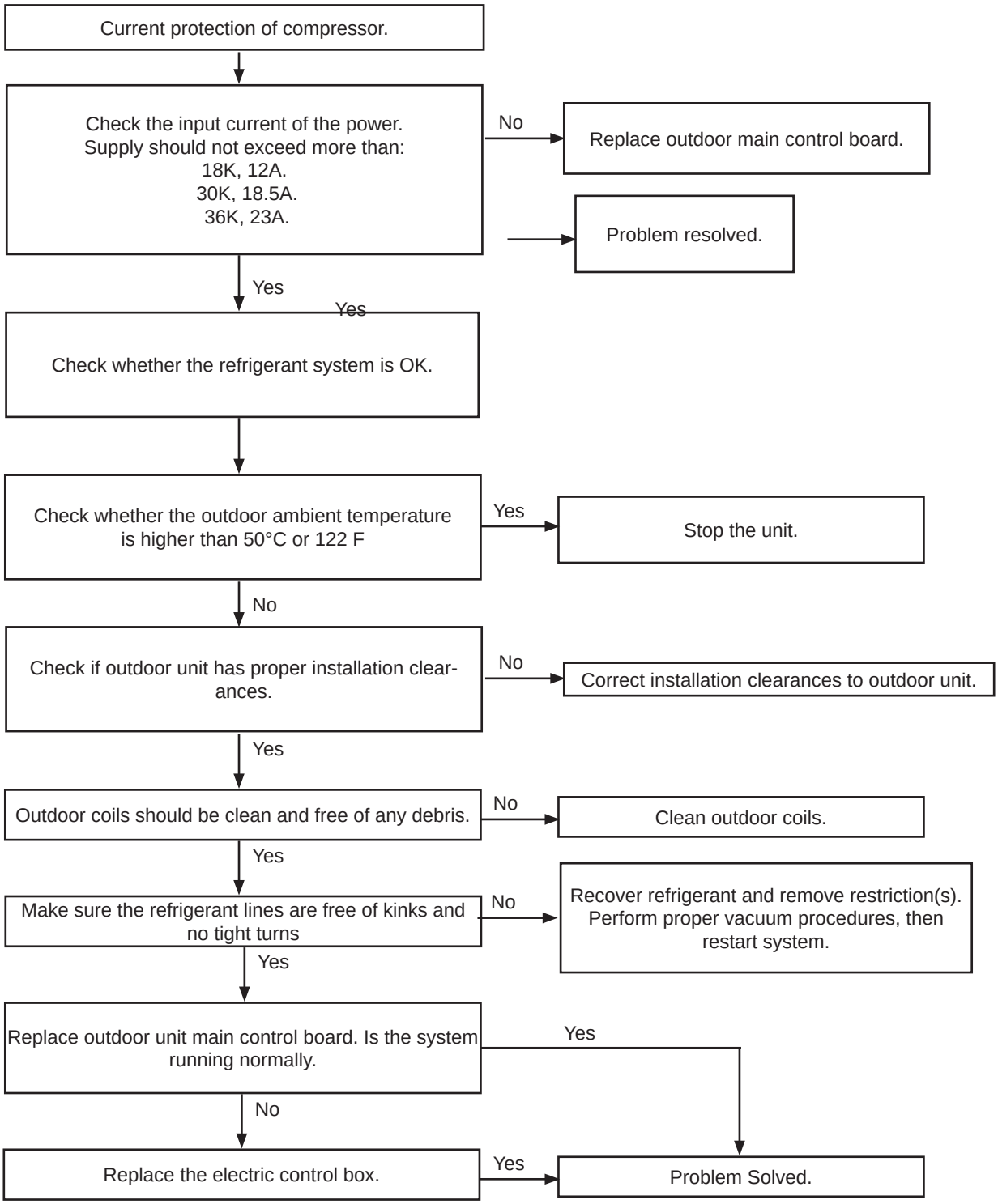





FLUKE 73III MULTIMETER
OFF
300mV
Ω
10A
500V CAT II
FUSED
COM

5.10. P3 and PC 08

Description:	Outdoor compressor current overload sensed
General Note:	If the outdoor current exceeds the current limit value, the LED will display the failure.

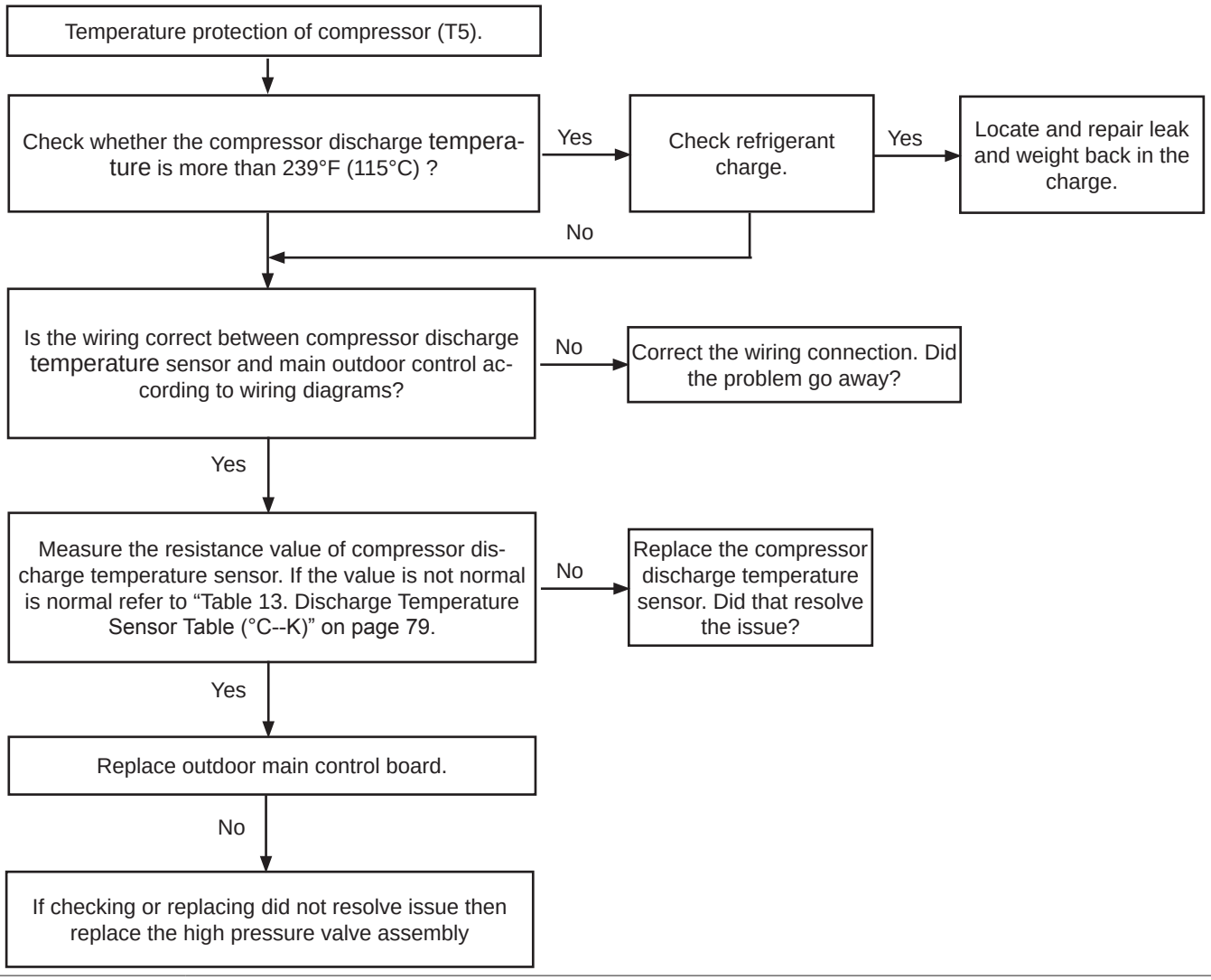



RANGE
HOLD
HIOKI 3282
6.53
DIGITAL CLAMP ON HITESTER
~600V
CAT IV
COM
TEMP


RANGE
HOLD
HIOKI 3282
6.61
DIGITAL CLAMP ON HITESTER
~600V
CAT IV
COM
TEMP

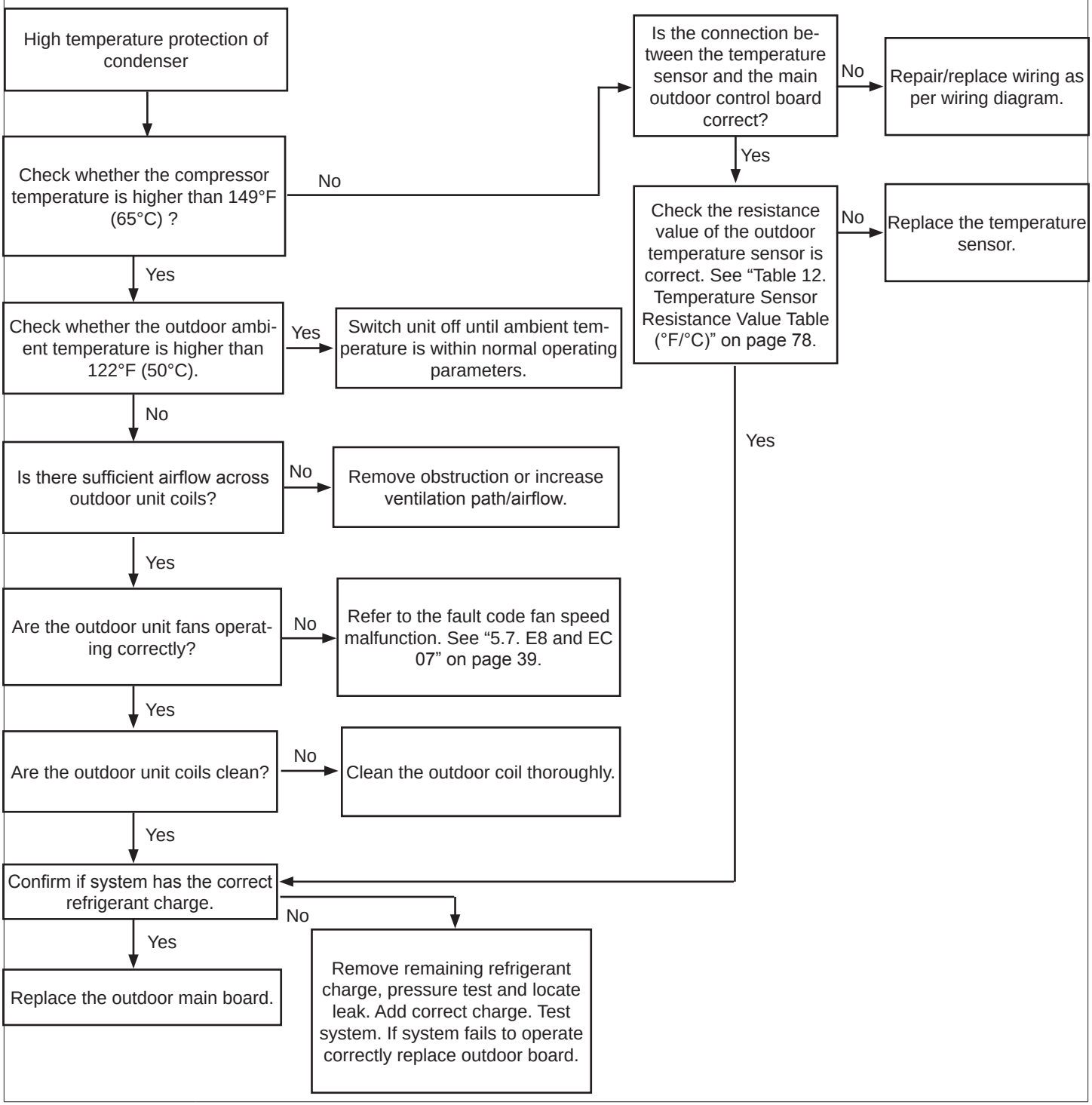
5.11. P4 and PC 06

Description:	High temperature sensed at compressor discharge line.
General Note:	When the compressor discharge temperature (T5) is more than 239°F (115°C) for 10 seconds, the compressor will stop and restart until T5 is less than 194°F (90°C).



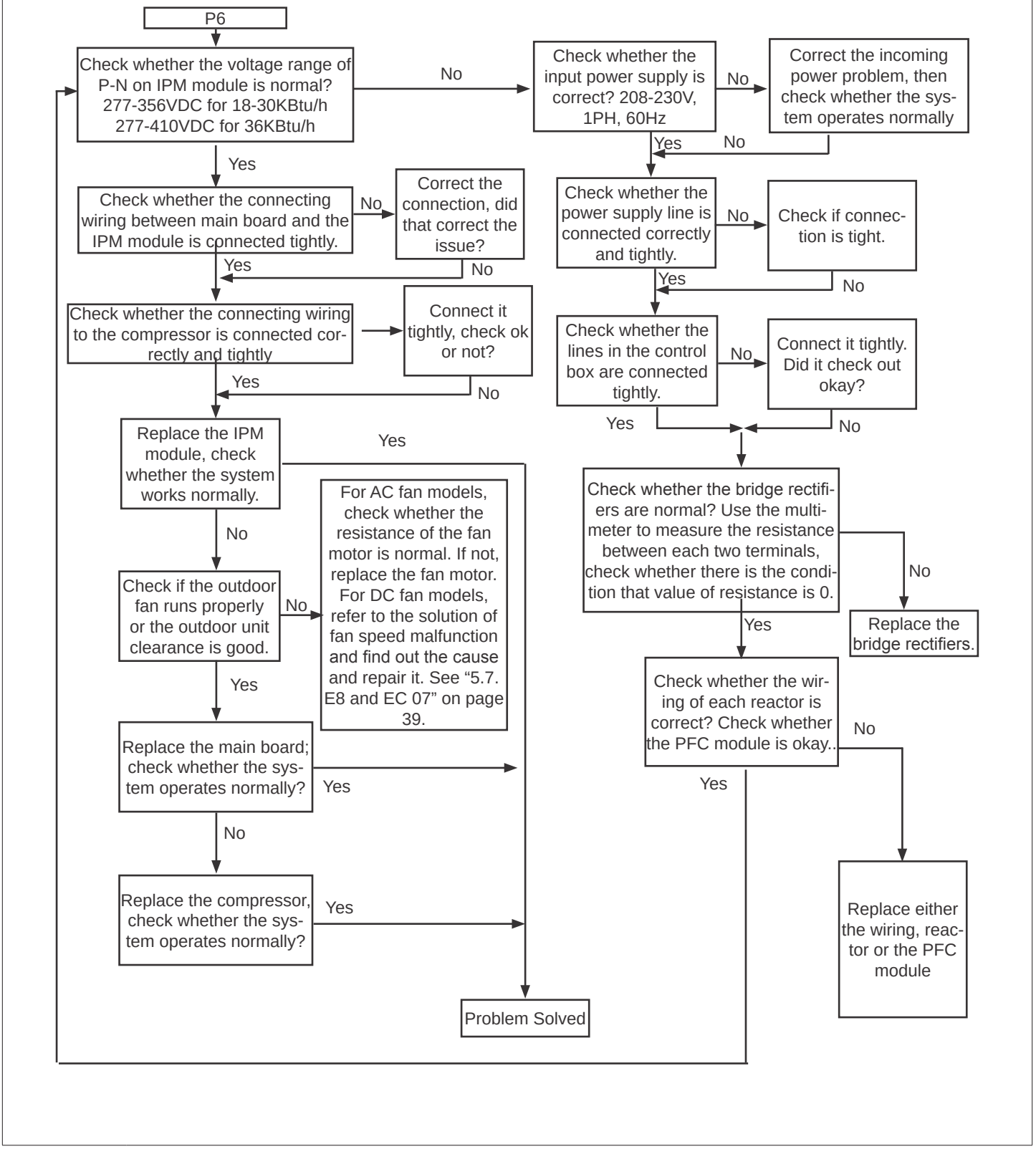
5.12. P5 and PC 0A

Description:	High temperature sensed at outdoor coil (T3).
General Note:	When outdoor pipe temperature is more than 149°F (65°C), the unit will stop, and unit runs again when outdoor pipe temperature is less than 125.6°F (52°C).



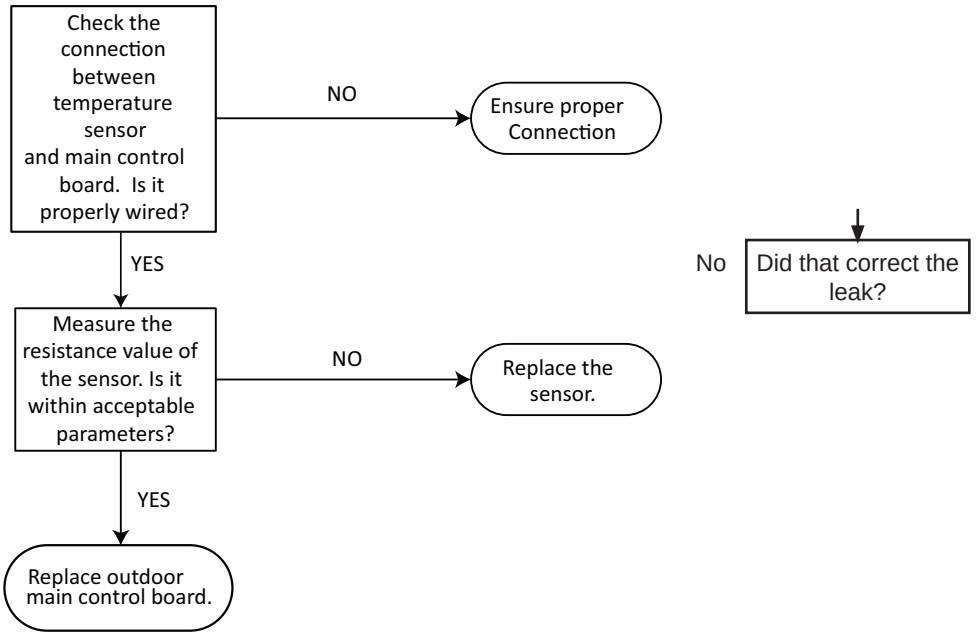
5.13. P6 and PC 00

Description:	Integrated power module (IPM) error.
General Note:	When the voltage signal that IPM sends to the compressor drive chip is abnormal, the display LED will show “P6” and unit will turn Off.



5.14. P7

Description:	Outdoor Integrated Power Module (IPM) Module Temperature Sensor Malfunction Diagnosis and Solution
General Note:	If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays a failure.

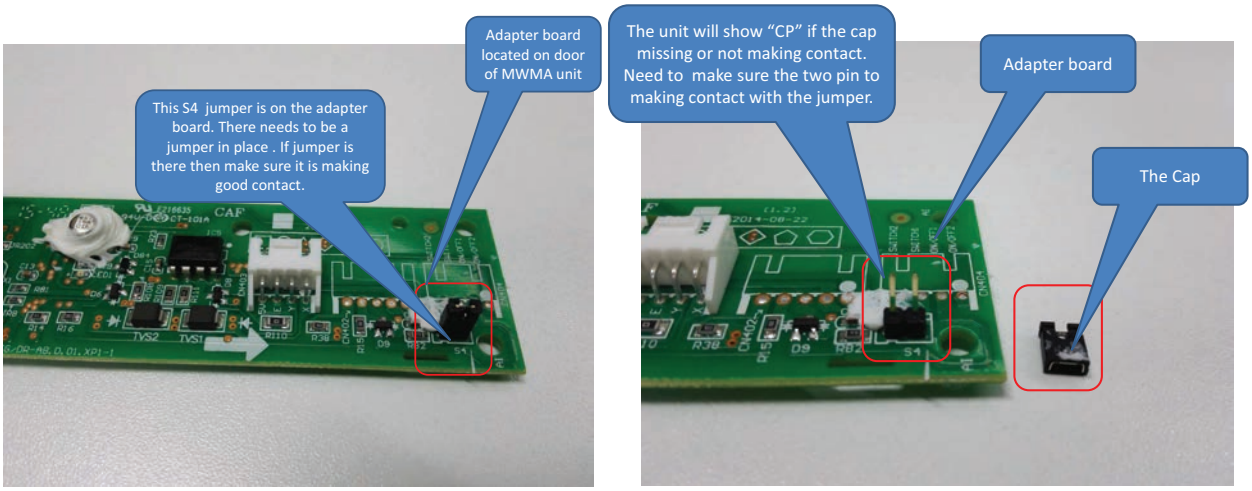


6. Extended Reference Guide - Indoor Unit Alert Codes

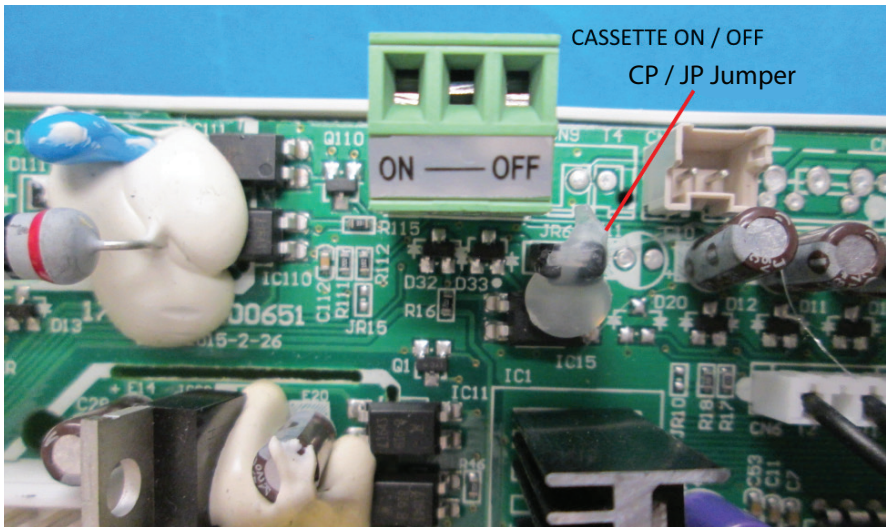
6.1. CP

Description:	MCFA, MCFB, MMDB, MWMC and 3WMC models only.
General Note:	None.

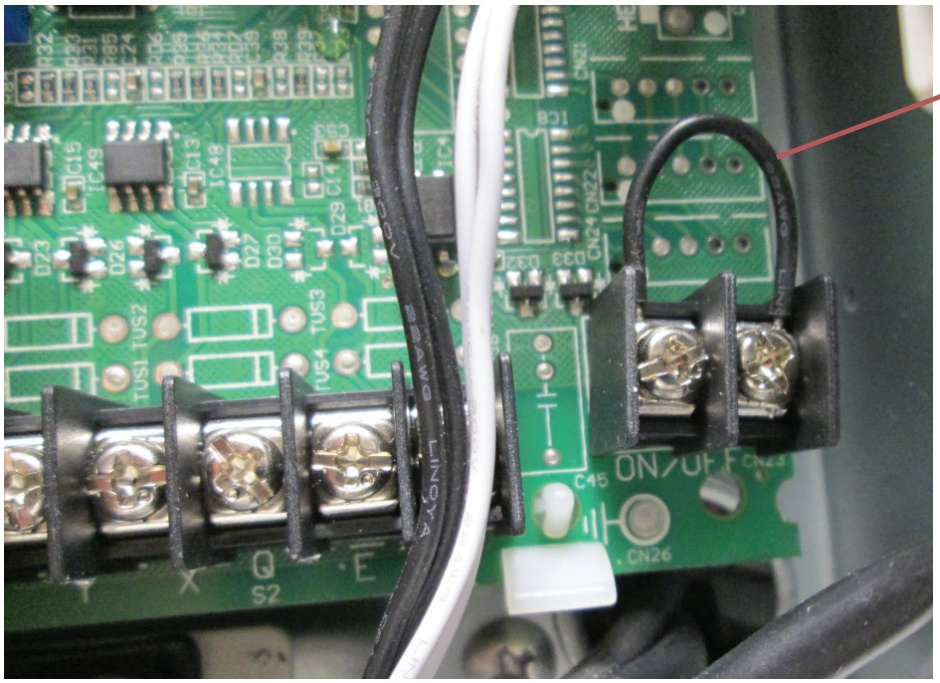
MWMC and 3WMC



M22A and M33C

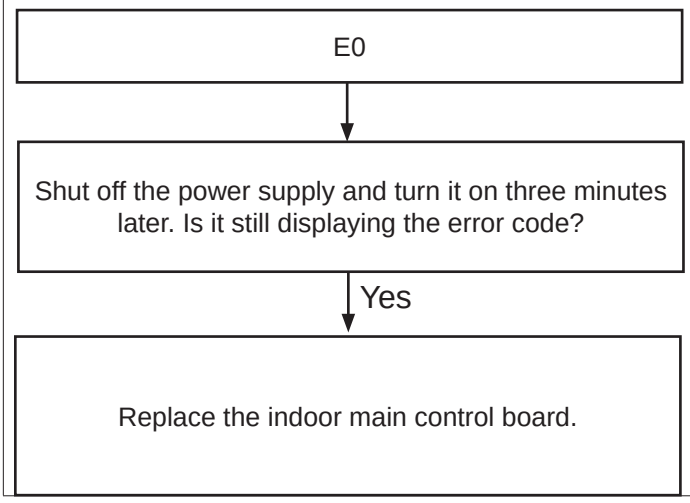


MMDA and MMDB



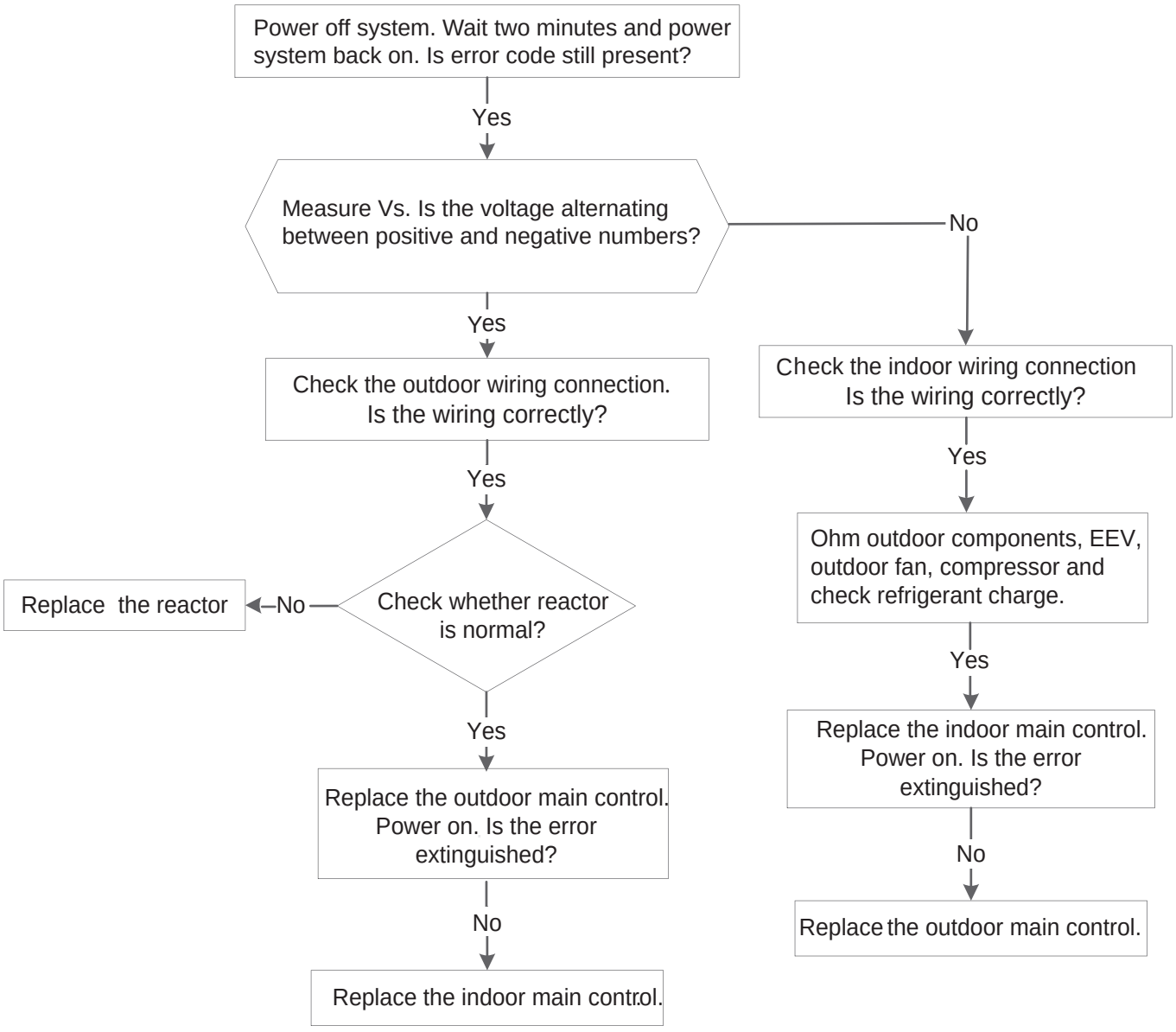
6.2. E0, EH 00 and EH 0A

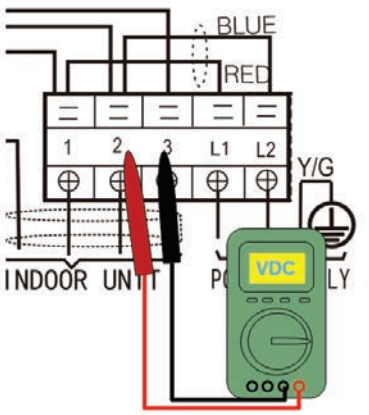
Description:	Indoor Unit EEPROM malfunction.
General Note:	Main Outdoor Control board's main chip is not receiving feedback from EEPROM chip.



6.3. E1 and EL 01

Malfunction decision conditions:	Indoor unit did not receive feedback from outdoor unit for 110 seconds and this condition has repeated four times continuously.
Supposed causes	• Wiring error • Indoor or outdoor main control board fault



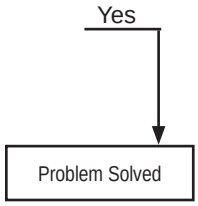


REMARK: Use a multimeter to test the DC voltage between L2 and L3 of outdoor unit. The red pin of the multimeter connects with L2 while the black pin is for L3.

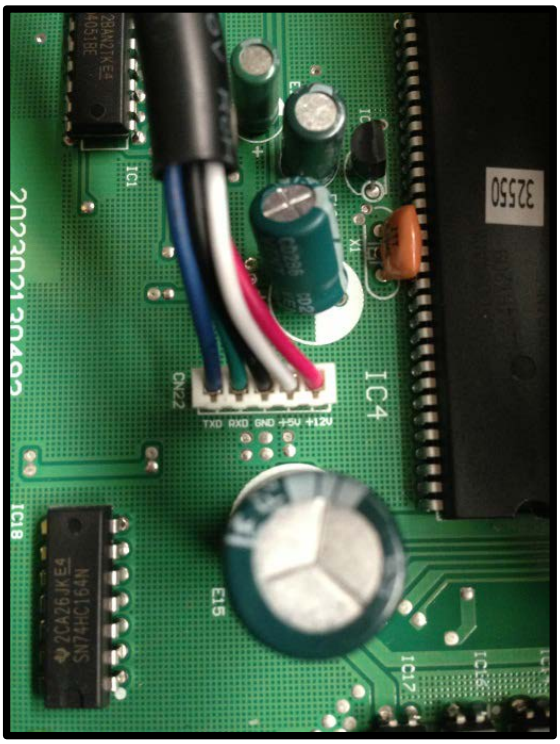
When AC is running normally, the votlage will move alternately between a negative and a positive number.

If positive reading the outdoor board needs to be replaced.

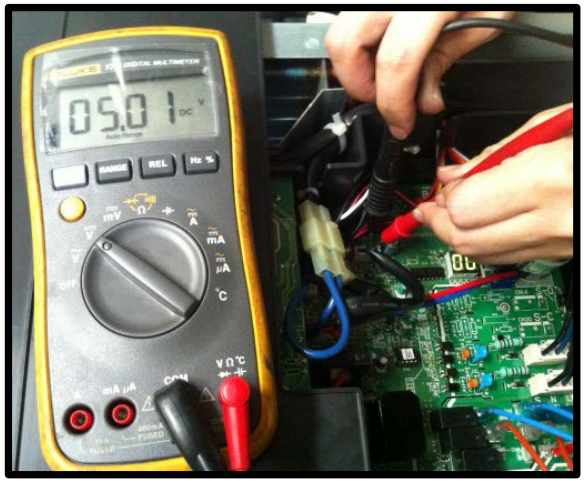
If negative reading then the indoor board needs to be replaced.

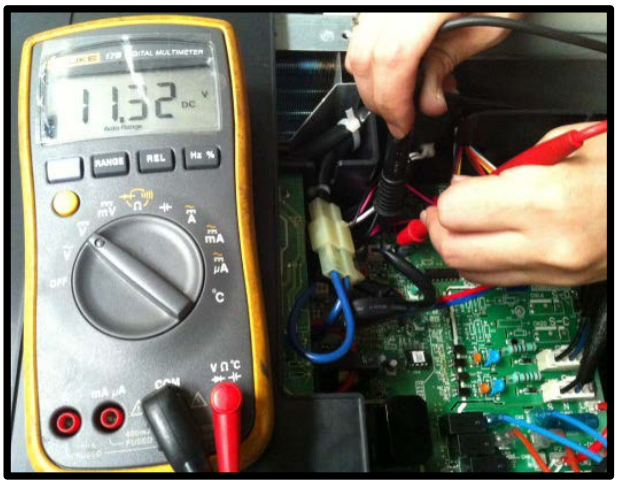


REMARK: Use a multimeter to test the resistance of the reactor which does not connect with the capacitor.
The normal value should be around zero ohm. Otherwise, the reactor has malfunctioned.



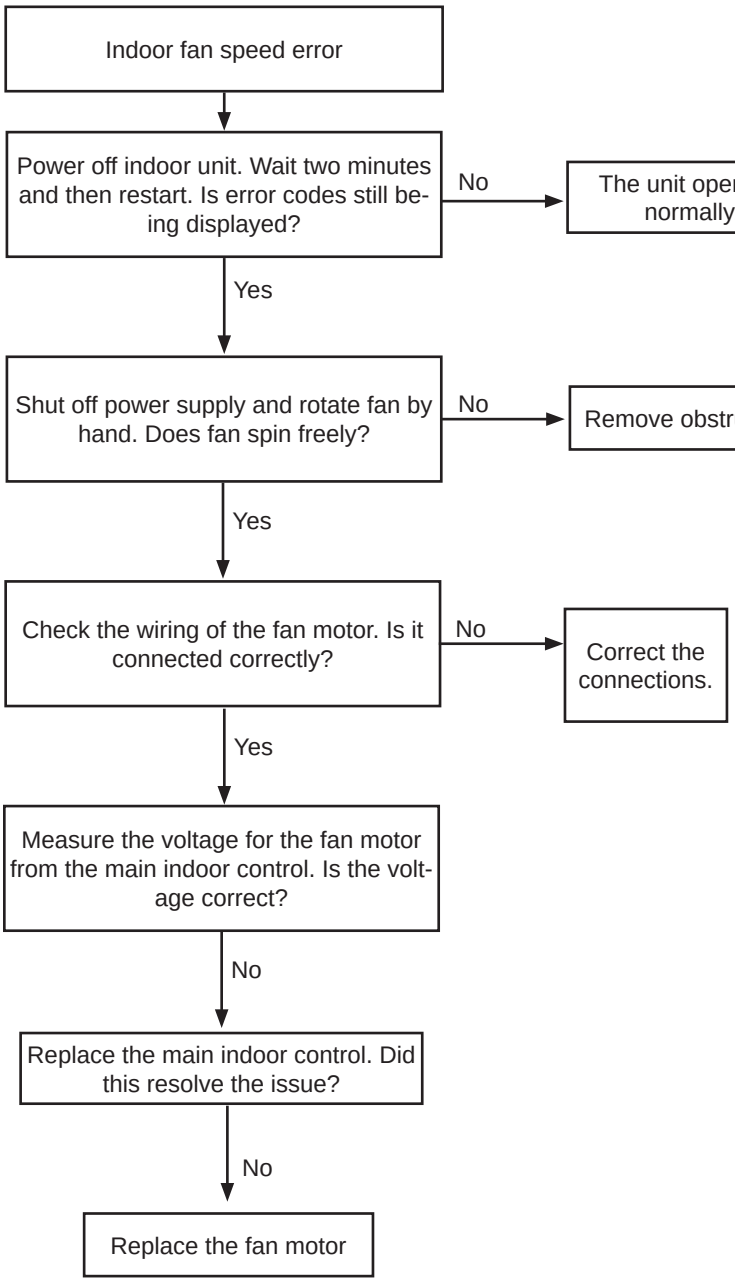
NOTE - Use a multimeter to test the DC voltage between black pin and white pin of signal wire The normal value should be around 5V.
Use a multimeter to test the DC voltage between black pin and red pin of signal wire. The normal value should be around 12V.





6.4. E3 and EH 03

Description:	Indoor fan speed error.
General Note:	When indoor fan speed runs too low (300 RPM) for a predefined amount of time, the unit will stop and the LED will display the error.



Indoor DC Fan Motor Check

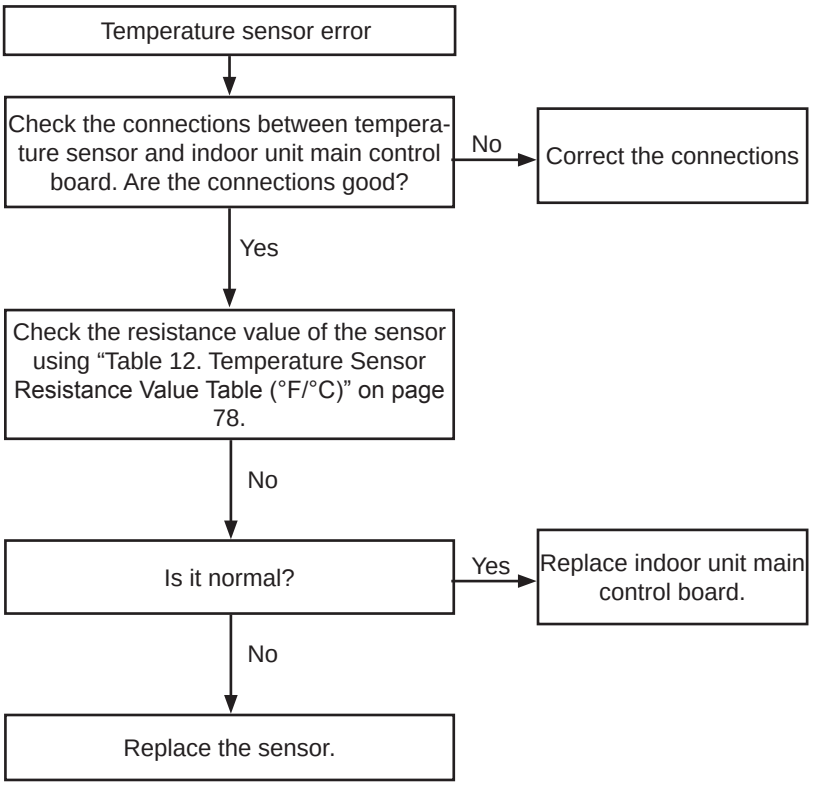
1. Indoor DC fan motor (Control Chip is in Fan Motor)
2. Turn power on and while the unit is on standby, measure the voltage between pin 1 and pin 3 as well as between pin 4 and pin 3 in fan motor connector. If the value of the voltage is not within the range shown in the following table, the indoor unit main control board may be experiencing problems and need to be replaced.

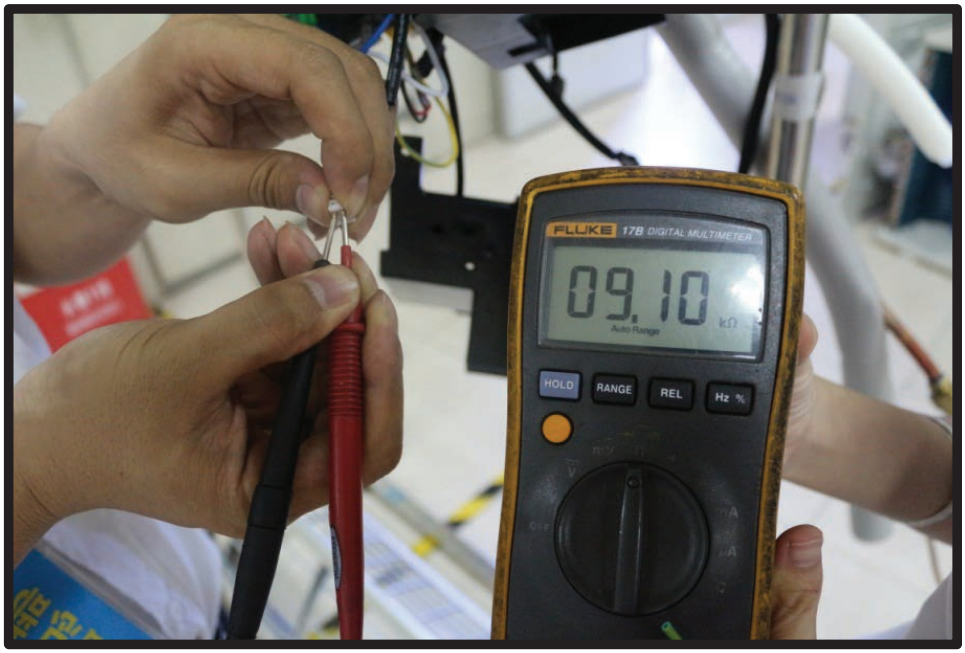
DC Motor Voltage Input and Output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	200~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5~16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5~16.5V

6.5. E4 and EC 51

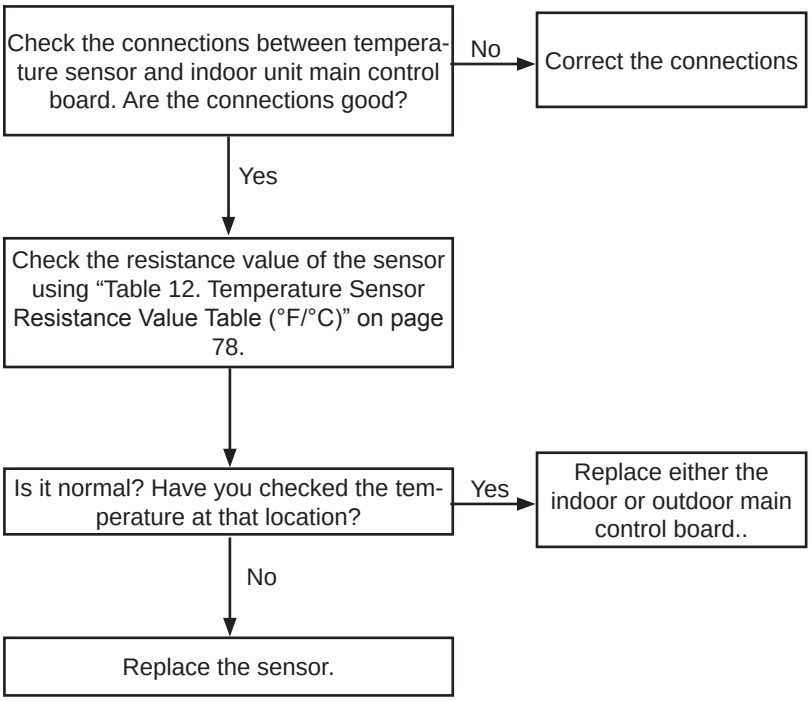
Description:	Indoor return air temperature (T1) sensor error.
General Note:	If the voltage is lower than 0.06V or higher than 4.94V, the LED will display this error.

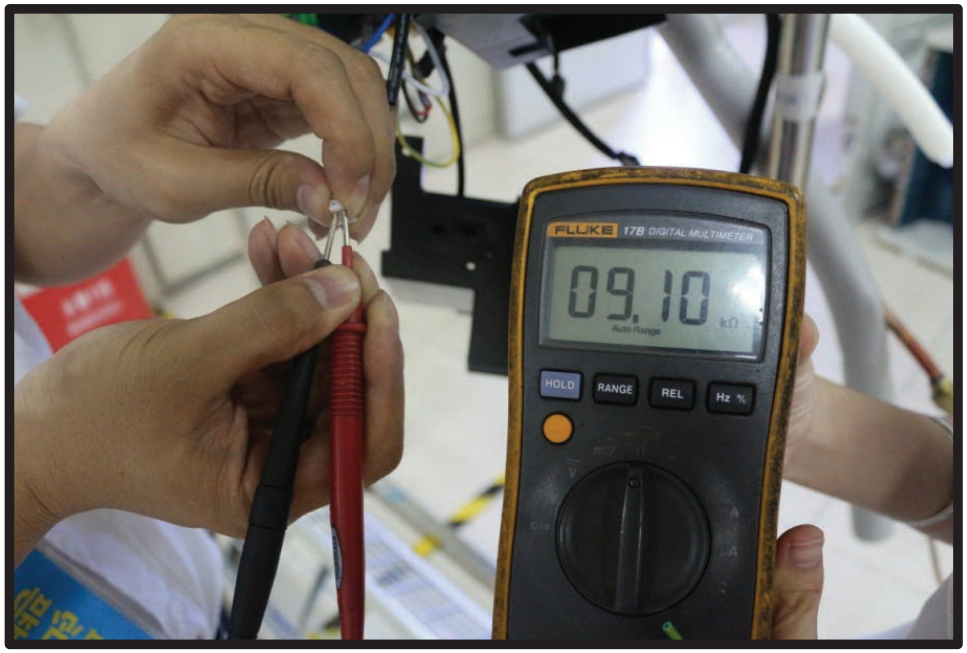




6.6. E5 and EC 07

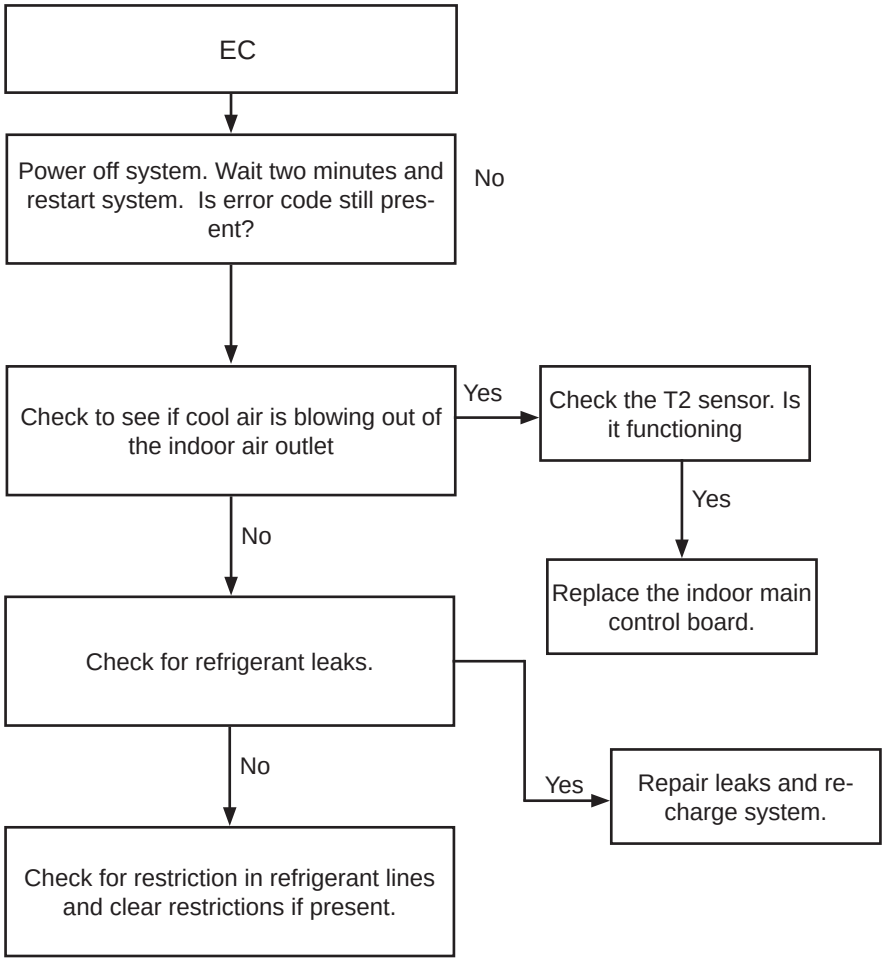
Description:	Indoor Coil Temperature (T2) Sensor Error
General Note:	If the voltage is lower than 0.06V or higher than 4.94V, the LED will display the error.





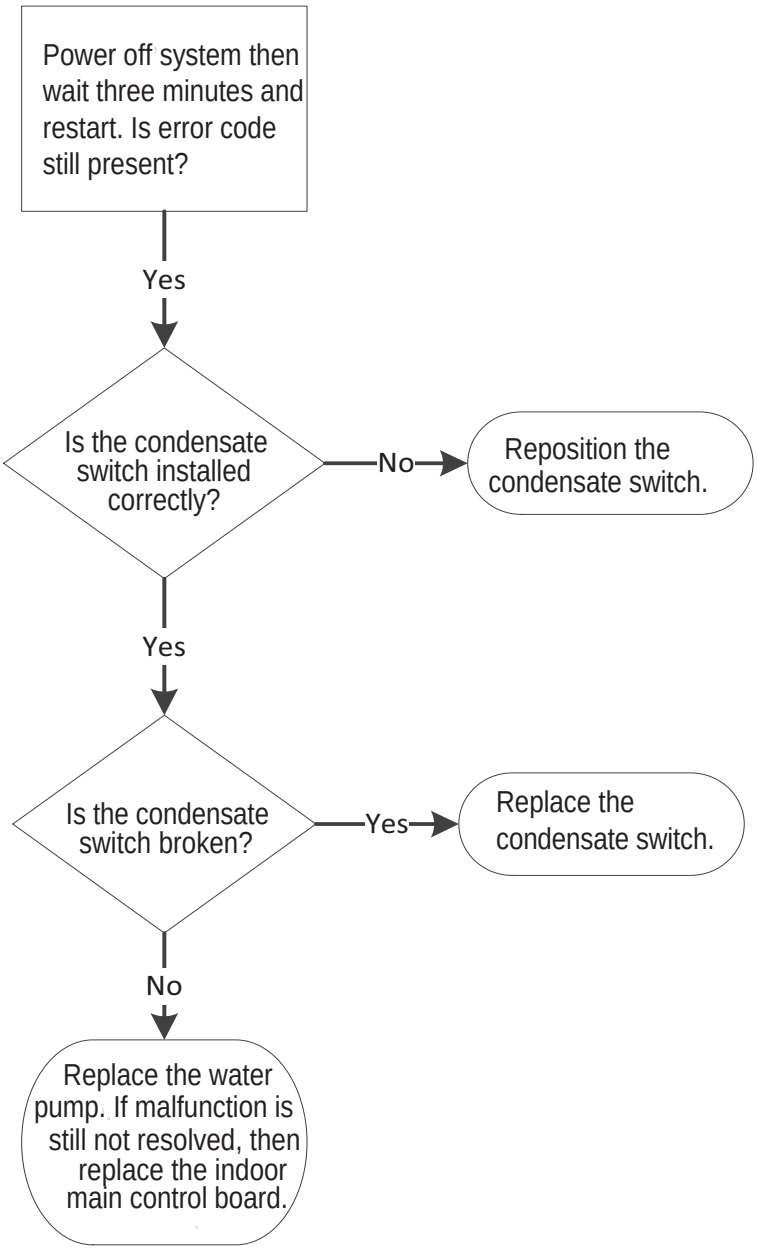
6.7. EC and EL 0C

Description:	Low Refrigerant Error
General Note:	The system monitors the value of evaporator coil sensor T2 for the first 5 minutes after startup. If the temperature of T2 drops per this formula three times in the first 5 minutes of operation, the system shuts down and the error code is displayed. For this formula “Tcool” = the T2 temperature at startup. T2 < Tcool - 3.6°F (2°C)



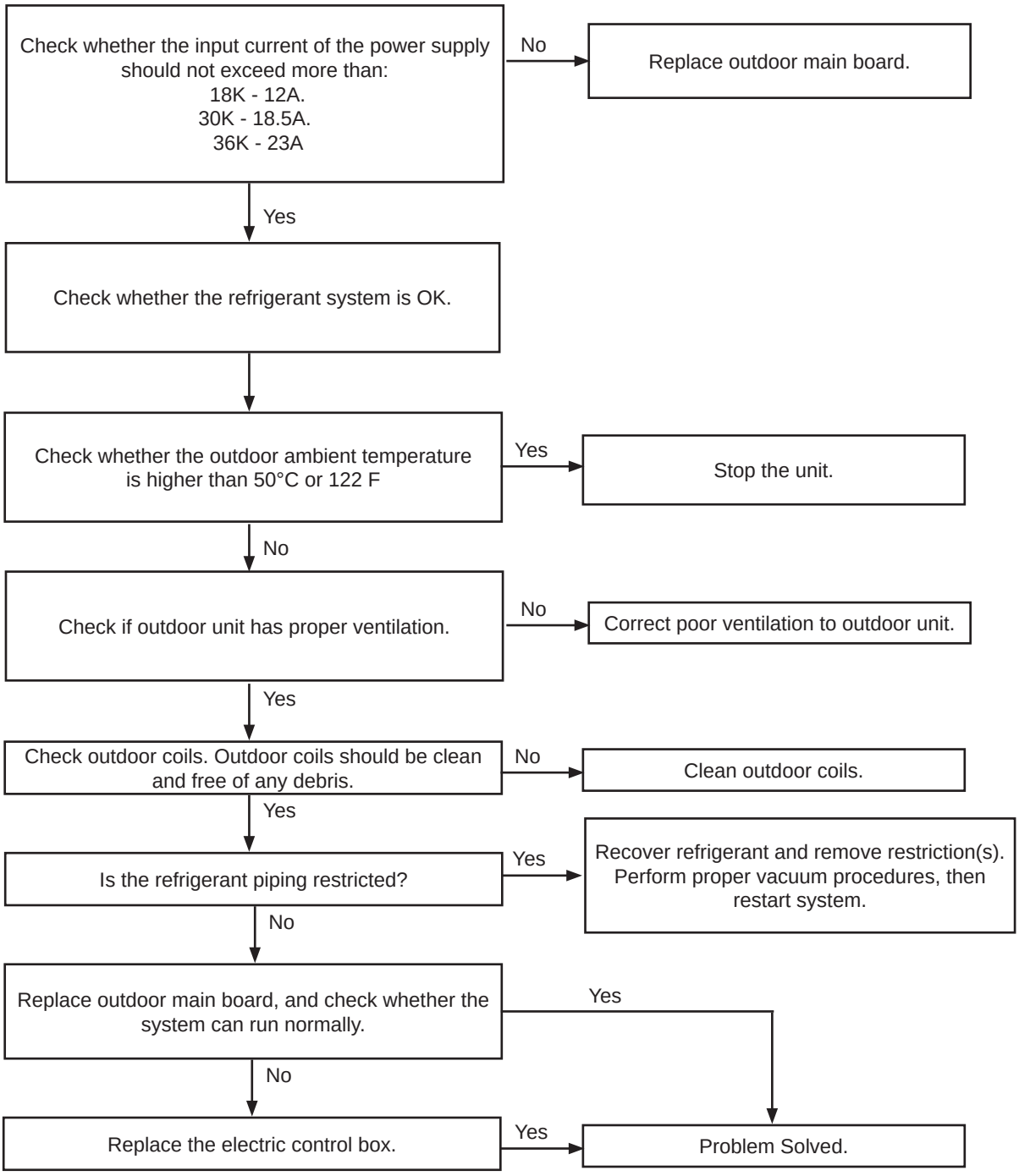
6.8. EE

Description:	Condensate switch (water level) alarm malfunction. (For M22A, M33A/B and MMDA units)
General Note:	If the sampling voltage is not 5V, the LED will display this failure. • Wiring mistakes • Faulty water-level switch • Faulty water pump • Faulty indoor main control board. ***NOTE:*** *Float is in the down postilion unless the condensate is restricted and the float has risen.* ***NOTE:*** *Water pump runs 100% of the time when the unit is calling for cooling.*



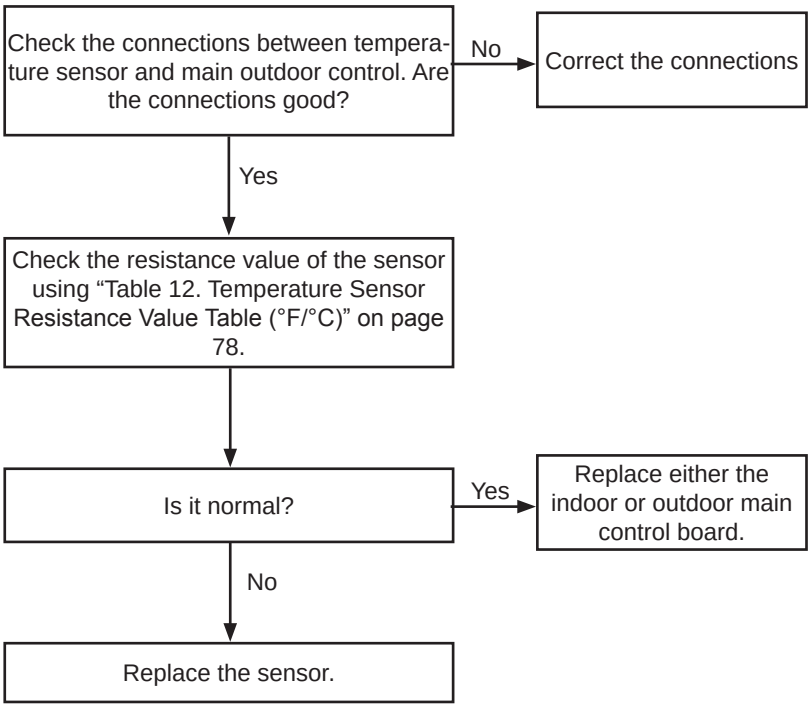
6.9. F0 and PC 08

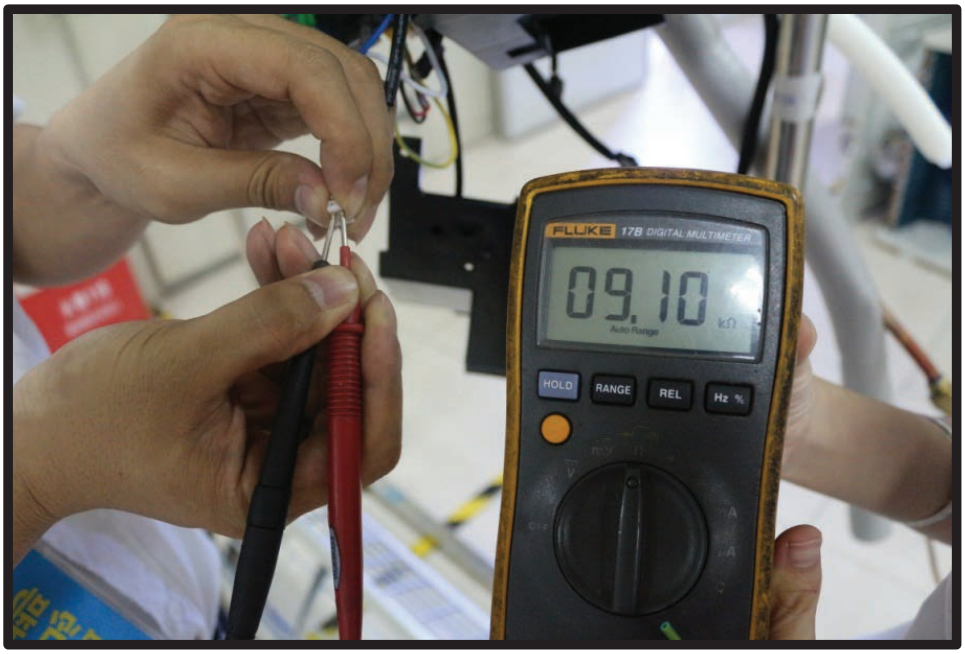
Description:	Outdoor compressor current overload sensed
General Note:	If the outdoor current exceeds the current limit value, the LED will display this failure.



6.10. F1 and EC 53

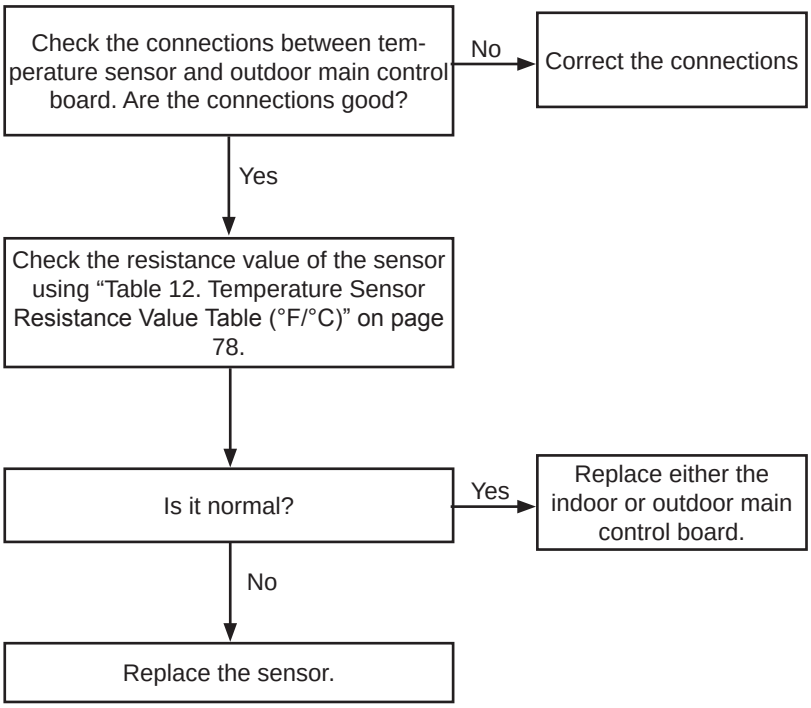
Description:	Outdoor Temperature Sensor T4 Error.
General Note:	If the voltage is lower than 0.06V or higher than 4.94V, the LED will display the error.

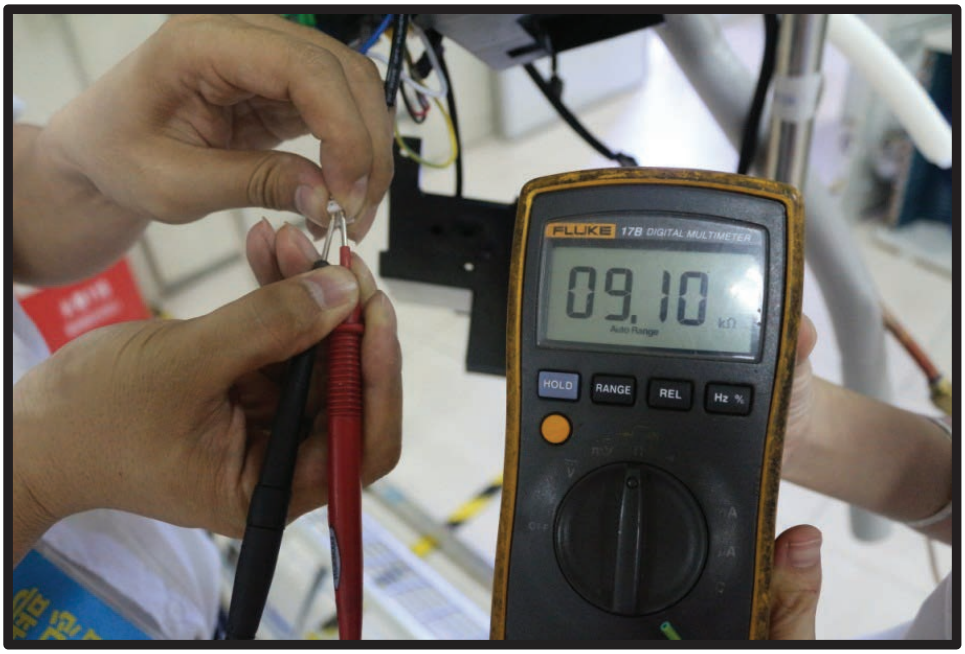




6.11. F2 and EC 52

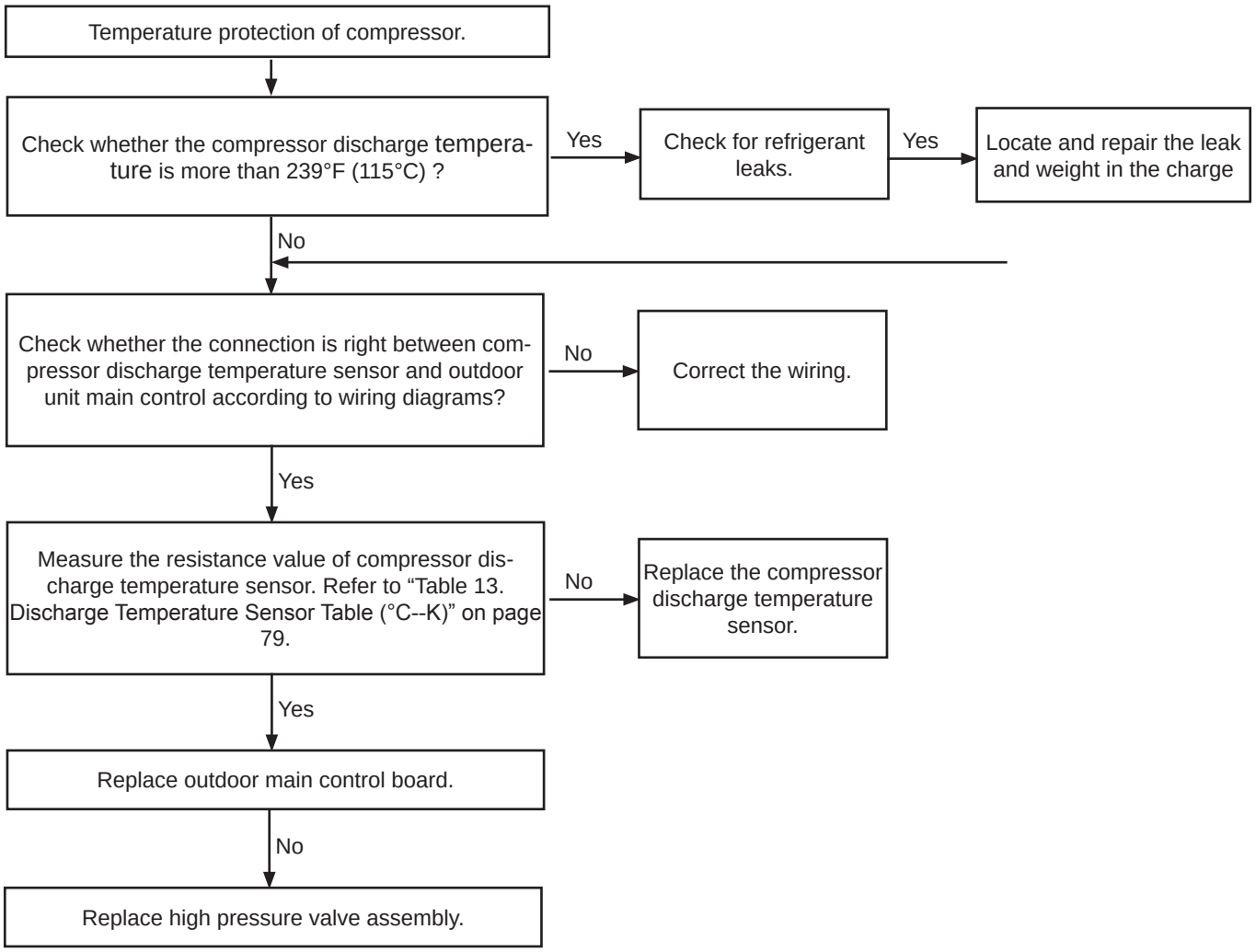
Description:	Faulty Outdoor Coil Temperature Sensor T3
General Note:	If the voltage is lower than 0.06V or higher than 4.94V, the LED will display the error.





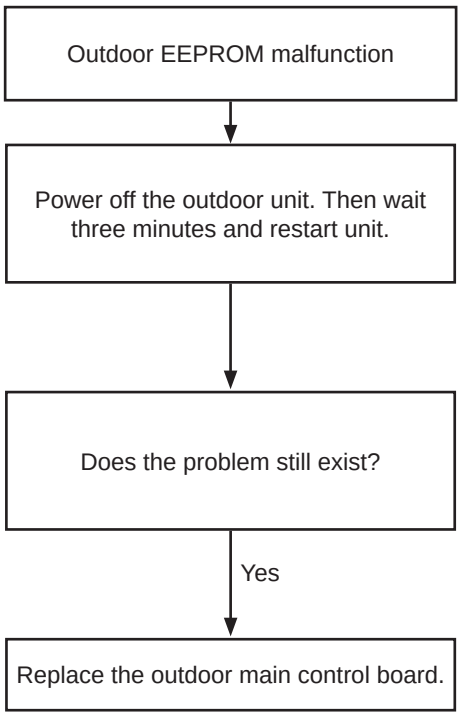
6.12. F3 and EC 54

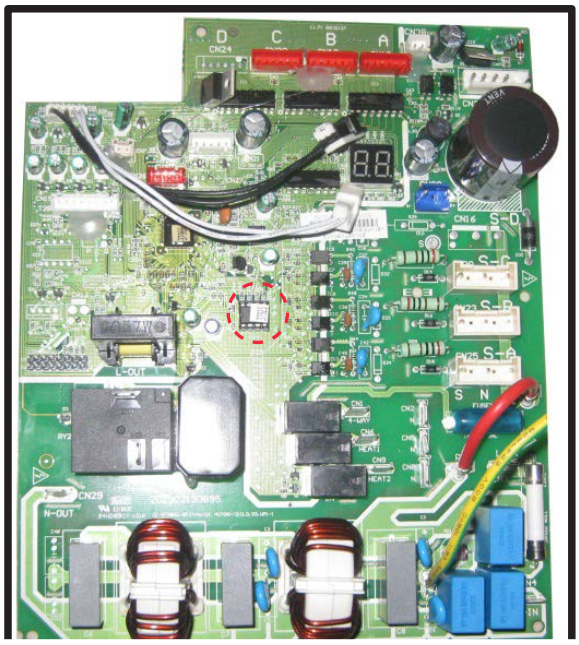
Description:	Compressor discharge temperature sensor error
General Note:	When the compressor discharge temperature (T5) is more than 239°F (115°C) for 10 seconds, the compressor will stop and restart once T5 is less than 194°F (90°C).



6.13. F4 and EC 51

Description:	Outdoor EEPROM error.
General Note:	Main outdoor control board main chip is not receiving feedback from EEPROM chip. For the location of EEPROM chip, please refer to the below image.

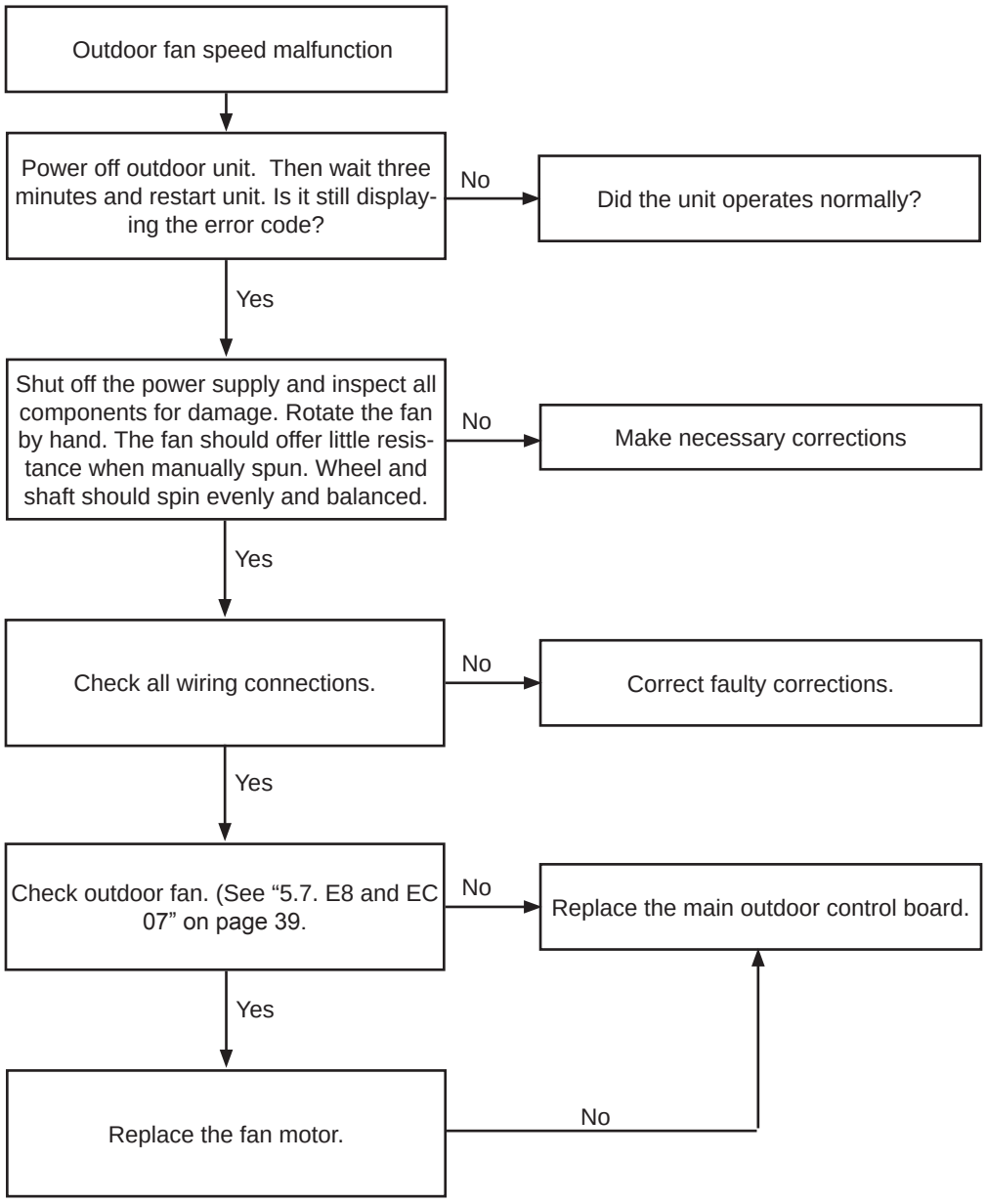




Outdoor PCB(M3OC-30HRFN1-M)

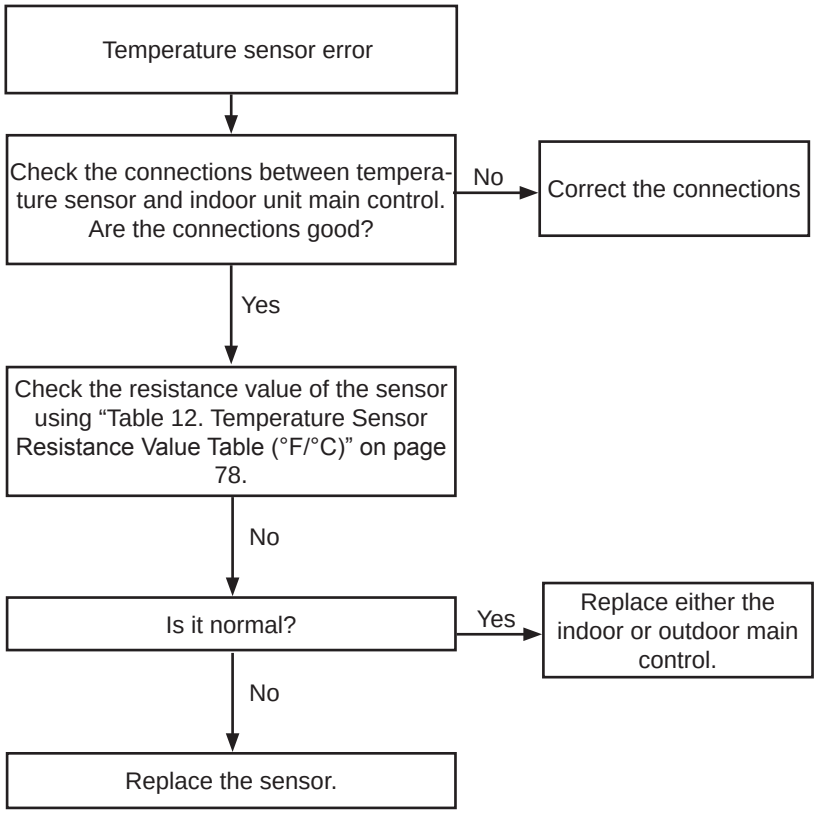
6.14. F5 and EC 07

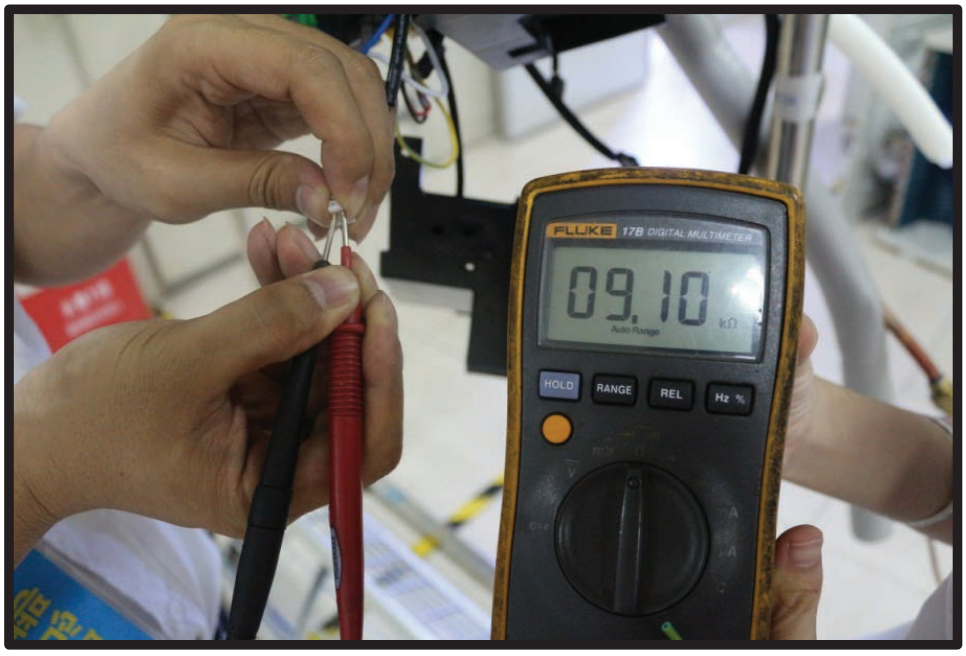
Description:	Outdoor unit fan speed error
General Note:	When outdoor fan speed is to slow (300 RPM) or too fast (2400 RPM) for a predefined amount of time. The unit will stop and the LED will display the failure.



6.15. F6 and EC 56

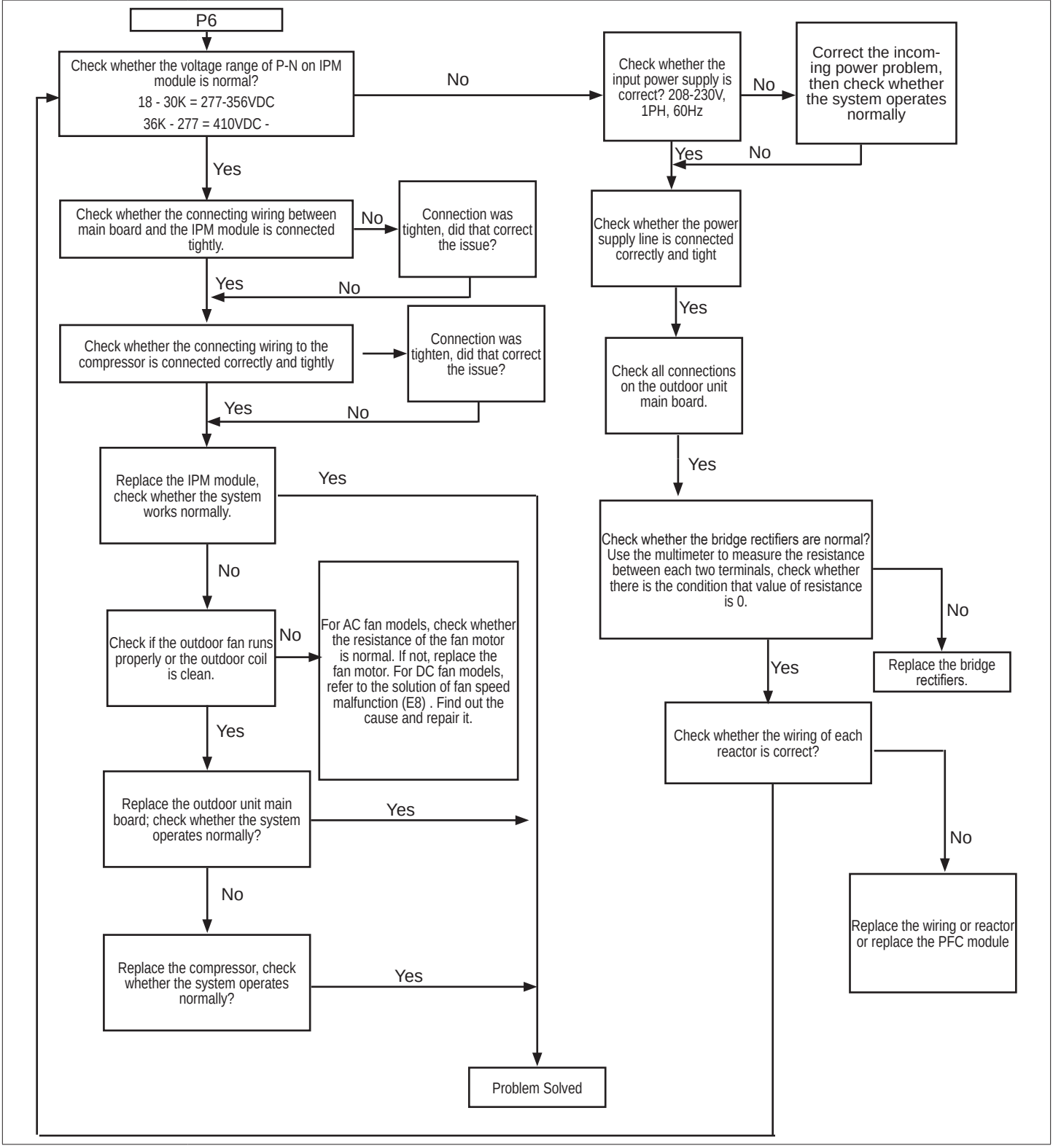
Description:	Indoor Unit Evaporator Outlet Coil Temperature (T2) Sensor Faulty
General Note:	If the voltage is lower than 0.06V or higher than 4.94V, the LED will display the error.

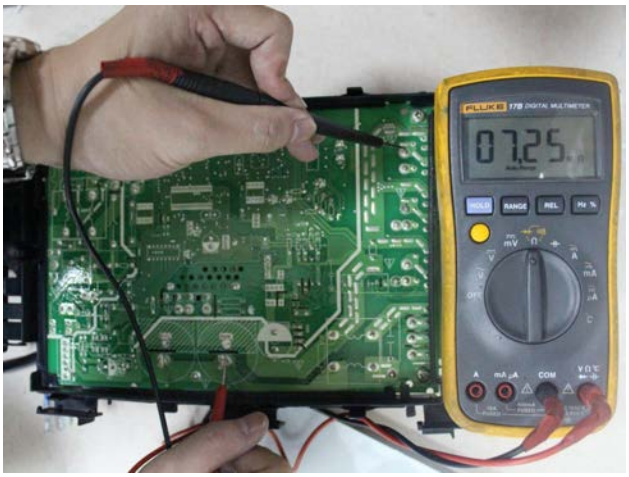




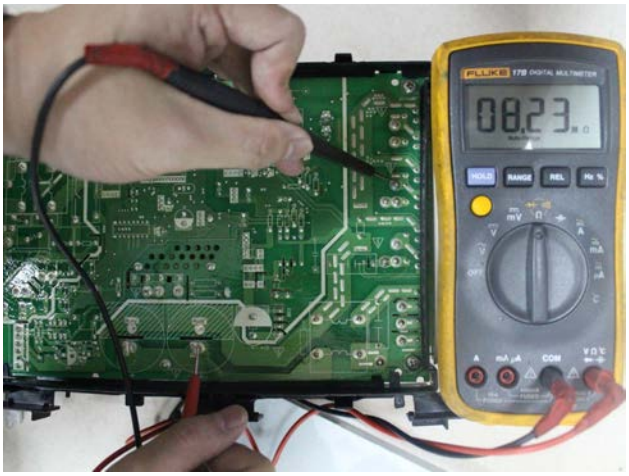
6.16. P0 and PC 00

Description:	Integrate Power Module (IPM) module or Insulated gate bipolar transistor (IGBT) over current protection.
General Note:	When the voltage signal that IPM sends to the compressor drive chip is abnormal, the display LED will show “P6” and unit will turn Off.

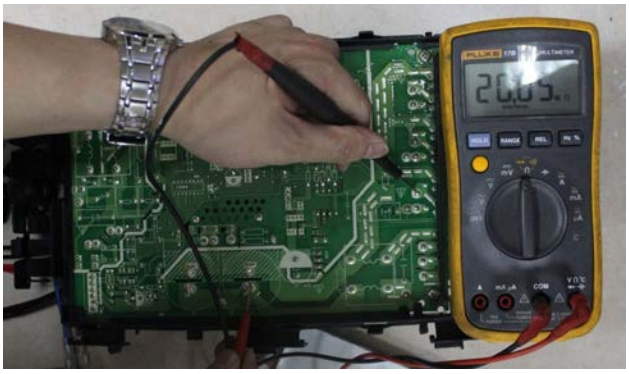



FLUKE 179 DIGITAL MULTIMETER
07.25
HOLD
RANGE
REL
COM

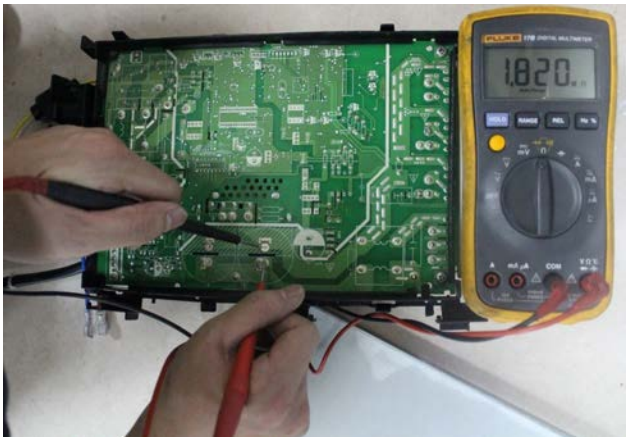
P-U


FLUKE 179 DIGITAL MULTIMETER
08.23
HOLD
RANGE
REL
COM

P-V


FLUKE 179
HOLD
RANGE
REL
COM

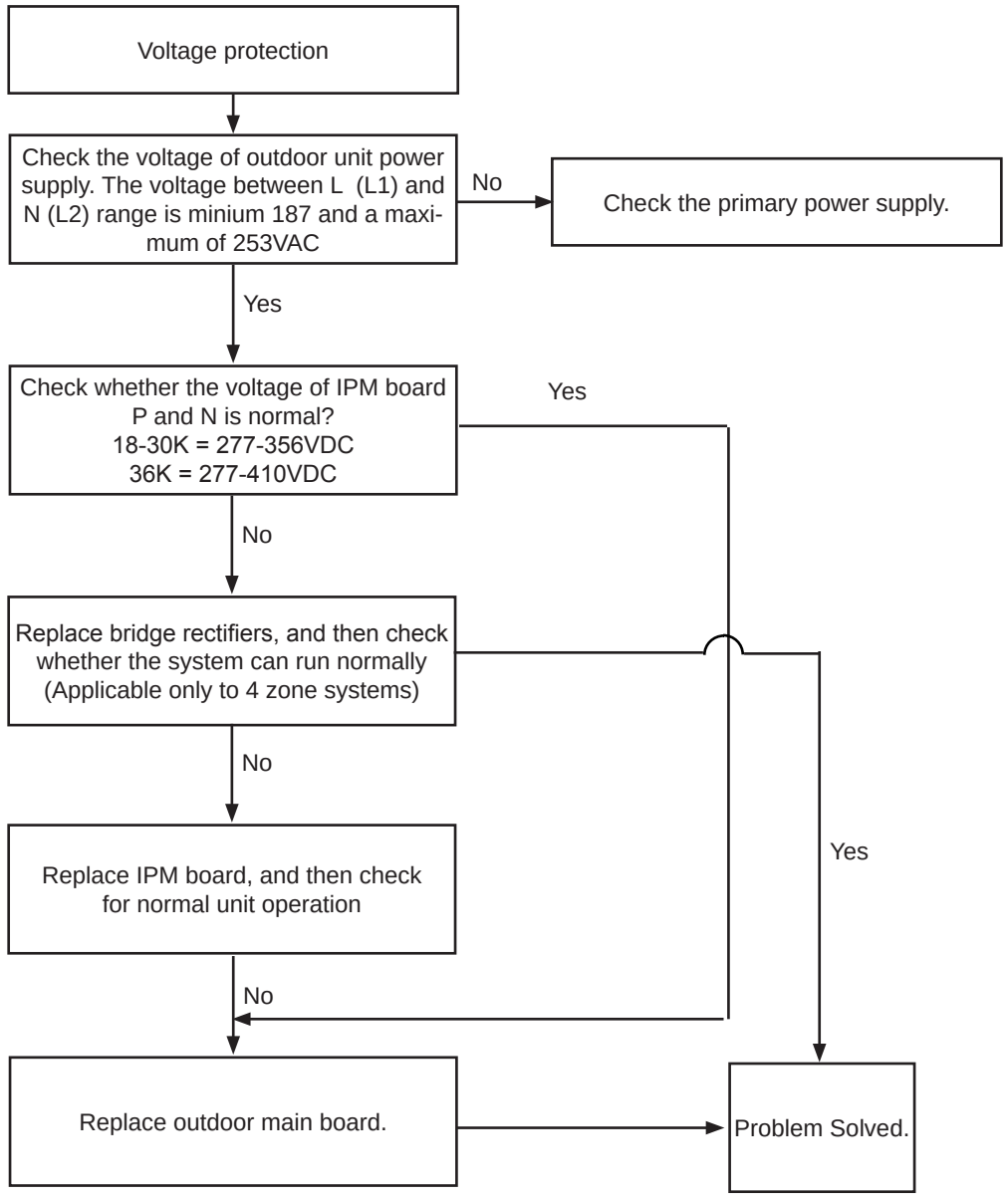
P-W


FLUKE 179 DIGITAL MULTIMETER
1.820
HOLD
RANGE
REL
COM

P-N

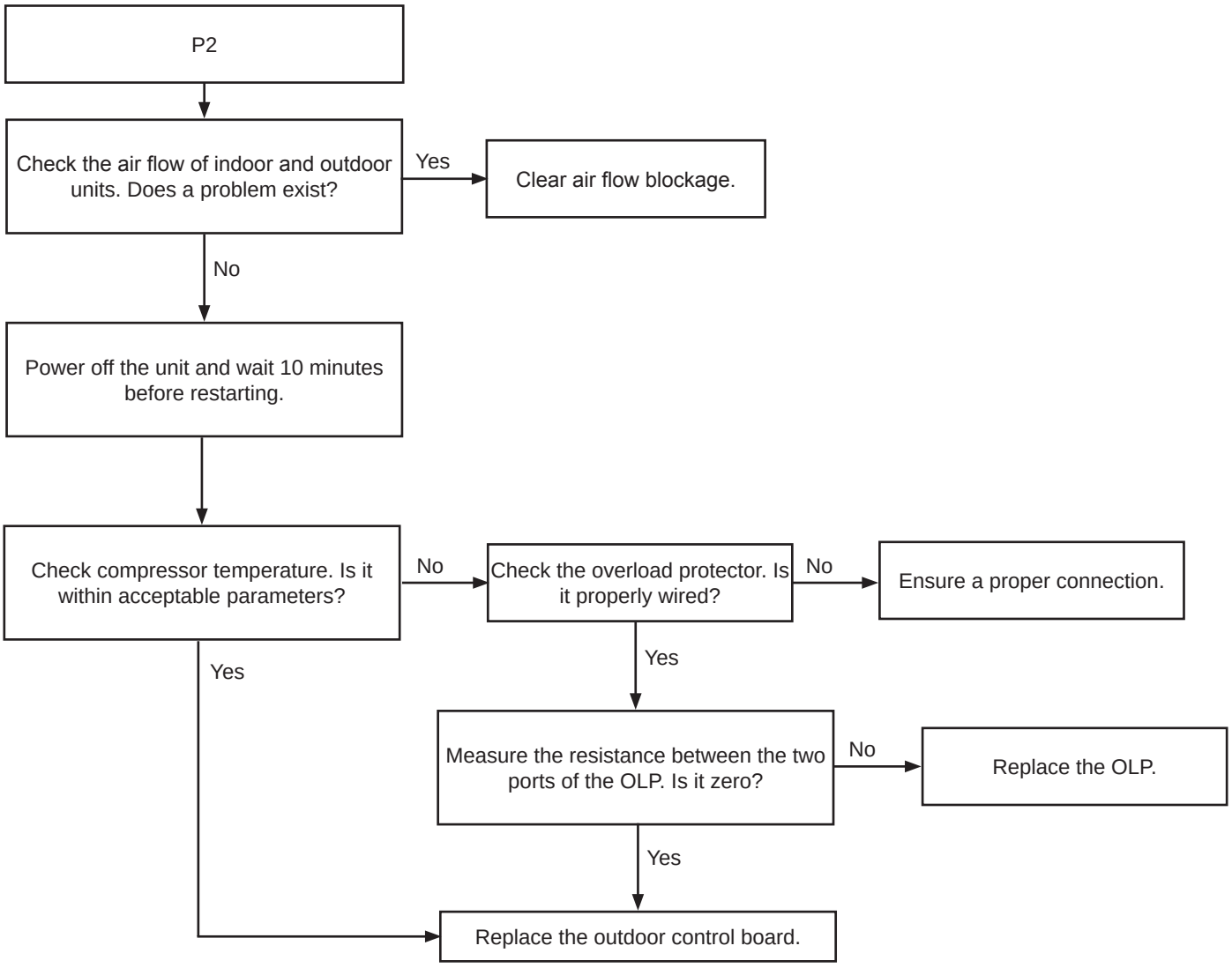
6.17. P1 and PC 01

Description:	High or Low voltage protection
General Note:	An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit.



6.18. P2 and PC 02

Description:	Compressor top high temperature protection (OLP)
General Note:	If the sampling voltage is not 5V, the LED will display the P2 error code.

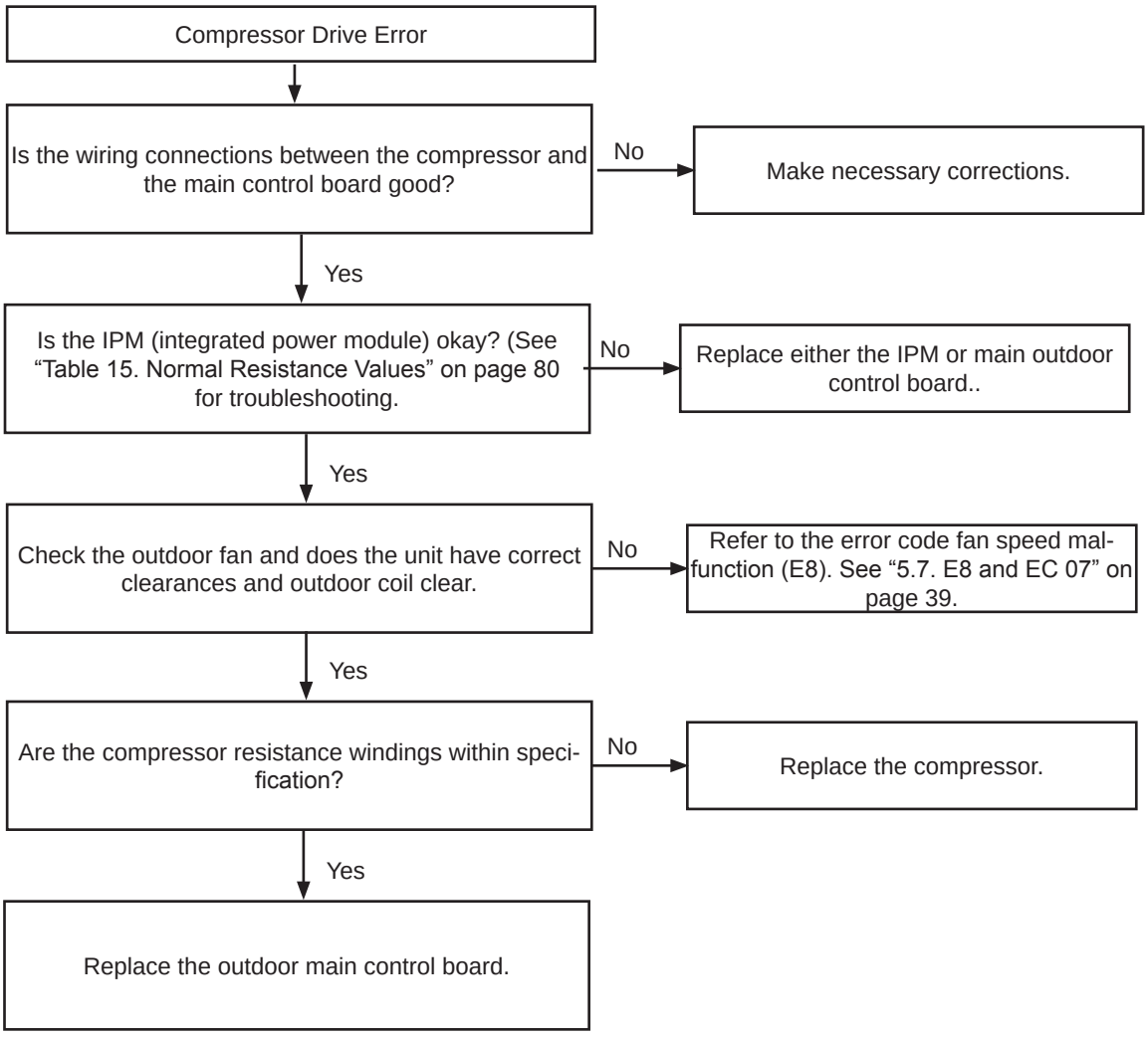


6.19. P3 and PC 0L

Description:	Outdoor unit low temperature lockout.
General Note:	The outdoor unit will lockout in heating mode when the outdoor temperature is lower than -13°F (-25°C) for one hour, on MPA and MPB units. For MLA unit the lockout occurs at -22 F. The outdoor unit will resume operation when either: • Outdoor temperature is higher than -7.6°F (-22°C) for 10 minutes and compressor has been stopped for one hour • Outdoor temperature is higher than 23°F (-5°C) for 10 minutes

6.20. P4

Description:	Compressor Drive Error
General Note:	An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and etc



6.21. - -

Description:	Mode conflict.
General Note:	The indoor units cannot work cooling mode and heating mode at the same time in multi-zone applications. Heating mode has priority. • Suppose indoor unit A working in cooling mode or fan mode, and indoor unit B is set to heating mode, then A will change to Off and B will work in heating mode. • Suppose indoor unit A working in heating mode, and indoor unit B is set to cooling mode or fan mode, then B will change to stand by and A will be no change.

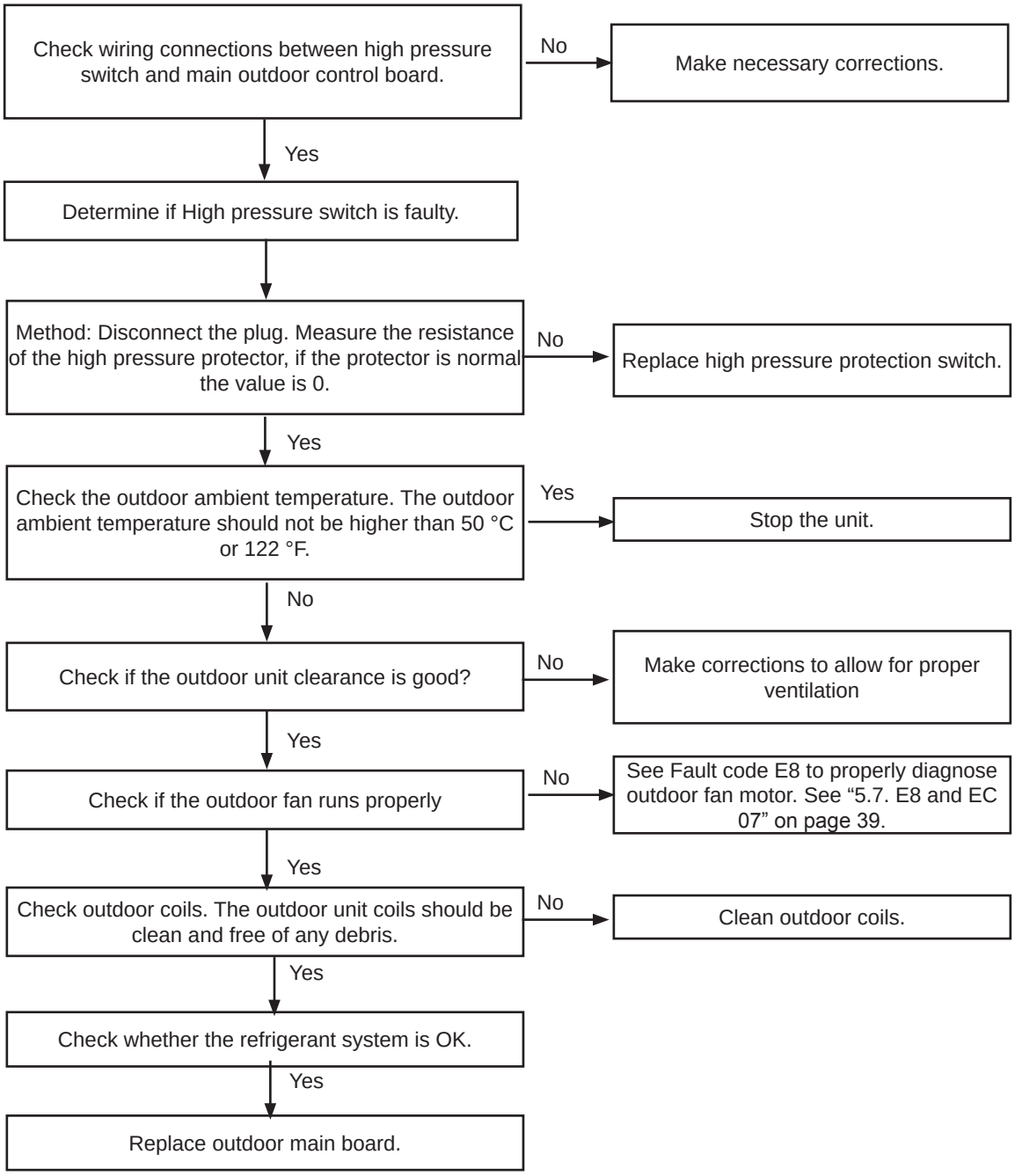
	Cooling mode	Heating mode	Fan	Off
Cooling Mode	No	Yes	No	No
Heating Mode	Yes	No	Yes	No
Fan	No	Yes	No	No
Off	No	No	No	No

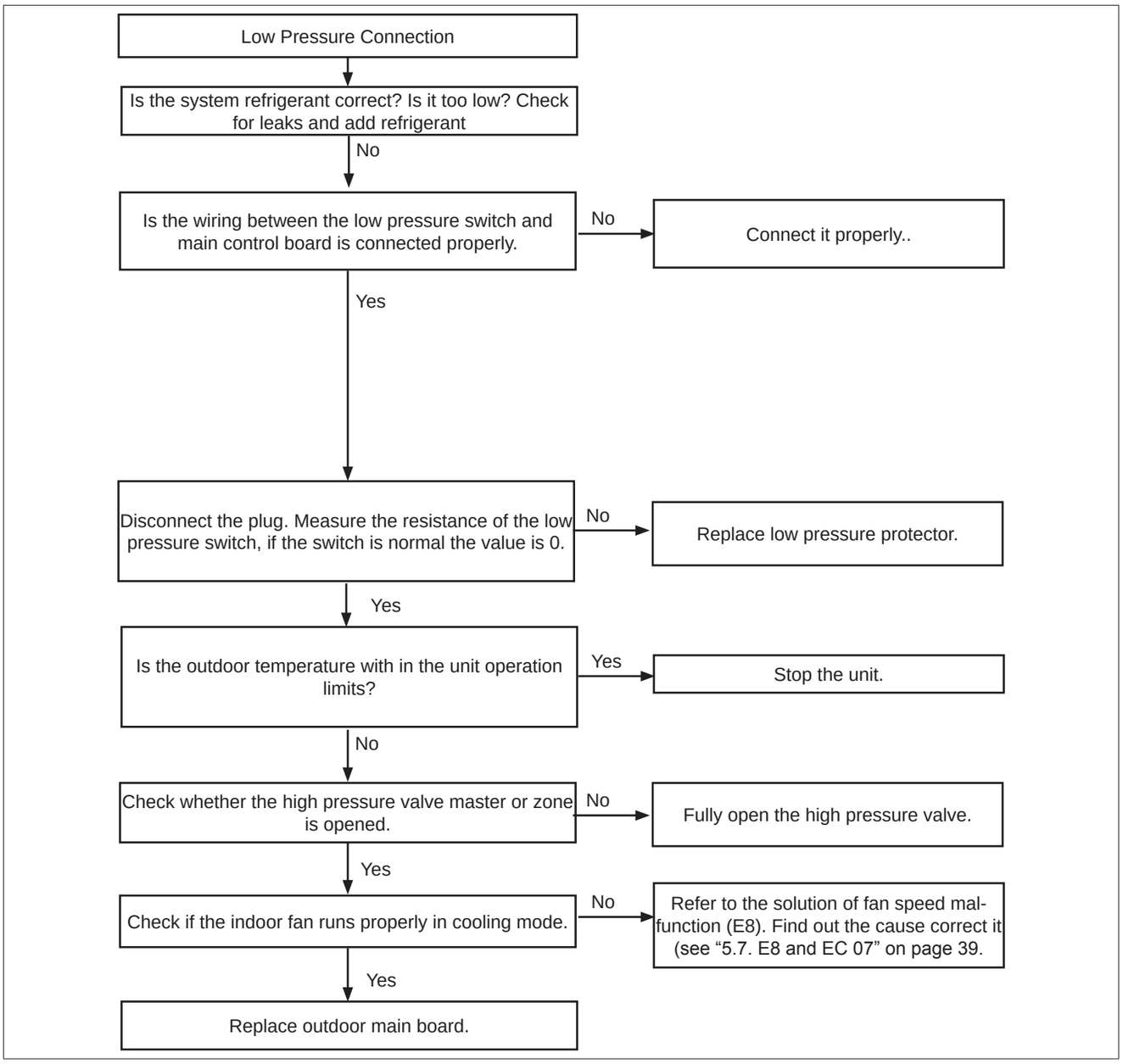
No = No mode conflict.

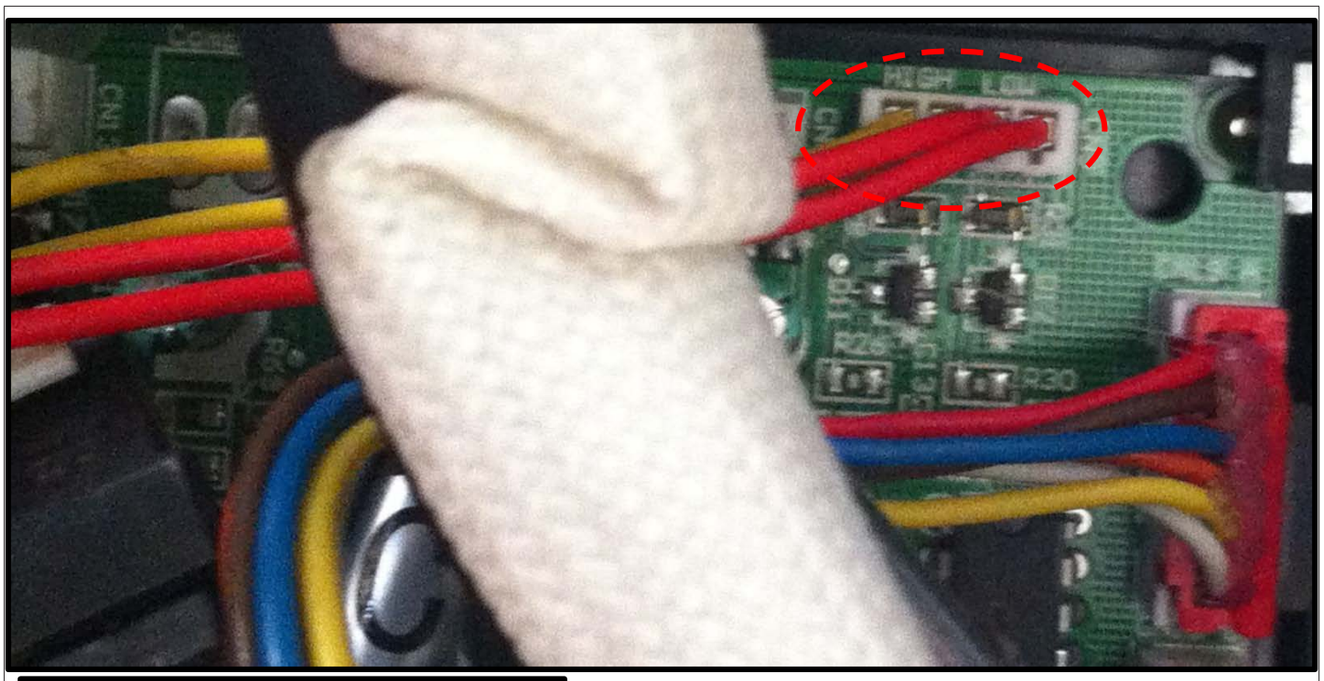
Yes = Mode conflict

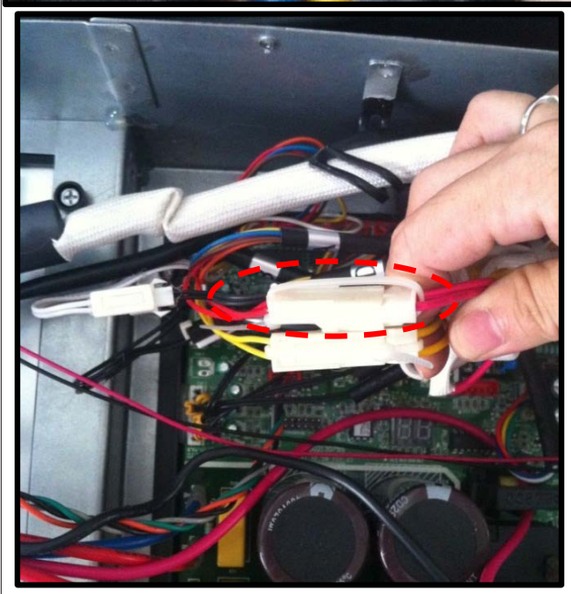
6.22. P6

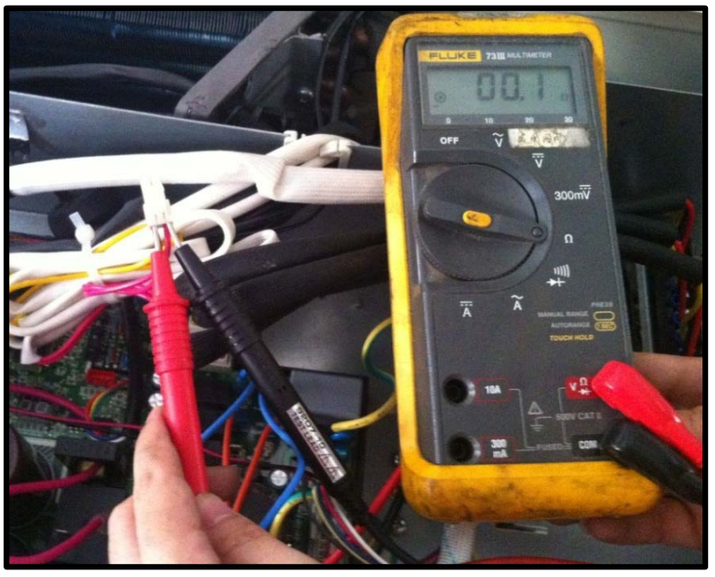
Description:	Compressor high-pressure or low-pressure switch open
General Note:	If the sampling voltage of pressure switch is not 5V, the LED will display the failure. Test each pressure switch separately following the two provided flow charts.




Low Pressure Connection
Is the system refrigerant correct? Is it too low? Check for leaks and add refrigerant
No
Is the wiring between the low pressure switch and main control board is connected properly.
No
Connect it properly..
Yes
Disconnect the plug. Measure the resistance of the low pressure switch, if the switch is normal the value is 0.
No
Replace low pressure protector.
Yes
Is the outdoor temperature with in the unit operation limits?
Yes
Stop the unit.
No
Check whether the high pressure valve master or zone is opened.
No
Fully open the high pressure valve.
Yes
Check if the indoor fan runs properly in cooling mode.
No
Refer to the solution of fan speed mal-function (E8). Find out the cause correct it (see “5.7. E8 and EC 07” on page 39.
Yes
Replace outdoor main board.

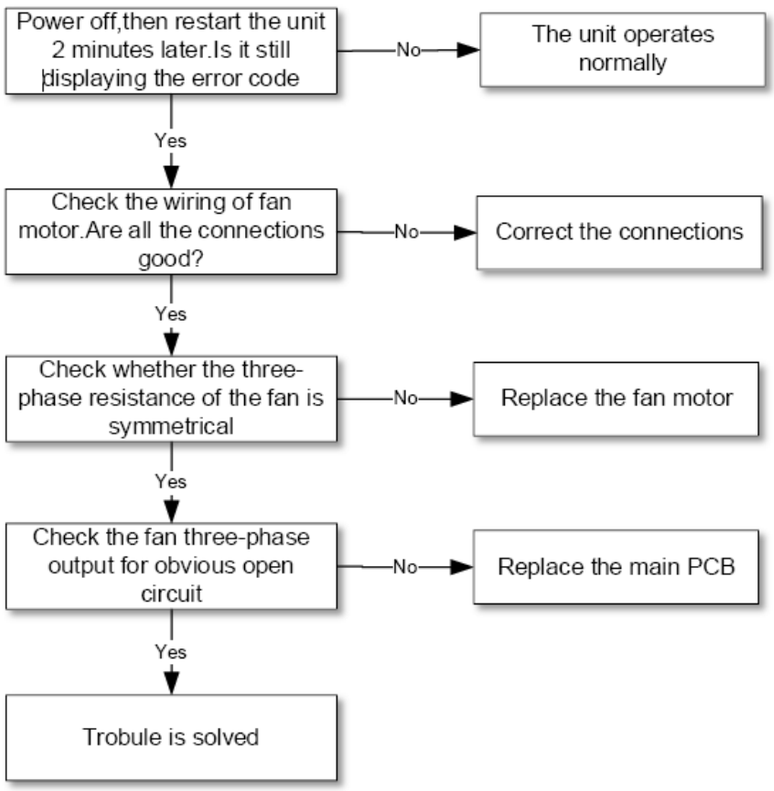






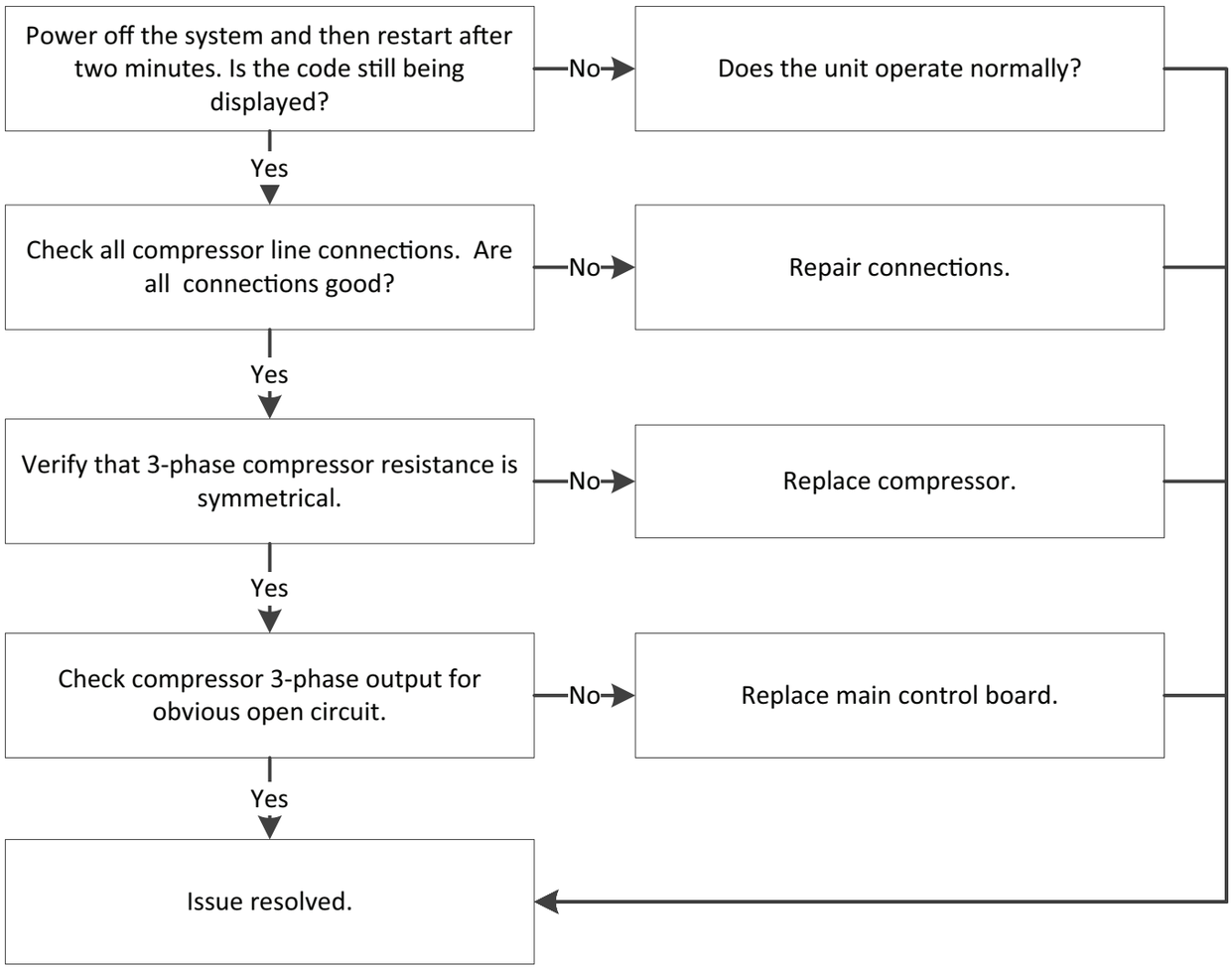
6.23. EC 72

Description:	Lack phase failure of outdoor DC fan motor.



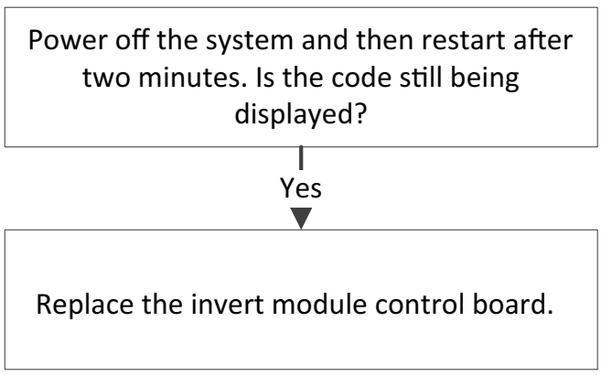
6.24. PC 43

Description:	Outdoor compressor lack phase protection



6.25. PC 45

Description:	Outdoor unit IR chip drive failure



7. Temperature Sensor Resistance Values

Table 12. Temperature Sensor Resistance Value Table (°F/°C)

°F	°C	K Ohm	°F	°C	K Ohm	°F	°C	K Ohm	°F	°C	K Ohm
-4	-20	115.266	68	20	12.6431	140	60	2.35774	212	100	0.62973
-2.2	-19	108.146	69.8	21	12.0561	141.8	61	2.27249	213.8	101	0.61148
-0.4	-18	101.517	71.6	22	11.5	143.6	62	2.19073	215.6	102	0.59386
1.4	-17	96.3423	73.4	23	10.9731	145.4	63	2.11241	217.4	103	0.57683
3.2	-16	89.5865	75.2	24	10.4736	147.2	64	2.03732	219.2	104	0.56038
5	-15	84.219	77	25	10	149	65	1.96532	221	105	0.54448
6.8	-14	79.311	78.8	26	9.55074	150.8	66	1.89627	222.8	106	0.52912
8.6	-13	74.536	80.6	27	9.12445	152.6	67	1.83003	224.6	107	0.51426
10.4	-12	70.1698	82.4	28	8.71983	154.4	68	1.76647	226.4	108	0.49989
12.2	-11	66.0898	84.2	29	8.33566	156.2	69	1.70547	228.2	109	0.486
14	-10	62.2756	86	30	7.97078	158	70	1.64691	230	110	0.47256
15.8	-9	58.7079	87.8	31	7.62411	159.8	71	1.59068	231.8	111	0.45957
17.6	-8	56.3694	89.6	32	7.29464	161.6	72	1.53668	233.6	112	0.44699
19.4	-7	52.2438	91.4	33	6.98142	163.4	73	1.48481	235.4	113	0.43482
21.2	-6	49.3161	93.2	34	6.68355	165.2	74	1.43498	237.2	114	0.42304
23	-5	46.5725	95	35	6.40021	167	75	1.38703	239	115	0.41164
24.8	-4	44	96.8	36	6.13059	168.8	76	1.34105	240.8	116	0.4006
26.6	-3	41.5878	98.6	37	5.87359	170.6	77	1.29078	242.6	117	0.38991
28.4	-2	39.8239	100.4	38	5.62961	172.4	78	1.25423	244.4	118	0.37956
30.2	-1	37.1988	102.2	39	5.39689	174.2	79	1.2133	246.2	119	0.36954
32	0	35.2024	104	40	5.17519	176	80	1.17393	248	120	0.35982
33.8	1	33.3269	105.8	41	4.96392	177.8	81	1.13604	249.8	121	0.35042
35.6	2	31.5635	107.6	42	4.76253	179.6	82	1.09958	251.6	122	0.3413
37.4	3	29.9058	109.4	43	4.5705	181.4	83	1.06448	253.4	123	0.33246
39.2	4	28.3459	111.2	44	4.38736	183.2	84	1.03069	255.2	124	0.3239
41	5	26.8778	113	45	4.21263	185	85	0.99815	257	125	0.31559
42.8	6	25.4954	114.8	46	4.04589	186.8	86	0.96681	258.8	126	0.30754
44.6	7	24.1932	116.6	47	3.88673	188.6	87	0.93662	260.6	127	0.29974
46.4	8	22.5662	118.4	48	3.73476	190.4	88	0.90753	262.4	128	0.29216
48.2	9	21.8094	120.2	49	3.58962	192.2	89	0.8795	264.2	129	0.28482
50	10	20.7184	122	50	3.45097	194	90	0.85248	266	130	0.2777
51.8	11	19.6891	123.8	51	3.31847	195.8	91	0.82643	267.8	131	0.27078
53.6	12	18.7177	125.6	52	3.19183	197.6	92	0.80132	269.6	132	0.26408
55.4	13	17.8005	127.4	53	3.07075	199.4	93	0.77709	271.4	133	0.25757
57.2	14	16.9341	129.2	54	2.95896	201.2	94	0.75373	273.2	134	0.25125
59	15	16.1156	131	55	2.84421	203	95	0.73119	275	135	0.24512
60.8	16	15.3418	132.8	56	2.73823	204.8	96	0.70944	276.8	136	0.23916
62.6	17	14.6181	134.6	57	2.63682	206.6	97	0.68844	278.6	137	0.23338
64.4	18	13.918	136.4	58	2.53973	208.4	98	0.66818	280.4	138	0.22776
66.2	19	13.2631	138.2	59	2.44677	210.2	99	0.64862	282.2	139	0.22231

8. Discharge Temperature Sensor Resistance Values

Table 13. Discharge Temperature Sensor Table (°C--K)

°F	°C	K Ohm	°F	°C	K Ohm	°F	°C	K Ohm	°F	°C	K Ohm
-4	-20	542.7	68	20	68.66	140	60	13.59	212	100	3.702
-2.2	-19	511.9	69.8	21	65.62	141.8	61	13.11	213.8	101	3.595
-0.4	-18	455.9	71.6	22	59.98	143.6	62	12.21	215.6	102	3.392
1.4	-17	455.9	73.4	23	59.98	145.4	63	12.21	217.4	103	3.392
3.2	-16	430.5	75.2	24	57.37	147.2	64	11.79	219.2	104	3.296
5	-15	406.7	77	25	54.89	149	65	11.38	221	105	3.203
6.8	-14	384.3	78.8	26	52.53	150.8	66	10.99	222.8	106	3.113
8.6	-13	363.3	80.6	27	50.28	152.6	67	10.61	224.6	107	3.025
10.4	-12	343.6	82.4	28	48.14	154.4	68	10.25	226.4	108	2.941
12.2	-11	325.1	84.2	29	46.11	156.2	69	9.902	228.2	109	2.86
14	-10	307.7	86	30	44.17	158	70	9.569	230	110	2.781
15.8	-9	291.3	87.8	31	42.33	159.8	71	9.248	231.8	111	2.704
17.6	-8	275.9	89.6	32	40.57	161.6	72	8.94	233.6	112	2.63
19.4	-7	261.4	91.4	33	38.89	163.4	73	8.643	235.4	113	2.559
21.2	-6	247.8	93.2	34	37.3	165.2	74	8.358	237.2	114	2.489
23	-5	234.9	95	35	35.78	167	75	8.084	239	115	2.422
24.8	-4	222.8	96.8	36	34.32	168.8	76	7.82	240.8	116	2.357
26.6	-3	211.4	98.6	37	32.94	170.6	77	7.566	242.6	117	2.294
28.4	-2	200.7	100.4	38	31.62	172.4	78	7.321	244.4	118	2.233
30.2	-1	190.5	102.2	39	30.36	174.2	79	7.086	246.2	119	2.174
32	0	180.9	104	40	29.15	176	80	6.859	248	120	2.117
33.8	1	171.9	105.8	41	28	177.8	81	6.641	249.8	121	2.061
35.6	2	163.3	107.6	42	26.9	179.6	82	6.43	251.6	122	2.007
37.4	3	155.2	109.4	43	25.86	181.4	83	6.228	253.4	123	1.955
39.2	4	147.6	111.2	44	24.85	183.2	84	6.033	255.2	124	1.905
41	5	140.4	113	45	23.89	185	85	5.844	257	125	1.856
42.8	6	133.5	114.8	46	22.89	186.8	86	5.663	258.8	126	1.808
44.6	7	127.1	116.6	47	22.1	188.6	87	5.488	260.6	127	1.762
46.4	8	121	118.4	48	21.26	190.4	88	5.32	262.4	128	1.717
48.2	9	115.2	120.2	49	20.46	192.2	89	5.157	264.2	129	1.674
50	10	109.8	122	50	19.69	194	90	5	266	130	1.632
51.8	11	104.6	123.8	51	18.96	195.8	91	4.849			
53.6	12	99.69	125.6	52	18.26	197.6	92	4.703			
55.4	13	95.05	127.4	53	17.58	199.4	93	4.562			
57.2	14	90.66	129.2	54	16.94	201.2	94	4.426			
59	15	86.49	131	55	16.32	203	95	4.294		B(25/50)=3950K	
60.8	16	82.54	132.8	56	15.73	204.8	96	4.167			
62.6	17	78.79	134.6	57	15.16	206.6	97	4.045		R(90°C)=5KΩ±3%	
64.4	18	75.24	136.4	58	14.62	208.4	98	3.927			
66.2	19	71.86	138.2	59		210.2	99	3.812			

9. Temperature Sensor Identification Table

Table 14. Temperature Sensor Identification Table

Sensor Number	Sensor Name
T1	ID Return Air
T2	Indoor Coil
T2B	Coil temperature of indoor heat exchanger outlet. (Located in outdoor unit)
T3	Outdoor Coil
T4	OD ambient temp
T5	Compressor Discharge

10. Component Diagnostics

10.1. Compressor Check

Measure the resistance value of each winding by using the tester. This can also be used to check for shorted compressor windings, and identifying terminals when they are no longer legible.

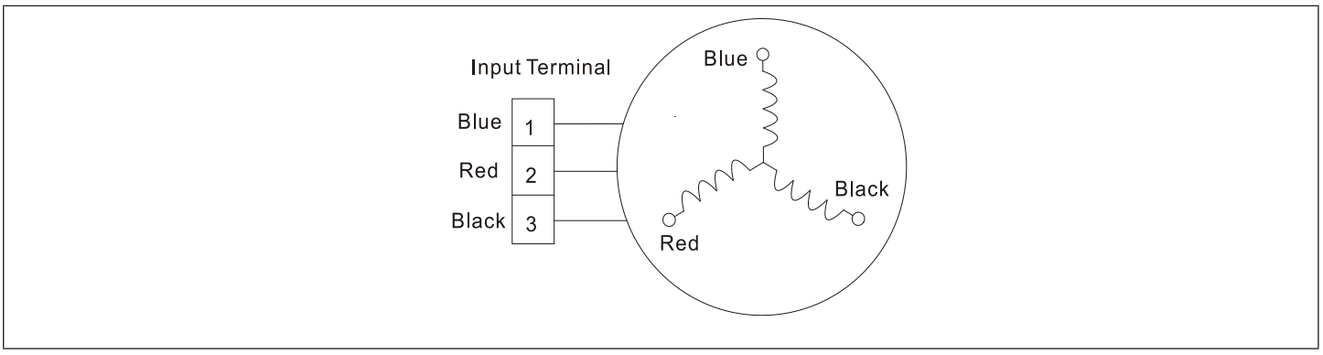


Figure 30. Compressor Terminals

10.2. IPM Check

Measure the resistance value of each winding by using the tester.

Turn off the power, let the large capacity electrolytic capacitors discharge completely, and unplug the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

Table 15. Normal Resistance Values

Digital Tester		Normal Resistance Value	Digital Tester		Normal Resistance Value
(+)Red	(-)Black		(+)Red	(-)Black	
P	N	∞ (Several MΩ)	U	N	∞ (Several MΩ)
	U		V		
	V		W		
	W		(+)Red		
NOTE: *Any Meg ohm reading is good*					

Figure 31. Testing

10.3. Fan Motors

10.3.1. AC Fan Motor

Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin 1 and pin 2. If the value of the voltage is less than 100V (208~240V power supply) or 50V(115V power supply), the main control board may have issues and will need to be replaced.

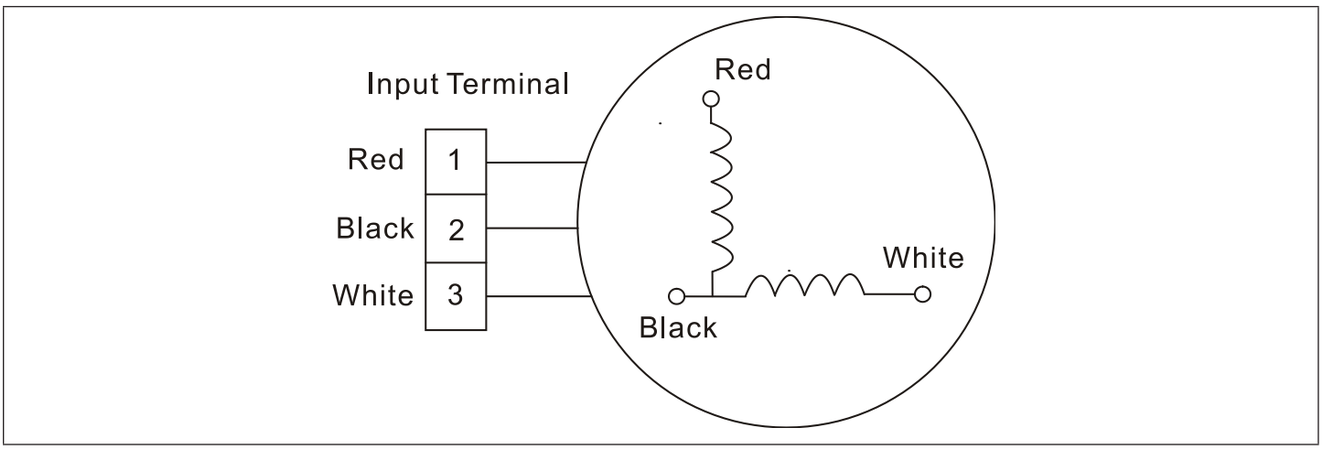


Figure 32. Terminals

Table 16. Resistance Value for AC or DC Fan Motors

Position	Resistance Value			
	RPG20B		RPG28H	
Black - Red	381Ω±8% (20°C) (Brand: Weiling)	342Ω±8% (20°C) (Brand: Dayang)	183.6Ω±8% (20°C) (Brand: Weiling)	180Ω±8% (20°C) (Brand: Wolong)
White - Black	267Ω±8% (20°C) (Brand: Weiling)	253Ω±8% (20°C) (Brand: Dayang)	206Ω±8% (20°C) (Brand: Weiling)	190Ω±8% (20°C) (Brand: Wolong)

Measure the resistance value of each winding by using the tester

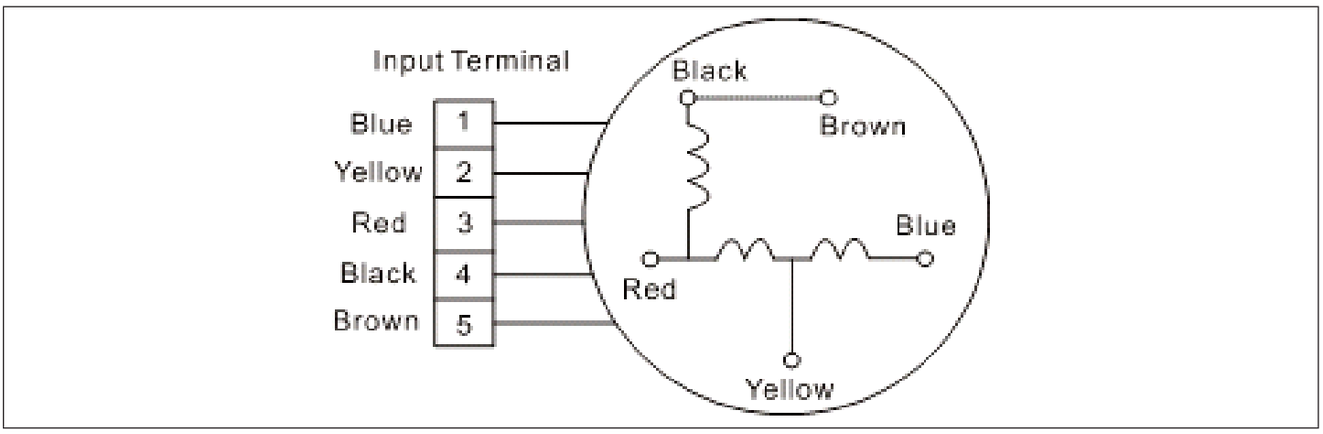


Figure 33. Terminals

Table 17. Resistance Values for DC Fan Motors

Position	Resistance Value						
	YDK70-6FB	YDK180-8GB	YSK27-4G	YSK68-4B	YDK45-6B	YSK25-6L	YDK53-6FB(B)
Black - Red	56Ω±8% (20°C)	24.5Ω±8% (20°C)	317Ω±8% (20°C)	145Ω±8% (20°C)	345Ω±8% (20°C)	627Ω±8% (20°C)	88.5Ω±8% (20°C)
Red - Yellow	76Ω±8% (20°C)	19Ω±8% (20°C)	252Ω±8% (20°C)	88Ω±8% (20°C)	150Ω±8% (20°C)	374.3Ω±8% (20°C)	138Ω±8% (20°C)
Yellow - Blue	76Ω±8% (20°C)	19Ω±8% (20°C)	252Ω±8% (20°C)	88Ω±8% (20°C)	150Ω±8% (20°C)	374.3Ω±8% (20°C)	138Ω±8% (20°C)

Table 18. Resistance Value for DC Fan Motors

Unit	Product	Capacity	Voltage	**Resistance (Ω)**
IDU	Ducted	9K	208-230V	46.5
IDU	Ducted	12K	208-230V	46.5
IDU	Ducted	18K	208-230V	43
IDU	Ducted	24K	208-230V	43
IDU	Ducted	9K	208-230V	46.5
IDU	Ducted	12K	208-230V	46.5
IDU	Ducted	18K	208-230V	43
IDU	Ducted	24K	208-230V	43
IDU	Ducted	36K	208-230V	30
IDU	Ducted	48K	208-230V	10.2
IDU	Ducted	9K	208-230V	46.5
IDU	Ducted	12K	208-230V	46.5
IDU	Ducted	18K	208-230V	17.8
IDU	Ducted	24K	208-230V	17.8
IDU	Ducted	36K	208-230V	6.74
IDU	Ducted	48K	208-230V	4
IDU	Ceiling-flooring	18K	208-230V	46.5
IDU	Ceiling-flooring	24K	208-230V	46.5
IDU	Ceiling-flooring	24K	208-230V	46.5
IDU	Ceiling-flooring	36K	208-230V	42
IDU	Ceiling-flooring	48K	208-230V	43
IDU	Casstte	48K	208-230V	22
ODU	Standard Single Zone	9K	115V	100
ODU	Standard Single Zone	12K	115V	100
ODU	Standard Single Zone	9K	208-230V	100
ODU	Standard Single Zone	12K	208-230V	100
ODU	Standard Single Zone	18K	208-230V	37.3
ODU	Standard Single Zone	24K	208-230V	42
ODU	Standard Single Zone	30K	208-230V	42
ODU	Standard Single Zone	36K	208-230V	42
ODU	Standard Single Zone	36K	208-230V	42
ODU	Standard Single Zone	48K	208-230V	32.3
ODU	Low Ambient Single Zone	9K	208-230V	100
ODU	Low Ambient Single Zone	12K	208-230V	100
ODU	Low Ambient Single Zone	18K	208-230V	37.3
ODU	Low Ambient Single Zone	24K	208-230V	42

Table 18. Resistance Value for DC Fan Motors

Unit	Product	Capacity	Voltage	**Resistance (Ω)**
ODU	Standard multi-zone	18K	208-230V	37.3
ODU	Standard multi-zone	30K	208-230V	42
ODU	Standard multi-zone	36K	208-230V	42
ODU	Standard multi-zone	48K	208-230V	32.3
ODU	Low ambient multi-zone	18K	208-230V	42
ODU	Low ambient multi-zone	30K	208-230V	42
ODU	Low ambient multi-zone	36K	208-230V	32.3
IDU	Ceiling-flooring	18K	208-230V	46.5
ODU	Current single zone	9K	208-230V	52.5
ODU	Current single zone	12K	208-230V	52.5
ODU	Current single zone	18K	208-230V	37.3
ODU	Current single zone	30K	208-230V	42
ODU	Current single zone	36K	208-230V	42
ODU	Current single zone	36K	208-230V	42

10.3.2. DC Fan Motor (Control Chip is Inside Fan Motor)

Power on and when the unit is in standby, measure the voltage of pin 1 to pin 3, pin 4 to pin 3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the printed circuit board must have problems and needs to be replaced.

For other models:

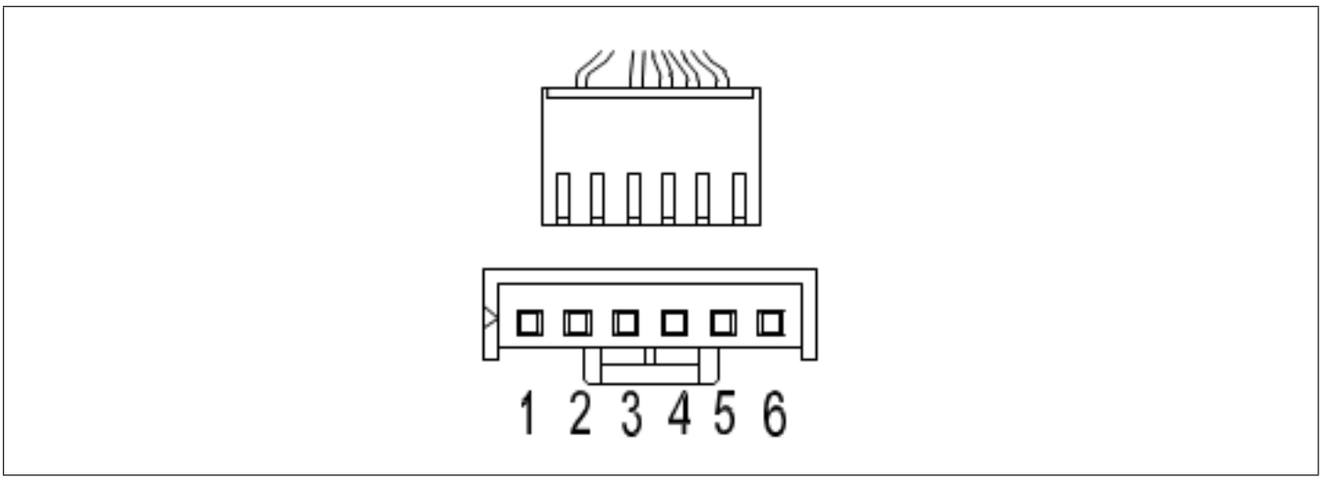


Figure 34. Pinouts

DC Motor Voltage Input and Output

Table 19. DC Motor Voltage Input and Output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	200V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5-16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5-16.5V

10.4. Four-Way Valve

NOTE: *For example Reversing Valve*

a. Power on, use a digital tester to measure the voltage, when the unit operates in cooling, it is 0V. When the unit operates in heating, it is about 230VAC. If the value of the voltage is not in the range, the outdoor unit main control board must have problems and will need to be replaced.

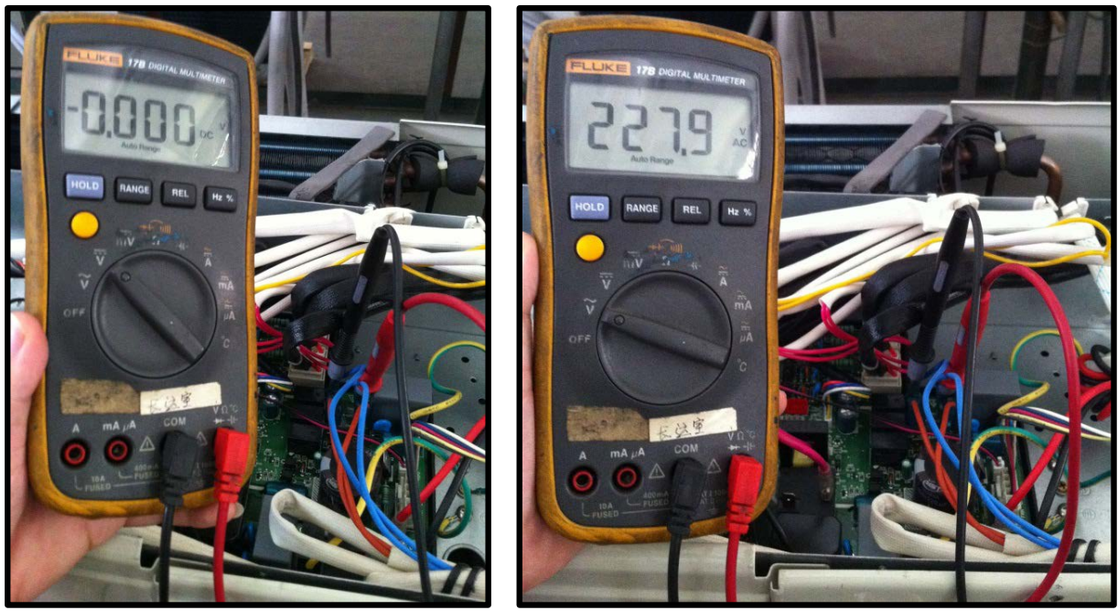


Figure 35. Measure Voltage

b. Turn off the power, use a digital tester to measure the resistance. The value should be 1.8~2.5 KΩ.

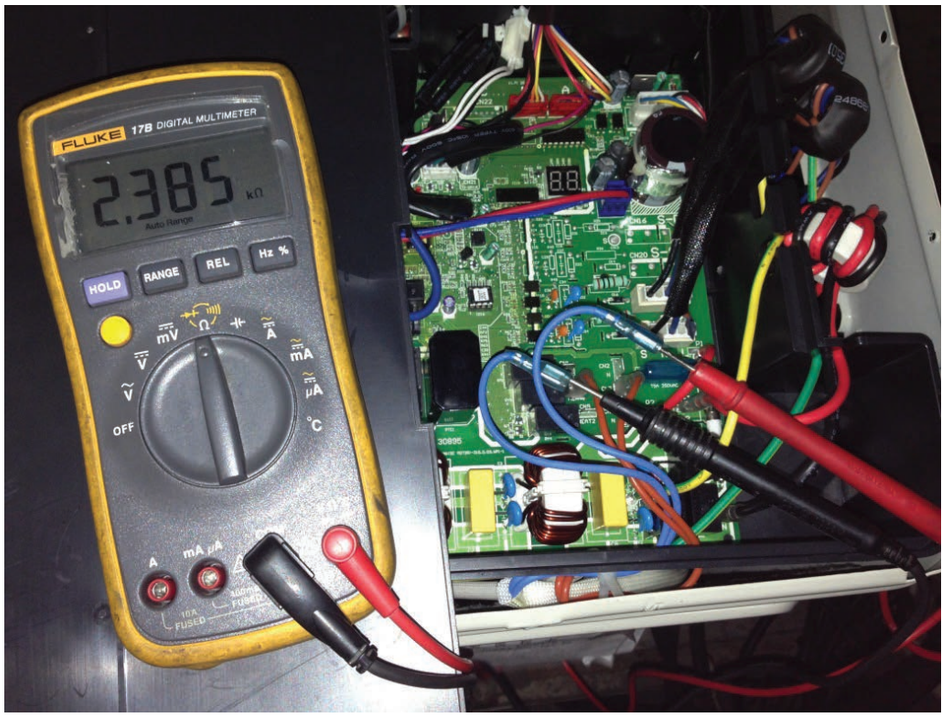


Figure 36. Measure Resistance

10.5. EXV Check

10.5.1. Original Production Models

Disconnect the connectors.

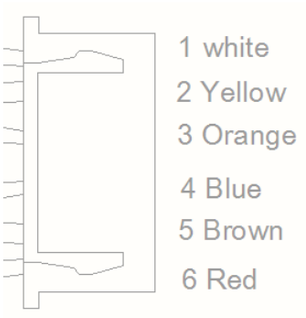


Figure 37. Connector Pin-Out

Table 20. Resistance

Color of lead wire	Normal Value
White	About 50Ω
Yellow	
Orange	
Blue	
Brown	Common
Red	

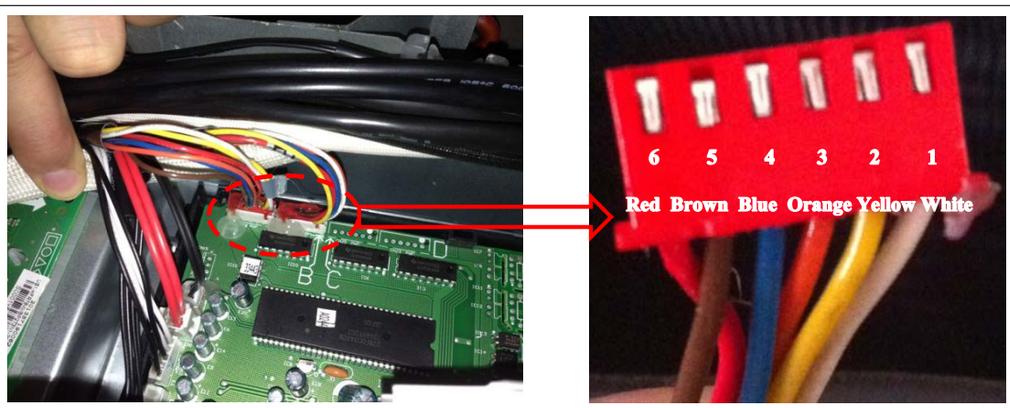


Figure 38. Connector Pin-Out

10.5.2. Later Production Models (Sanhua EEV)

Disconnect the connectors.

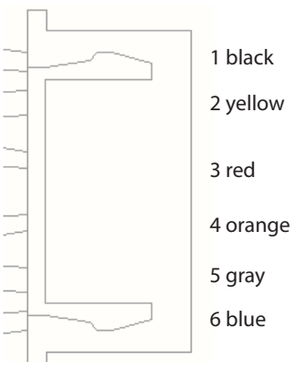


Figure 39. Connector Pin-Out

Table 21. Resistance

Color of lead wire	Normal Value
Black	About 50Ω
Yellow	
red	
Orange	
Gray	Common
Blue	

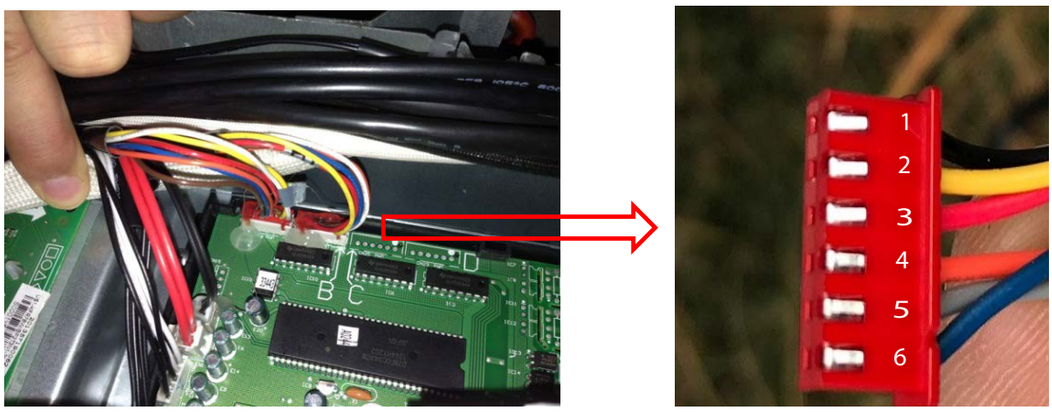


Figure 40. Connector Pin-Out

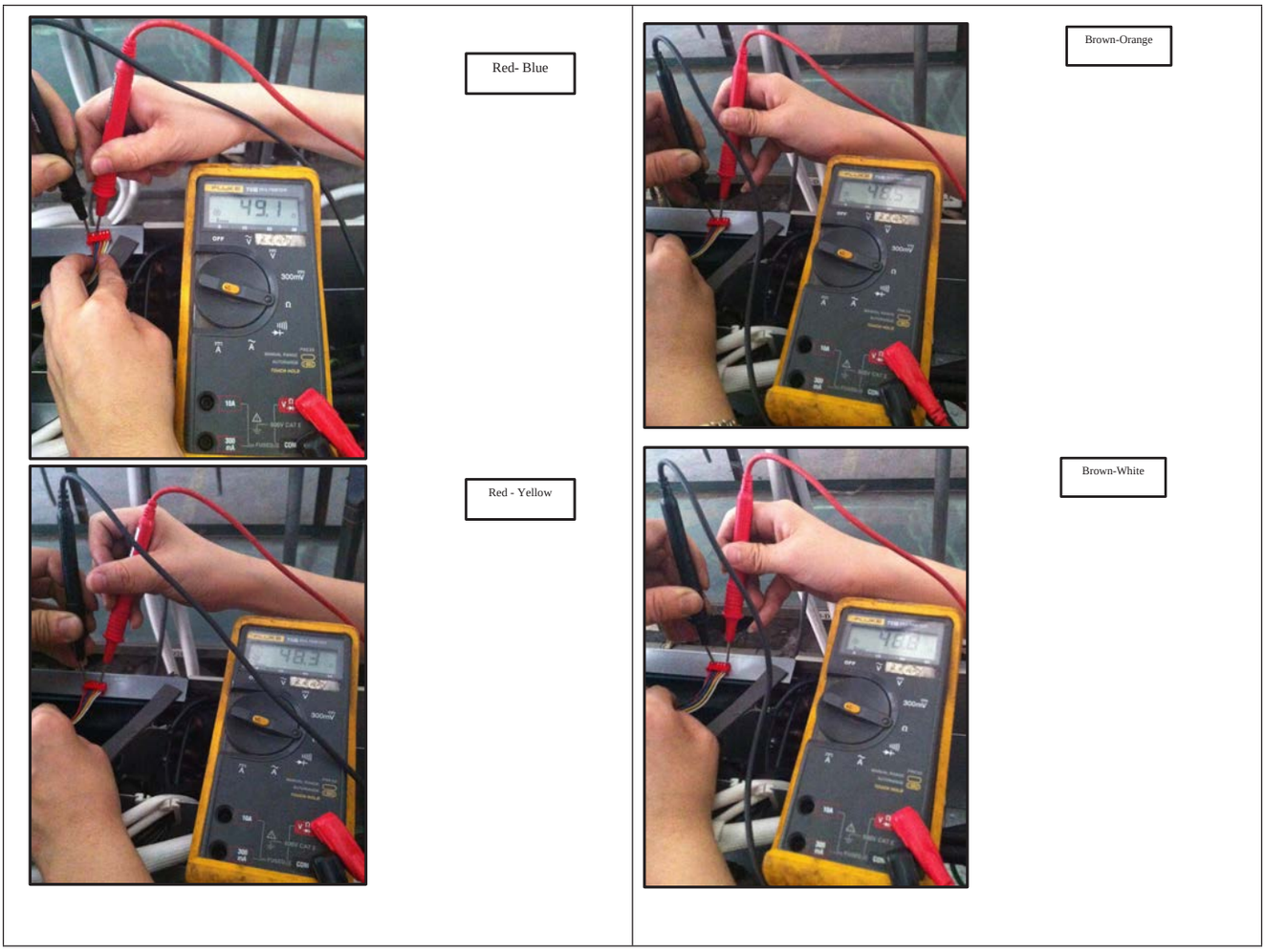


Figure 41. Connector Pin-Out

10.6. Electronic Expansion Valve (EXV) Control

a. EXV will be fully closed when turning on the power. Then EXV will be standby with 350P open and will open to target angle after compressor starts.

b. EXV will close with -160P when compressor stops. Then EXV will be standby with 350P open and will open to target angle after compressor starts.

c. The action priority of the EXVs is A-B-C-D.

d. Compressor and outdoor fan start operation only after EXV is initialized.

10.6.1. Cooling mode

The initial open angle of EXV is 250P, adjustment range is 100-350p. When the unit start to work for 3 minutes, the outdoor will receive indoor units(of capacity demand) T2B information and calculate the average of them. After comparing each indoor's T2B with the average, the outdoor gives the following modification commands: If the T2B>average, the relevant valve needs more 16p open; If the T2B= average, the relevant valve's open range remains; If the T2B<average, the relevant valve needs more 16p close.

This modification will be carried out every 2 minutes.

10.6.2. Heating mode

The initial open angle of EXV is 250P, adjustment range is 100-350p. When the unit start to work for 3 minutes, the outdoor will receive indoor units (of capacity demand) T2 information and calculate from subject received, size and categories.

After comparing each indoor's T2 with the average, the outdoor gives the following modification commands: If the T2>average+2, the relevant valve needs more 16p close;

If average+2≥the T2≥ average-2, the relevant valve's open range remains;

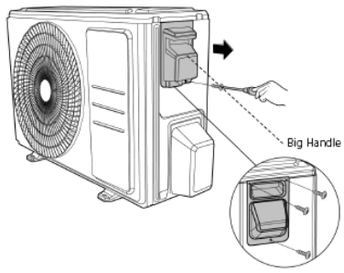
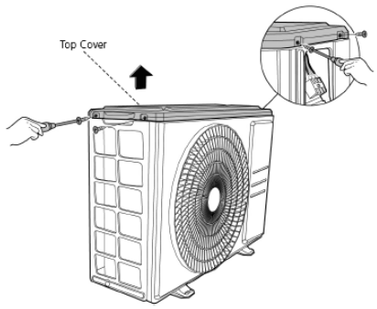
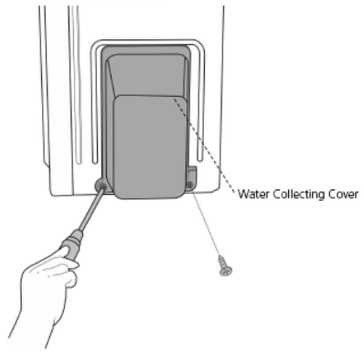
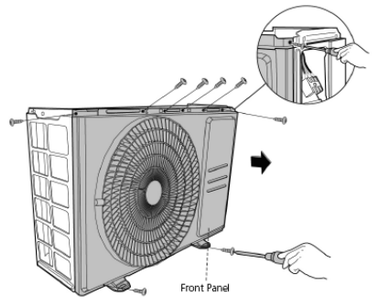
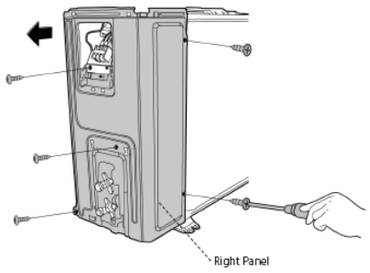
If the T2<average-2, the relevant valve needs more 16p open.

This modification will be carry out every 2 minutes.

11. Single-Zone Outdoor Unit Component Disassembly

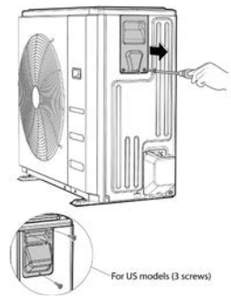
11.1. Panel Plate Removal

11.1.1. MPC009S4S, MLB009S4S-1P, MPC012S4S-1L, MPC012S4S, and MLB012S4S

<table>
<tr><th>Procedures</th><th>Illustrations</th><th>Procedures</th><th>Illustrations</th></tr>
<tr><td>1. Disconnect power to the system.
2. Remove the three screws securing the big handle and then remove the big handle.</td><td> 
</td><td>3. Remove the four top cover screws and then remove cover.
NOTE: One of the screws is located underneath the big handle.</td><td> 
</td></tr>
<tr><td>4. Remove the two screws securing the cover and then remove cover. .</td><td> 
</td><td>5. Remove the nine screws securing the front panel and then remove the panel.</td><td> 
</td></tr>
<tr><td>6. Remove the five screws securing the right panel and then remove the panel.</td><td> 
</td><td></td><td></td></tr>
</table>

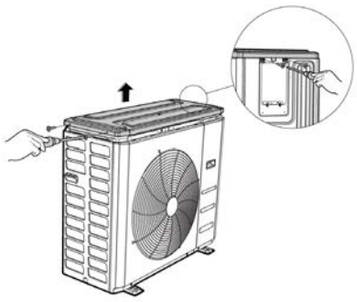
11.1.2. MPC024S4S-1P, MLB024S4S-1P, MPC030S4S-1P, MPC036S4S-1P and 3PC036S4S-1P

1. Disconnect power to the system.
2. Remove the three screws securing the big handle and then remove the big handle.

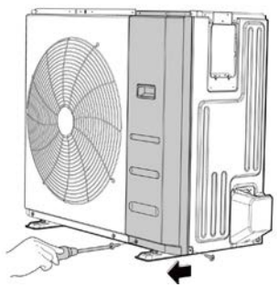


3. Remove the four screws securing the top cover and then remove the cover

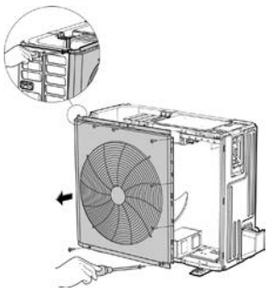
NOTE: *One of the screws is located underneath the big handle.*



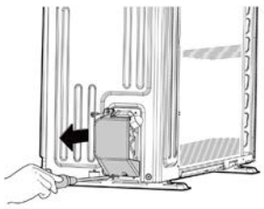
4. Remove the two screws securing the front right panel and then remove the panel.



5. Remove the nine screws securing the front panel and then remove the panel.

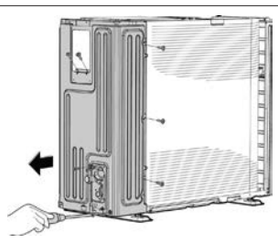


6. Remove the two screws securing the cover and then remove the cover.



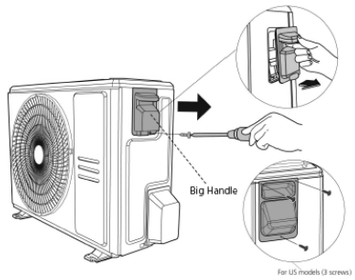
7. Remove the two screws securing the coil guard and then remove the guard.

8. Remove the eight screws securing the right panel and then remove the right panel.



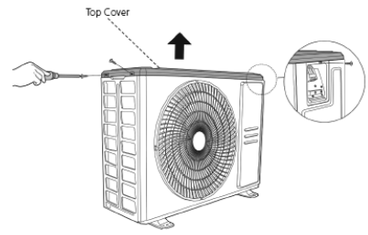
11.1.3. MPC018S4S-1P and MLB018S4S-1P

1. Disconnect power to the system.
2. Remove the two screws securing the big handle and then remove the big handle.

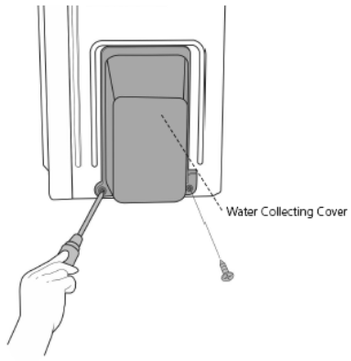


3. Remove the three screws securing the top cover and then remove the top cover.

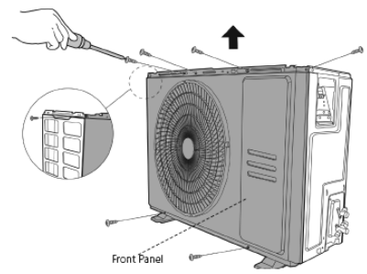
NOTE: *One of the screws is located underneath the big handle.*



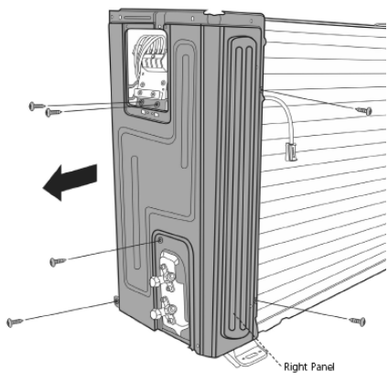
4. Remove the two screws of securing the cover and then remove the cover.



5. Remove the nine screws securing the front panel and then remove the panel.

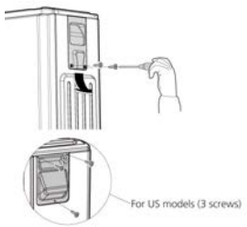


6. Remove the six screws securing the right panel and then remove the panel.



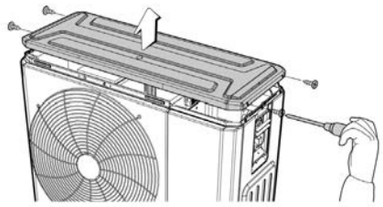
11.1.4. MPC048S4S-1P, MLB036S4S-2P and MLB048S4S-2P

1. Disconnect power to the system.
2. Remove the two screws securing the big handle and then remove the big handle.

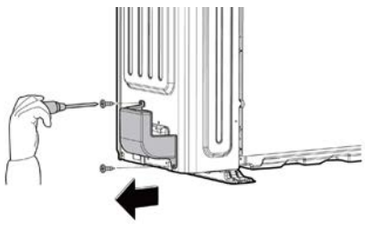


3. Remove the four screws securing the top cover and then remove the top cover.

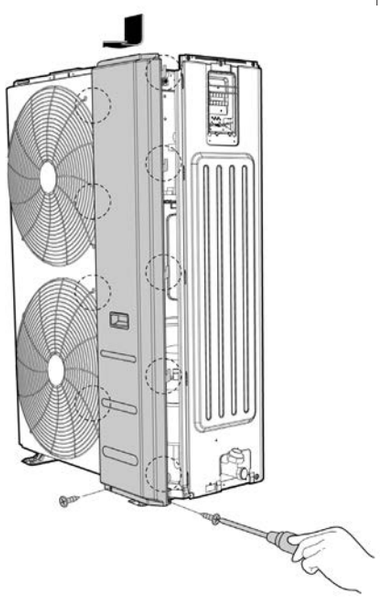
NOTE: *Two of the screws is located underneath the big handle.*



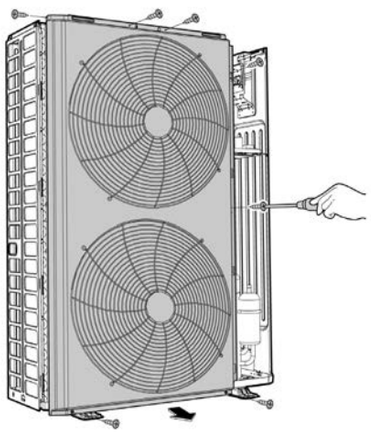
4. Remove the two screws of securing the cover and then remove the cover.



5. Remove the two screws securing the front right panel and then remove the panel.

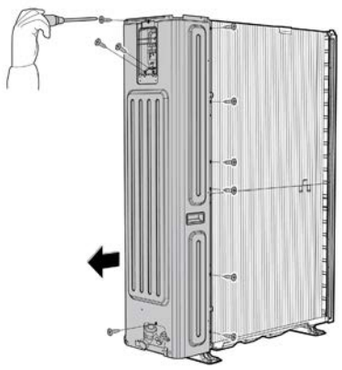


6. Remove the seven screws securing the front panel and then remove the panel.



7. Remove the 10 screws of the right panel and then remove the right panel

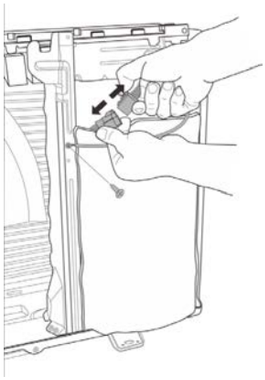
8.



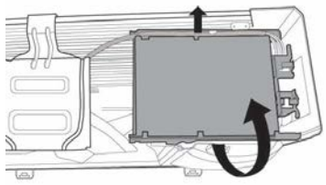
11.2. Control Board Removal

11.2.1. MPC009S4S-1P, MLB009S4S-1P, MPC012S4S-1P, MPC012S4S-1L and MLB012S4S-1P

1. Disconnect power to the system.
2. Disconnect the compressor connector for compressor and disconnect the ground wire by removing the screw securing it.

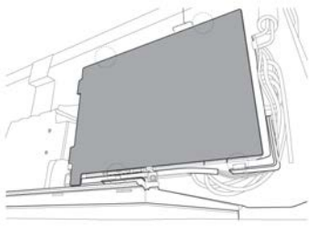


3. Remove the electronic control box sub-assembly.



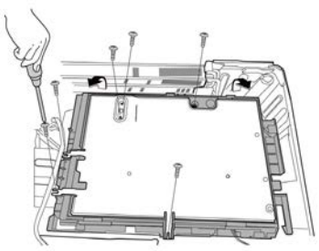
11.2.2. MLB024S4S-1P, MPC030S4S-1P, MPC036S4S-1P and 3PC036S4S-1P

1. Disconnect the four hooks and then open the cover.

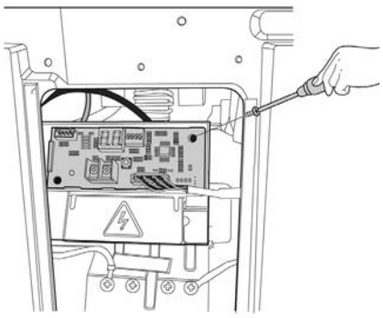


2. Remove six screws securing the electronic control board and then remove the electronic control box sub-assembly.

NOTE: *Electronic installing box cannot be opened, so the voltage between P and N cannot be measured.*

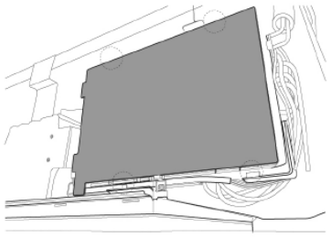


3. Pull out the connector and remove one screw and then remove the key board sub-assembly on terminal board.

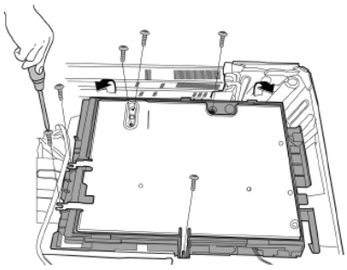


11.2.3. MPC018S4S-1P, MLB018S4S-1P and MPC024S4S-1P

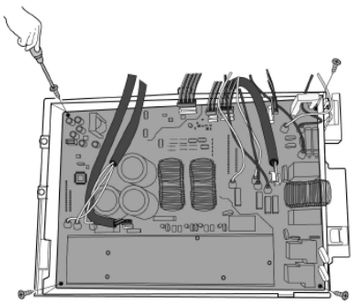
1. Disconnect the four hooks and then open the electronic control box cover.



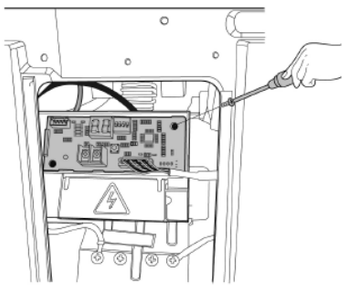
2. Remove the six screws securing the electronic control board and then flip the electronic control board.



3. Pull out the connectors.
4. Remove the four screws and then remove the electronic control board.

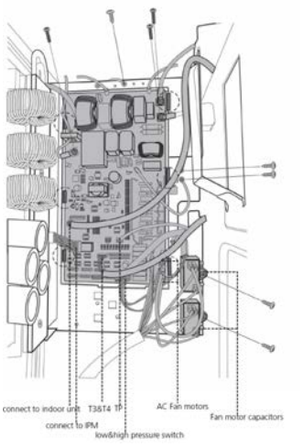


5. Pull out the connector, remove one screw and then remove the key board sub-assembly.

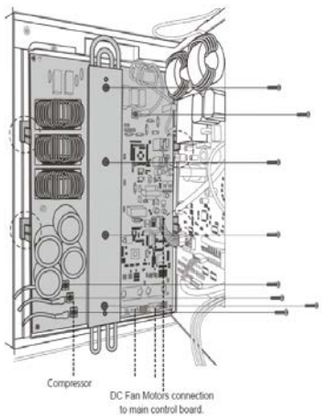


11.2.4. MLB036S4S-2P, MLB048S4S-2P and MPC048S4S-1P

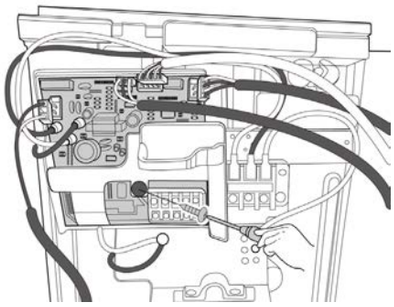
1. Remove two screws to disconnect the power supply wires.
2. Remove three screws to disconnect ground wires.
3. Disconnect the wires connected to main control board.
4. Disconnect the wires between main control board and IPM module board.
5. Remove the four screws and unfix the six hooks and then remove the main control board.
6. Remove the one screw to remove the fan motor capacitor (1 screw for each capacitor)..



7. Remove two screws to disconnect the power supply wires.
8. Remove three screws to disconnect the wires connected to the compressor.
9. Remove three screws to remove the radiator.
10. Disconnect the wires between IPM module board and main control board.
11. Remove the four screws and unfix the four hooks and then remove the IPM module board.



12. Remove the one screw and disconnect the wires and then remove the 24V board.

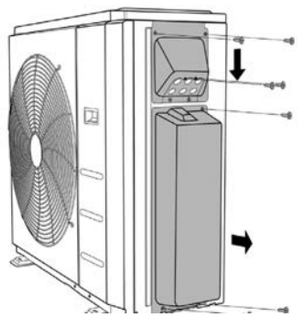


12. Multi-Zone Outdoor Unit Component Disassembly

12.1. Panel Plate Removal

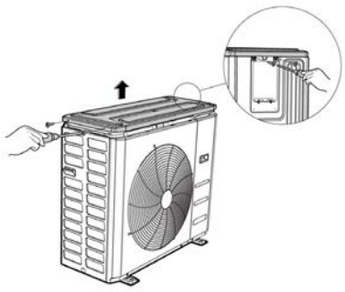
12.1.1. MLB018S4M-1P, MPC024S4M-1P, MPC030S4M-1P, MLB030S4M-1P and MPC036S4M-1P

1. Disconnect power to the system.
2. Remove four screws securing the big handle and then remove the big handle.

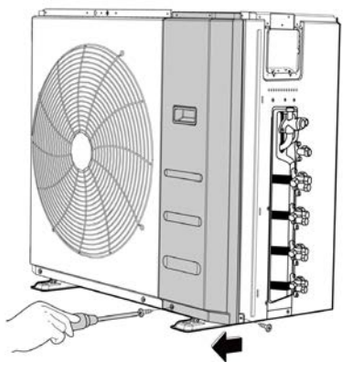


3. Remove the four screws securing the top cover and then remove the top cover

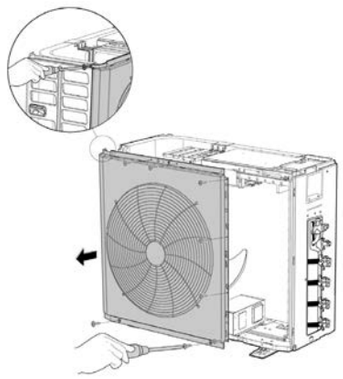
NOTE: *Two of the screws is located underneath the big handle.*



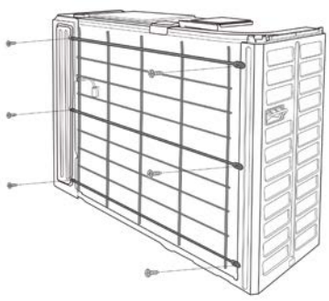
4. Remove the two screws securing the front right panel and then remove the panel.



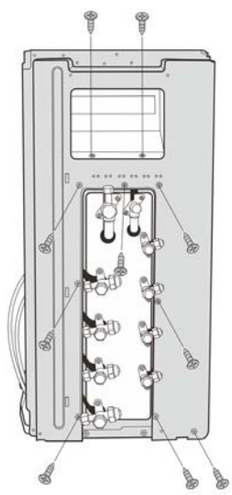
5. Remove the nine screws securing the front panel and then remove the panel.



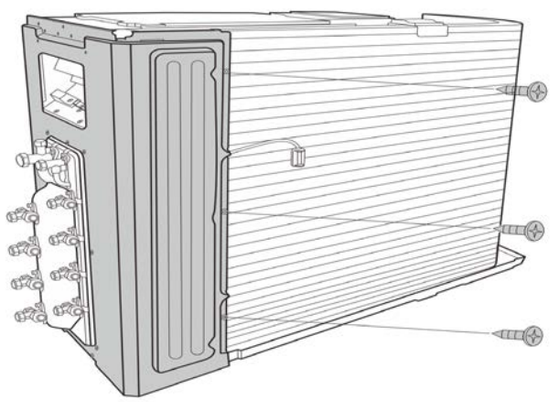
6. Remove the six screws securing the coil guard and then remove the guard.



7. Remove the 12 screws securing the right panel and then remove the panel.

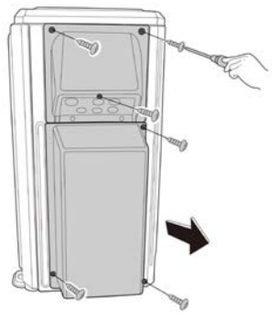


8.



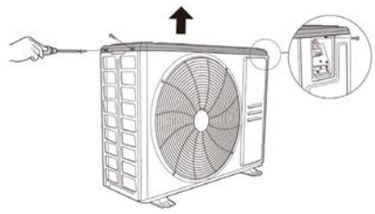
12.1.2. MPC018S4M-1P

1. Disconnect power to the system.
2. Remove the six screws securing the big handle assembly and cover and then remove them both.

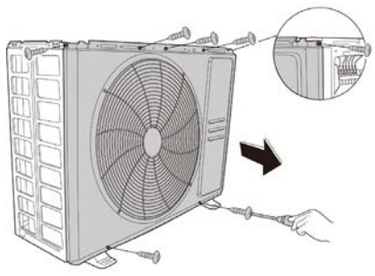


3. Remove the three screws securing the top cover and then remove the cover.

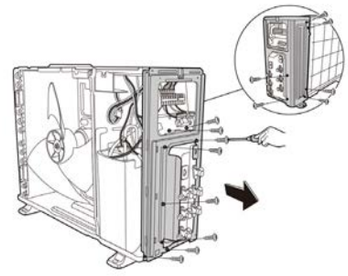
NOTE: *One of the screws is located underneath the big handle*



4. Remove the seven screws securing the front panel and then remove the panel.

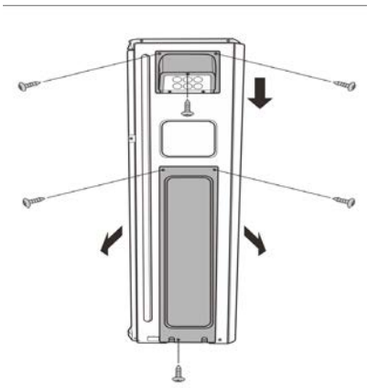


5. Remove the 14 screws securing the right panel and then remove the panel

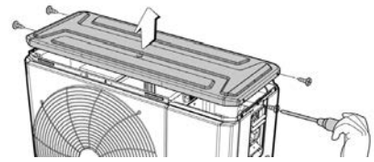


12.1.3. MLB036S4M-1P, MLB048S4M-1P and MPC048S4M-1P

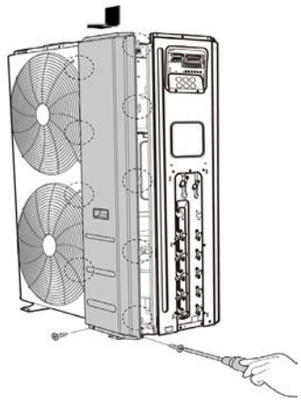
1. Disconnect power to the system.
2. Remove the three screws securing the big handle and then remove the big handle.
3. Remove the three screws securing the cover and then remove it.



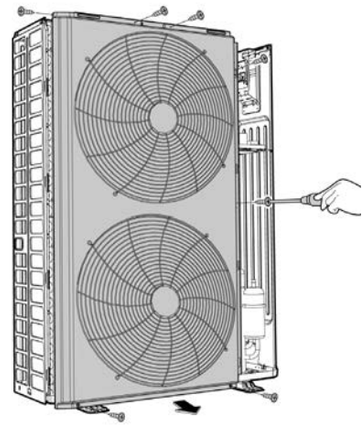
4. Remove the four screws securing the top cover and then remove it.



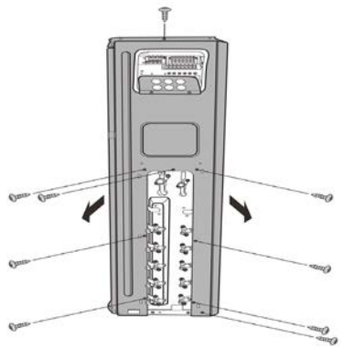
5. Remove the two screws securing the right front panel and then push it down to unhook the right front panel from the nine hooks.



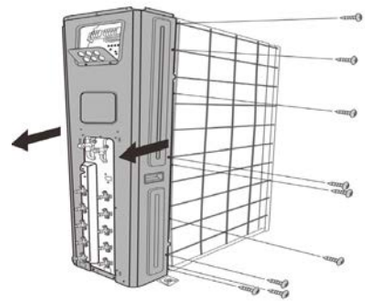
6. Remove the seven screws securing the front panel and then remove the panel



7. Remove the nine screws securing the right side of the right panel.

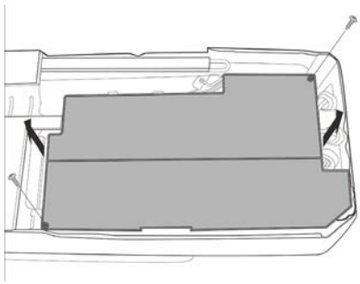
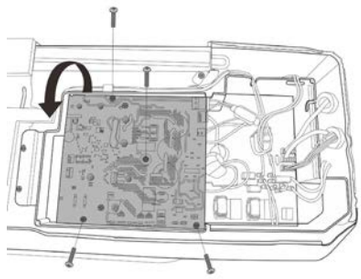
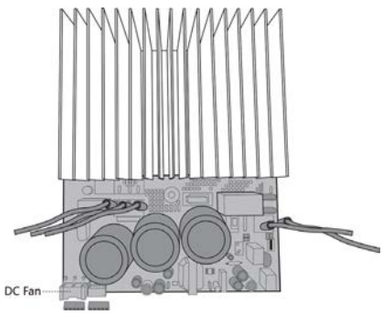
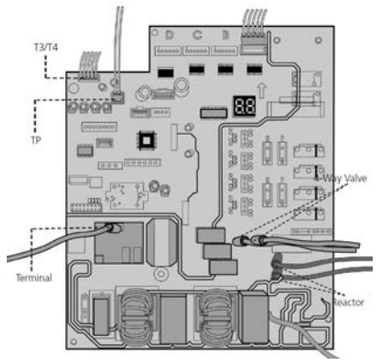


8. Remove the nine screws located on the back of the right panel and then remove the right panel.



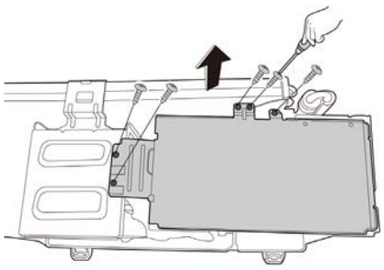
12.2. Control Board Removal

12.2.1. MPC024S4M-1P, MPC30S4M-1P, MLB030S4M-1P and MPC036S4M-1P,

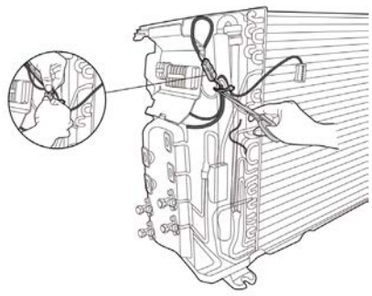
<table>
<tr>
<td>1. Disconnect power to the system.
2. Remove the two screws securing the top cover.
  </td>
<td>3. Remove the four screws securing the IPM board and then flip the board.
  </td>
</tr>
<tr>
<td>4. Disconnect the connector for outdoor DC fan from the electronic control board.
 
</td>
<td>5. Remove the connector for the compressor.
6. Pull out the two blue wires connected with the four way valve.
7. Pull out connectors of the condenser coil temp. sensor (T3),outdoor ambient temp. sensor (T4) and discharge temp. sensor (TP).
8. Disconnect the electronic expansion valve wire.
9. Disconnect the communication wire indoor PCB.
10. Disconnect the PFC inductor.
11. Then remove the electronic control box.
 
</td>
</tr>
</table>

12.2.2. MPC018S4M-1P

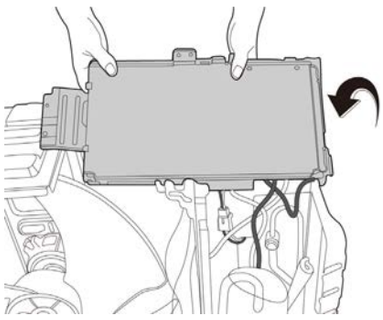
1. Disconnect power to the system.
2. Remove five screws of the cover of electrical control box cover and remove it.



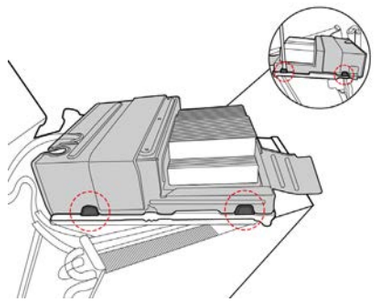
3. Cut the wire tie by and disconnect the reversing valve connector.



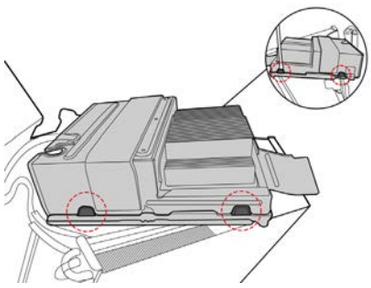
4. Ture over the electronic control box subassembly



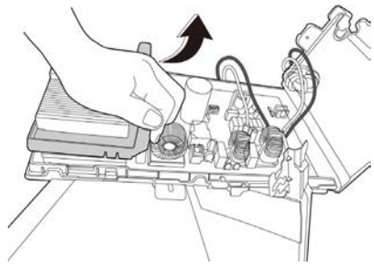
5. Remove the electronic installing box subassembly (4 hooks).



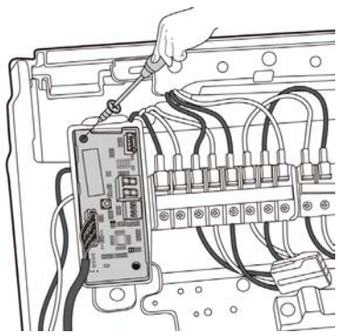
6. Remove the support of electronic control box.(



7. Disconnect the connectors from the electronic control board.
8. Remove two screws and then remove the electronic control board.(

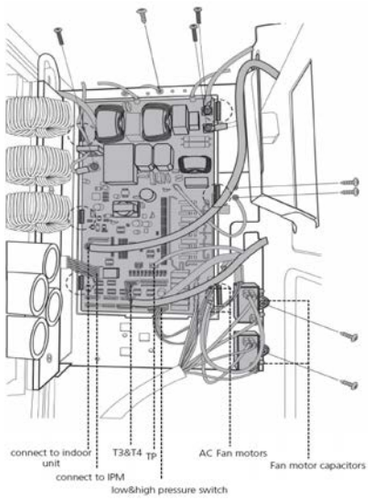


9. Pull out the connector, remove one screw and then remove the key board subassembly on terminal board.

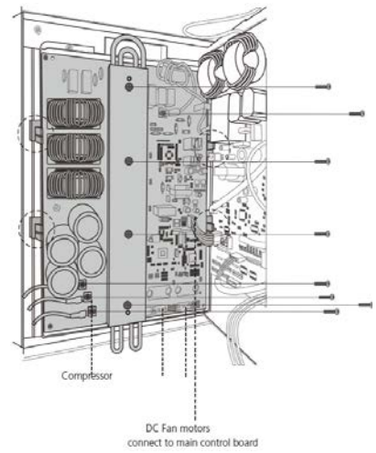


12.2.3. MLB036S4M-1P, MPC048S4M-1P and MLB048S4M-2P

1. Disconnect power to the system.
2. Remove two screws to disconnect the power supply wires.
3. Remove three screws to disconnect ground wires.
4. Disconnect the wires connected to main control board.
5. Disconnect the wires between main control board and IPM module board.
6. Remove the four screws and unfix the six hooks and then remove the main control board.
7. Remove one screw to remove the fan motor capacitor (one screw for each capacitor).



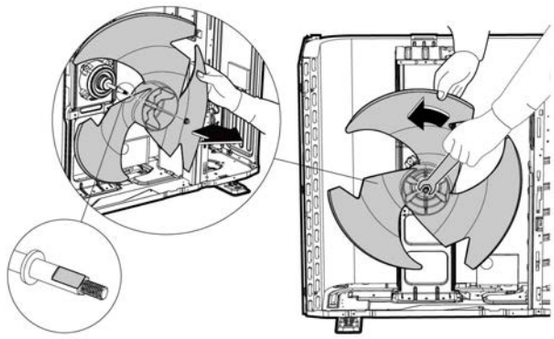
8. Remove two screws to disconnect the power supply wires.
9. Remove three screws to disconnect the ires connected to the compressor.
10. Remove three screws to remove the radiator.
11. Disconnect the wires between IPM module board and main control board.
12. Remove the four screws and unfix the 4 hooks and then remove the IPM module board.



13. Outdoor Unit Fan and Fan Motor Disassembly (All Models)

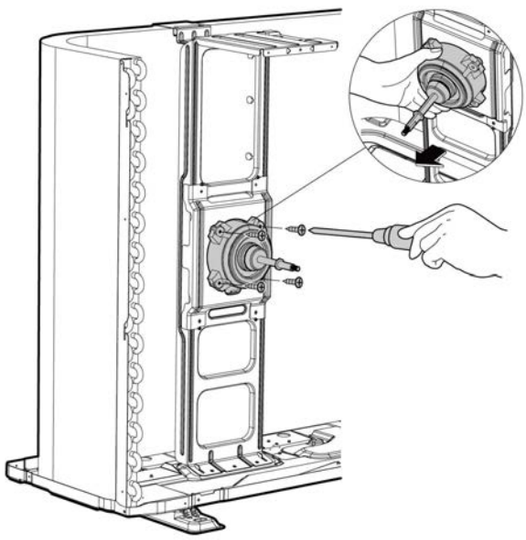
13.1. Fan Disassembly

1. Remove the nut securing the fan with a spanner
2. Remove the fan.



13.2. Fan Motor Removal

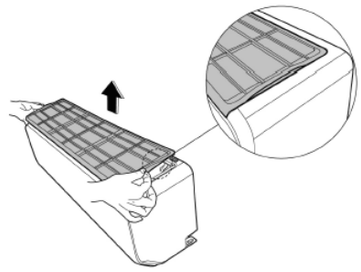
1. Remove the four screws securing the fan motor.
2. Remove the fan motor.



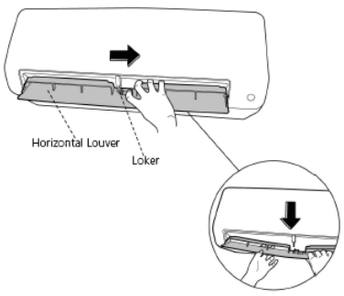
14. MWMC and 3WMC Unit Disassembly

14.1. Front Panel Removal

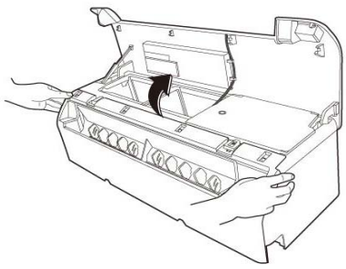
1. Place your hands both sides of filter and gently pull the filter along the vertical direction and then remove it.



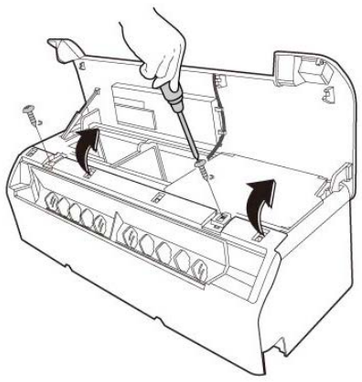
2. Open the horizontal louver and push the locker towards right to open it.
3. Bend the horizontal louver lightly to loosen the hooks, then remove the horizontal louver.



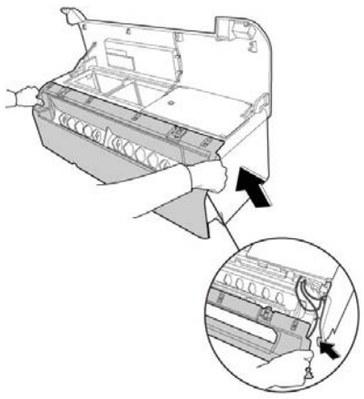
4. Open the panel assembly, move the slider to fix the panel.

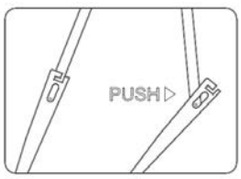


5. Remove the two screws securing the panel frame.



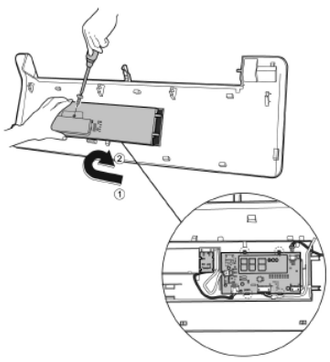
6. Pull two sides of the bottom panel along the direction indicated in right image to remove it.
7. Remove the panel assembly.(





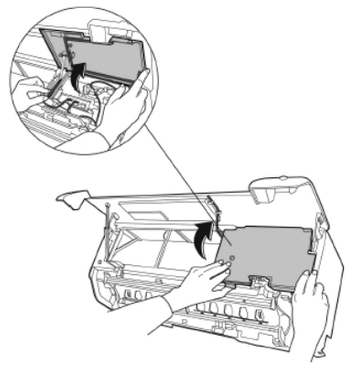
NOTE: *If you want to close the panel, you must bend the middle of mandril or it will break. For 9K to 18K models the mandril is located on the left of the unit. For 24K and up models, it is located in the middle of the machine.*

8. Remove the one screw securing the display board.
9. Rotate the display board subassembly in the direction shown in the right picture.
10. Pull the four clips to remove the display board.

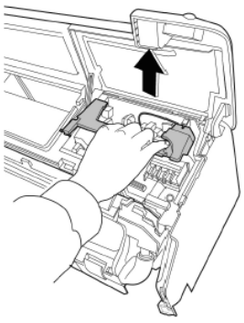


14.2. Main Control Board Removal Only

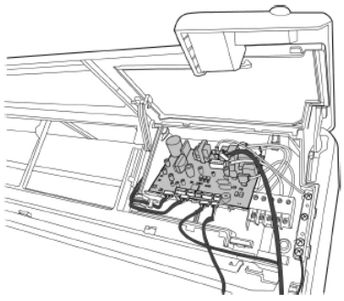
1. Pull the two lifts of the cover of electronic control box with thumbs and then open it.
2. Raise the mandril to fix the cover.(



3. Pull the electrical control box holder to remove it.



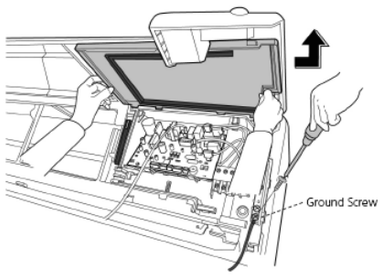
4. Disconnect the wires.



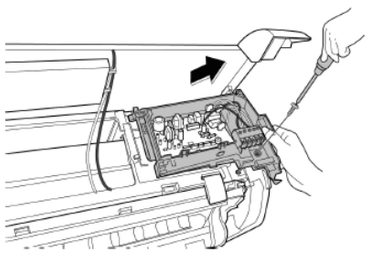
5. Remove one screw used for the ground connection.
6. Pull two clips of the electronic control box along the direction shown in the right picture to remove the main control board.

Main Control Board and Box Subassembly Removal

1. Remove the other screw used for the ground connection.
2. Collapse the mandril.
3. Pull the cover of electronic control box along the direction indicated in right image to remove it.

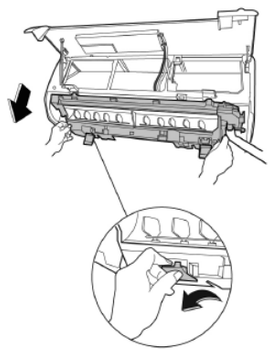


4. Remove one fixing screw then pull out the electronic control box subassembly.

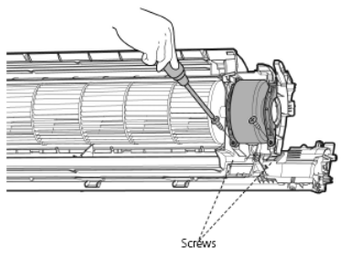


14.3. Fan Motor and Fan Removal

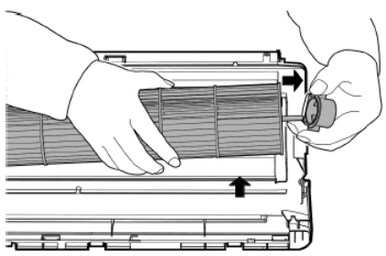
1. Open two stop blocks of chassis assembly.
2. Remove chassis assembly along the direction shown in the right picture



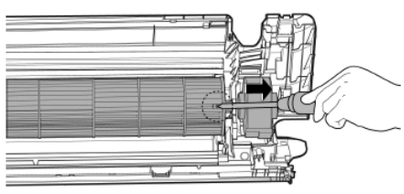
3. Remove the two screws and remove the fixing board of the fan motor



4. Remove the bearing sleeve

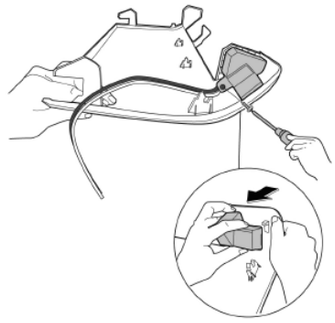


5. Remove the fixing screw.
6. Pull out the fan motor and fan assembly from the side.

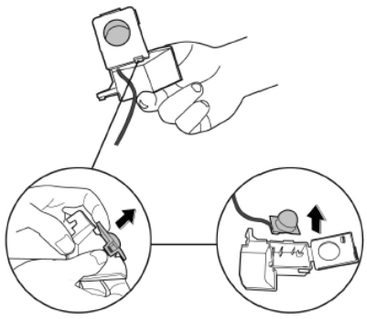


14.4. Step Motor Removal

1. Remove one screw to remove cover of louver motor.

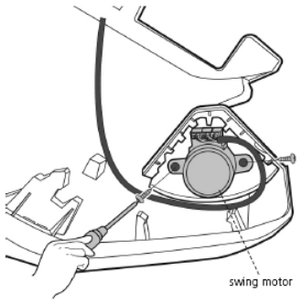


2. Open the cover of louver motor, pull out intelligent eye subassembly



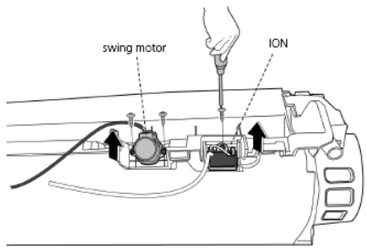
3. Remove the two screws, then remove the horizontal swing motor.

NOTE: *The horizontal swing motor is located n panel assembly.*



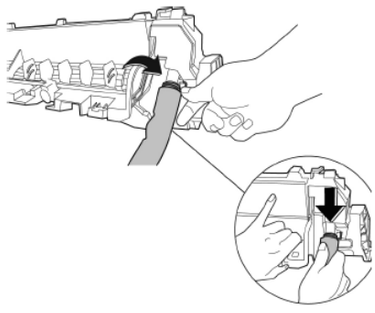
4. Remove two screws, then remove the vertical swing motor.
5. Remove 1 screw, then remove the ionizer generator.

NOTE: *The vertical swing motor and ionizer generator are located in chassis assembly*



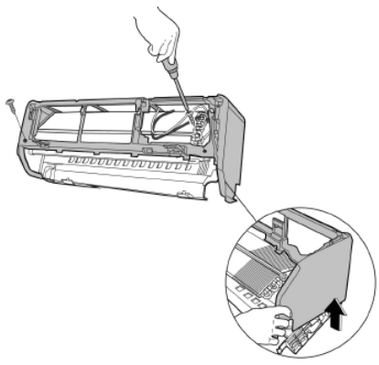
14.5. Drain Hose Removal

1. Rotate the fixed wire clockwise indicated in right image.
2. Pull up the drain hose to remove it.

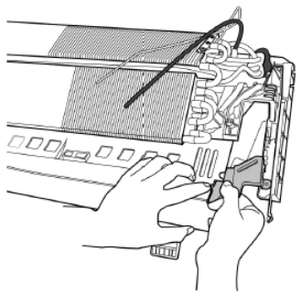


14.6. Evaporator Removal

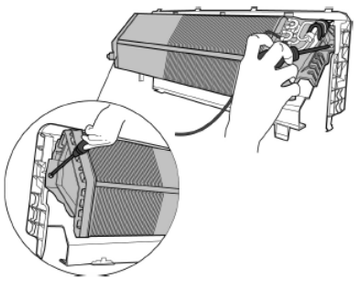
1. Remove the two screws then remove the panel frame assembly.(



2. Disassemble the pipe clamp board.



3. Remove the one screw on the evaporator located at the left fixed plate .
4. Remove the one screw on the evaporator located on the right side.



5. Bend the piping carefully, separate the chassis assembly and the evaporator then take the evaporator out.