

VersaPro™ Gas Package Unit Service Manual

MODELS:

- MPG24S060M413B
- MPG30S060M413B
- MPG36S090M413B
- MPG42S090M413B
- MPG48S090M413B
- MPG60S110M413B



Read this manual carefully before installation and keep it where the operator can easily find it for future reference.

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change without notice.

Version Date: 05/10/24

Please visit www.mrcool.com/documentation to ensure you have the latest version of this manual.

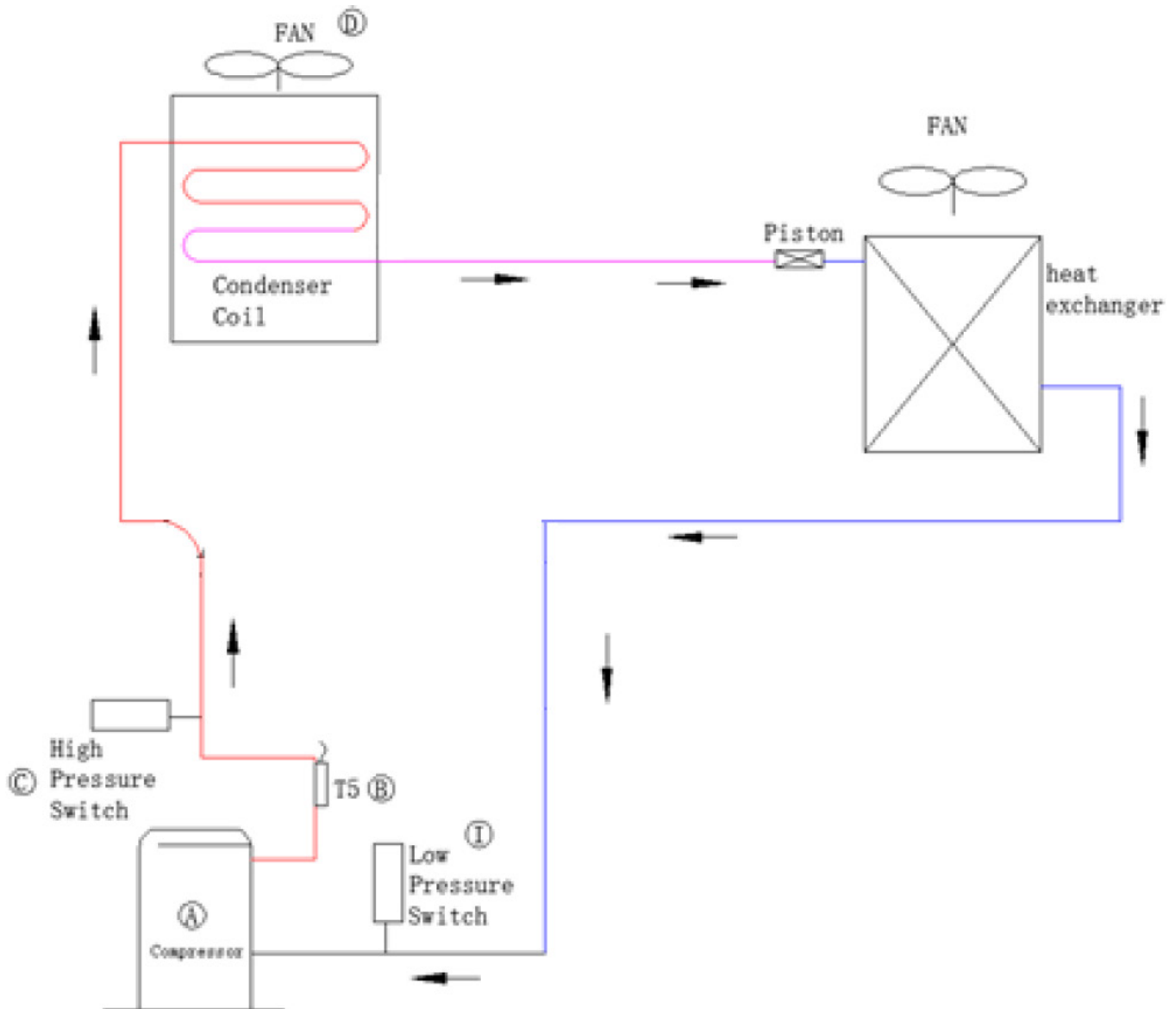


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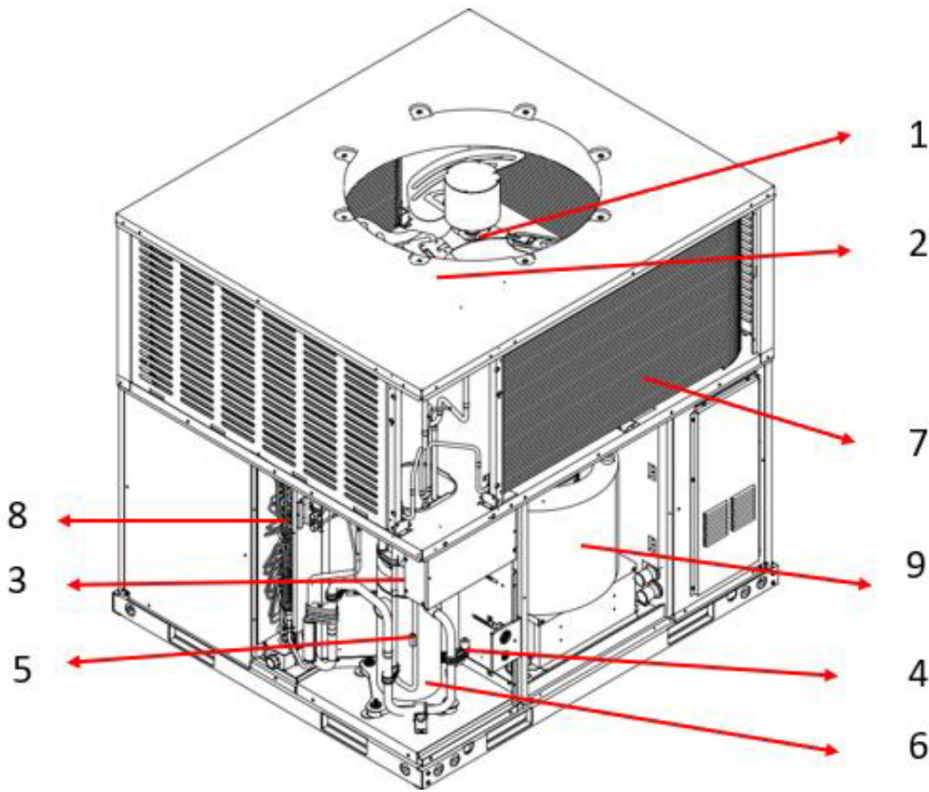
1.1 Refrigeration Circuit

Diagram Letter	Symbol	Part Name	Major Function
A	Comp.	Compressor	Compresses & drives the refrigerant
B	T5	Compressor discharge temperature sensor	Used to discharge temperature protection
C	HPS	High pressure switch	Used for high pressure protection up to 609 PSIG and recovery when below 464 PSIG
D	Fan	Fan of outdoor	Used to help heat exchange by PSC motor
I	LPS	Low Pressure Switch	Used for low pressure protection when below 29 PSIG and recovery when up to 44 PSIG.

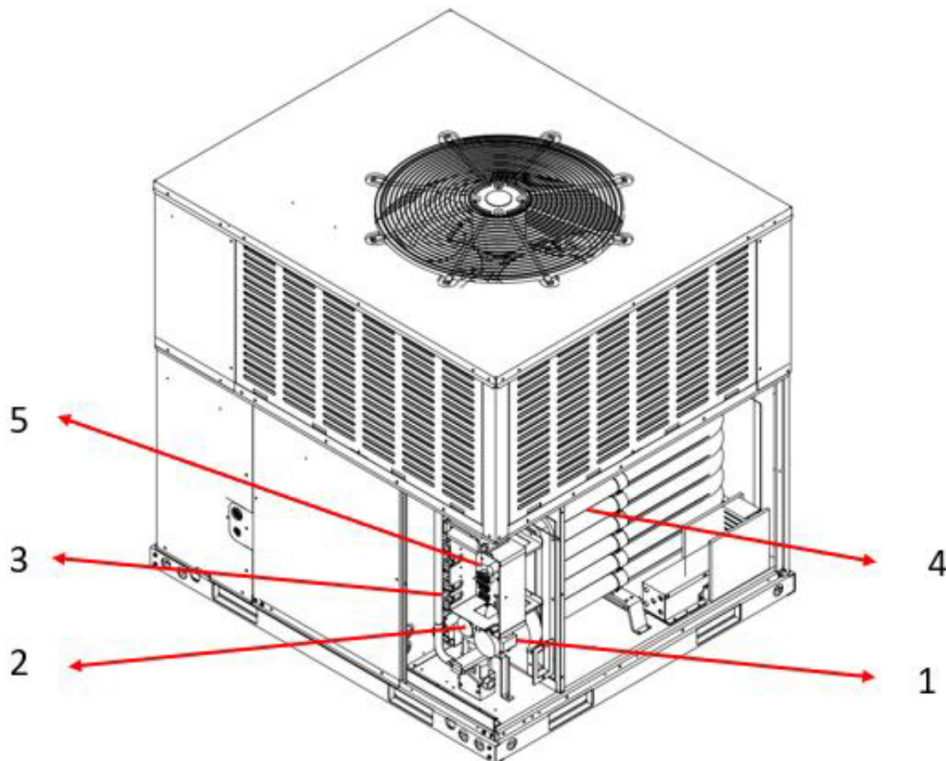


1 REFRIGERATION

1.2 Functional Parts



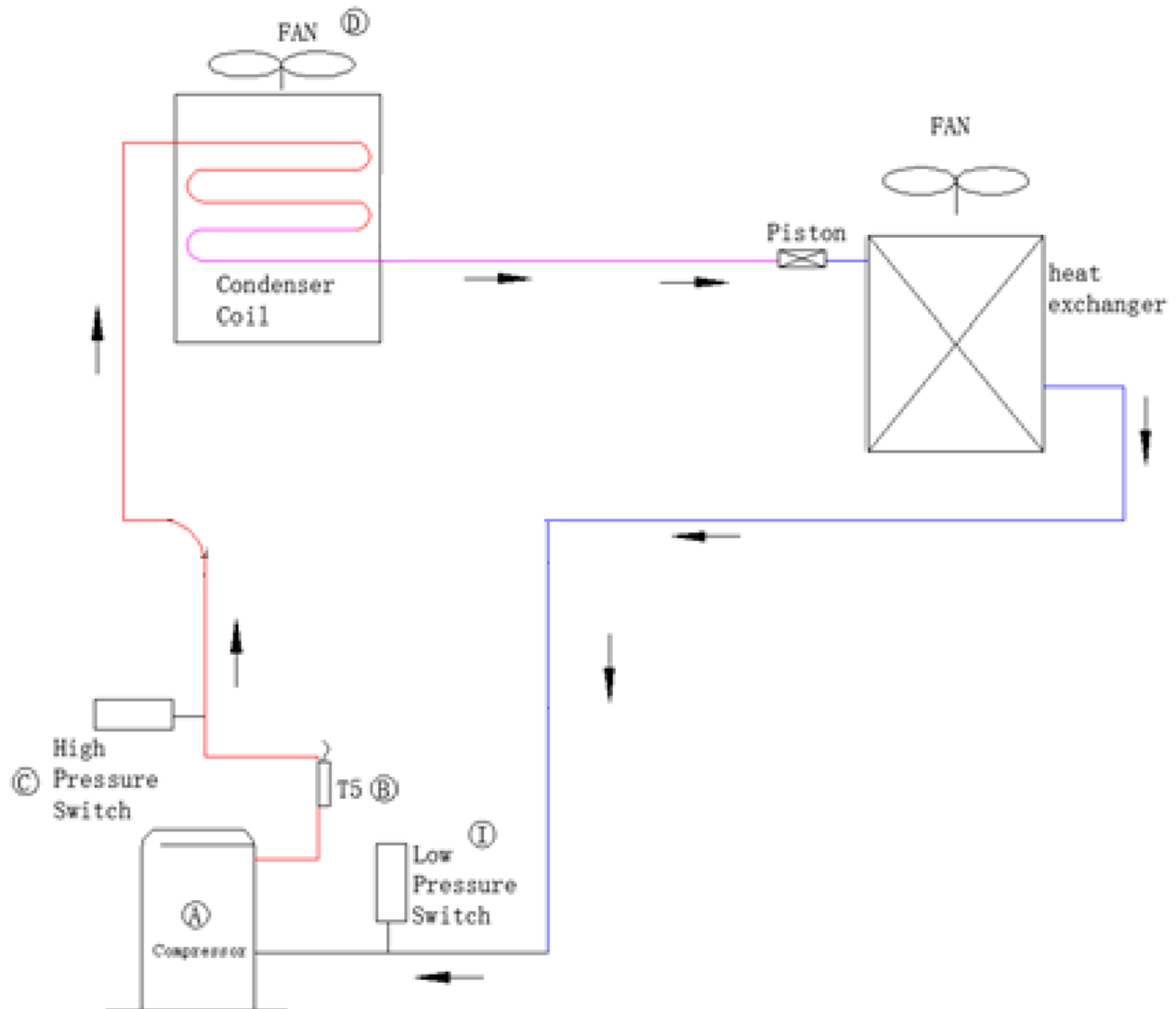
	Symbol	Part Name
1	Motor	Fan motor
2	Fan	Outdoor fan
3	HPS	High pressure switch
4	LPS	Low pressure switch
5	DTS	Discharge temperature switch
6	Comp.	Compressor
7	Cond.	Condenser Coil
8	Evap.	Evaporator Coil
9	Fan	Indoor Fan



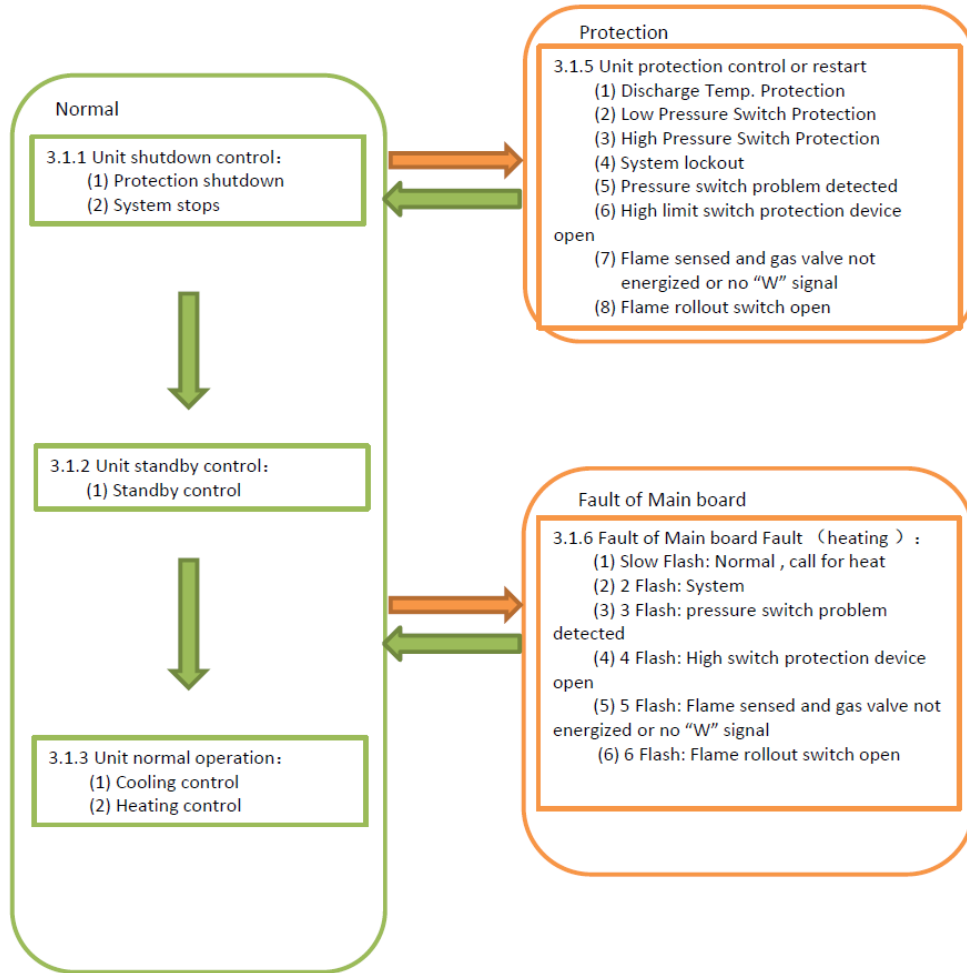
	Symbol	Part Name
1	Motor	Exhaust fan motor
2	PS	Pressure switch
3	Burner	Burner assembly
4	HEP	Heat exchange pipe
5	CB	Control board

1.3 Refrigerant Flow Chart

- High pressure gas
- High pressure liquid
- Low pressure



2.1 General Function



2.2 Unit Shutdown Control

1. Unit Protection Shutdown

To protect the outdoor unit, the system will shut down when an abnormality occurs. The LED will also show the fault code when a fault is present.

2. Thermostat Satisfied Shutdown

Anytime system is in unit standby, LED will flash slowly (2 seconds on, and 2 seconds off).

2.3 Unit Standby Control

Standby Control

- When compressor stops, the outdoor fan stops immediately.
- When "W" signal is lost, the gas valve will shut down immediately, while the smoke extraction fan and inside fan will continue to work for the time delay.

2.4 Unit Normal Operation

Reversing Valve Control

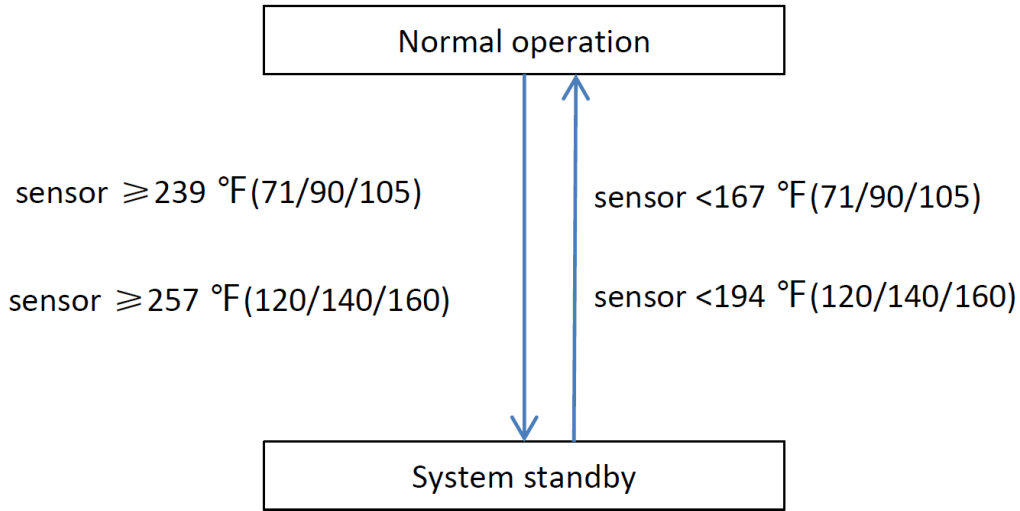
The unit needs R, C, G, Y, W signal of 24V wires.

Cooling: R, C, G, Y signals are on.

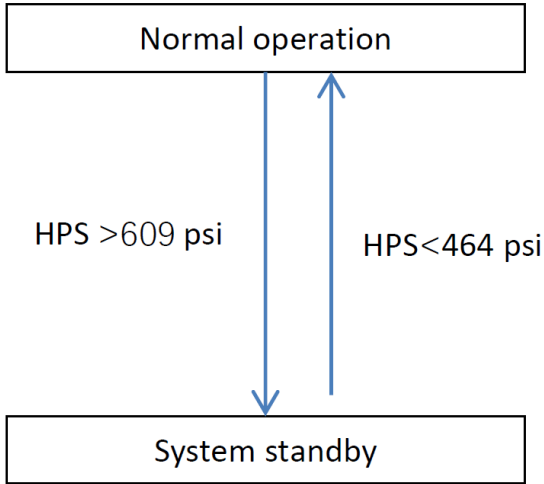
Heating: R, C, W signals are on.

2.5 Unit Protection Control

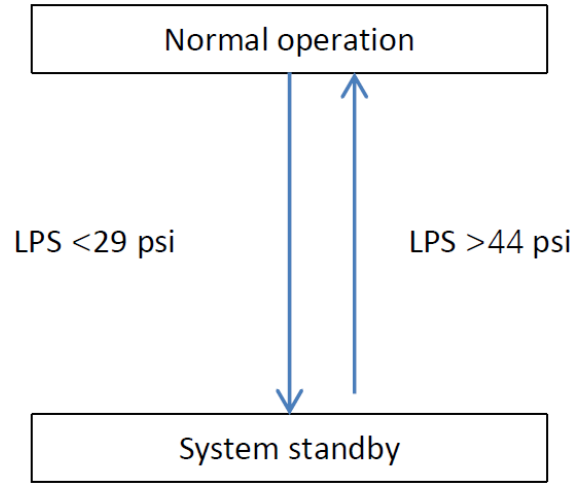
Discharge Temperature Protection in Cooling



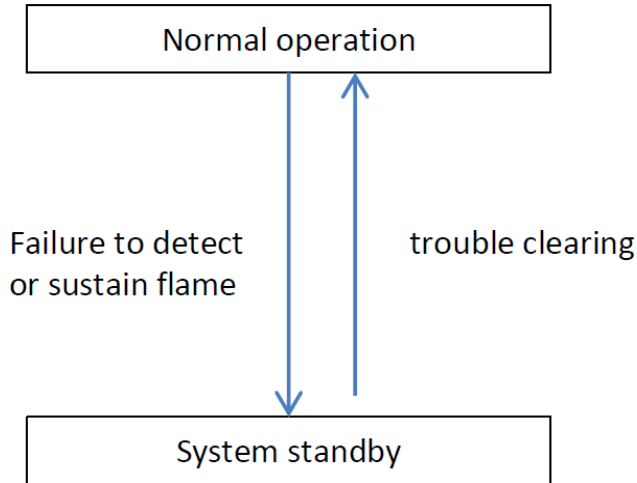
High Pressure Switch in Cooling



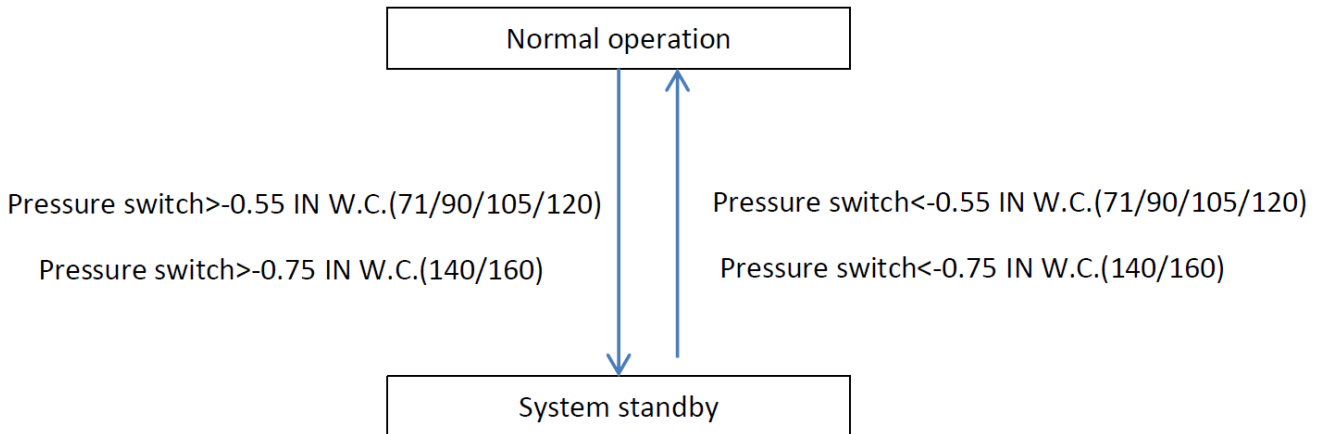
High Pressure Switch in Cooling



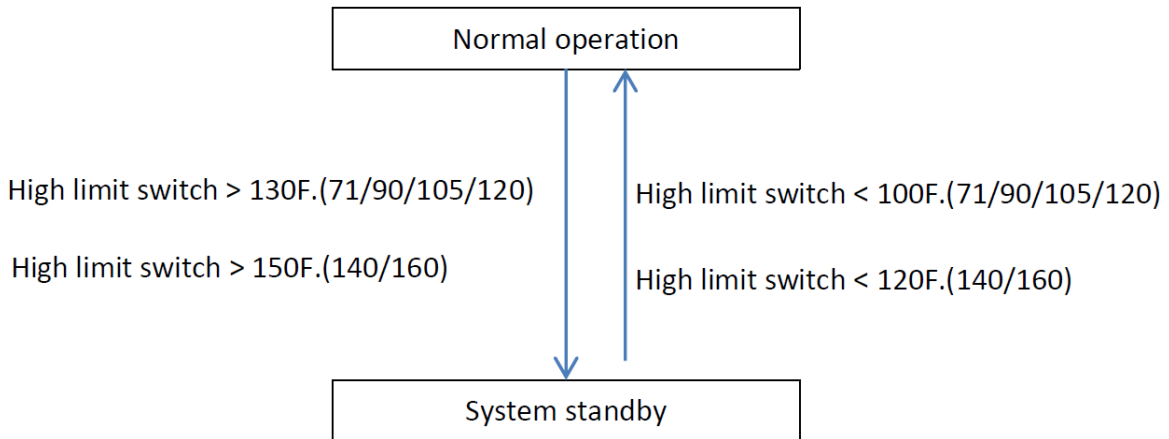
System Lockout in Heating



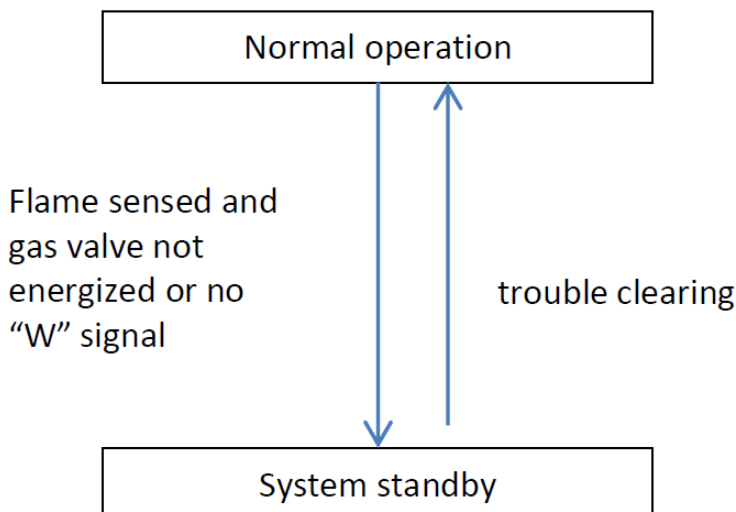
Pressure Switch Problem Detected



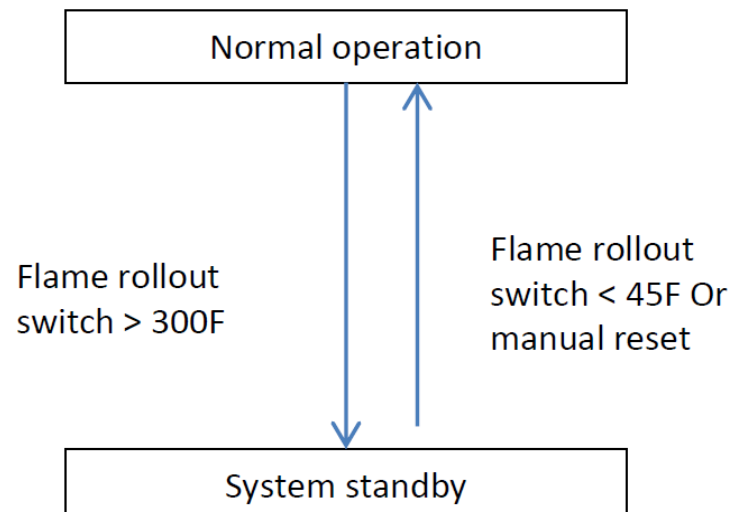
High Limit Switch Protection Device Open in Heating



Flame Sensed and Gas Valve Not Energized or No "W" Signal

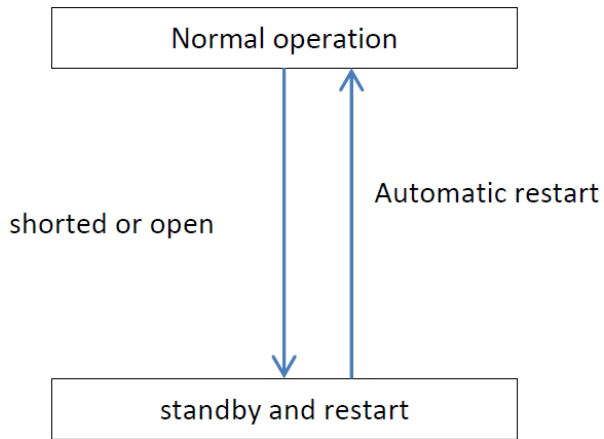


Flame Rollout Switch is Open

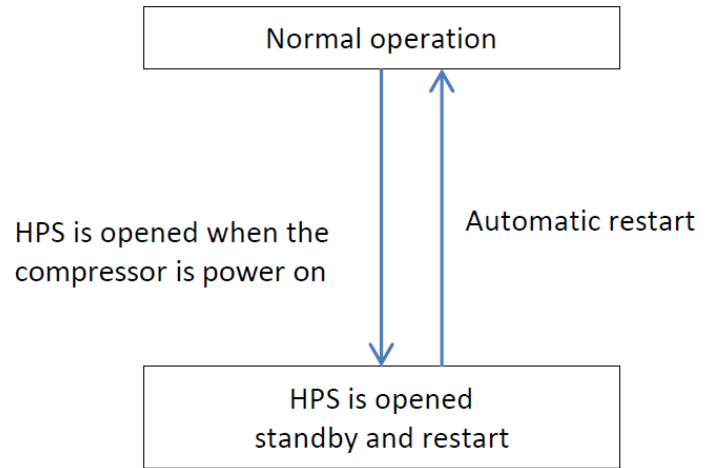


2.6 Unit Fault Control or Restart:

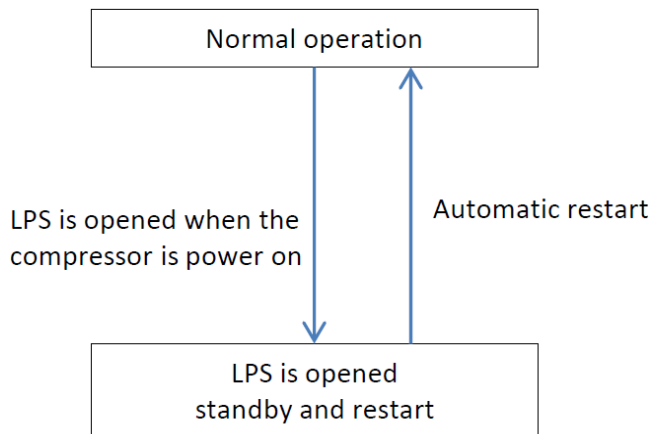
Discharge Temp. Sensor Not Reading Correctly in Cooling



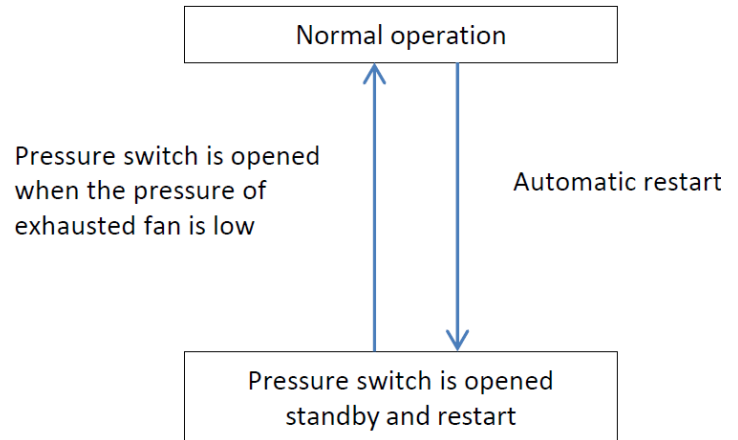
HPS Open



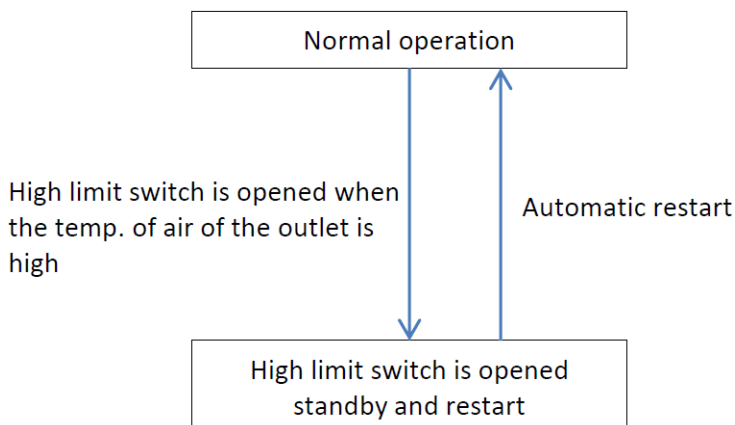
LPS Open



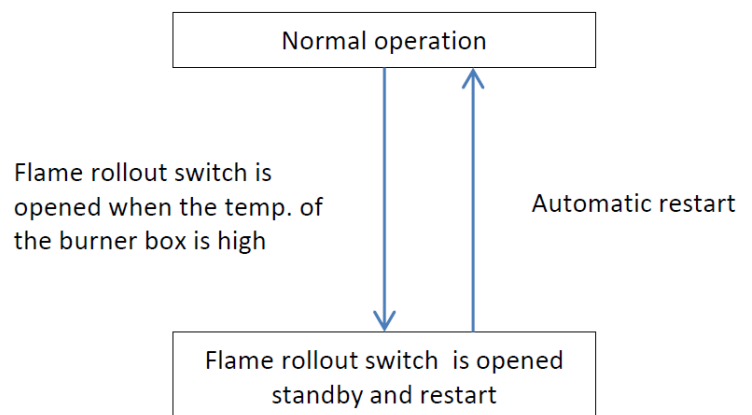
Pressure Switch in Heating



High Limit Switch Open



Flame Rollout Switch is Open

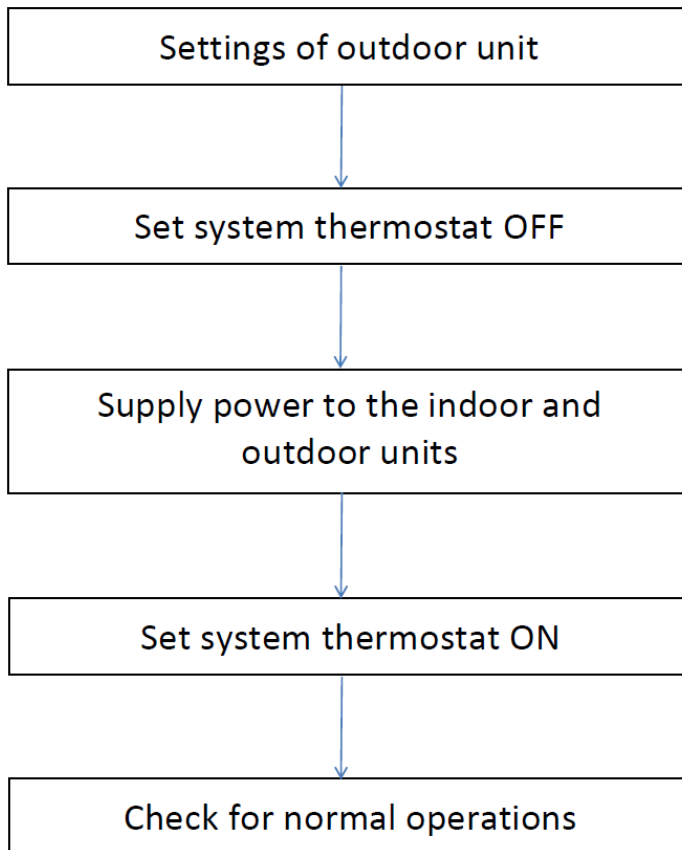


3 FIELD SETTINGS

3.1 Pre-Test Checks

	Checkpoints	Cautions or Warnings
1	Are all units securely installed?	Possibility of damage to pipe connections and unit turnover
2	Is the grounding wire installed according to the applicable local standard?	Dangerous if electrical leakage occurs
3	Is the condenser unit installed according to the location requirements?	Poor capacity; abnormal operation
4	Are all air inlets and outlets of the indoor and outdoor units unobstructed?	Poor cooling; poor heating
5	Does the drain flow out smoothly?	Pipeline water leak
6	Is piping adequately heat-insulated?	Pipeline water leak; poor capacity
7	Are the power supply wirings (including the grounding wire) connected normally?	Dangerous if electrical leakage occurs
8	Is the earth leakage circuit breaker connected normally?	Dangerous if electrical leakage occurs
9	Are the 24V signal wirings connected according to the wiring diagram? (Including the thermostat wiring and setting)	Abnormal operation
10	Does the supply voltage conform to the specifications on the name plate?	Abnormal operation; damage of unit
11	Are all sizes of cables as specified according to local regulations?	Damage of cables

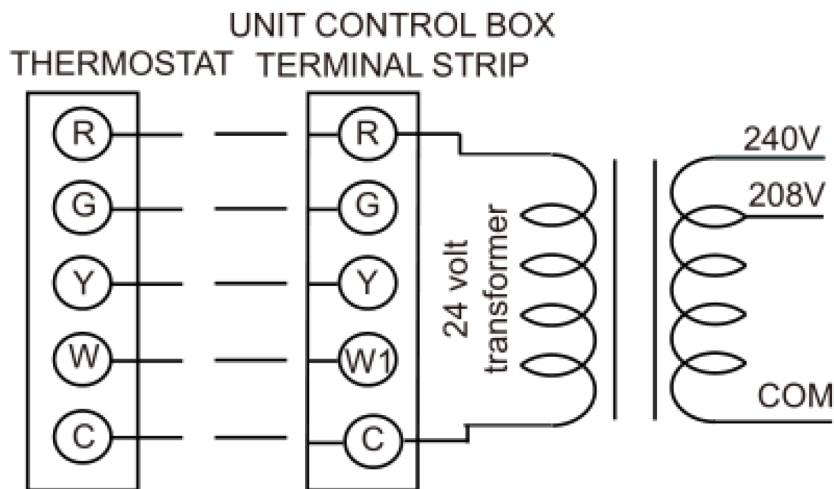
3.2 Turning Power On



Note:
 Check operations
 Check for the 24V signal from thermostat
 Check for operation mode

3.3 Thermostat

The thermostat should be mounted on an inside wall about 58" (1.6 yd) from the floor and should not be affected by unconditioned air, sun, and/or heat exposure. Follow the instructions carefully as there are many wiring requirements.



- * Only required on units with supplemental electric heat.
- ** Minimum wire size of 18 AWG wire should be used for all field-installed 24 volt wire.

4.1 System Diagnosis Introduction

Gas Board LED Code		
	Steady On	Normal Operation
	Off	Gas Board Failure
	Steady Flash	W Faults
	2 Flash	1 Hour Lockout
	3 Flash	Pressure Switch
	4 Flash	LIM Open
	5 Flash	Flame W/O Gas
	6 Flash	Rollout
	6 Flash	W1/W2 Swapped

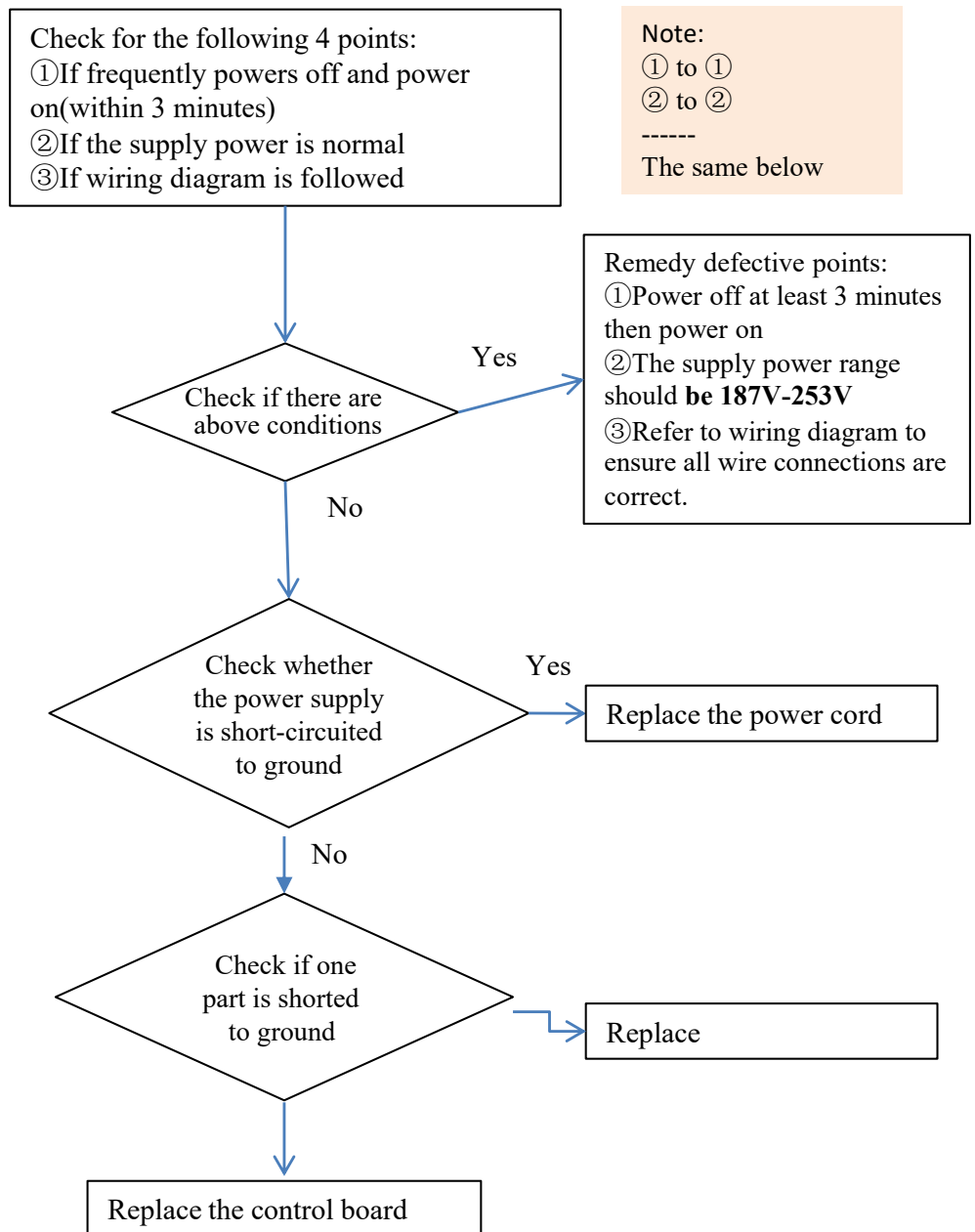
- These fault codes will be displayed until the issue is resolved.

4 TROUBLESHOOTING

4.2 Symptom-Based Troubleshooting

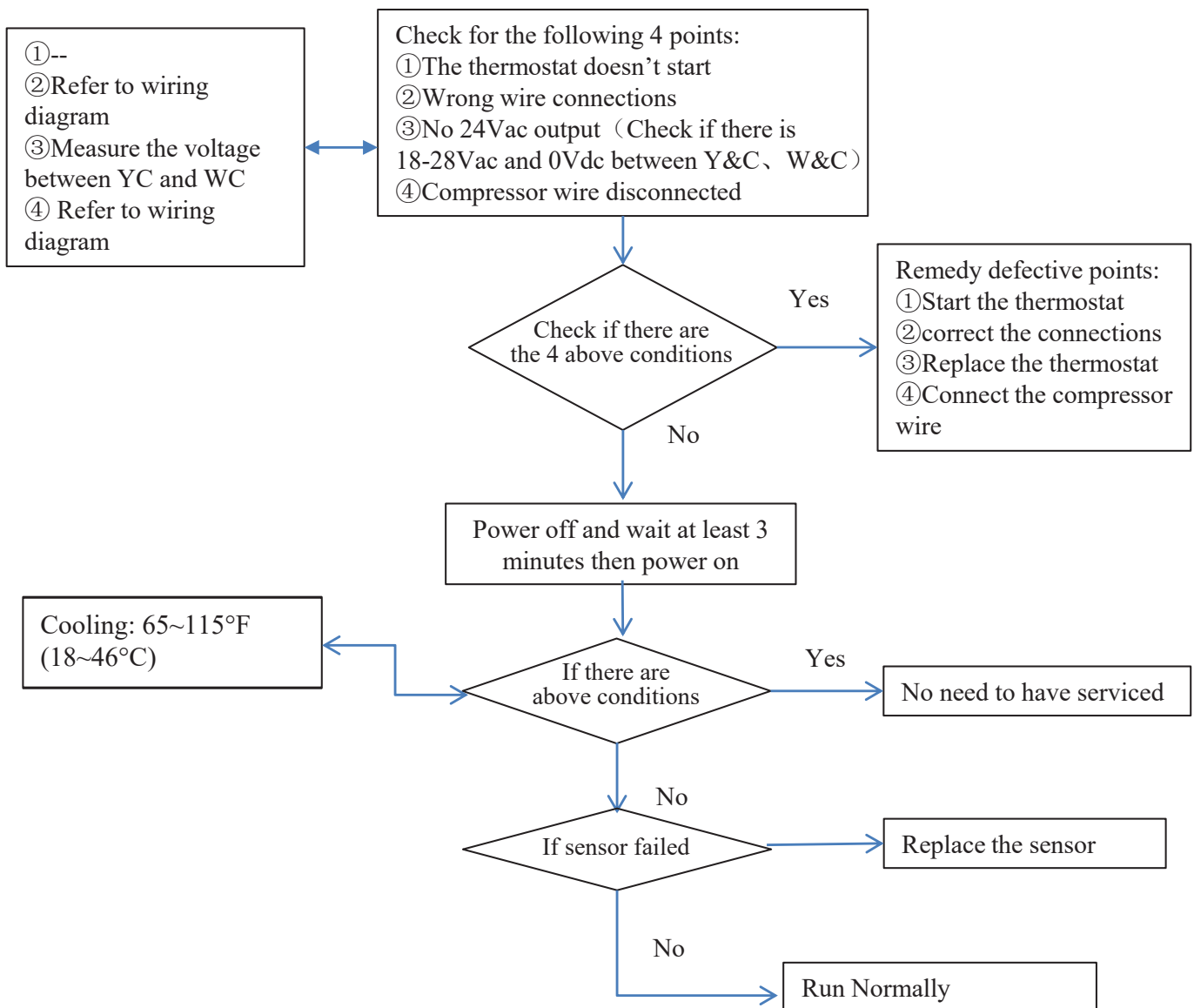
Indicator Light Off

Issue	Indicator Light Off
Model	All
Fault Name	/
Classification	Power/Electric Issue
Possible Cause	<ul style="list-style-type: none"> Frequently powers off and on (within 3 minutes) Abnormal power input Abnormal wire connections
Notes	



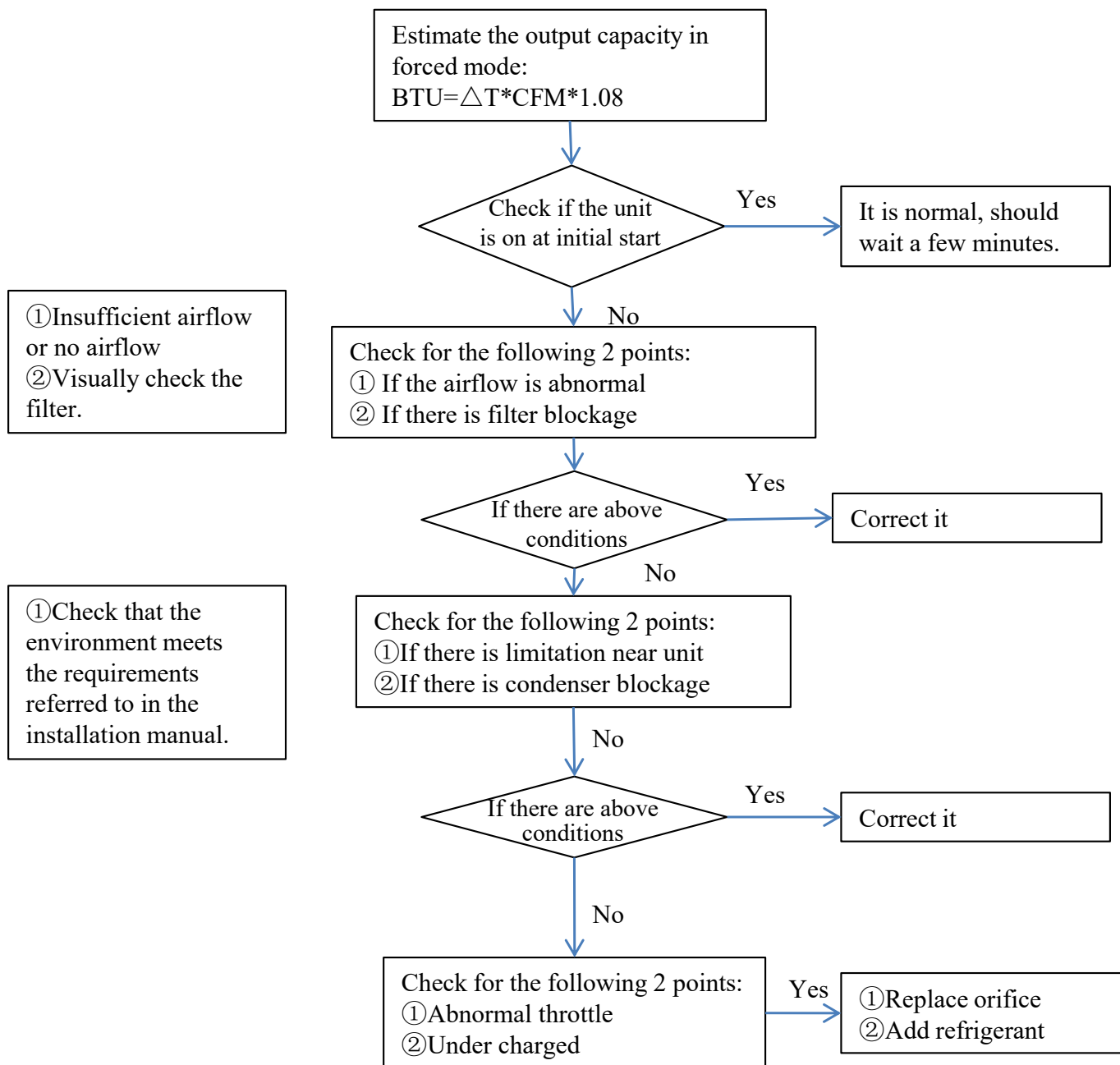
System Does Not Start Operation

Issue	System does not start operation
Model	All
Fault Name	/
Classification	Thermostat Fault
Possible Cause	<ul style="list-style-type: none"> • Thermostat doesn't start • Incorrect wiring between thermostat and unit • Damaged thermostat • Disconnected compressor wire (could occur after service)
Notes	



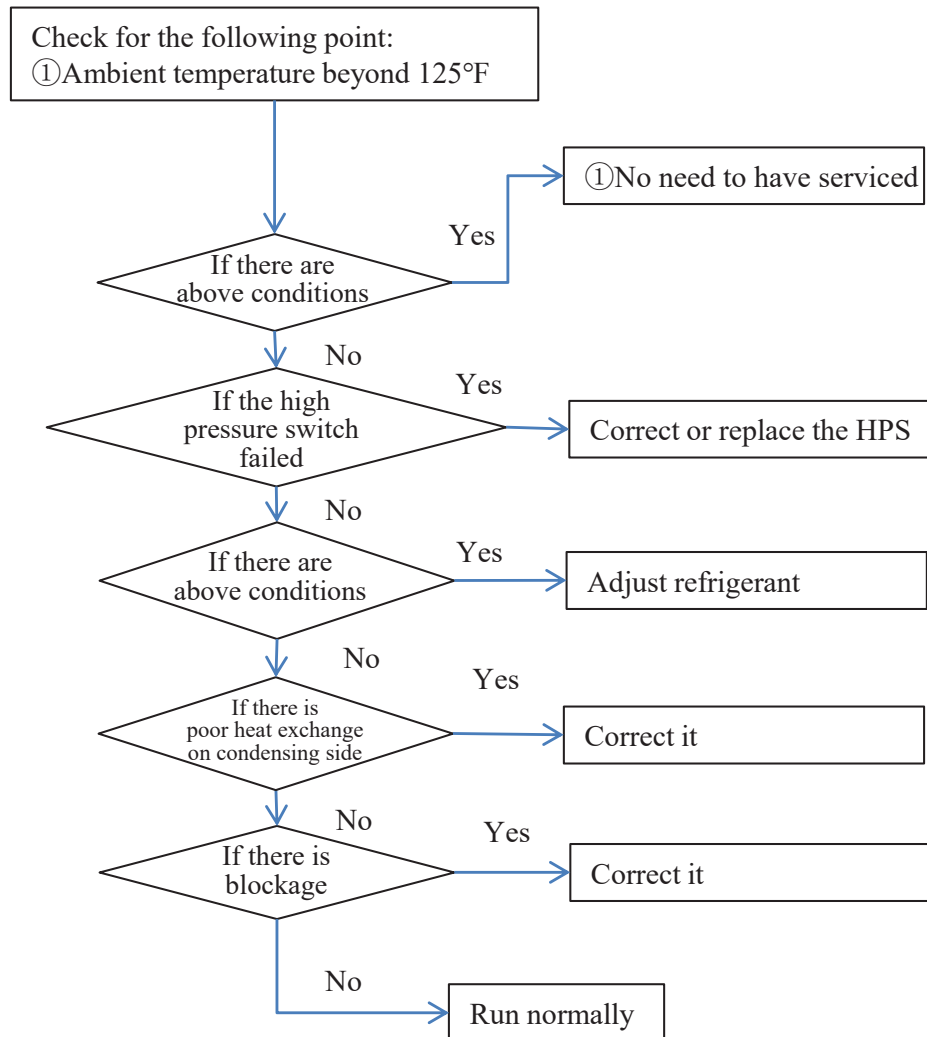
Capacity is Low

Issue	Capacity is low
Model	All
Fault Name	/
Classification	System Fault
Possible Cause	<ul style="list-style-type: none"> • Poor heat dissipation of the evaporator • Poor heat dissipation of the condenser • Undercharged • First start
Notes	



High Pressure Protection

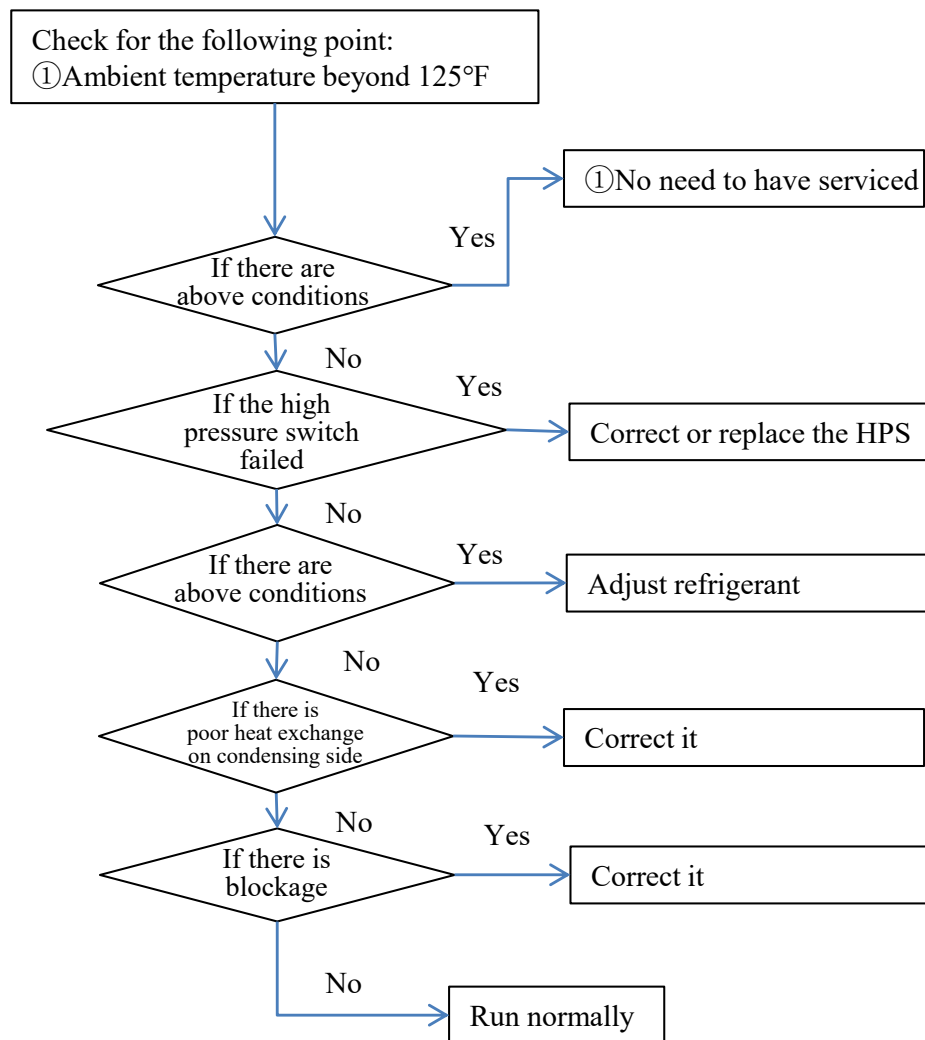
Issue	High Pressure Protection
Model	All
Fault Name	/
Classification	System Fault
Possible Cause	<ul style="list-style-type: none"> • High temperature and load • Poor heat exchange on condensing side • Orifice/filter blocked
Notes	



4 TROUBLESHOOTING

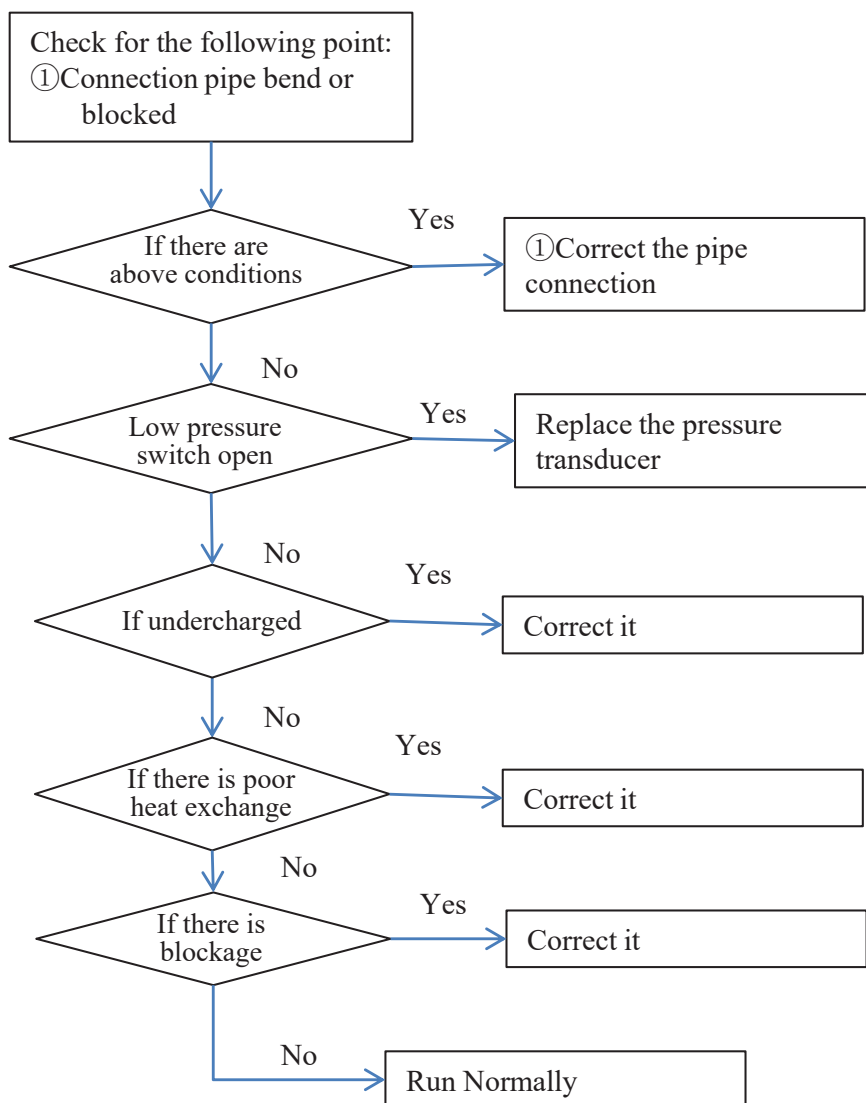
Low Pressure Protection

Issue	Low Pressure Protection
Model	All
Fault Name	T4 sensor not reading correctly in cooling
Classification	System Fault
Possible Cause	<ul style="list-style-type: none"> • Indoor fan stopped abnormally / poor heat exchange • Orifice / Filter Dryer / Indoor Coil blocked • Undercharged
Notes	



Discharge Temperature Protection

Issue	Discharge Temperature Protection
Model	All
Fault Name	/
Classification	System Fault
Possible Cause	<ul style="list-style-type: none"> • Orifice / Filter Dryer Blocked • Undercharged • Indoor unit motor stopped abnormally • Poor heat exchange on outdoor unit • Discharge temperature sensor (T5) fault
Notes	

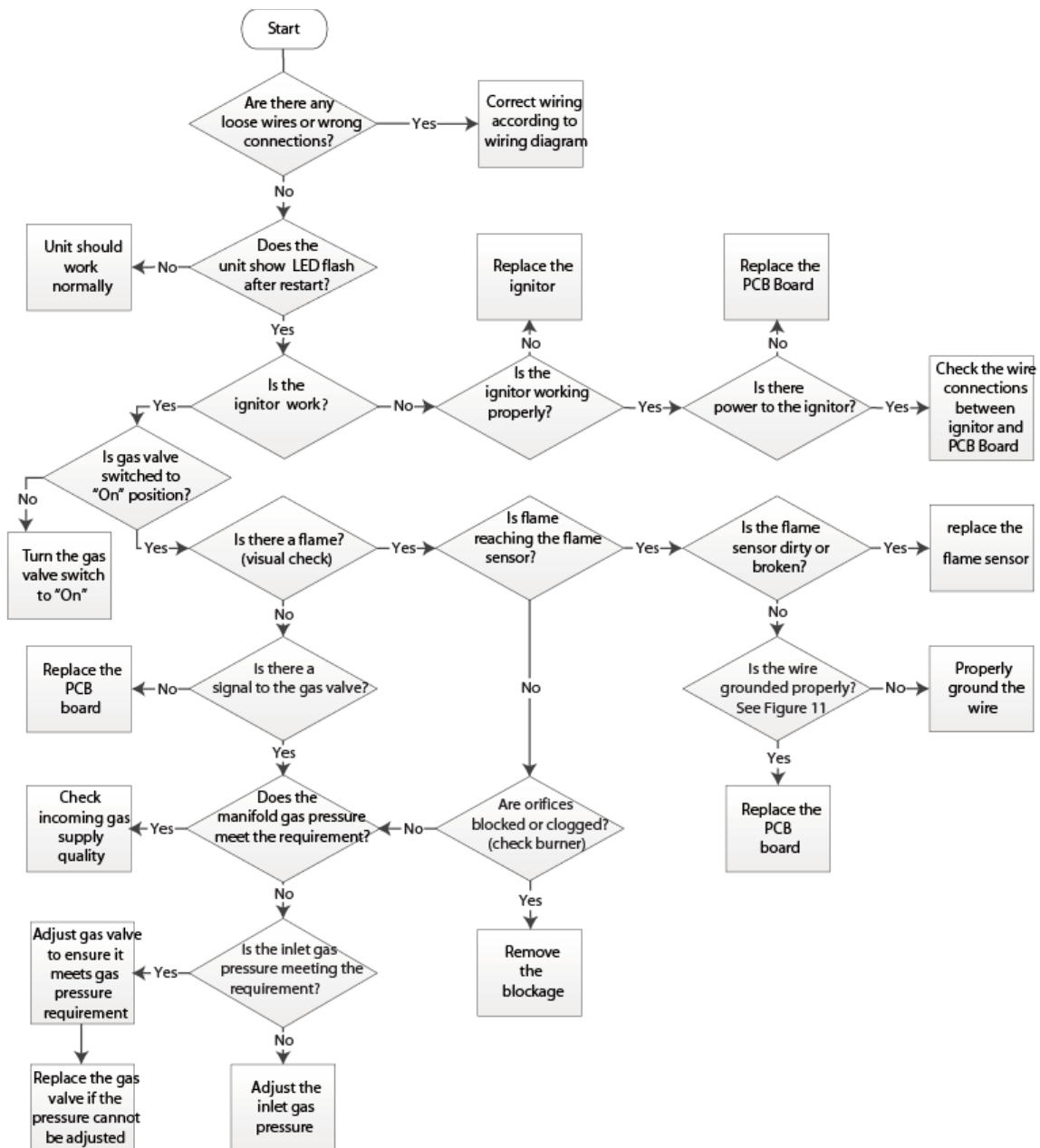


4 TROUBLESHOOTING

4.3 Troubleshooting by Main Board Fault Code

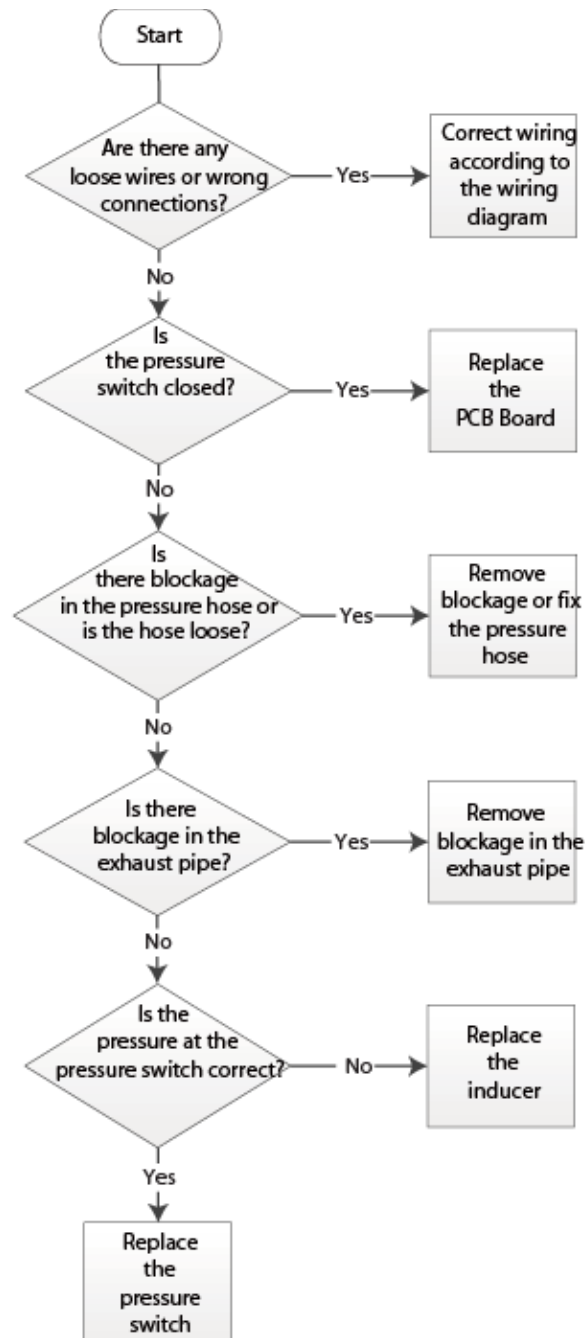
System Lockout (Heating)

Fault Code	2 Flash
Mode	All
Name	System Lockout (Heating)
Classification	System Fault
Possible Cause	<ul style="list-style-type: none"> System lockout due to failed ignition System lockout due to excessive flame dropouts System lockout due to failure to detect or sustain flame
Notes	



Pressure Switch Problem Detected

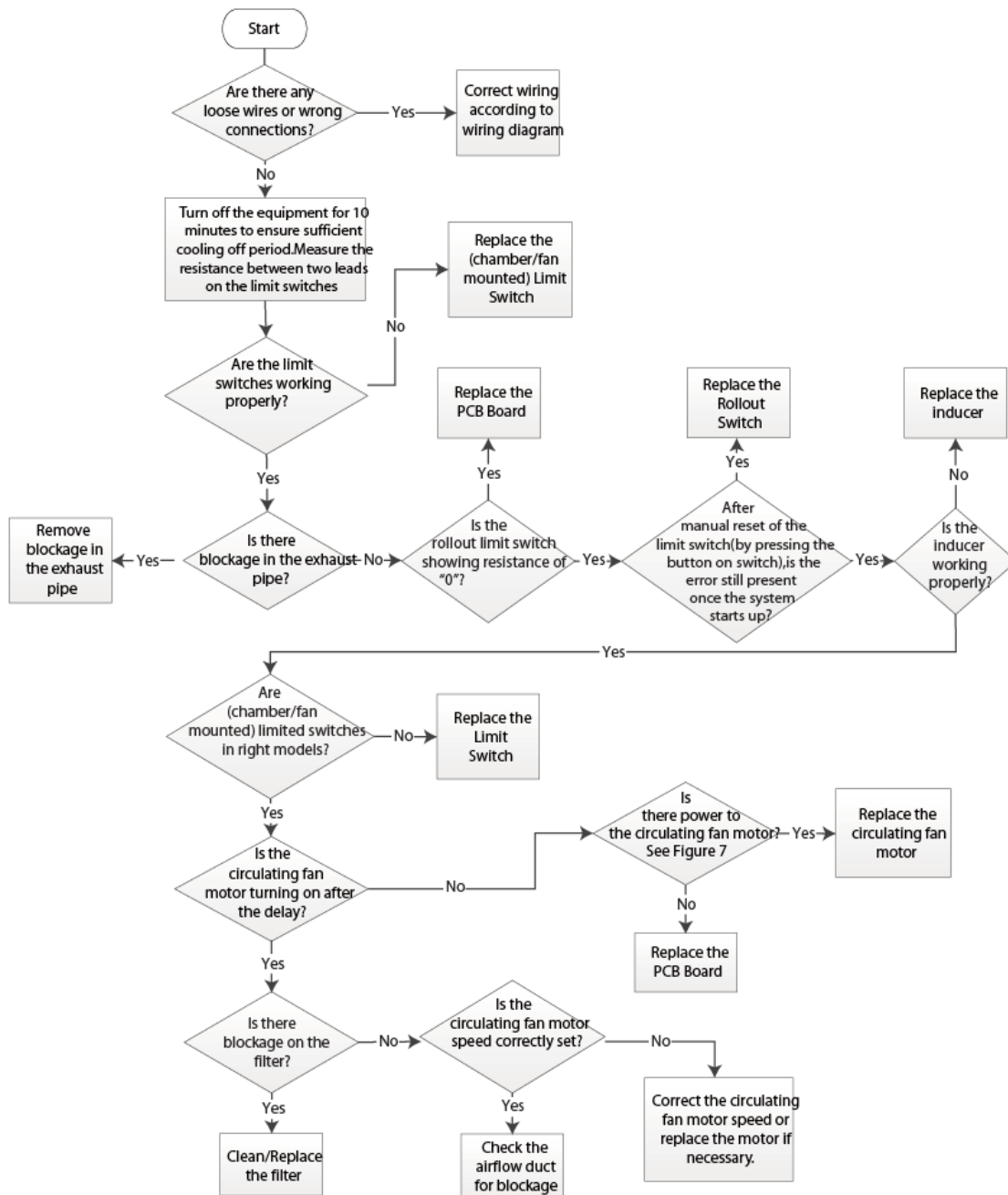
Fault Code	3 Flash
Mode	All
Name	Pressure switch problem detected
Classification	System Fault
Possible Cause	<ul style="list-style-type: none"> Faulty pressure switch Blockage in the pressure hose Blockage in the exhaust pipe
Notes	



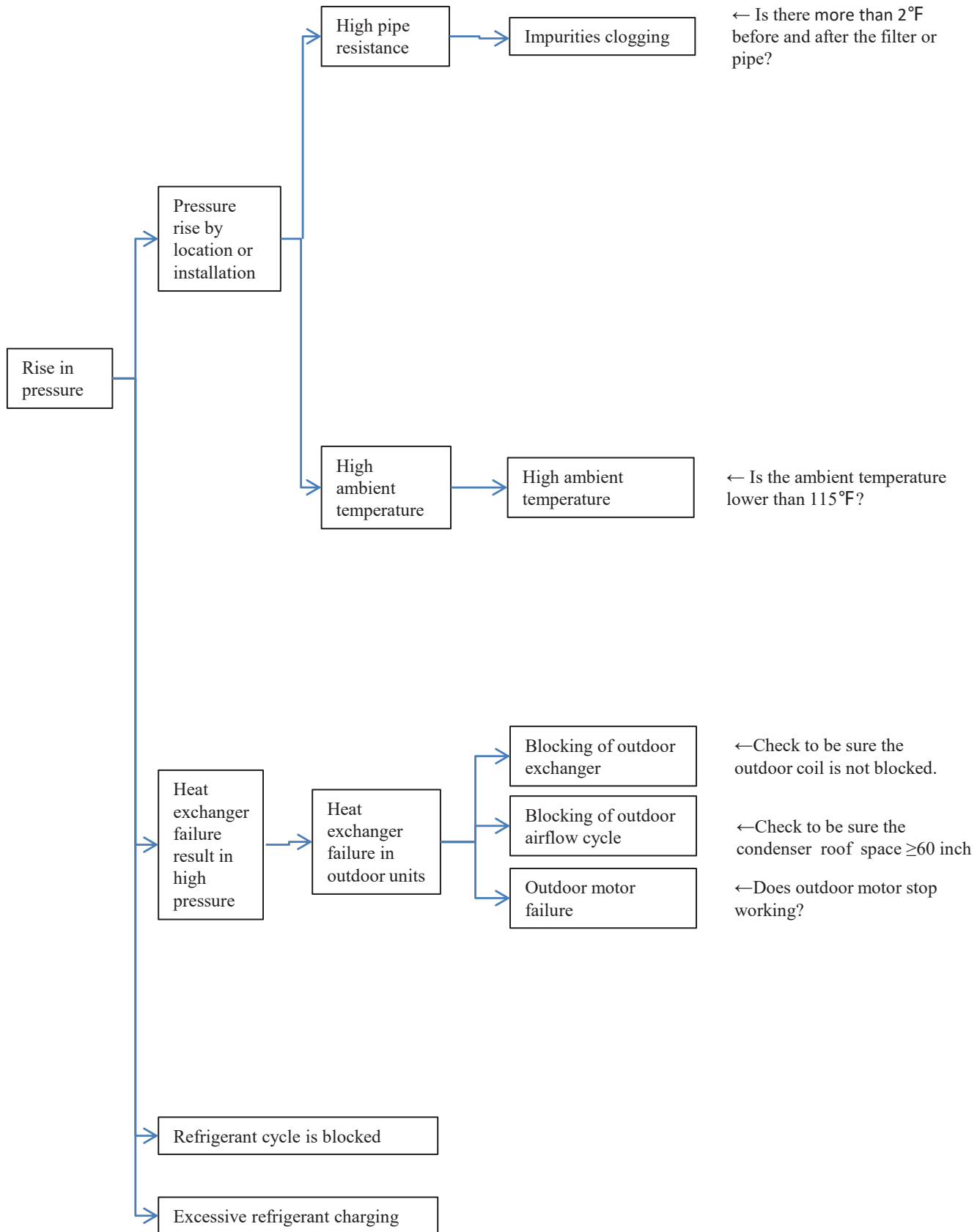
4 TROUBLESHOOTING

High Limit Switch Protection Device Open (Heating)

Fault Code	4 Flash or 6 Flash
Mode	All
Name	High limit switch protection device open (heating) Flame rollout switch open (heating)
Classification	System Fault
Possible Cause	<ul style="list-style-type: none"> • Low airflow • Blockage in the exhaust pipe
Notes	



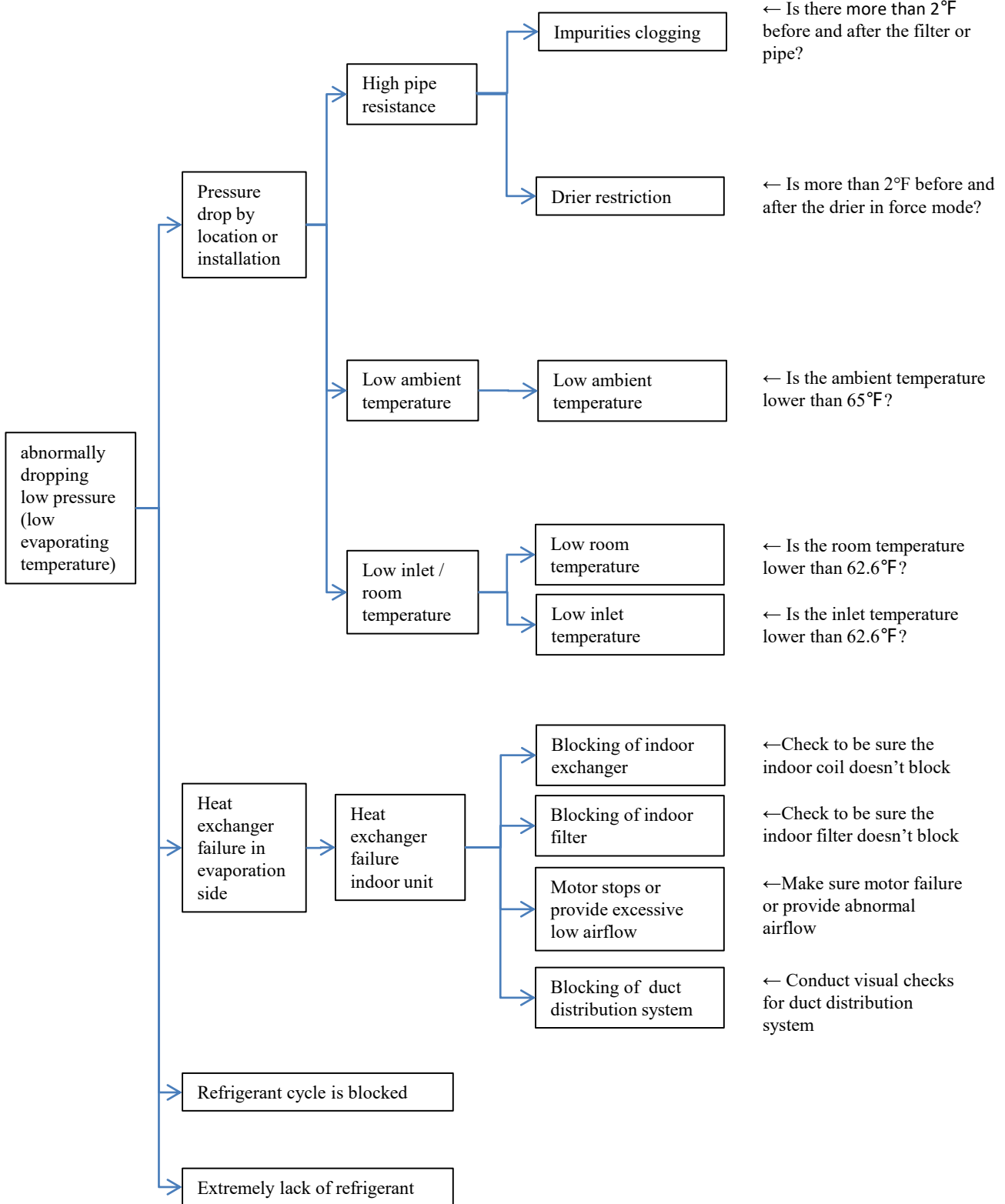
5.1 High Pressure Rise



5 SYSTEM CHECKS

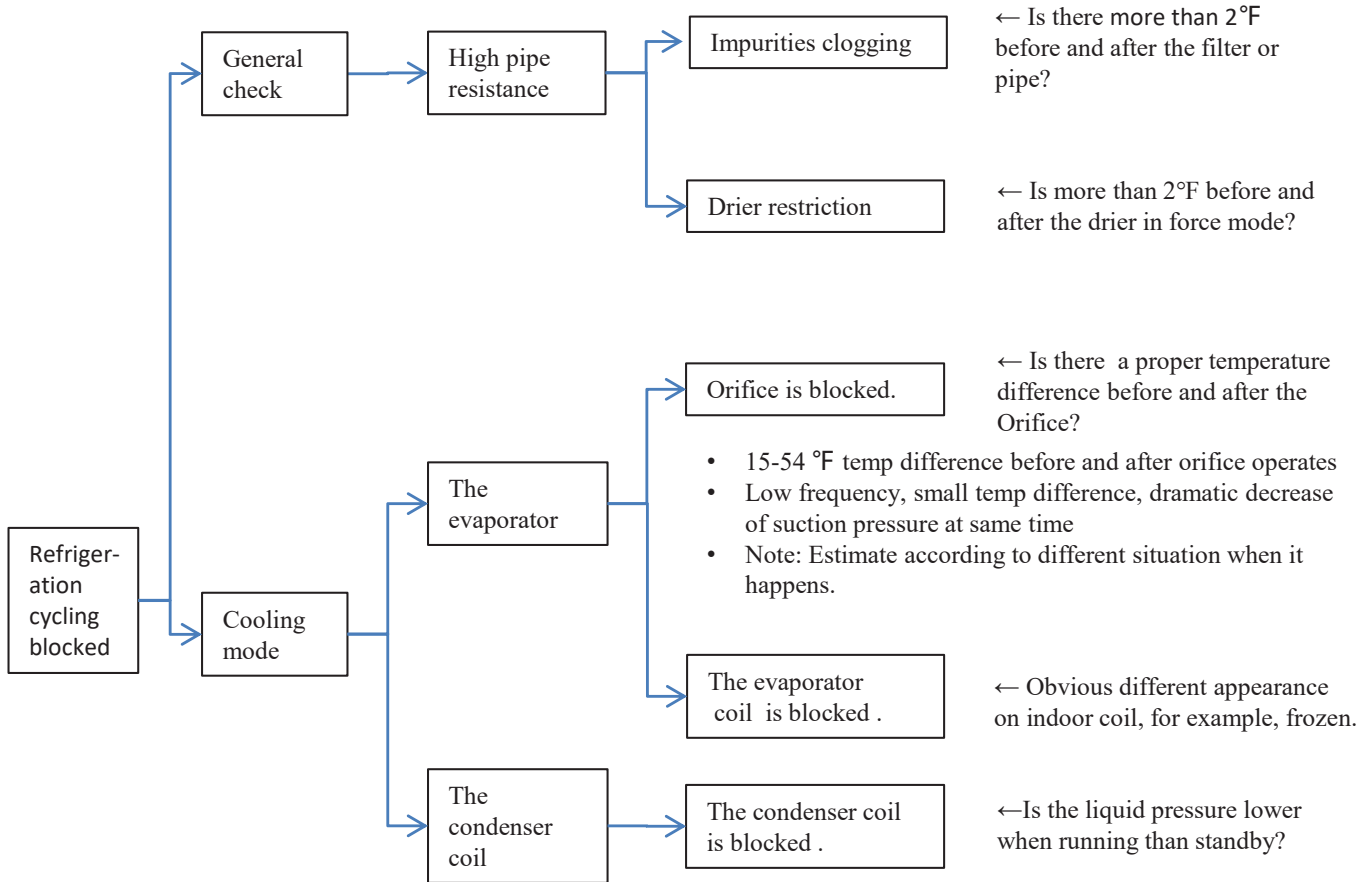
5.2 Low Pressure Drop-Cooling

Note: 110-140 PSIG head pressure is normal in cooling conditions. The value may be lower/higher at start-up or return oil stages.



5.3 Blocked Refrigeration Cycling

Note: Check during normal operation. Some problems will be more obvious.

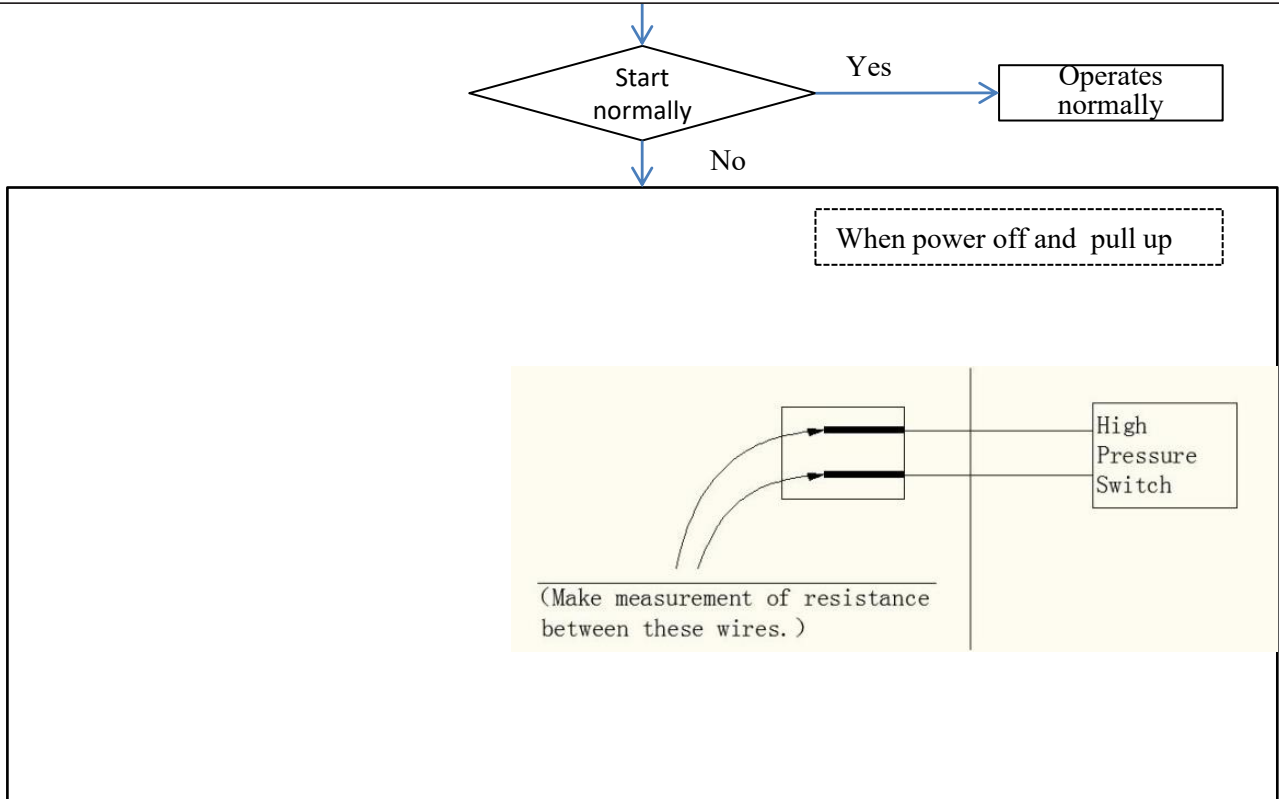


5 SYSTEM CHECKS

5.4 High Pressure Switch (HPS)

High Pressure Switch:

Ensure the switch starts normally when the unit is powered on



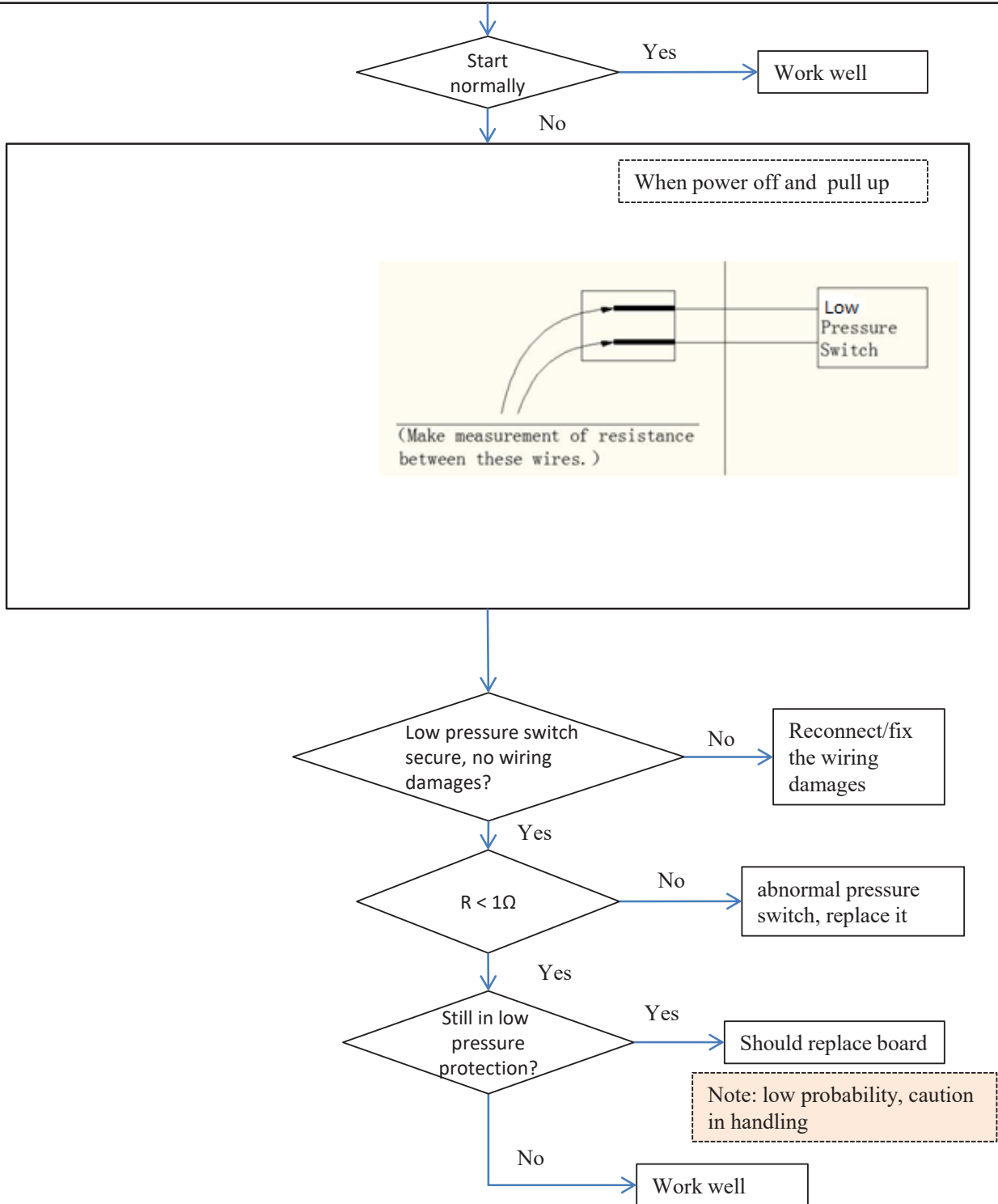
Note:
Normal high pressure switch
opens above 600PSIG, resets
below 435PSIG.

Note: low probability, caution
in handling

5.5 Low Pressure Switch (LPS)

Low Pressure Switch:

Ensure the switch starts normally when the unit is powered on

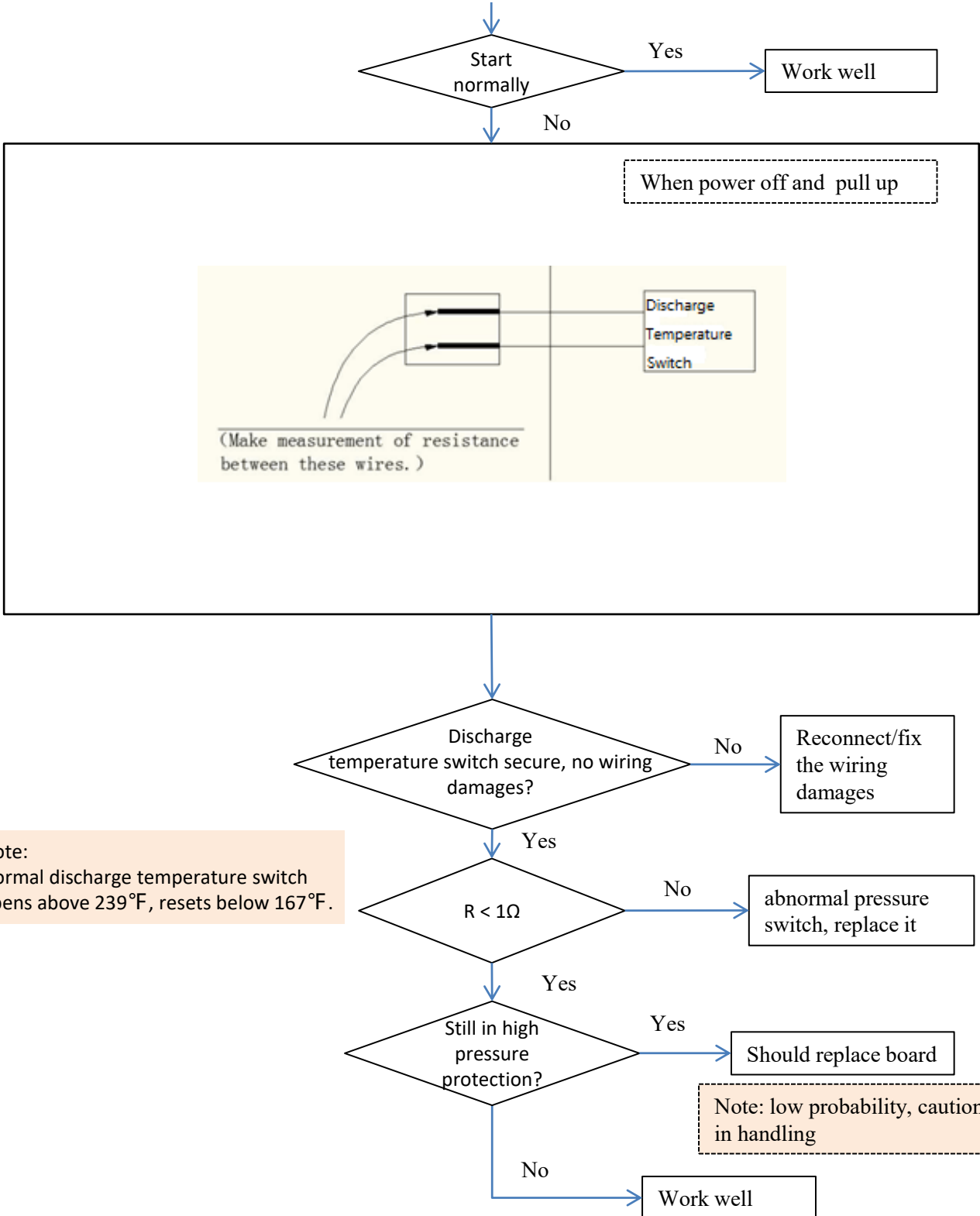


5 SYSTEM CHECKS

5.6 Discharge Temperature Switch

Discharge Temperature Switch:

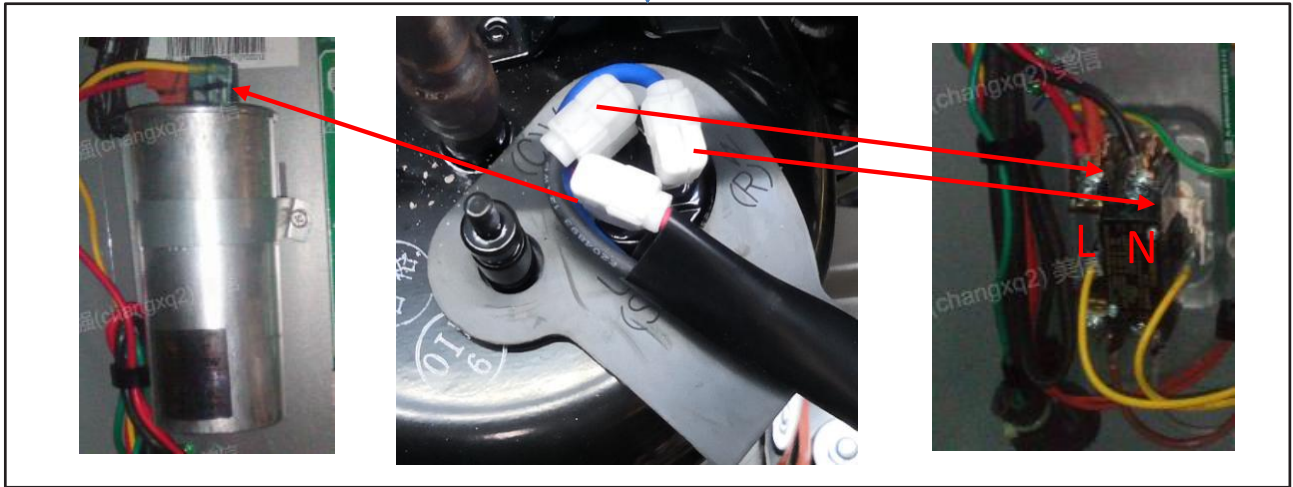
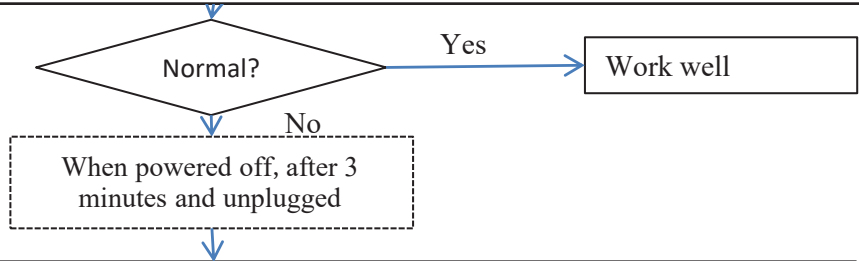
Ensure the switch starts normally when the unit is powered on



5.7 Compressor

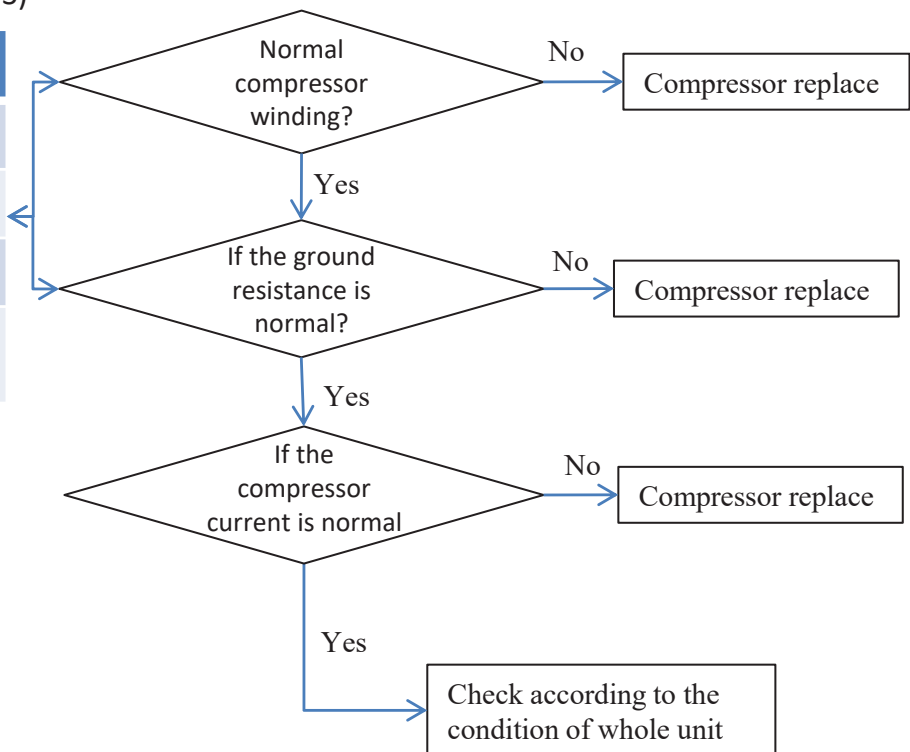
Compressor:

Ensure the compressor starts normally when the unit is powered on



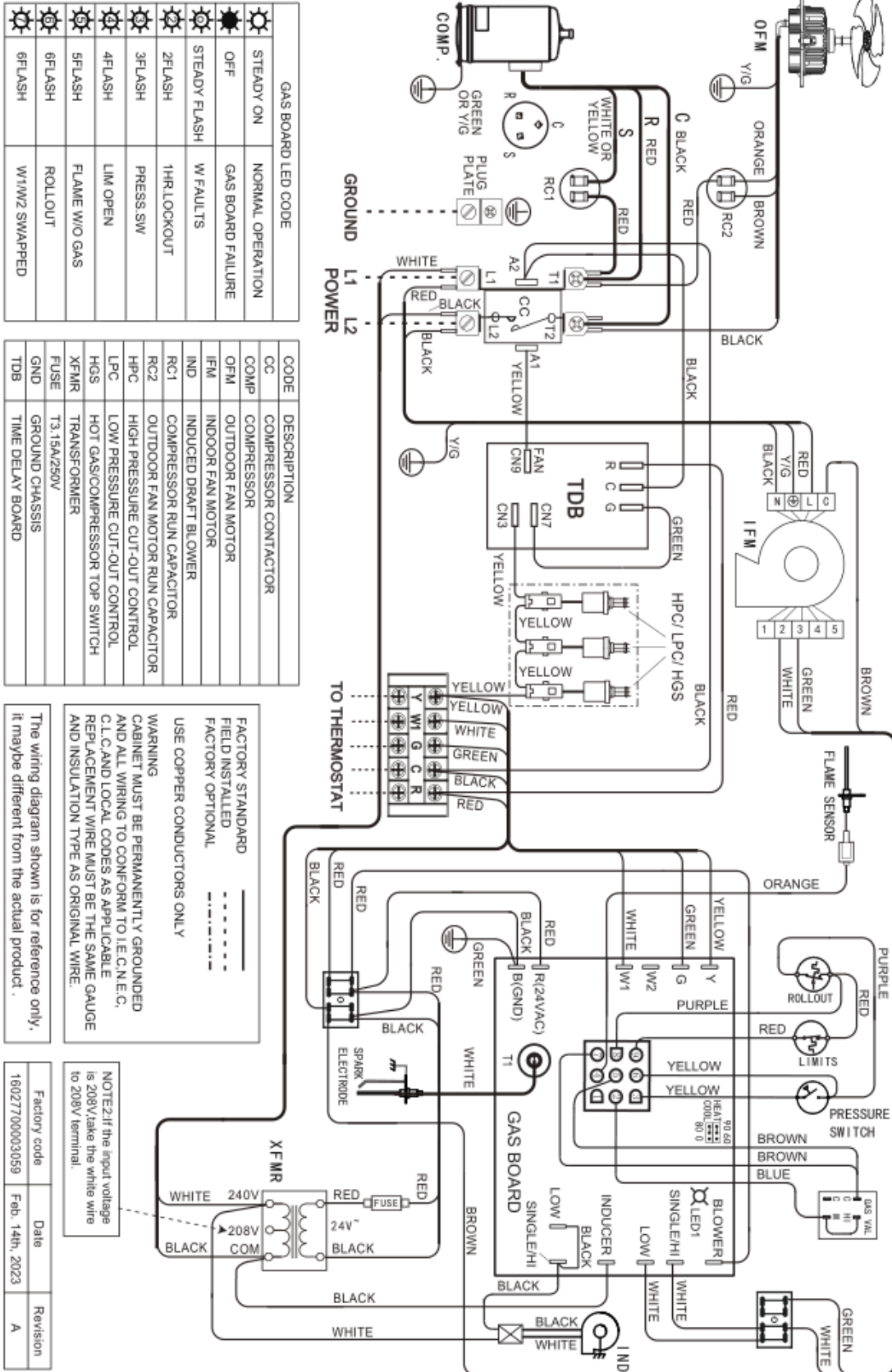
For Scroll compressor, supply wiring is unitary, you can check it with color (Red for L1, Black for L2, White for S)

Resistance (Ω)	Rotary	Scroll
Between R and C (L1 and L2)	<2	<2
Between C and S (L1 and S)	<2	<1
Between R and S (L2 and S)	<4	<1
Between U/V/W and ground	>10M	>10M

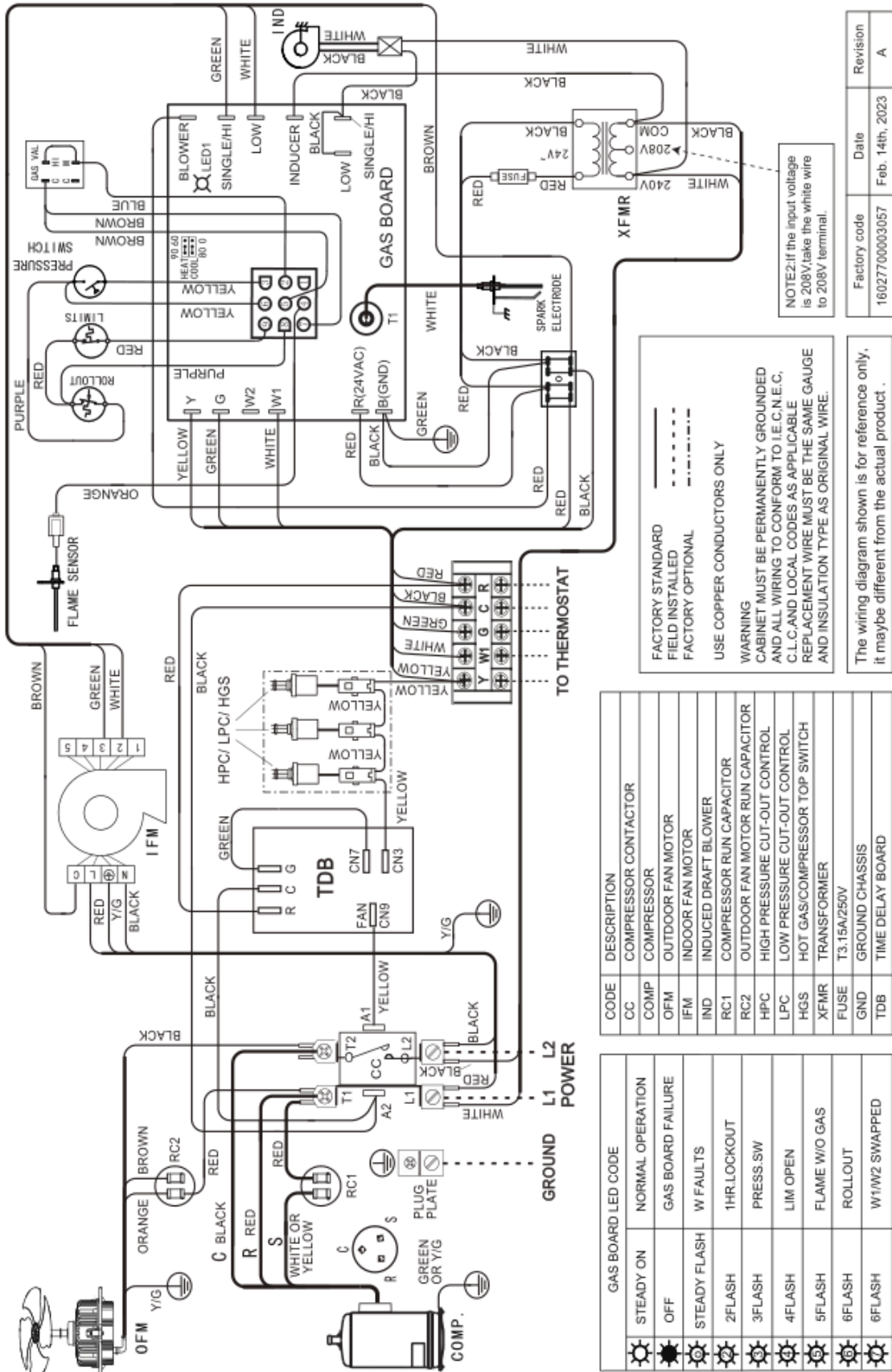


6.1 Wiring Diagrams

Wiring Diagram-24K



Wiring Diagram-30K



CODE	DESCRIPTION
CC	COMPRESSOR CONTACTOR
COMP	COMPRESSOR
OFM	OUTDOOR FAN MOTOR
IFM	INDOOR FAN MOTOR
IND	INDUCED DRAFT BLOWER
RC1	COMPRESSOR RUN CAPACITOR
RC2	OUTDOOR FAN MOTOR RUN CAPACITOR
HPC	HIGH PRESSURE CUT-OUT CONTROL
LPC	LOW PRESSURE CUT-OUT CONTROL
HGS	HOT GAS/COMPRESSOR TOP SWITCH
XFMR	TRANSFORMER
FUSE	T3.15A/250V
GND	GROUND CHASSIS
TDB	TIME DELAY BOARD

GAS BOARD LED CODE	DESCRIPTION
☀	STEADY ON
☀	NORMAL OPERATION
☀	OFF
☀	GAS BOARD FAILURE
☀	STEADY FLASH
☀	W FAULTS
☀	2FLASH
☀	1HR LOCKOUT
☀	3FLASH
☀	PRESS. SW
☀	4FLASH
☀	LIM OPEN
☀	5FLASH
☀	FLAME W/O GAS
☀	6FLASH
☀	ROLLOUT
☀	6FLASH
☀	W1/W2 SWAPPED

Wiring Diagram-36K

GAS BOARD LED CODE	
	STEADY ON
	OFF
	STEADY FLASH
	2FLASH
	3FLASH
	4FLASH
	5FLASH
	6FLASH
	6FLASH SWAPPED

CODE	DESCRIPTION
CC	COMPRESSOR CONTACTOR
COMP	COMPRESSOR
OFM	OUTDOOR FAN MOTOR
IFM	INDOOR FAN MOTOR
IND	INDUCED DRAFT BLOWER
RC1	COMPRESSOR RUN CAPACITOR
RC2	OUTDOOR FAN MOTOR RUN CAPACITOR
HPC	HIGH PRESSURE CUT-OUT CONTROL
LPC	LOW PRESSURE CUT-OUT CONTROL
HGS	HOT GAS/COMPRESSOR TOP SWITCH
XFMR	TRANSFORMER
FUSE	T3.15A/250V
GND	GROUND CHASSIS
TDB	TIME DELAY BOARD

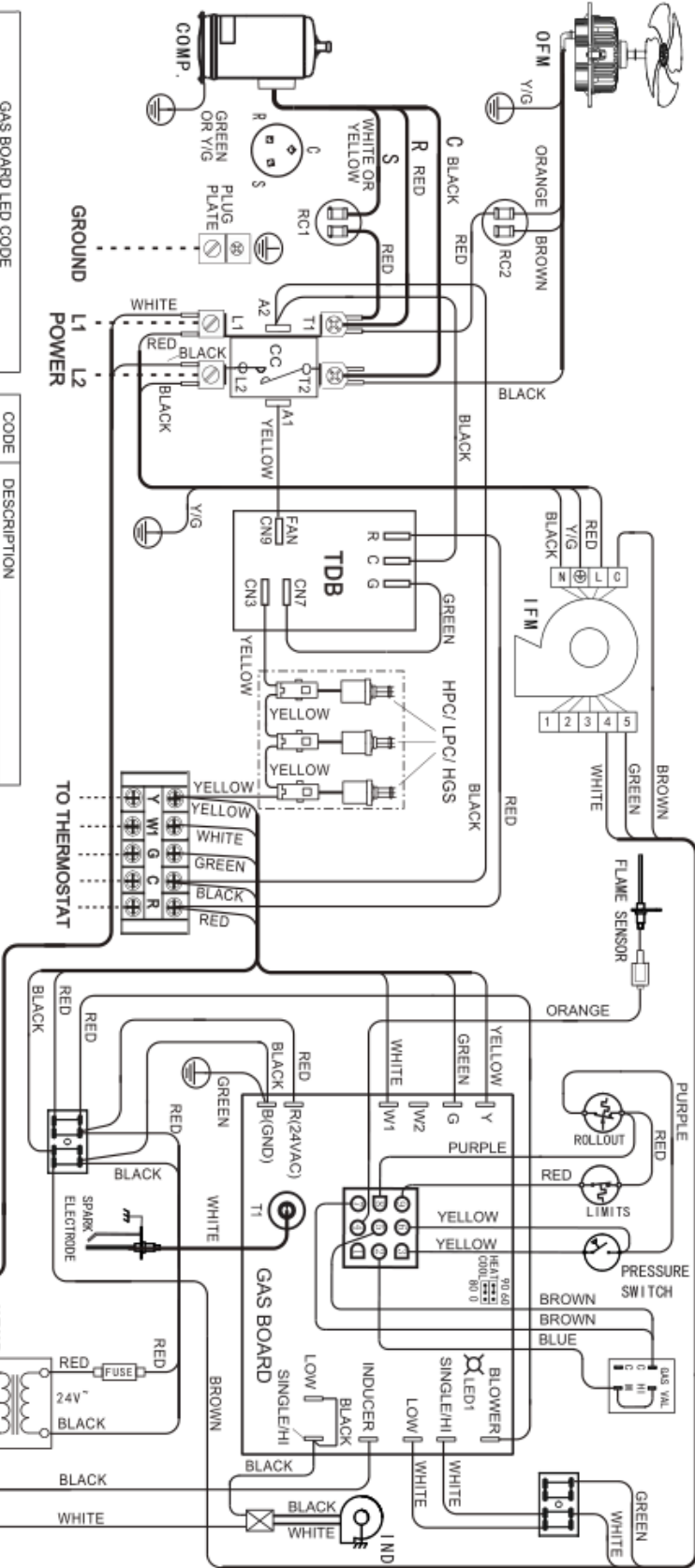
FACTORY STANDARD
FIELD INSTALLED
FACTORY OPTIONAL

USE COPPER CONDUCTORS ONLY

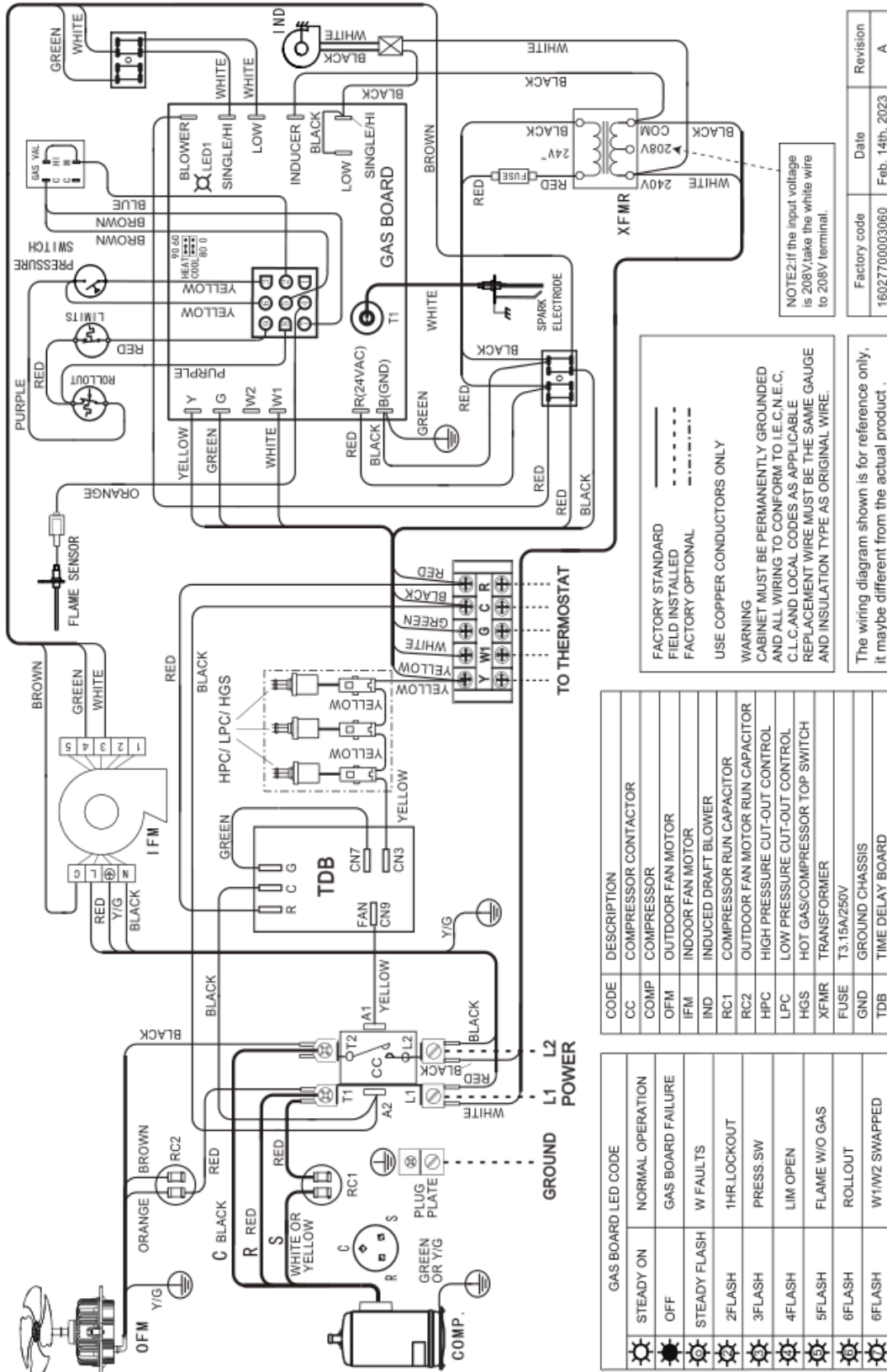
WARNING
CABINET MUST BE PERMANENTLY GROUNDED
AND ALL WIRING TO CONFORM TO I.E.C. N.E.C.
C.L.C. AND LOCAL CODES AS APPLICABLE
REPLACEMENT WIRE MUST BE THE SAME GAUGE
AND INSULATION TYPE AS ORIGINAL WIRE.

NOTE: If the input voltage is 208V, take the white wire to 208V terminal.

Factory code	Date	Revision
16027700003082	Feb. 14th, 2022	A



Wiring Diagram-42K



CODE	DESCRIPTION
CC	COMPRESSOR CONTACTOR
COMP	COMPRESSOR
OFM	OUTDOOR FAN MOTOR
IFM	INDOOR FAN MOTOR
IND	INDUCED DRAFT BLOWER
RC1	COMPRESSOR RUN CAPACITOR
RC2	OUTDOOR FAN MOTOR RUN CAPACITOR
HPC	HIGH PRESSURE CUT-OUT CONTROL
LPC	LOW PRESSURE CUT-OUT CONTROL
HGS	HOT GAS/COMPRESSOR TOP SWITCH
XFMR	TRANSFORMER
FUSE	T3.15A/250V
GND	GROUND CHASSIS
TDB	TIME DELAY BOARD

GAS BOARD LED CODE	
☀️	STEADY ON
🌑	OFF
🔴	NORMAL OPERATION
🟡	GAS BOARD FAILURE
🟢	W FAULTS
🟠	1HR LOCKOUT
🟤	PRESS SW
🟡	LIM OPEN
🟢	FLAME W/O GAS
🟠	ROLLOUT
🟤	W1/W2 SWAPPED

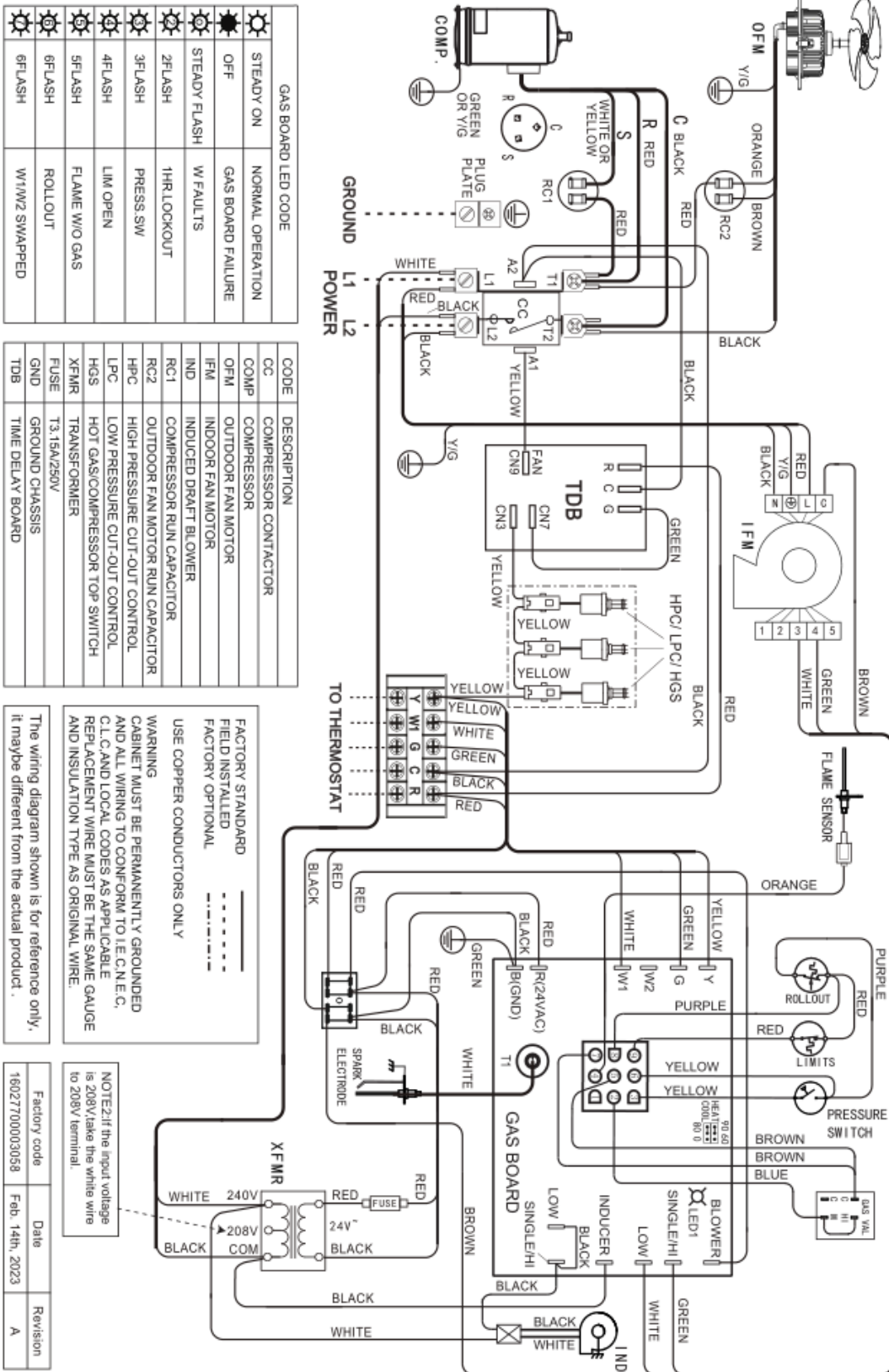
Factory code	Date	Revision
16027700003060	Feb. 14th, 2023	A

NOTE: If the input voltage is 208V, take the white wire to 208V terminal.

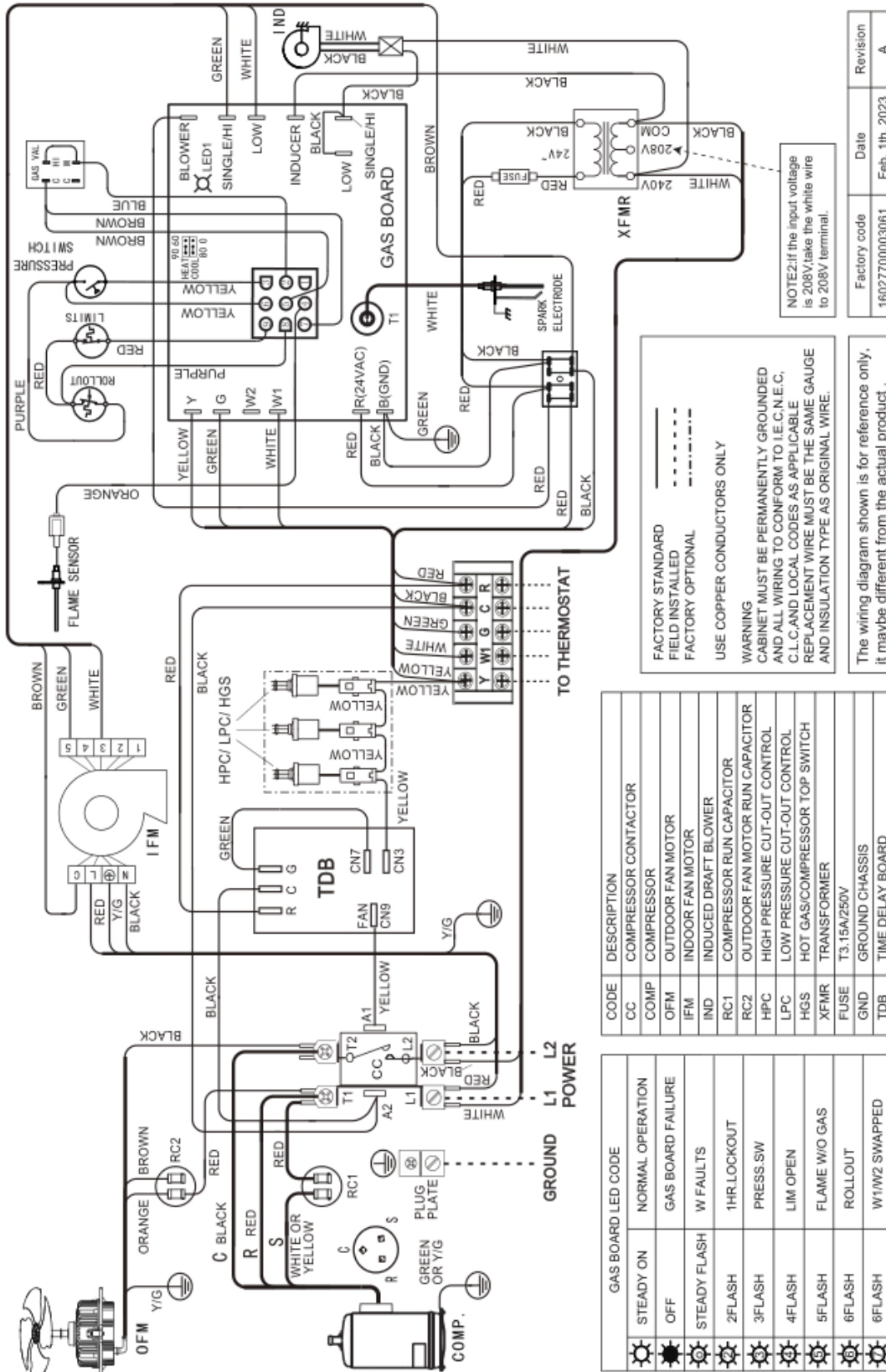
FACTORY STANDARD
 FIELD INSTALLED
 FACTORY OPTIONAL
 USE COPPER CONDUCTORS ONLY
 WARNING
 CABINET MUST BE PERMANENTLY GROUNDED AND ALL WIRING TO CONFORM TO I.E.C. AND LOCAL CODES AS APPLICABLE. REPLACEMENT WIRE MUST BE THE SAME GAUGE AND INSULATION TYPE AS ORIGINAL WIRE.

The wiring diagram shown is for reference only. It may be different from the actual product.

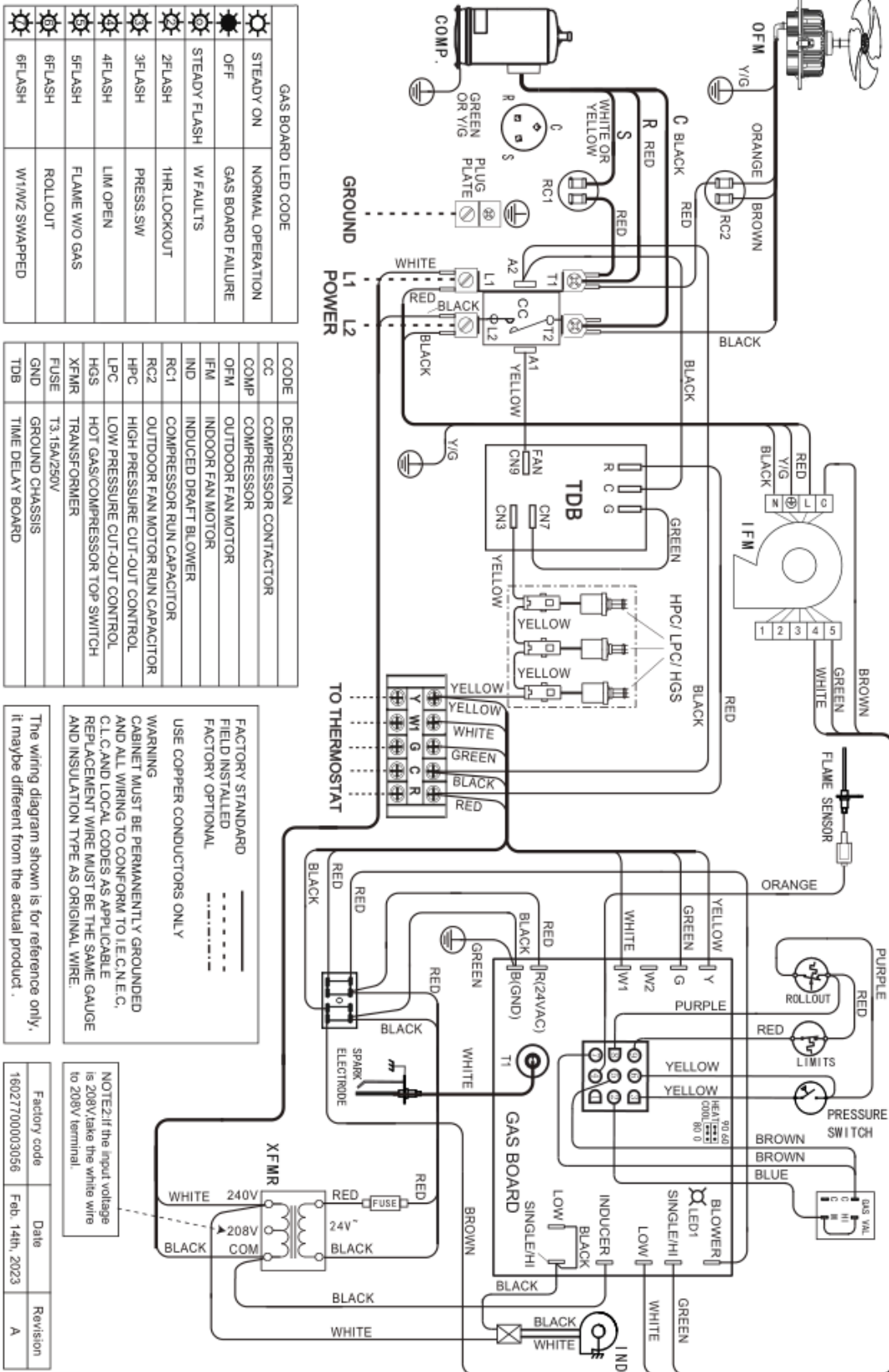
Wiring Diagram-48K



Wiring Diagram-60K (S090)



Wiring Diagram-60K (S110)



6.8 Indoor Fan Replacement Procedure



Bolts

1. Unplug the power and signal wires from the motor.
2. Use a screwdriver to loosen the 2 bolts.
3. Ensure that there are no obstacles in the direction of motor extraction.
4. Pull out the motor horizontally.
5. Ensure that there are no obstacles in the direction of motor insertion.
6. Push in the new motor horizontally.
7. Use a screwdriver to attach the two bolts.
8. Plug in the power and signal wires.



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The design and specifications of this product and/or manual are subject to change without prior notice.
Consult with the sales agency or manufacturer for details.