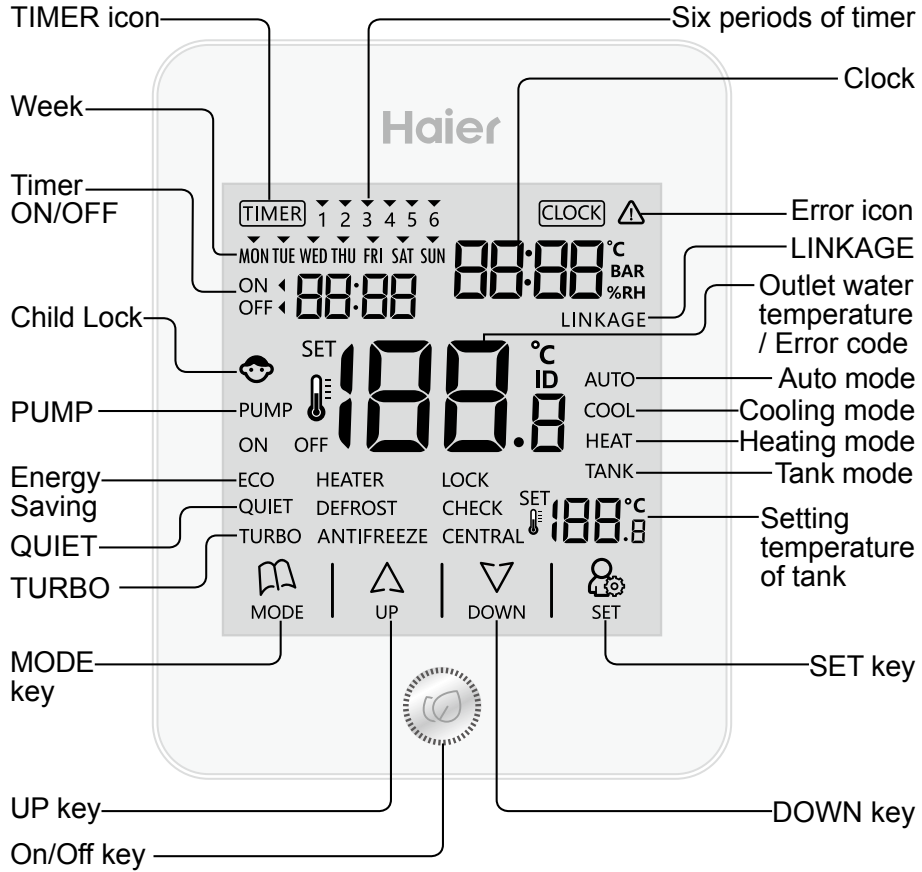


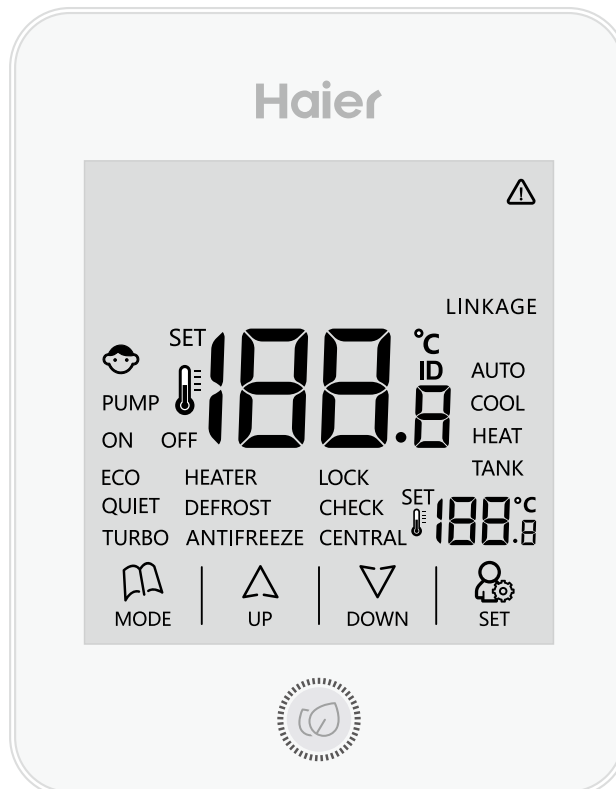
19. YR-E27(Optional wired controller)

19.1 Interface Display

(1) Standard Version



(2) Simple Version



19.2 Key and Icon

	On/Off key.
	Mode key: Press this key to switch mode.
	Up key: Press this key to adjust temperature in the main interface and other parameter value in other interface.
	Down key: Press this key to adjust temperature in the main Interface and other parameter value in other interface.
	Set key: Press this key to set special functions (ECO, QUIET and TURBO) and also can be combined with other keys for some other function settings.

	Outlet Water temperature display , Error code display
	Clock display , parameter display
	Timer: This icon will be displayed only when timer function is set.
	Six periods of timer
	Timer on/off and display the start time of next period of timer
	Week display
	Error icon
	Child Lock: This icon will be displayed only when child lock function is set.
	Pump: this icon will be displayed when pump is opened.
	On: This icon will be displayed when controller is turned on.





	Off: This icon will be displayed when controller is turned off.
	Energy Saving: This icon will be displayed only when energy saving function is set.
	Quiet: This icon will be displayed only when quiet is set.
	Turbo: This icon will be displayed only when turbo is chosen.
	Auto mode
	Cooling mode
	Heating mode
	Tank mode
	The setting temperature of the tank.
	Heater function
	Defrost icon
	Antifreeze icon
	Lock function
	Check function
	Central function
	Linkage function which is reserved

Note:












1. Setting range:
 - 1) Tank mode: 25°C~75°C (the default is 42°C).
 - 2) Cooling mode of air conditioning: water temperature 5°C~20°C (the default is 9°C).
 - 3) Heating mode of air conditioning: water temperature 25°C~55°C (the default is 40°C).Setting accuracy is 0.5°C.
2. Outlet water temperature display range: 0°C~100°C,display accuracy is 0.1°C.
3. The controller has two kinds of main display interface, standard version and simple version. The simple version has no timer, week, clock.If you want to change the interface,you need to change the DIP switch(SW1-6) of the wired controller,and it willbe effective after the system is powered again.











19.3 Operation

(1)Basic function description





Basic function description	Method of operation
ON/OFF	Press the key  to switch on/off the wired controller.
Mode control	In the state of on, press the key  to change mode. Whether there is "tank" mode or not depends on the indoor unit setting.
Adjusting setting temperature	In the state of on,press the key  or  to adjust the setting temperature.

(2)Special function index



Function	Method of operation
Forced to start pump (for debugging)	In the state of off, long press the key  for 15 seconds.
Set backlight time	In the state of off, press the key  and  for 5 seconds, 00 (stable lighting) /15S/30S/60S. Adjust the value by pressing the key  or  and confirm by pressing the key  .
Timer mode	Press the key  for 5 seconds to enter the timer ON/OFF setting, choose ON/OFF by pressing the key  or  and press the  to confirm.
Time setting	Press the key  for 10 seconds to enter into time setting function.

Function	Method of operation
Set parameter of timer	In the state of ON, long press the key  and  for 5 seconds to enter.
Check parameters and change functions (for debugging)	When the backlight is on, press the key  and  for 5 seconds to enter.
Set and cancel child lock	Press the key  and  for 10 seconds to set or cancel.
ECO(default) /QUIET/TURBO	In the state of on, press the key  to enter, switch by pressing the key  or  , and confirm by pressing the key  again.


Setting special functions

In the state of on, press the key , then switch among ECO, QUIET and TURBO by pressing  or  key, finally press key  to confirm. If there is no key is pressed for 10 seconds, it will automatically exit and the previous setting is invalid.



Child lock

Press the key  and  for 10 seconds to set or cancel child lock. In the state of child lock, all keys are not available.



ON/OFF

Press the key  to switch on /off the wired controller.



Forced to start pump (for debugging)

In the state of off, press the key  for 15 seconds to enter and press the key  for 15 seconds again to exit.







Checking parameters and change functions (for debugging)

When the backlight is on, press the key  and  for 5 seconds to enter into this function's interface, which is available under the status of on or off.

(Some functions reserved, if the relevant device is not connected in the system, the relevant function code and machine number will not participate in the loop.)

(1) Press the key  or  to switch the function code, category A (Heat exchange unit)/ B (outdoor unit)/ C (indoor unit-- reserved)/ D (Module control board-- reserved)/ E (slave wired controller -- reserved).

(2) A/B is displayed after the decimal point in the intermediate temperature display area, function code (00-FF) is displayed in the lower right corner. 00-3F can be viewed and changed, while 40-FF can only be queried. The specific parameters are displayed in the upper right corner.

(3) Switch the function code by using the  or  key. If the function code is flashing, which means that it can be queried and can be changed. And if the function code is still, which means that it can only be queried. When the function code is flashing, press the  key to make the function code still. Meanwhile, the parameter value flashes to indicate that it can be changed. You can adjust the value by the  or  key. After adjustment, press the  key again and the parameter value will not flash. And the function code flashes, indicating that the previous layer operation is returned. If there is no operation for over 10 seconds, or press the SET key in the state of viewing the parameter (when function code is 40-7F), exit the parameter viewing and setting interface. And you can also exit this interface by pressing on/off key.

(4) If there is no reply from the air-condition, the parameter display will be "--". If the communication returns that defrost, check or antifreeze is running, relevant icon will display

Category	Function code	Function description	Set/ Query
A	00	ON/OFF	Can be queried and set
A	01	Setting mode	Can be queried and set
A	02	temperature setting	Can be queried and set
A	03	Temperature compensation	Can be queried and set
A	04	Electric heating	Can be queried and set
A	05	Pump	Can be queried and set
A	06	Centralized controller group number	Can be queried and set
A	07	Rust prevention operation	Can be queried and set
A	08	Floor dry	Query only
A	09	Check 1	Can be queried and set
A	0A	Check 2	Can be queried and set
A	0B-3F Reserved	Reserved function, does not participate in the loop when the function code loops	Can be queried and set
A	40	Type of heat exchange unit	Query only
A	41	Operation mode	Query only
A	42	Antifreeze	Query only
A	43	Rust prevention operation	Query only
A	44	Defrost	Query only
A	45	Current fault	Query only
A	46	Number of connected indoor controllers	Query only
A	47	Number of connected indoor controllers that is on.	Query only
A	48	Number of connected indoor controllers that is thermo. on.	Query only
A	49	Power	Query only
A	4A	Electric heating state	Query only
A	4B	Pump state	Query only
A	4C	Micro switch	Query only

Category	Function code	Function description	Set/ Query
A	4D	Pressure difference switch	Query only
A	4E	Two-way valve chain	Query only
A	4F	Low voltage switch	Query only
A	50	Internal machine regulating valve target overheating (undercooling) degree	Query only
A	51	PMV opening degree	Query only
A	52	Heat exchange unit antifreeze temperature Tz	Query only
A	53	Heat exchange unit inlet water temperature Twi	Query only
A	54	Heat exchange unit outlet water temperature Two	Query only
A	55	Heat exchanger unit refrigerant liquid pipe temperature Thi	Query only
A	56	Heat exchanger unit refrigerant gas pipe temperature Tho	Query only
A	57	Cumulative running time	Query only
A	58	Continuous running time	Query only
A	59	Program version number	Query only
A	5A	E2 version	Query only
A	5B	Historical error 1	Query only
A	5C	Historical error 2	Query only
A	5D	Historical error 3	Query only
A	5E-FF Reserved	Reserved function, does not participate in the loop when the function code loops	Query only
B	00-3F Reserved	Reserved function, does not participate in the loop when the function code loops	Can be queried and set
B	40	Operation mode	Query only
B	41	Outdoor unit quiet	Query only
B	42	Defrost	Query only
B	43	Current outdoor unit error code	Query only
B	44	Type of outdoor unit	Query only
B	45	Power supply voltage type	Query only
B	46	Power frequency type	Query only

Category	Function code	Function description	Set/ Query
B	47	Horse power	Query only
B	48	Compressor target operating frequency	Query only
B	49	Actual operating frequency of the compressor	Query only
B	4A	Speed of fan 1	Query only
B	4B	Speed of fan 2	Query only
B	4C	Electronic expansion valve opening degree	Query only
B	4D	Target Pd	Query only
B	4E	Actual Pd	Query only
B	4F	Saturation temperature of Target Pd	Query only
B	50	Saturation temperature of actual Pd	Query only
B	51	Target Ps	Query only
B	52	Actual Ps	Query only
B	53	Saturation temperature of Target Ps	Query only
B	54	Saturation temperature of actual Ps	Query only
B	55	Temperature of Td	Query only
B	56	Temperature of Ts	Query only
B	57	Temperature of Tao	Query only
B	58	Temperature of Tdef	Query only
B	59	Temperature of Toil	Query only
B	5A	Compressor module temperature	Query only
B	5B	Compressor current	Query only
B	5C	Compressor DC voltage	Query only
B	5D	Cumulative running time	Query only
B	5E	Continuous running time	Query only
B	5F	Program version number	Query only
B	60	E2 version	Query only



















Category	Function code	Function description	Set/ Query
B	61	Historical error 1 of outdoor unit	Query only
B	62	Historical error 2 of outdoor Unit	Query only
B	63	Historical error 3 of outdoor Unit	Query only
B	64-FF Reserved	Reserved function, does not participate in the loop when the function code loops	Query only

(5) Timer

Note: This function is not available when the dial code is simple.

In the on state, press the key  and  for 5 seconds to enter this function interface.

The default values are as follows

Week icon	Time period	Default start time	Default switch	Default temperature
		6:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
		8:00	OFF	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
		12:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
		13:00	OFF	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
		18:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
		22:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
		8:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
		9:00	OFF	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
		12:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.

Week icon	Time period	Default start time	Default switch	Default temperature
SAT	4	13:00	OFF	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
SAT	5	18:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
SAT	6	22:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
SUN	1	8:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
SUN	2	9:00	OFF	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
SUN	3	12:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
SUN	4	13:00	OFF	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
SUN	5	18:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.
SUN	6	22:00	ON	Cooling mode: 9°C; Heating mode: 40°C; Hot water: 42°C.

After entering the setting interface, the week display area displays the week character, and the time period value is displayed above it.







You can switch between the time periods by using the UP and DOWN keys. You can also quickly switch between weeks by pressing the MODE key.

In the display state of a certain period of time, press the SET key to enter the parameter settings. You can switch the hour, minute, on/off, and temperature by the MODE or SET key. Switch to the corresponding position, its parameters flashing, indicating that it can be changed. Using the up and down keys to change its parameter value. Pressing the mode or set key to switch will save the previous settings.

If there is no operation for 10 seconds or if the ON/OFF key is pressed, the function will be exited and the last changed parameter will not be saved.

19.4 Week and clock function settings

Note: This function is not available when the dial code is simple.

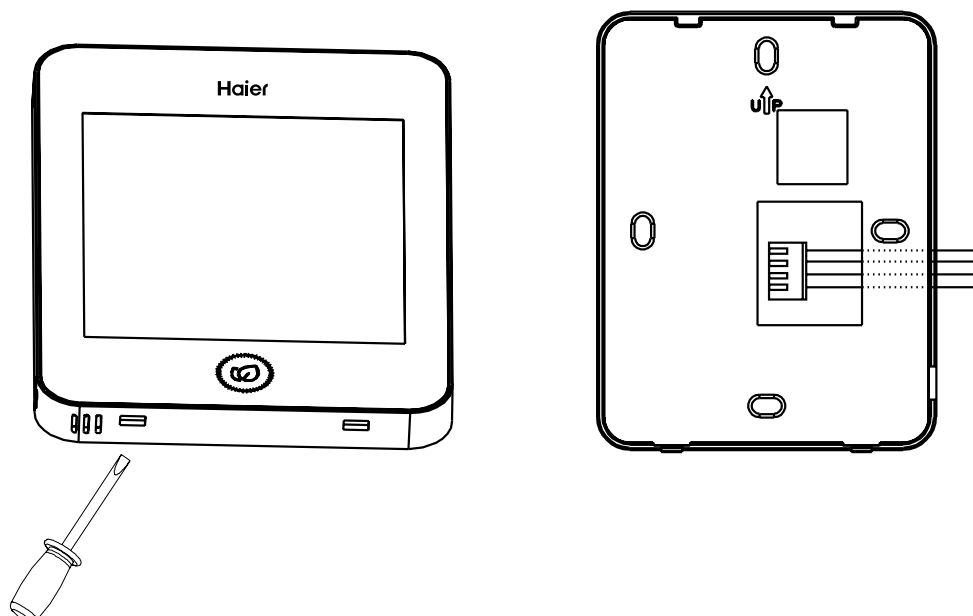
Enter the week and clock setting by pressing and holding the  key for 10 seconds. After you enter this function,  icon and the current value in  flashes, pressing UP and DOWN keys to change the week value. By pressing the  key to switch to the hour setting, the hour value flashes at this time, you can change the parameter by the UP and DOWN keys. Then press the  key to switch to the minute setting, the minute value flashes, you can change the minute value by using the UP and DOWN keys and press the  key to confirm the change. If there is no operation for 10 seconds, the function will be exited and the last changed parameter will not be saved.

19.5 Dip switch

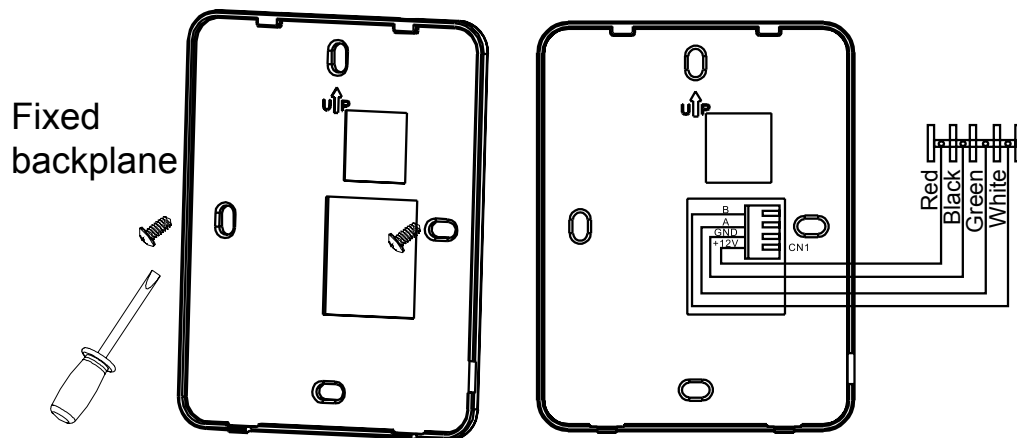
SW1	Definition content	Specific definition
1	Reserved	Reserved
2	Whether to display the outlet water temperature	ON -- do not display OFF -- display
3	Whether it is the demo version	ON -- demo version OFF -- Non-demo version
4	Single cooling	ON -- Single cooling OFF -- normal
5	Single heating	ON -- Single heating OFF -- normal
6	Simple	ON -- simple OFF -- normal
7	Reserved	Reserved
8	Reserved	Reserved

19.6 Wired Controller Wiring Instruction

1. First, put communication wire through the hole in the backplane.



2. Fix backplane and then connect communication wire to CN1 port of wired controller. Finally put the front cover of wired controller to backplane to complete the installation.



20. Error Code

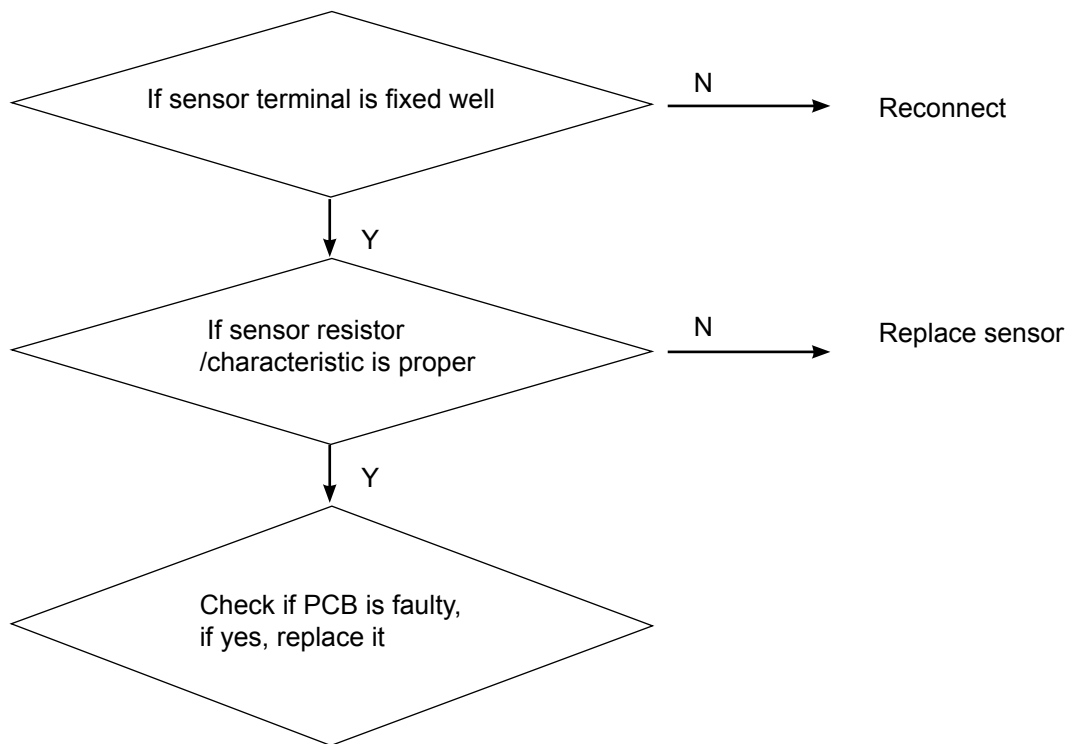
Error code	Error code definitionerror	Notes
1	In water temp.sensor(Twi)failure	Restorable
2	Out water temp.sensor(Two)failure	
3	In refrigerant temp.sensor(Thi)failure	
4	Out refrigerant temp.sensor(Tho) failure	
7	Communication fault with wired controller	
10	Flow rate too low failure	Restorable, 3 times fault an hour lock
15	Antifreeze fault	Restorable
16	Heat exchange unir HU in/out water temp. too high	
20	Defrosting temp.sensor(Te)failure	
21	Ambient temp.sensor(Ta)failure	
22	Suction temp.sensor(Ts)failure	
23	Discharging temp.sensor(Td)failure	
28	High pressure sensor failure	
29	Low pressure sensor failure	Restorable, 3 times fault an hour lock
30	High pressure switch HPS failure	
34	Discharging temp. too high protection(Td)	
35	4-way valve reversing failure	
38	High pressure too low protection(Pd)	
39	Low pressure too low(Ps)/compression ratio too high protection	
40	High pressure too high protection(Pd)	Restorable
43	Discharging temp. too high protection(Td)	
46	Discharging communication fault with IGBT Power Moudule	Restorable
71	DC FAN failure	Restorable, 3 times fault an hour lock
75	High-low differential pressure too small/no differential pressure	
82	Compressor current protection	
83	Outdoor unit model BM setting error	
110	Module hardware excess current	
111	Compressor out of step	
117	Software excess current	

When the screen of wire controller display hereinafter code,the unit is standby.Please check the parameters according to standby reason.

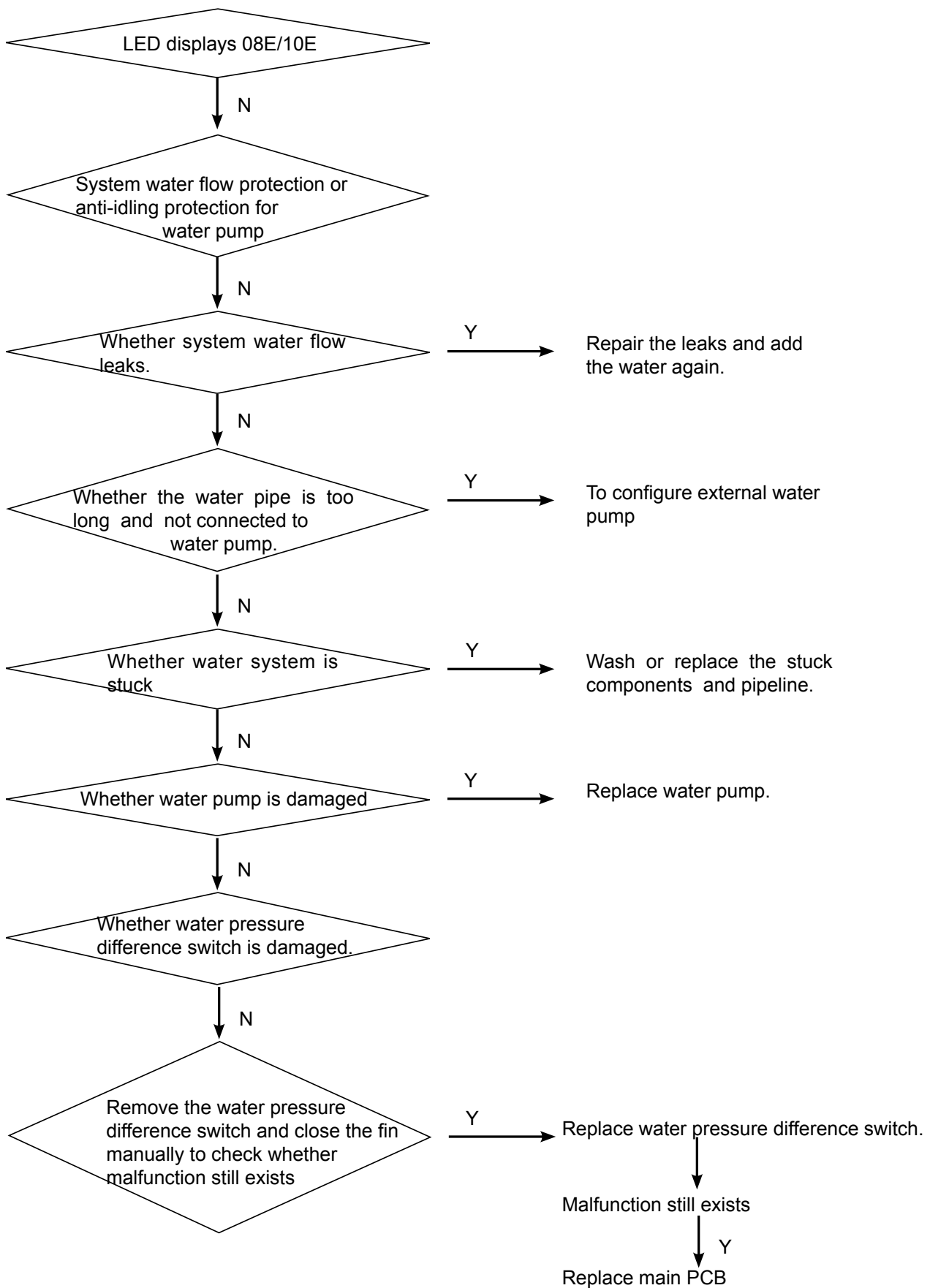
Standby code	Standby reason	Notes
555.1	Outer circumstance temp.Ta>27°C heating standby	Restorable
555.3	Outer circumstance temp.Ta>54°C or Ta<-10°C, refrigerantion standby	
555.4	Oil temp. fail to meet the condition of system start	
555.5	Outdoor unit mode don't match with indoor unit mode ,outdoor unit setting single cold single heat mode conflicted with indoor unit mode cause to standby	

21. Troubleshooting

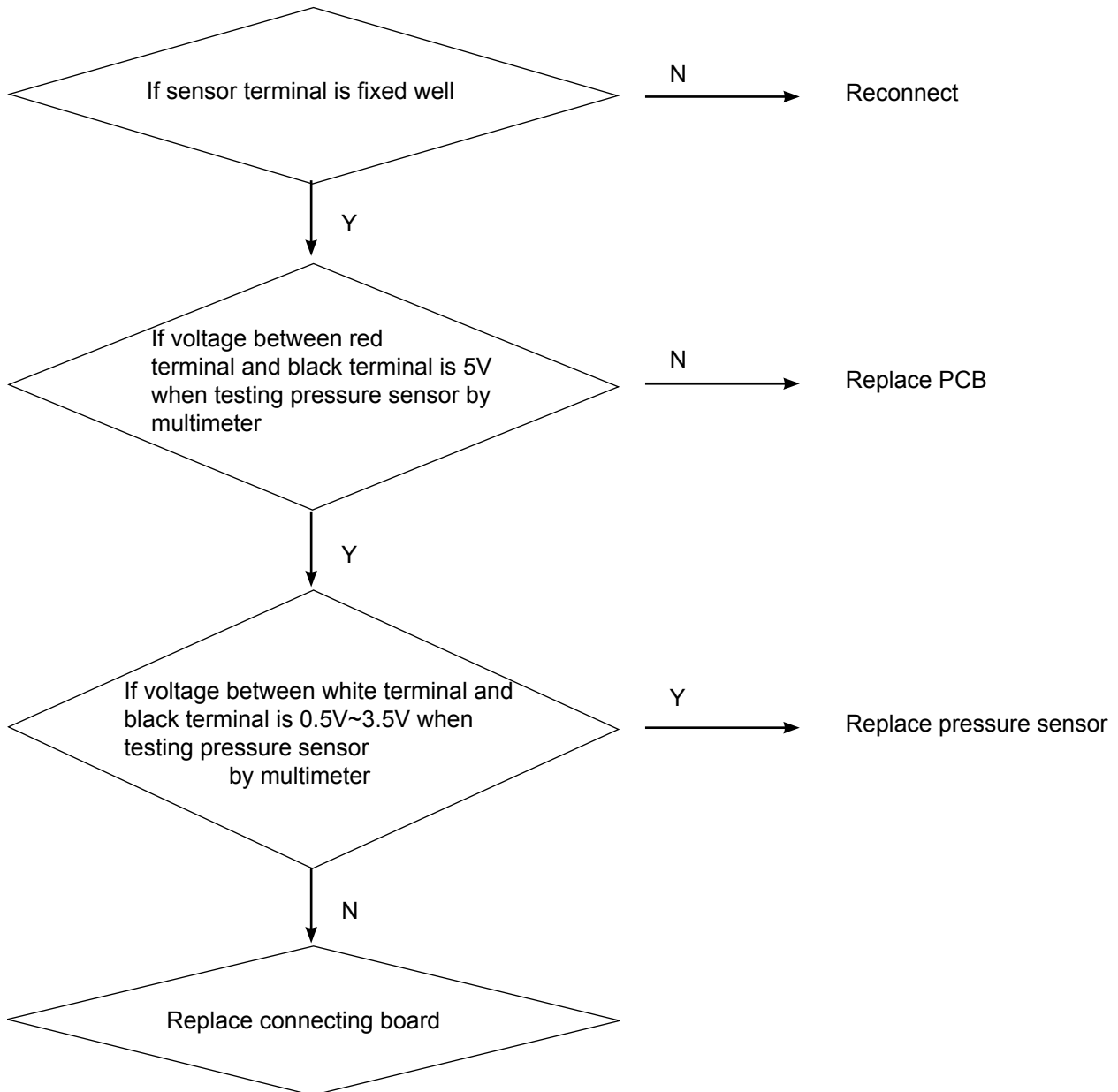
[1,2,3,4 ,20-24,69] Temperature sensor failure



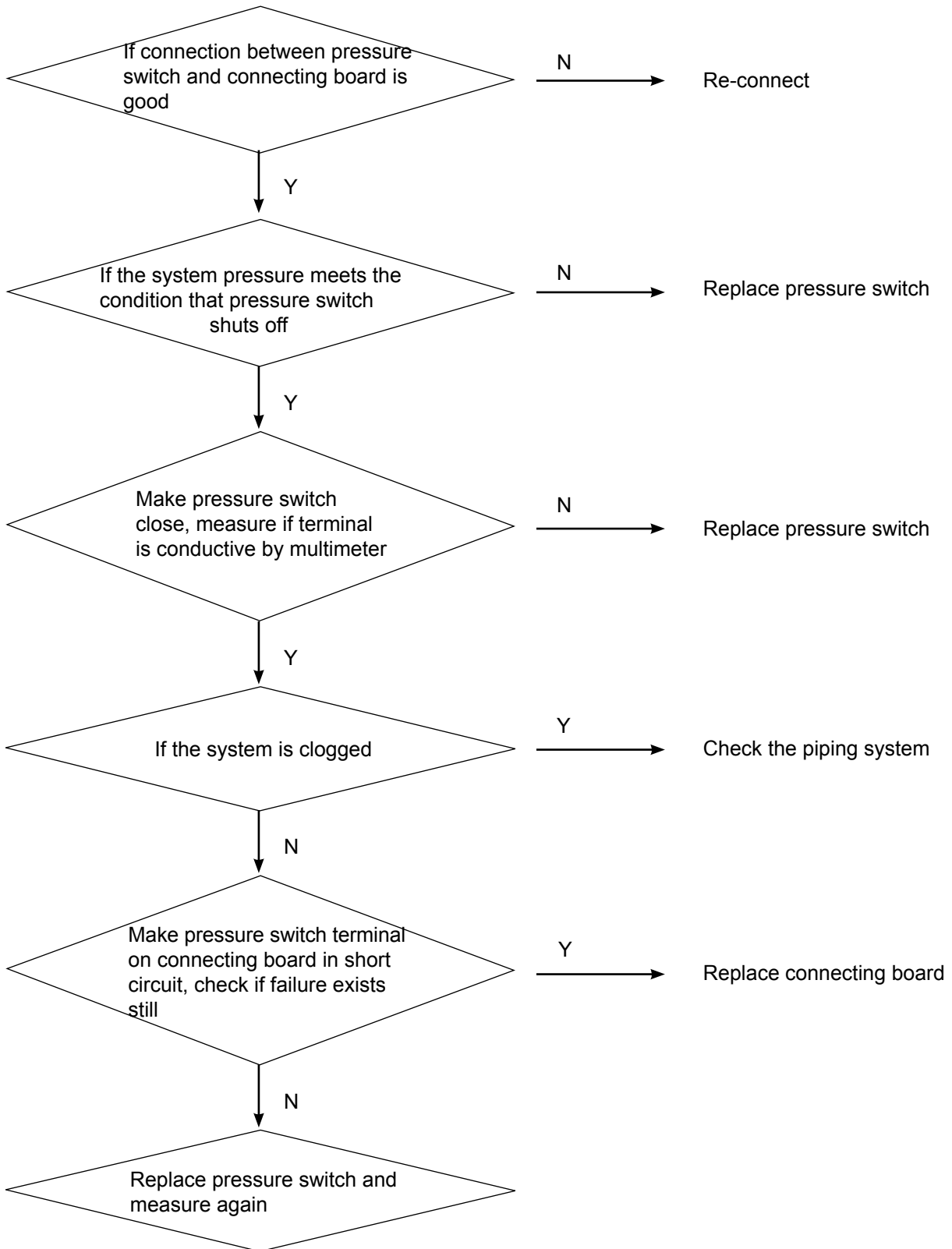
08,10: System water flow protection



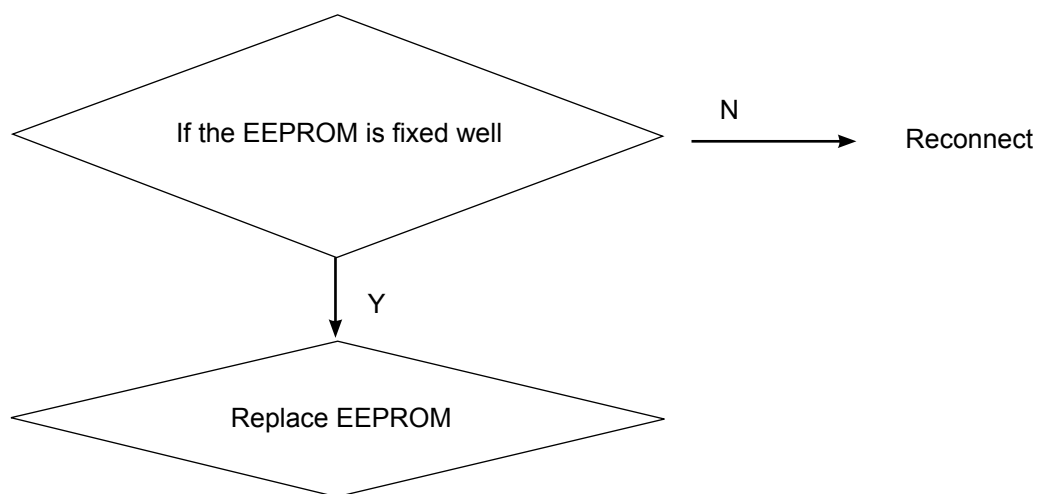
[28, 29] High/low pressure sensor failure



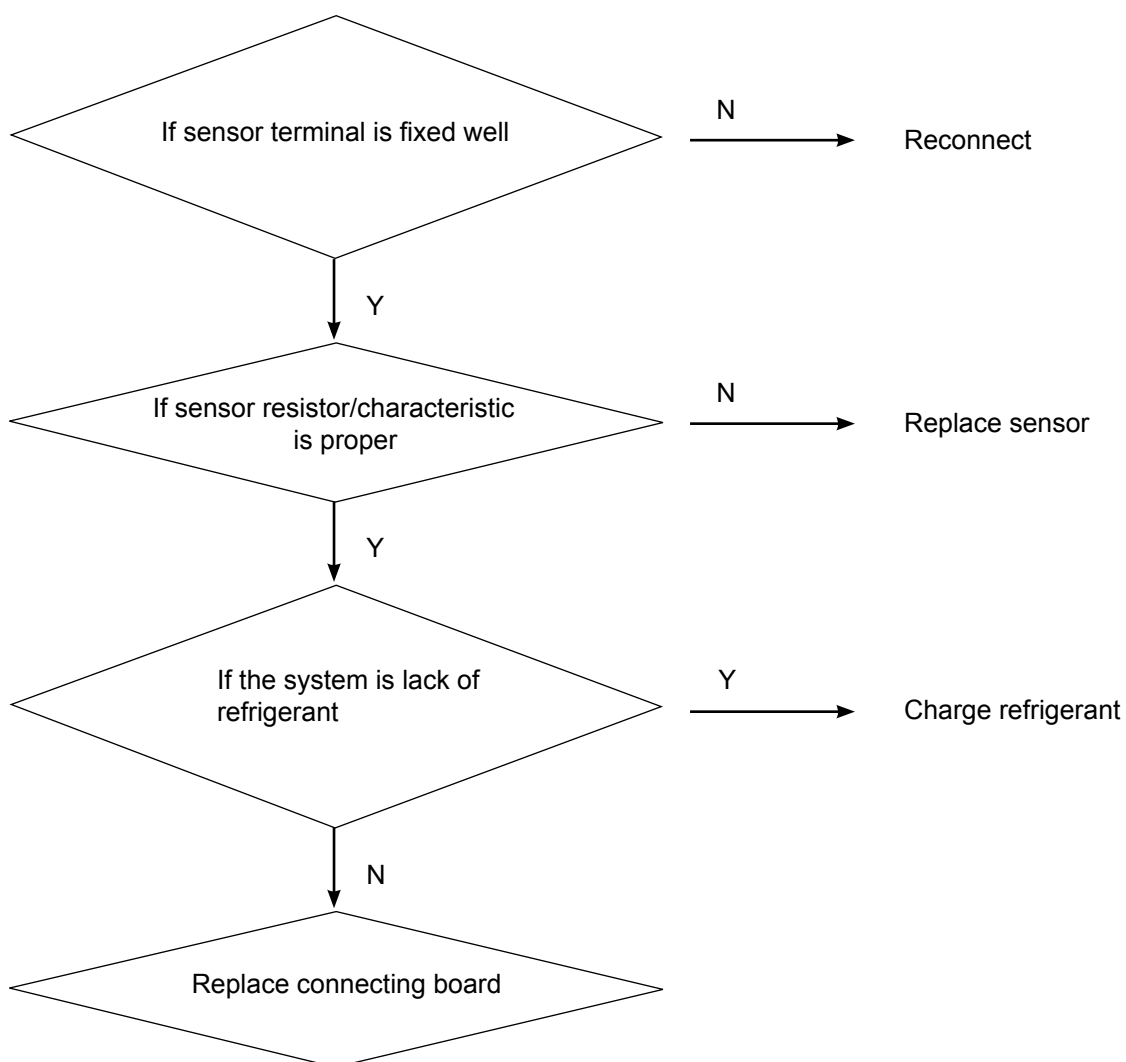
[30] High pressure switch failure



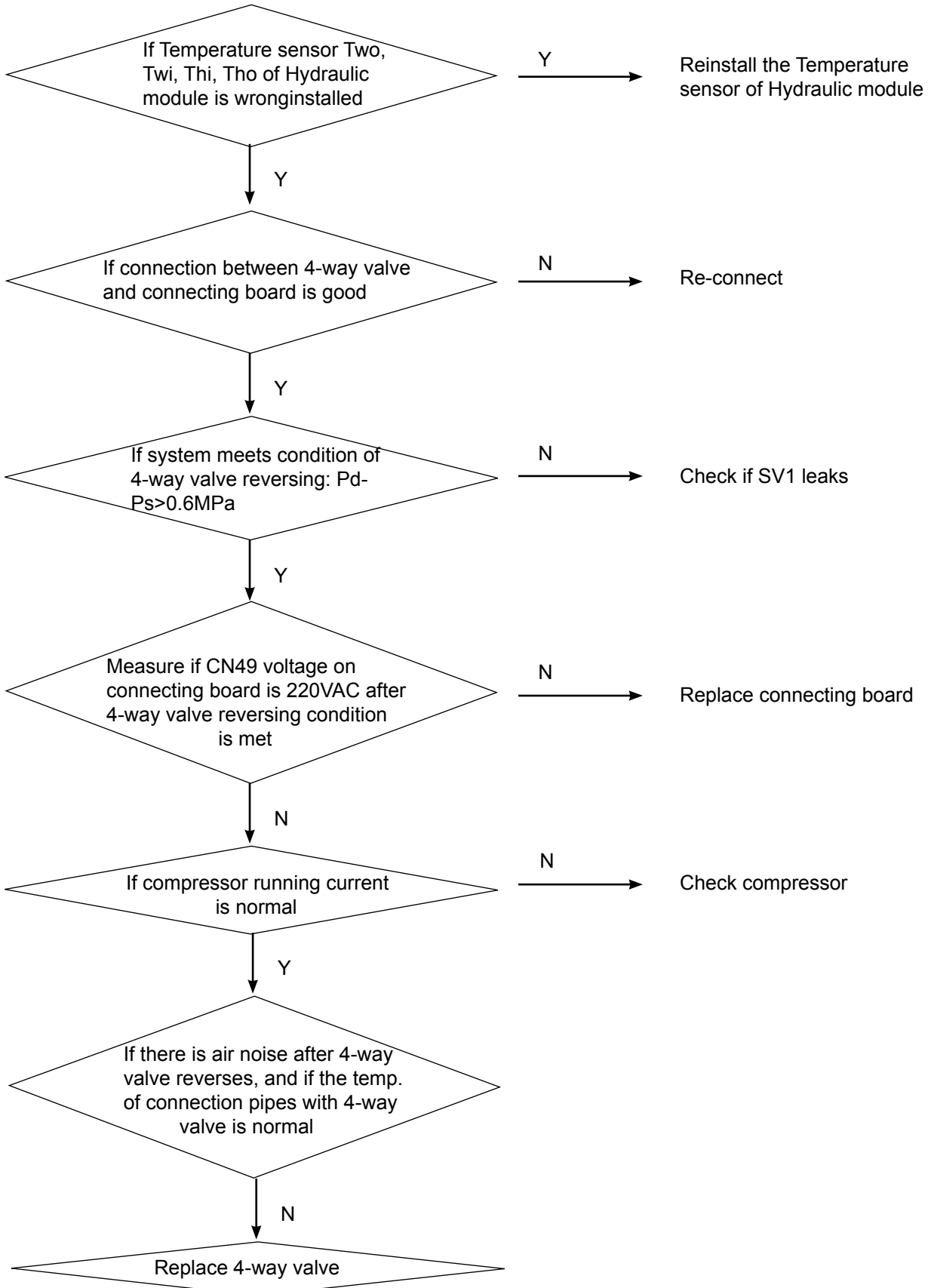
[33] Outdoor EEPROM failure



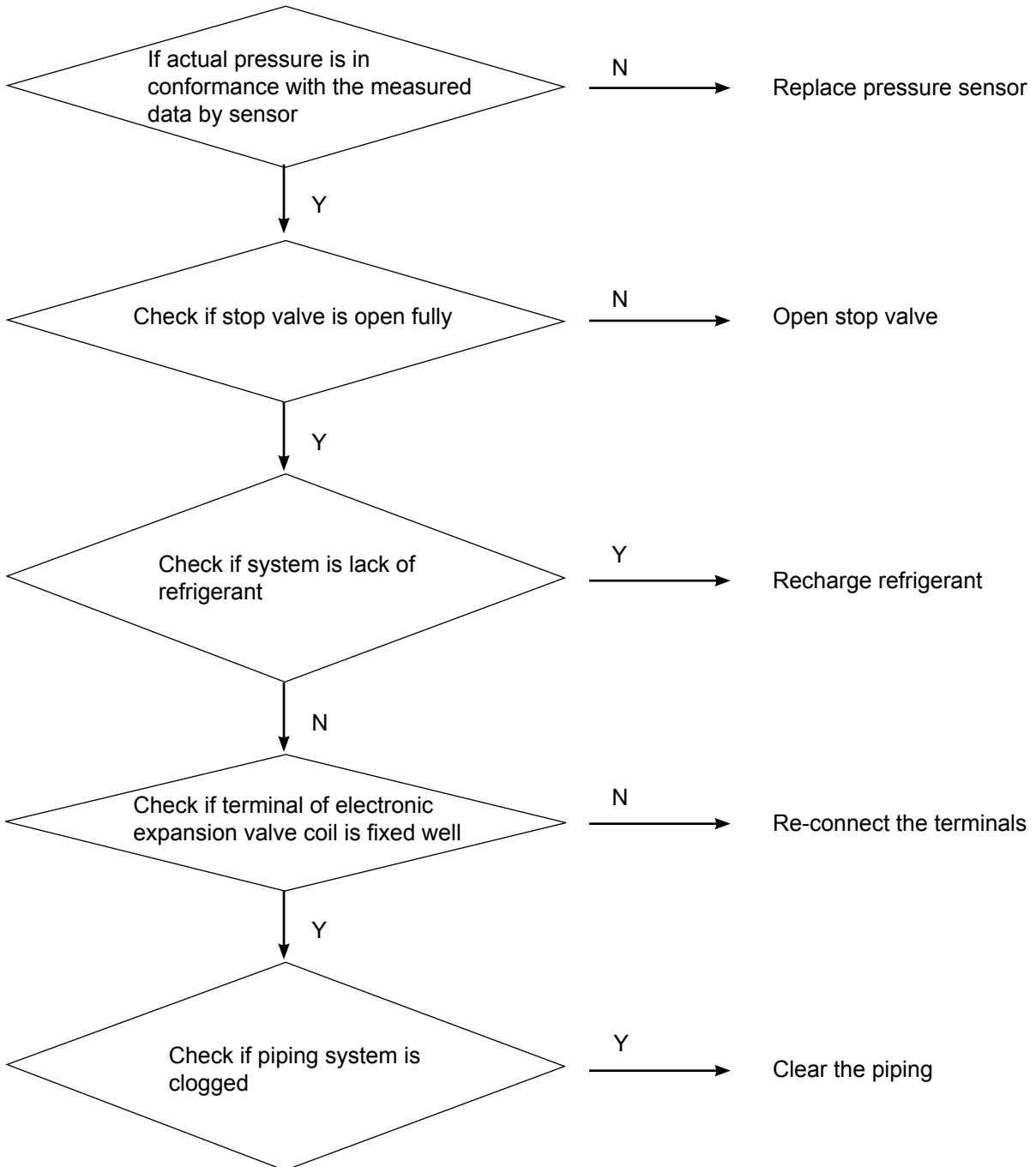
[34] Protection of discharging temp. too high



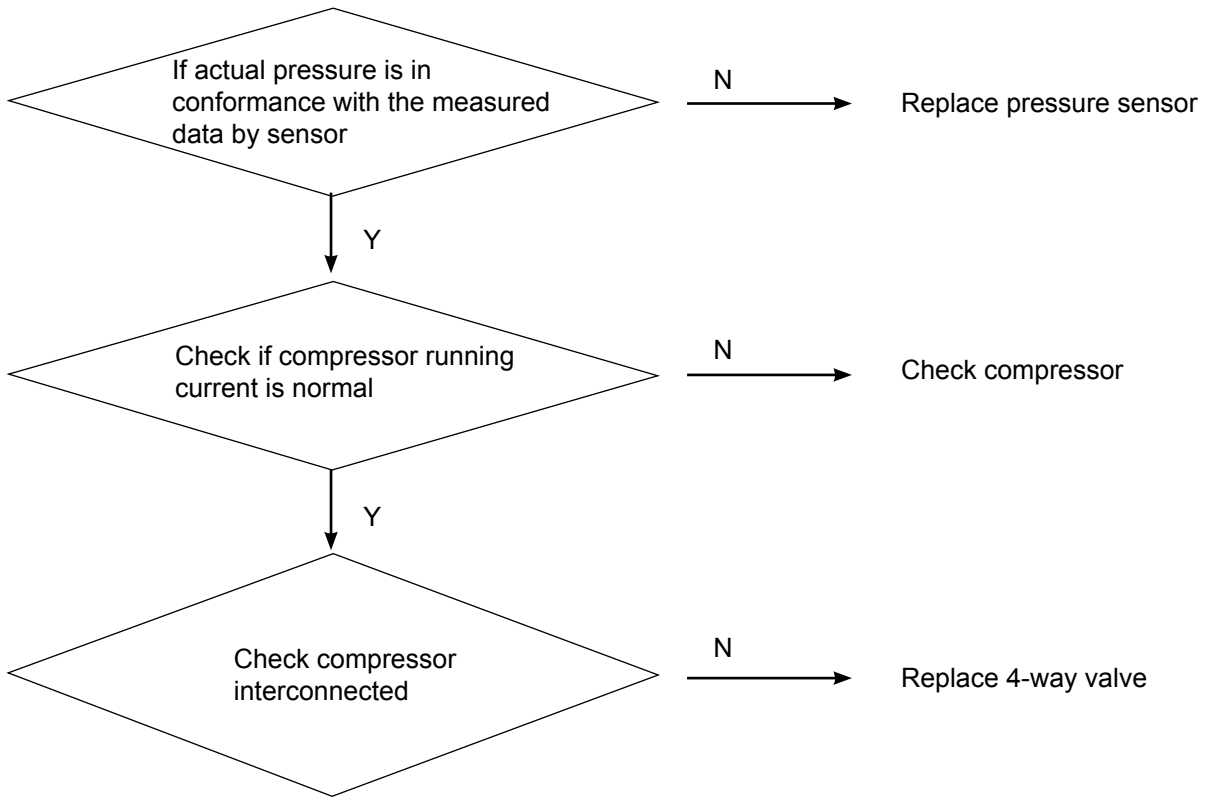
[35] 4-way valve reversing failure, or Temperature sensor Two, Twi, Thi, Tho of Hydraulic module is wrong installed



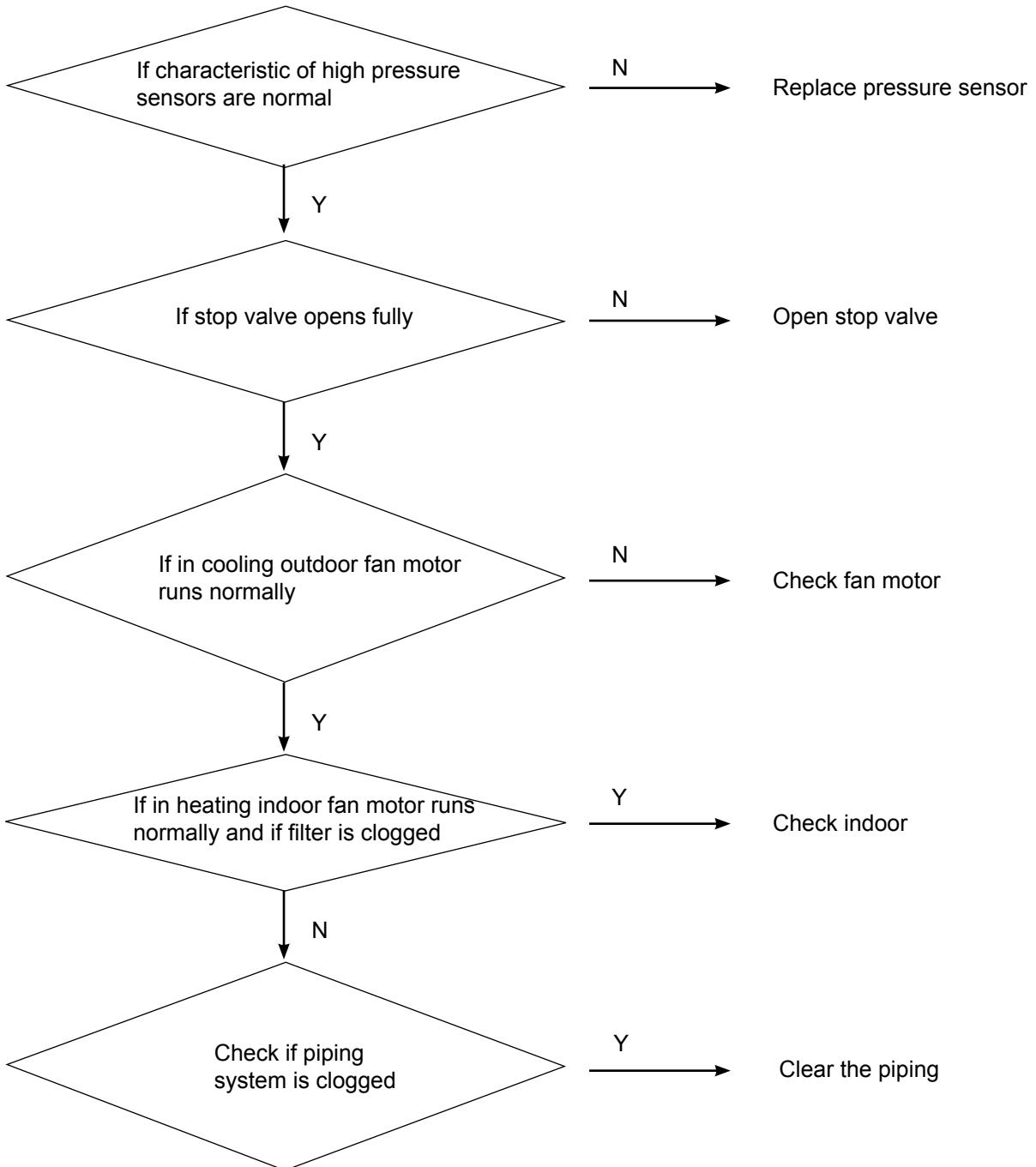
[39-0, 39-1] Low pressure too low and compression ratio too high



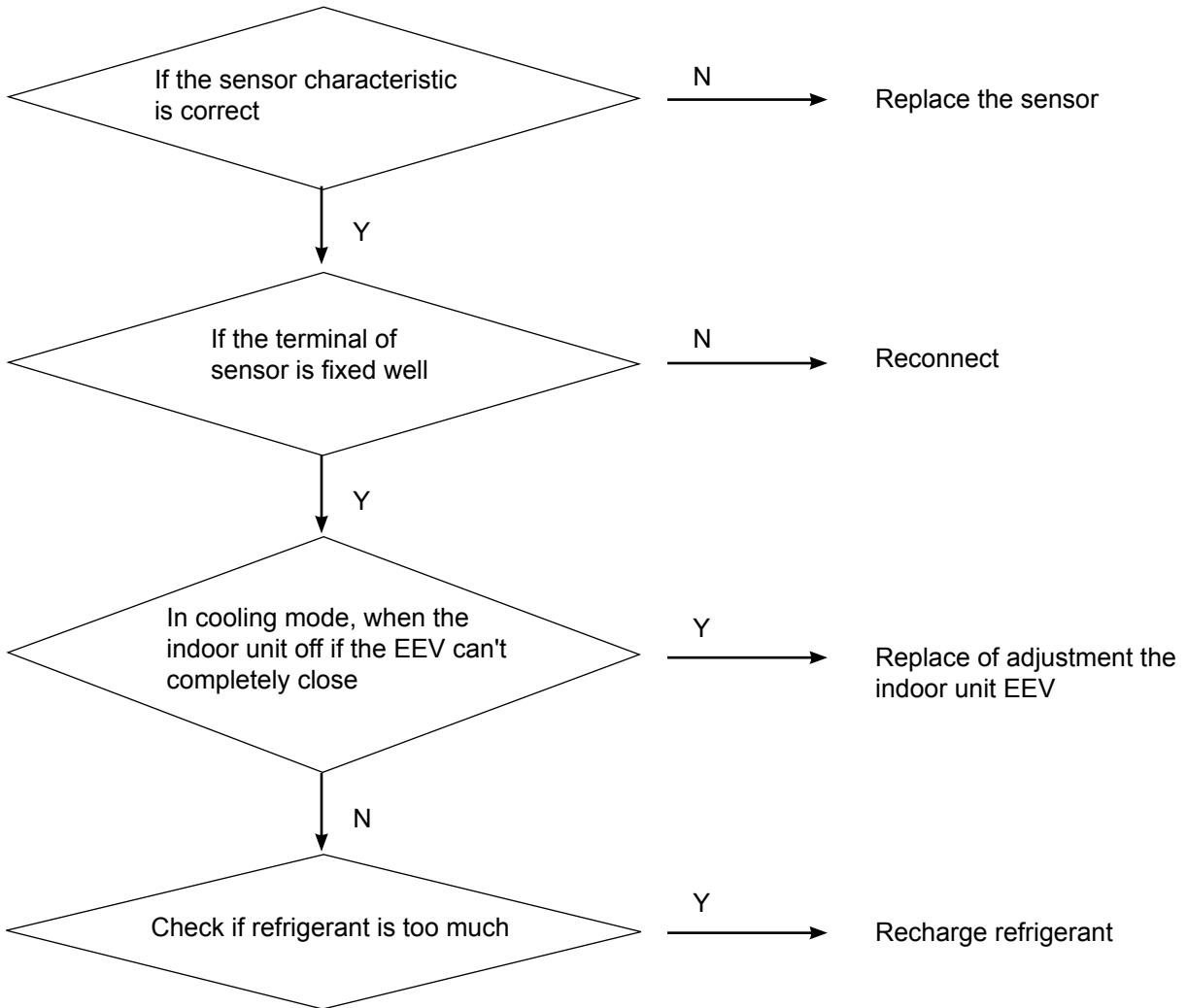
[39-2] Compression ratio too low



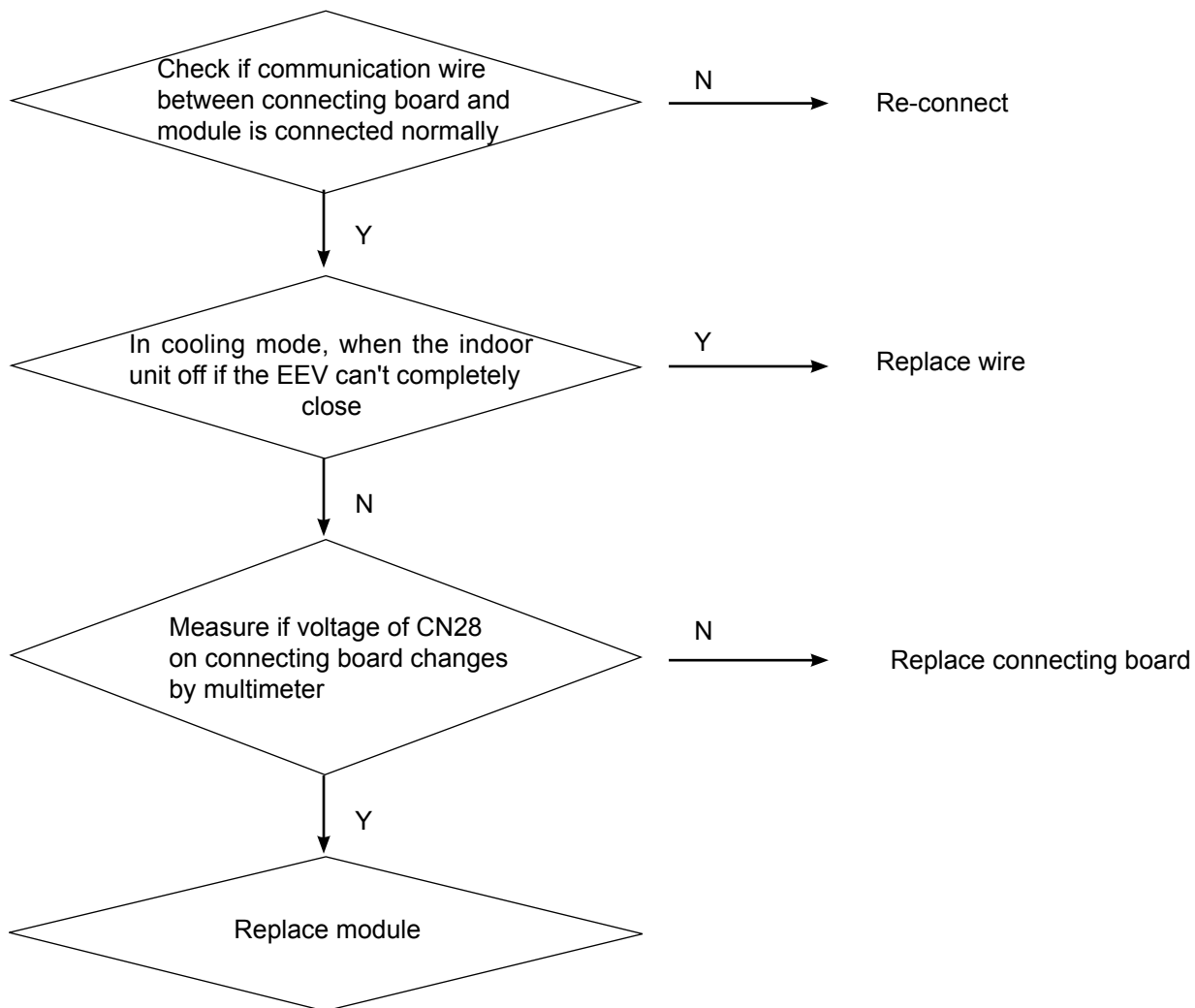
[40] High pressure too high failure



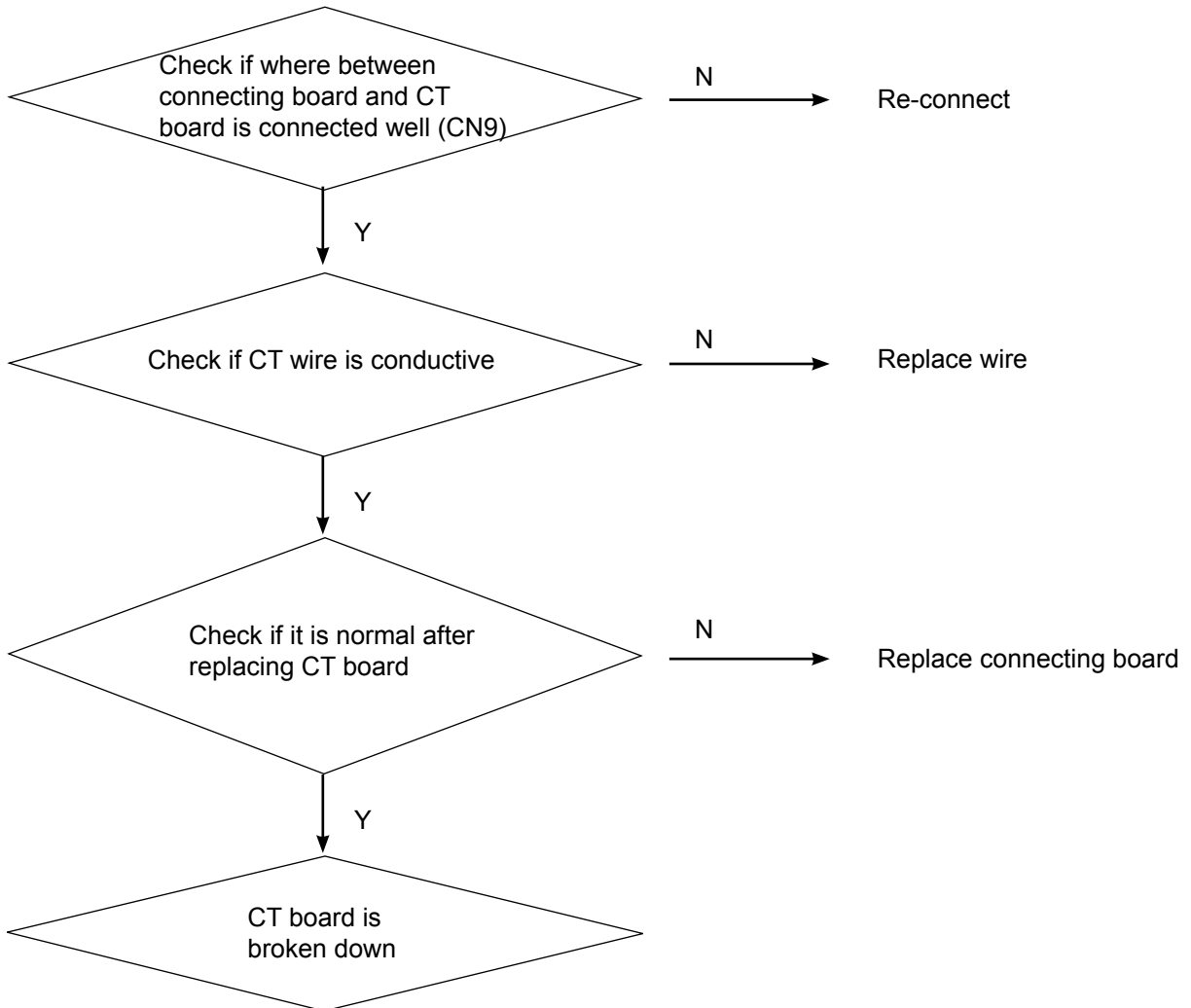
[43] Discharging temp. sensor Td too low protection



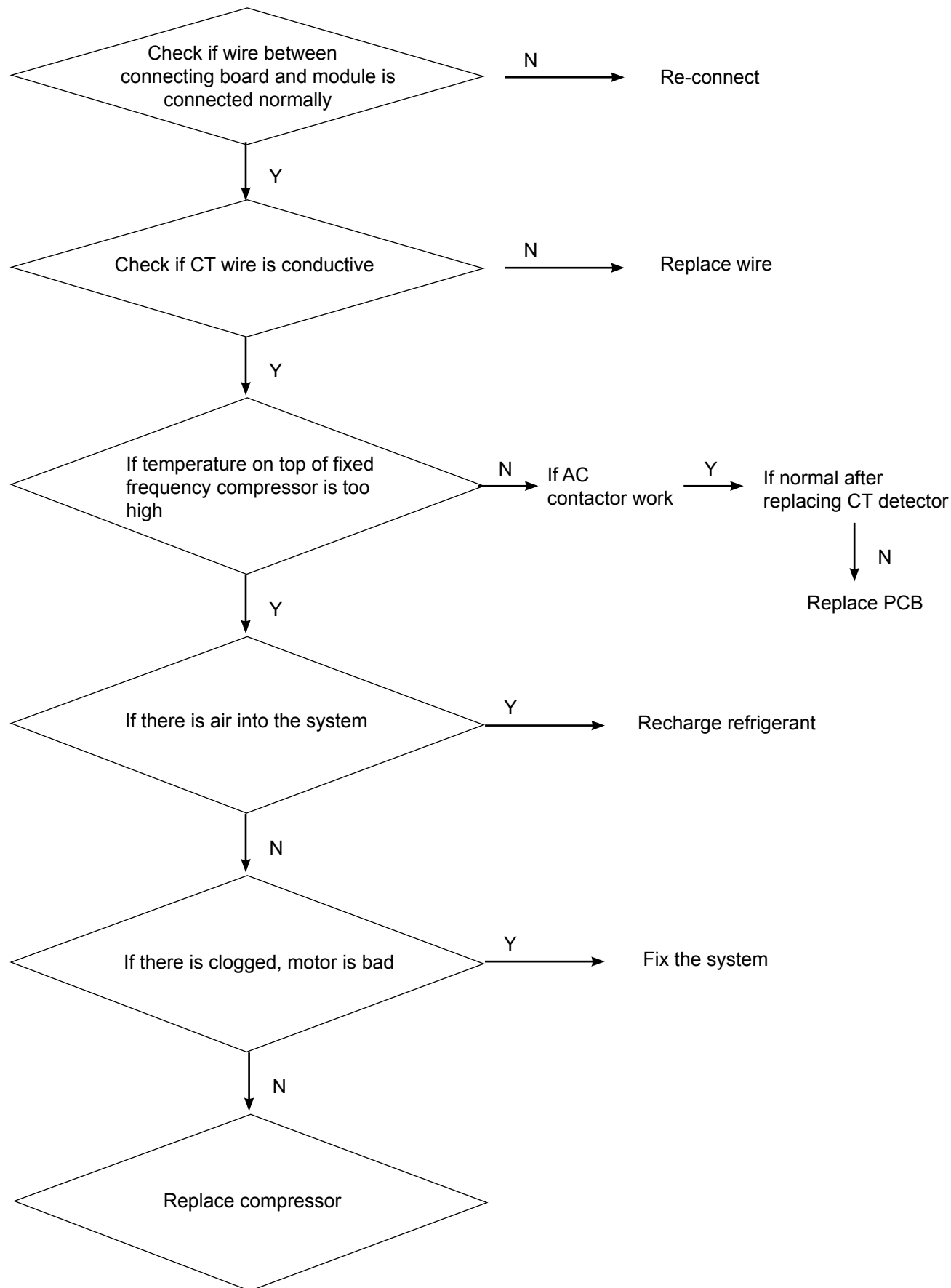
[46] Communication with inverter module failure



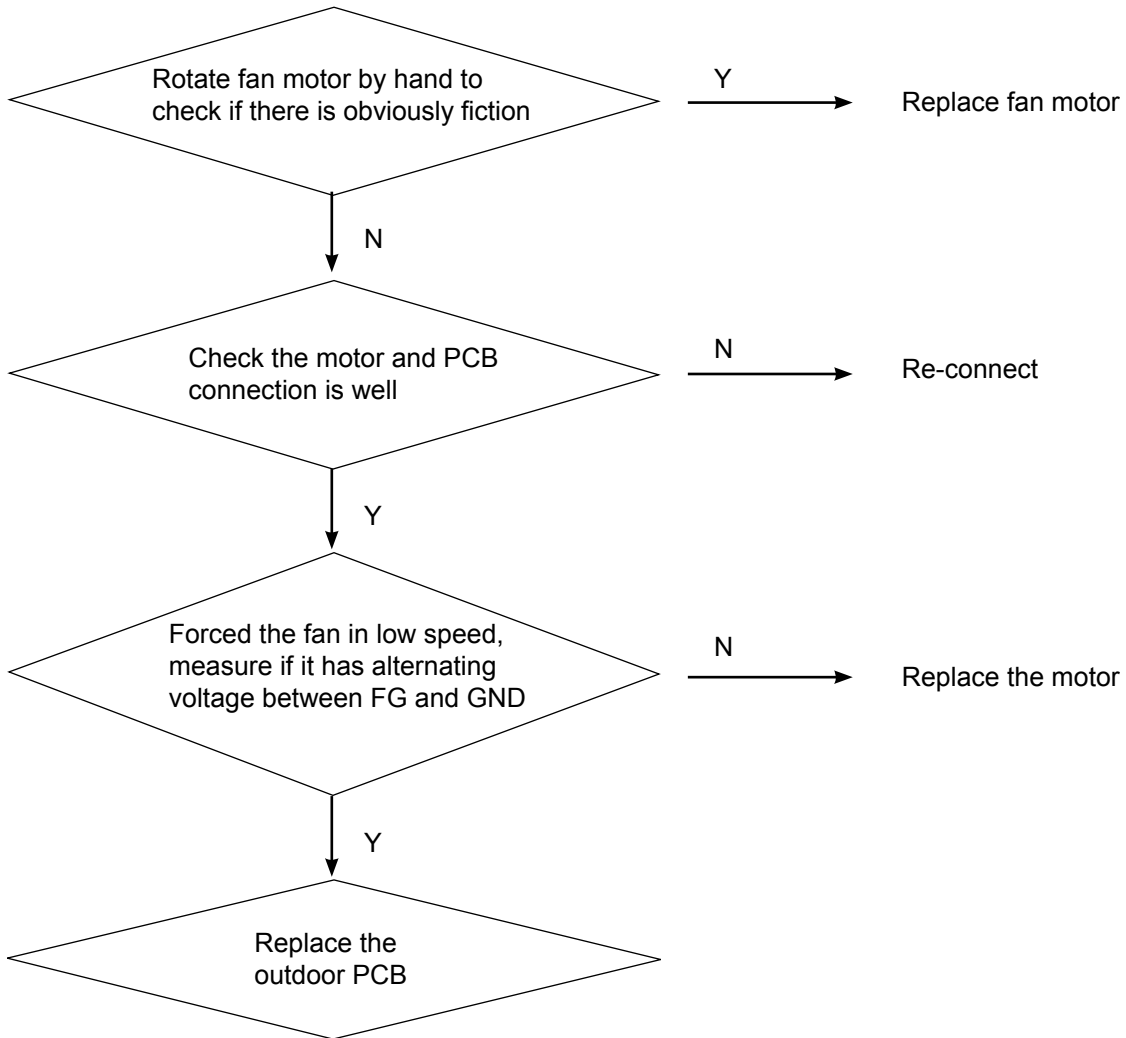
[53] CT Current too low or current sensor failure



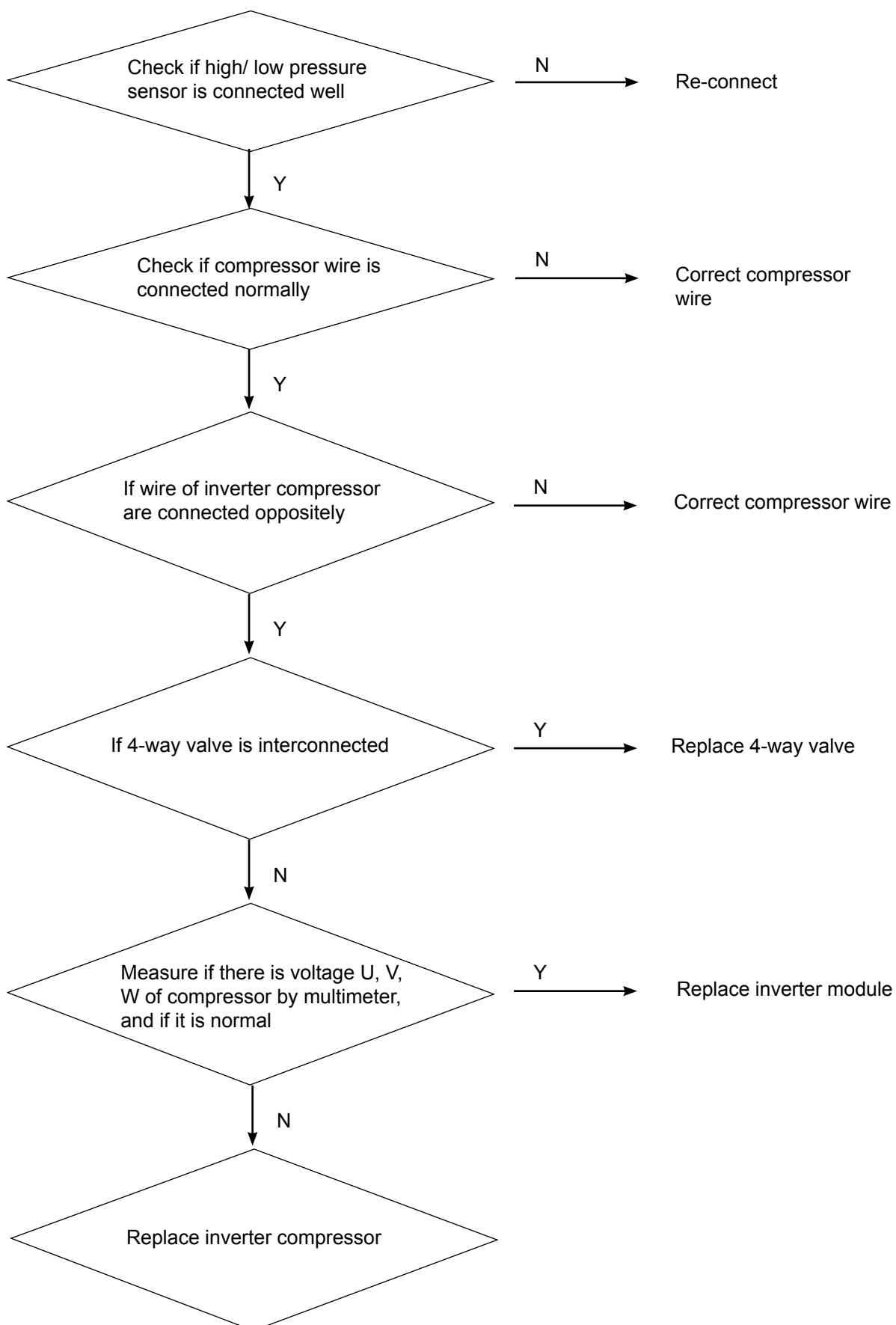
[64] CT current too high



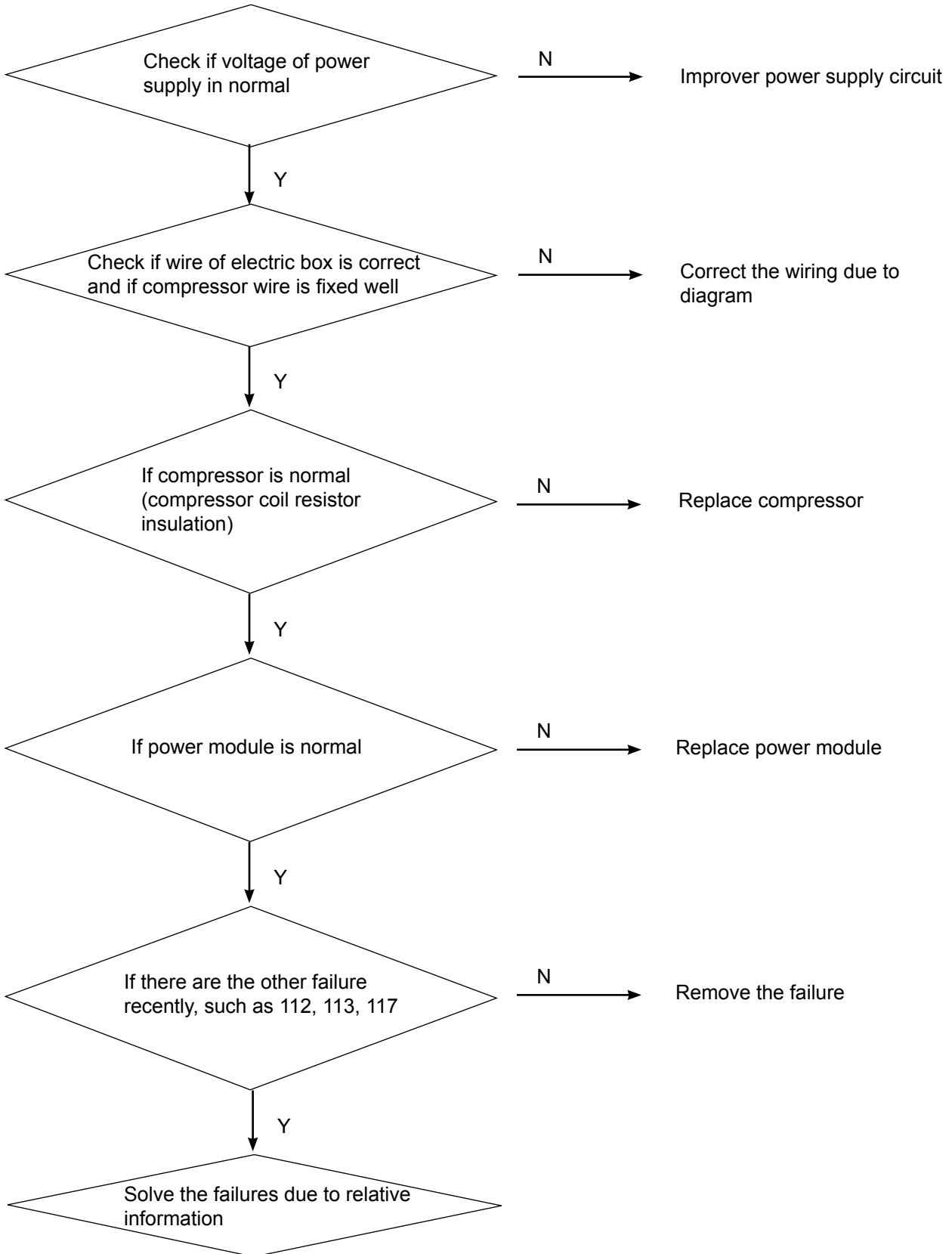
[71-0,71-1] DC motor blocked



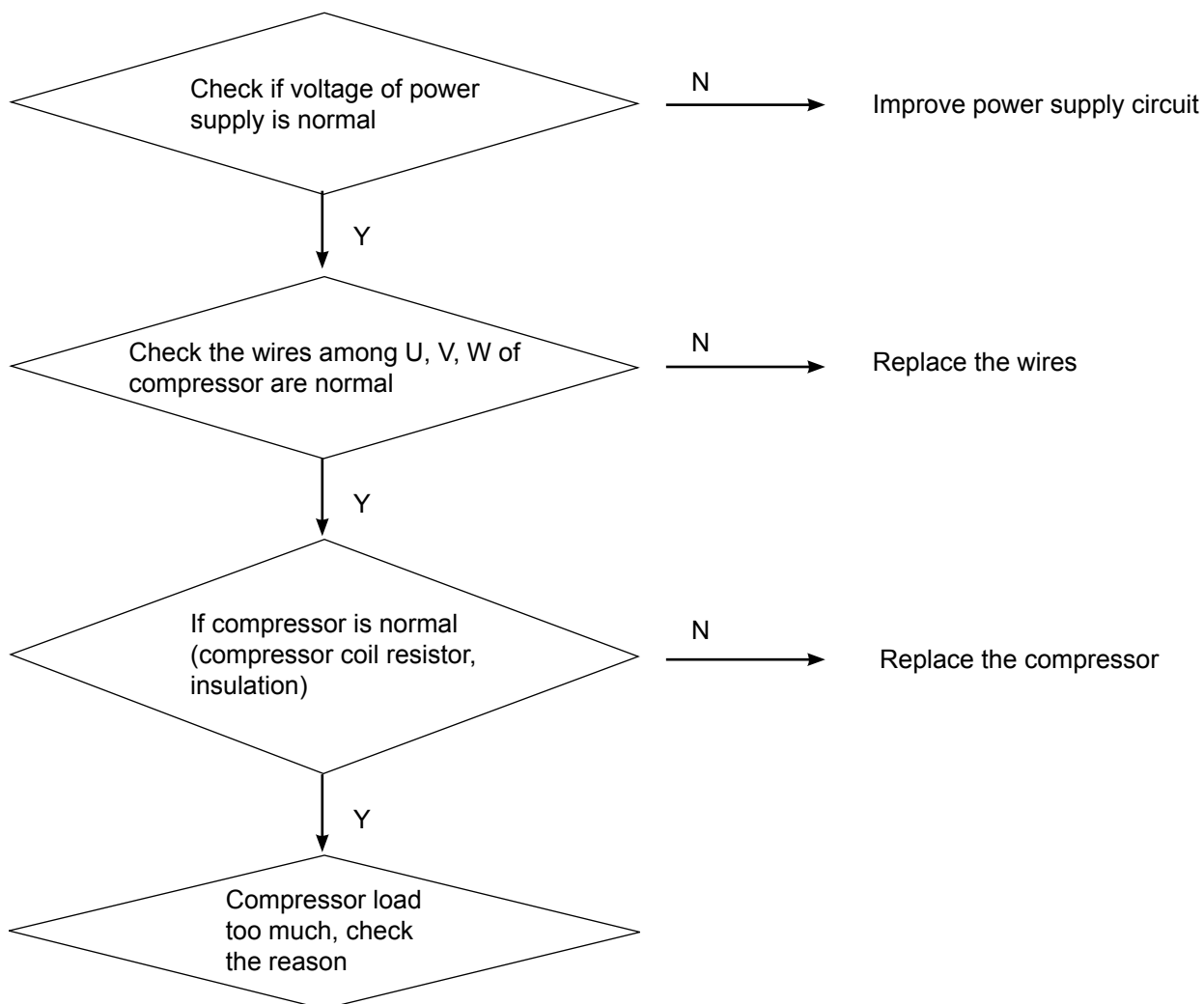
[75-0, 75-4] Pressure difference between high pressure and low pressure is abnormal



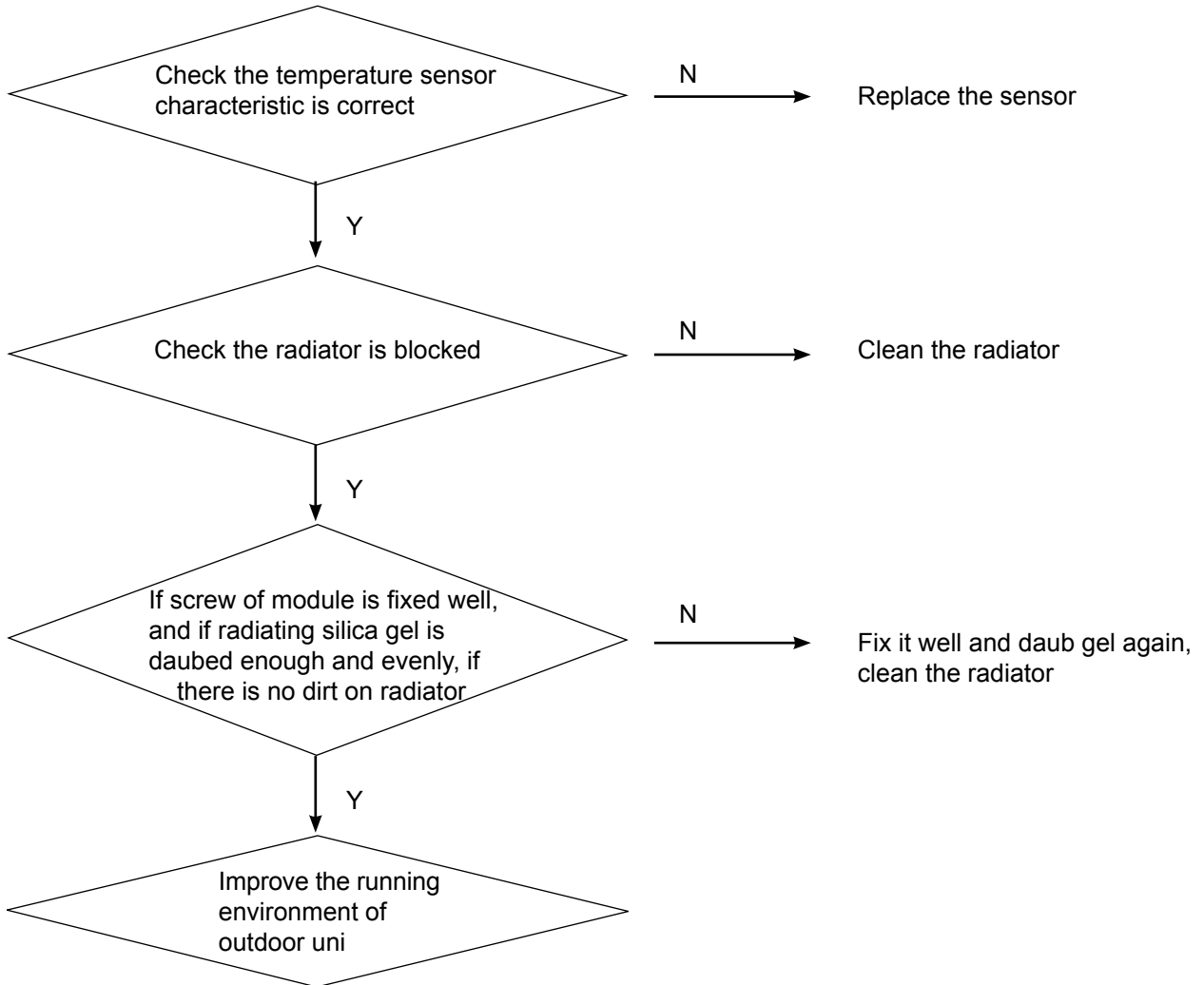
- [82] Compressor current protection
- [108] Transient over current in IPM module rectifier side software
- [110] IPM module hardware over current
- [123] Transient over current in IPM module rectifier side hardware



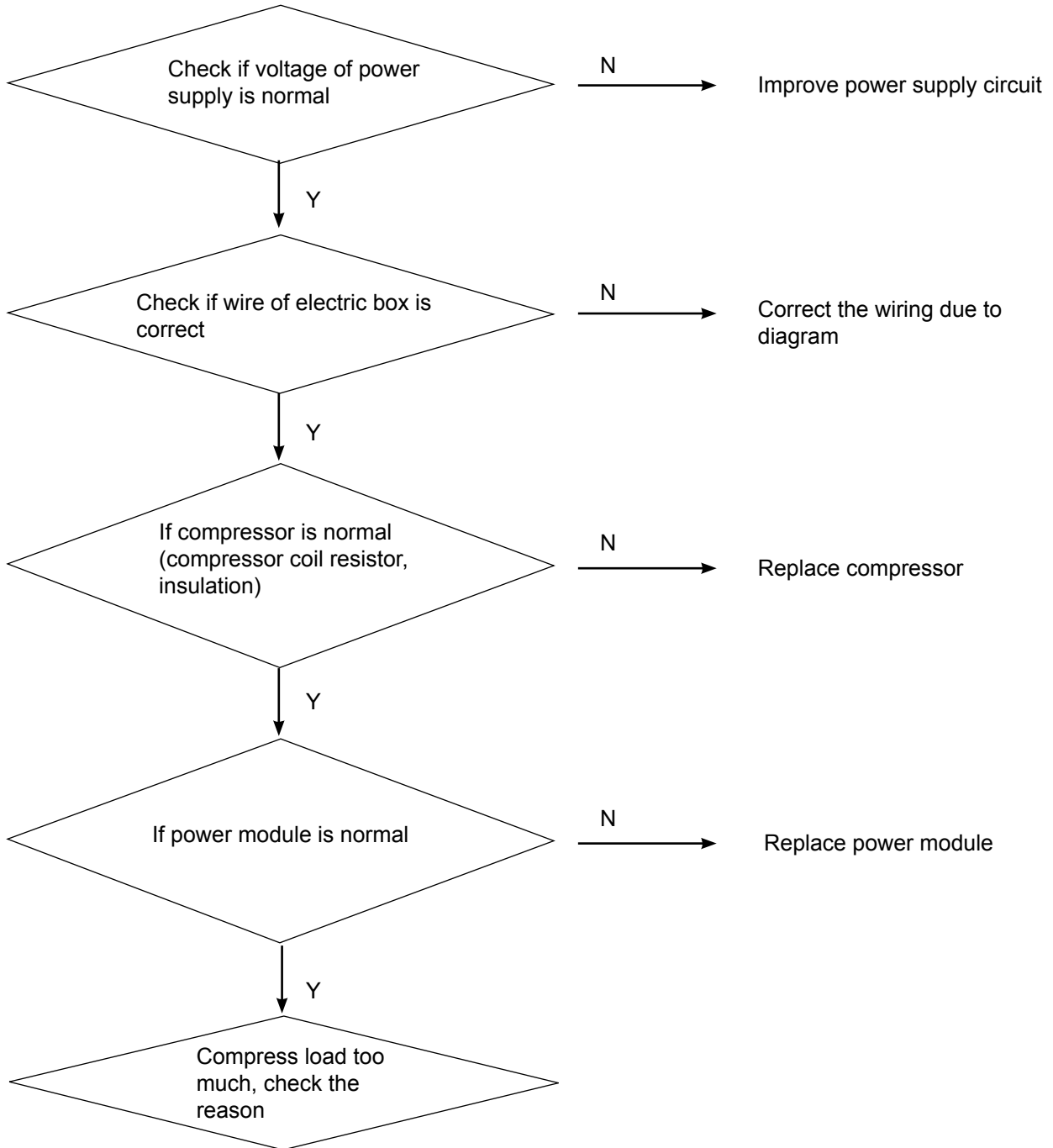
[111] Compressor out of control
[118] The compressor start failure



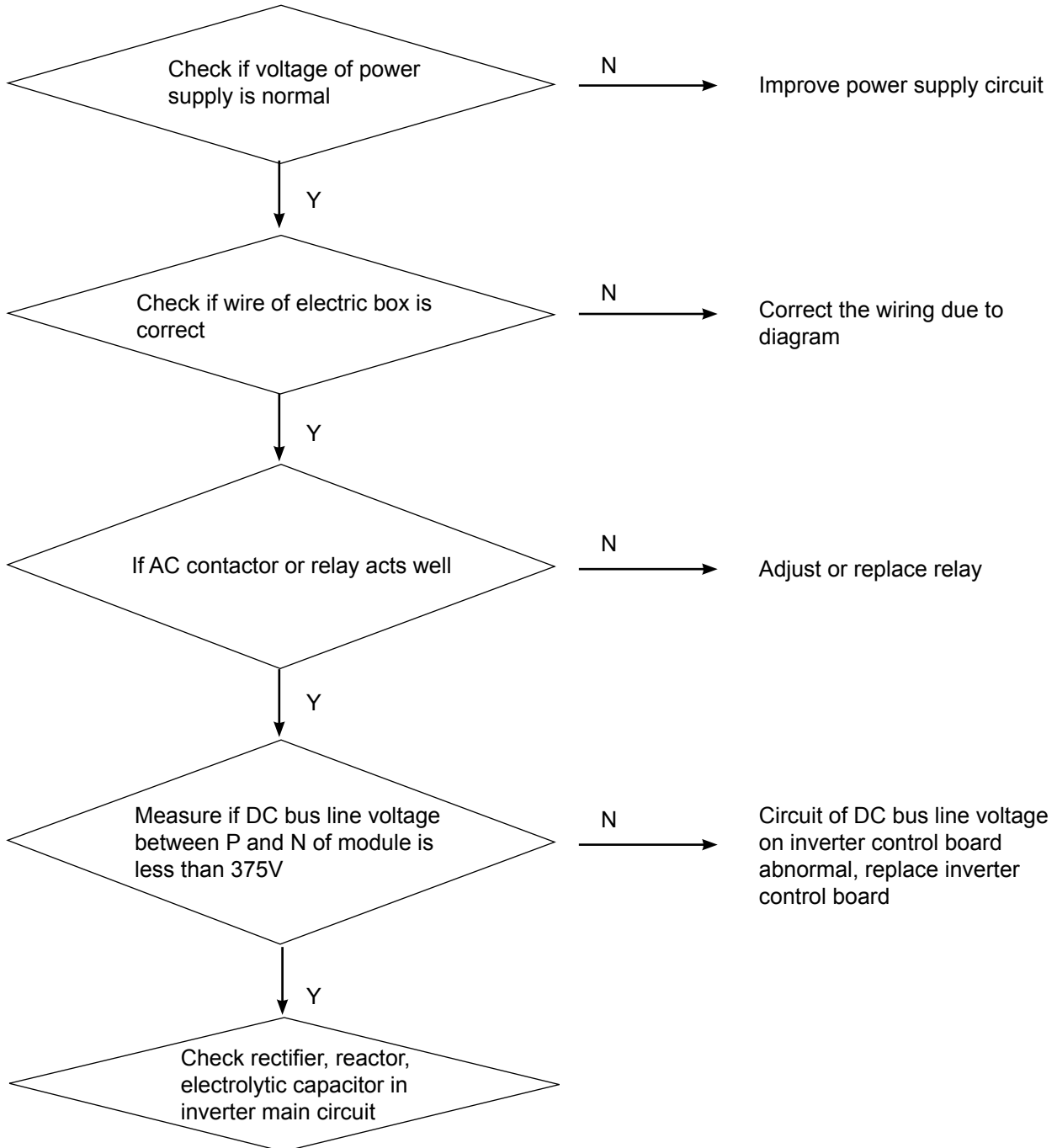
[112] Radiator temp. of transducer too high; [81] IPM module temp. too high



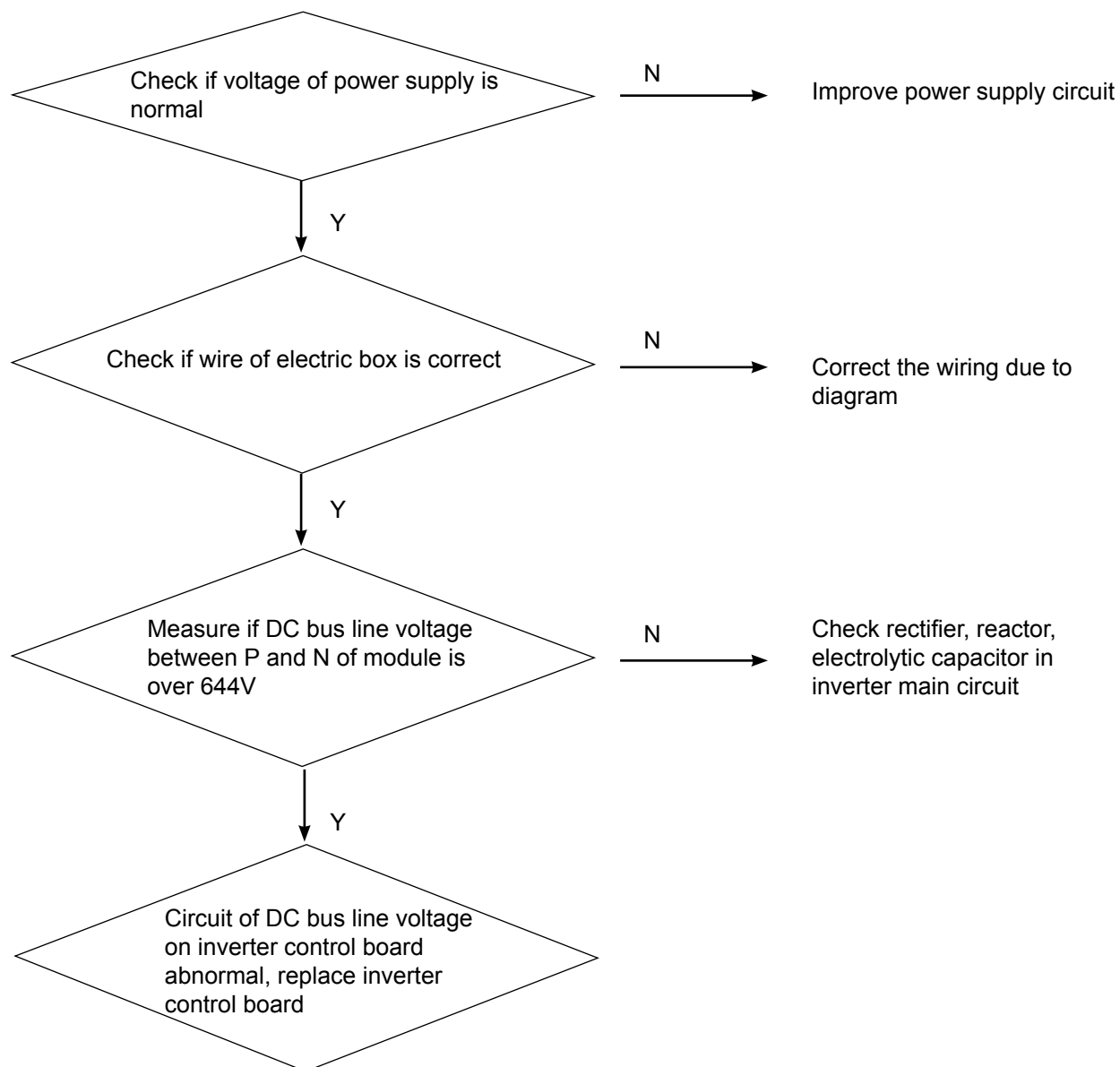
[113] Protection of overload



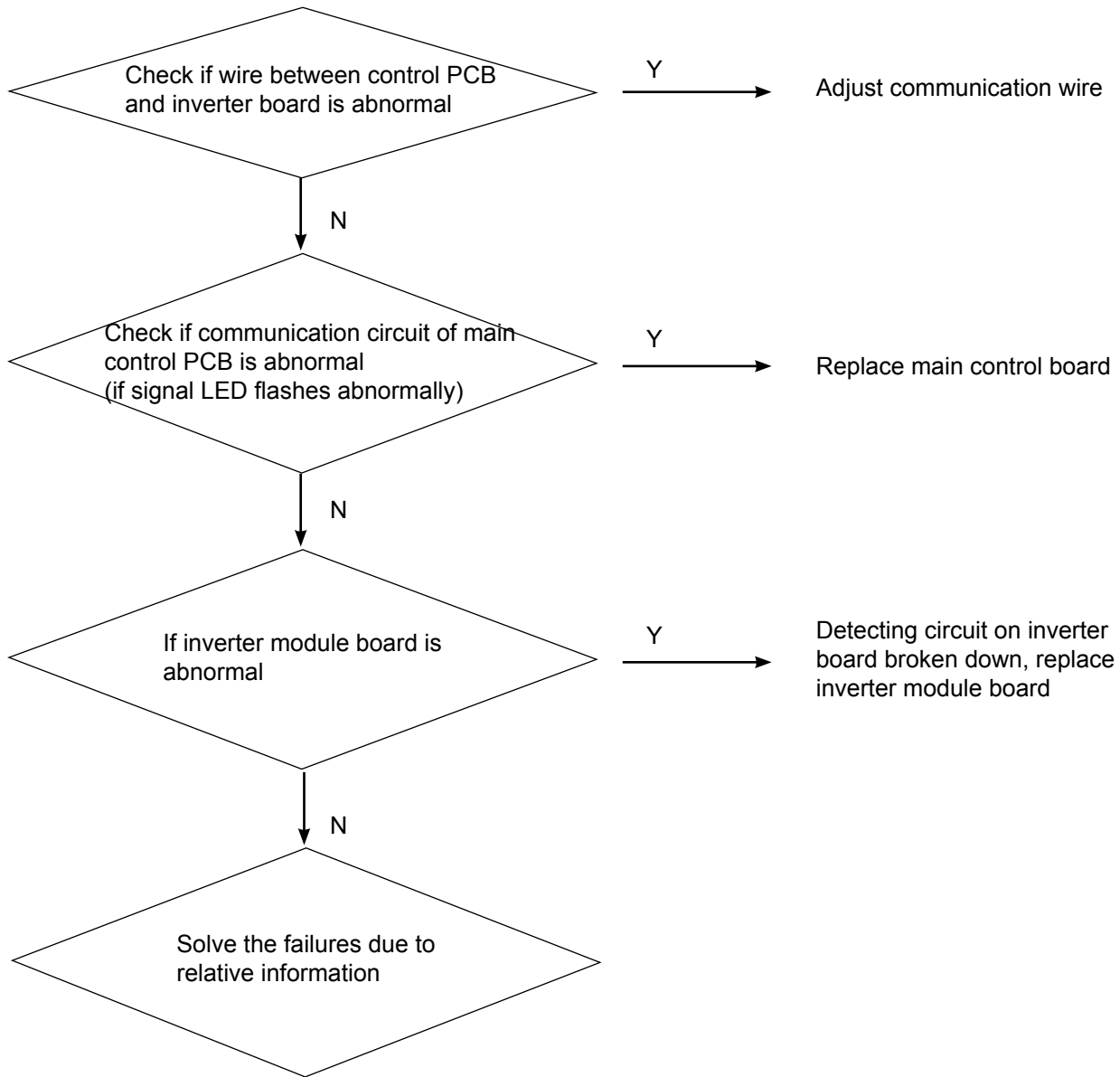
[114] Voltage too low of DC bus line of transducer



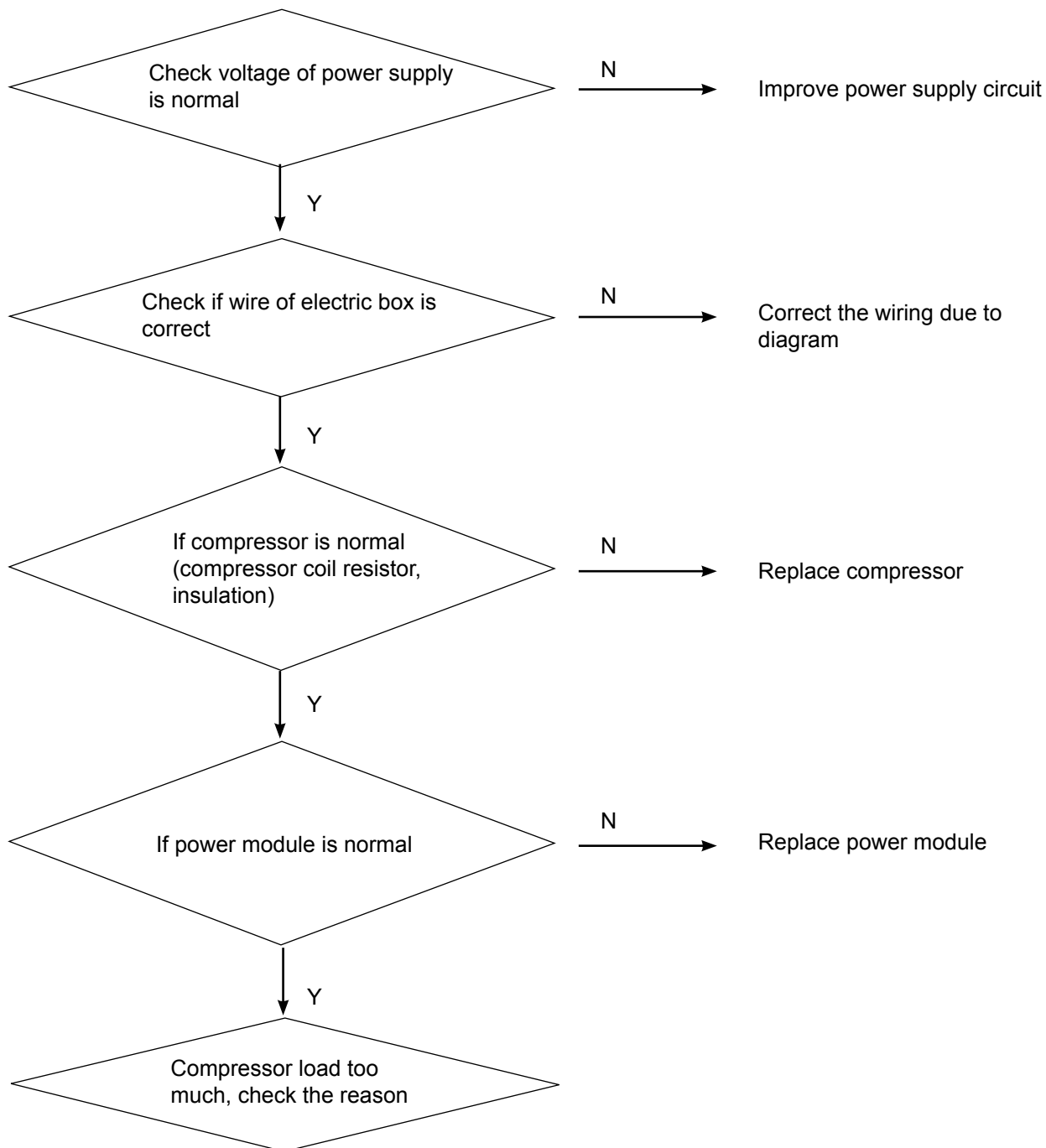
[115] Voltage too high of DC bus line of transducer



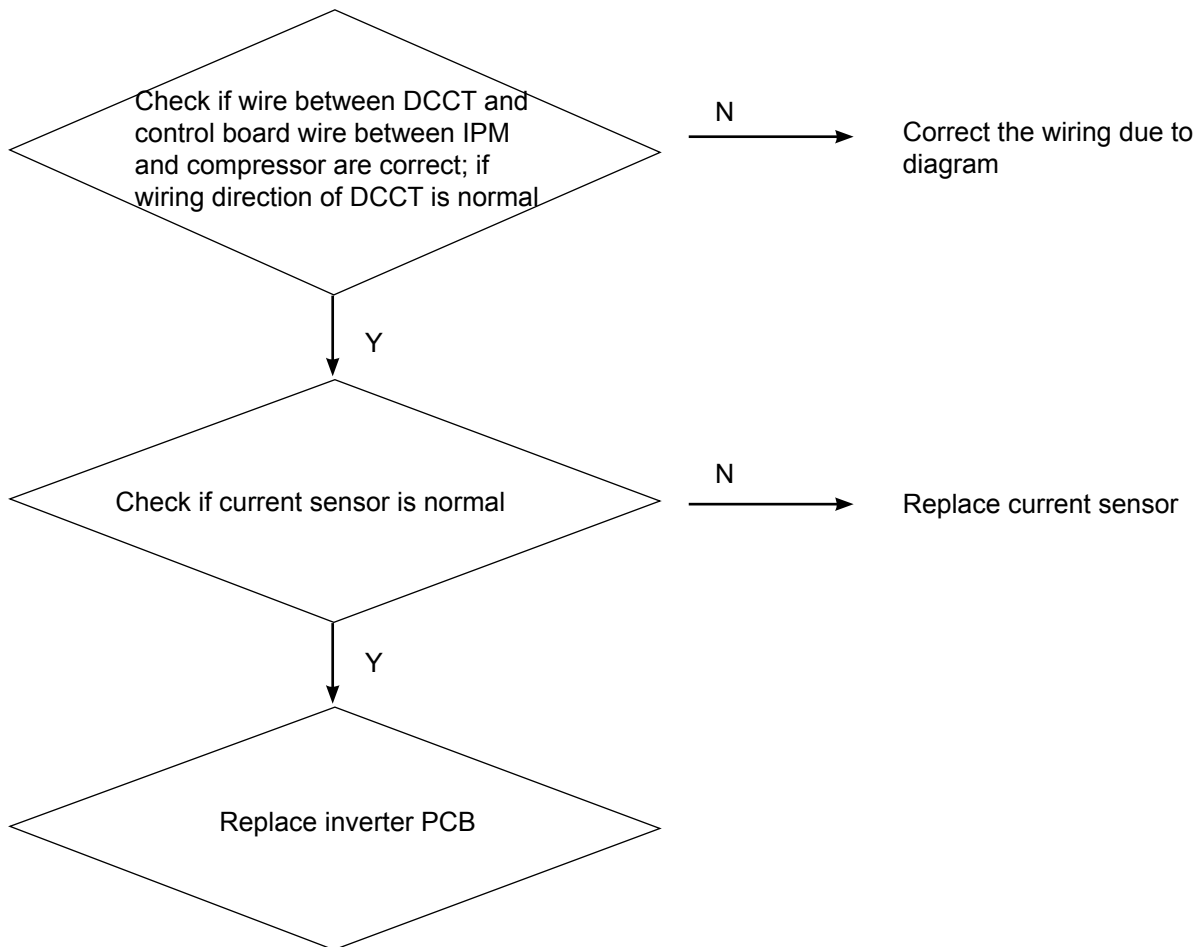
[116] Communication abnormal between transducer (inverter module board) and control PCB



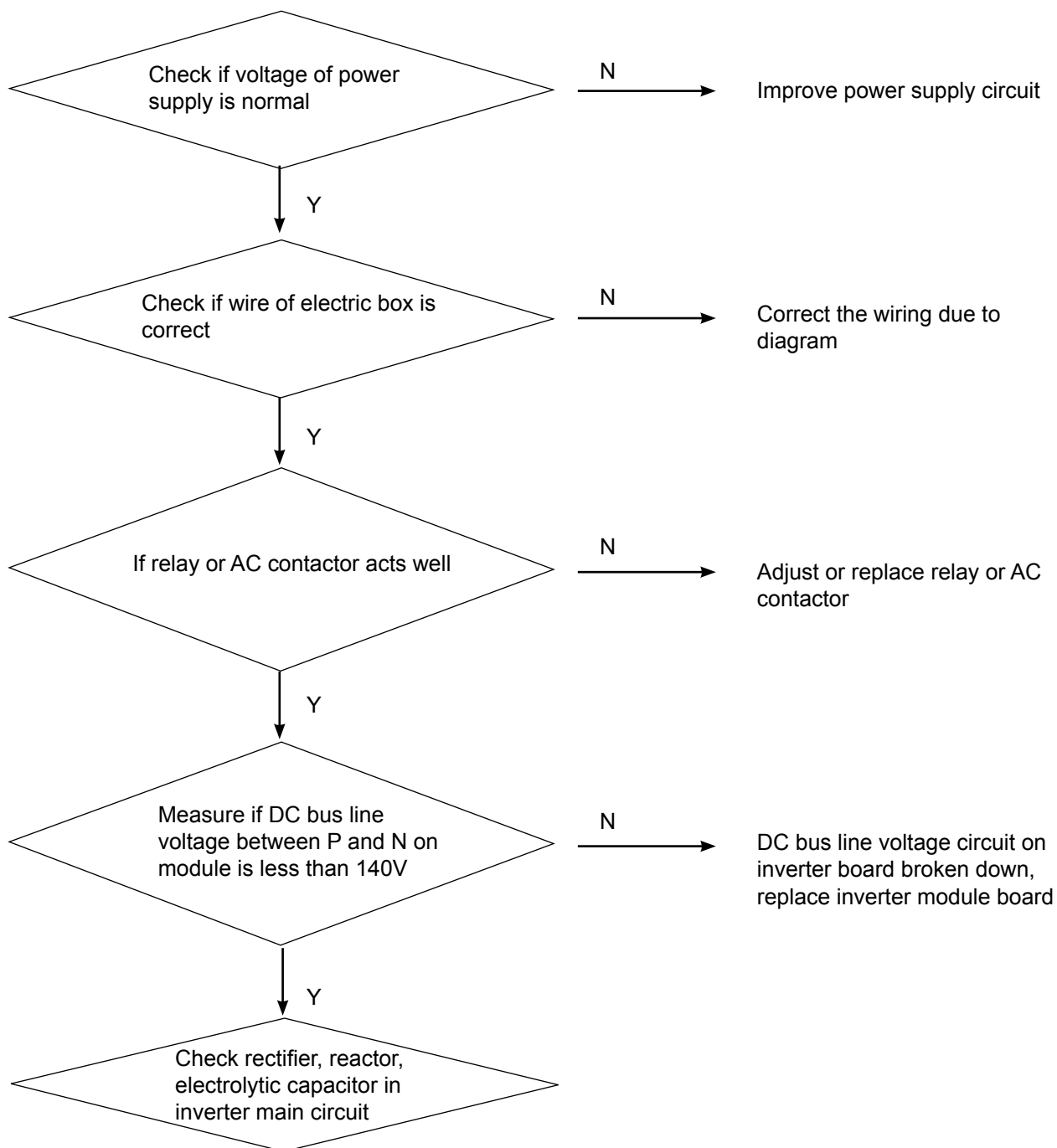
[117] Transducer over current (software protection)



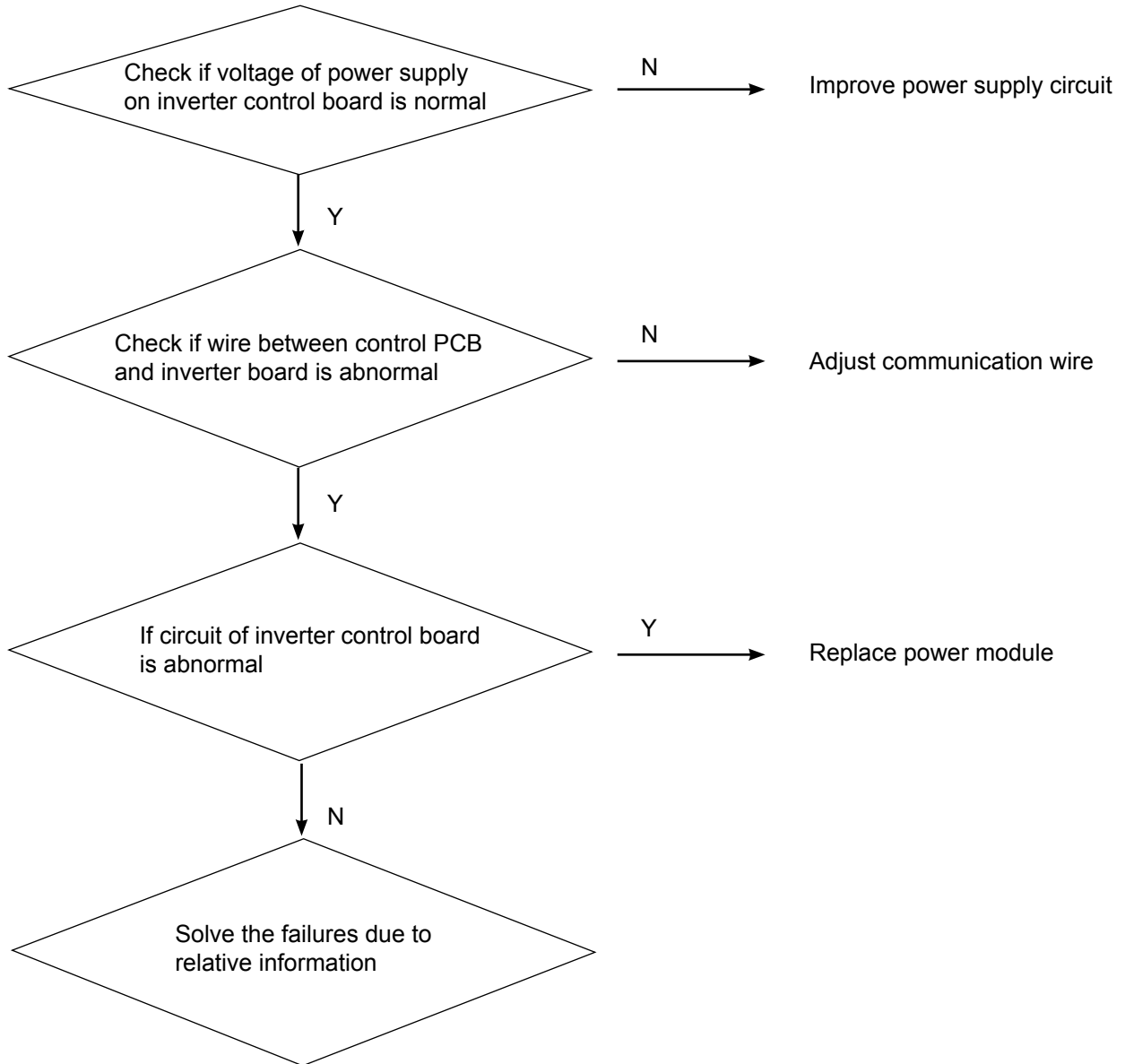
[119] Current detection circuit of transducer is abnormal



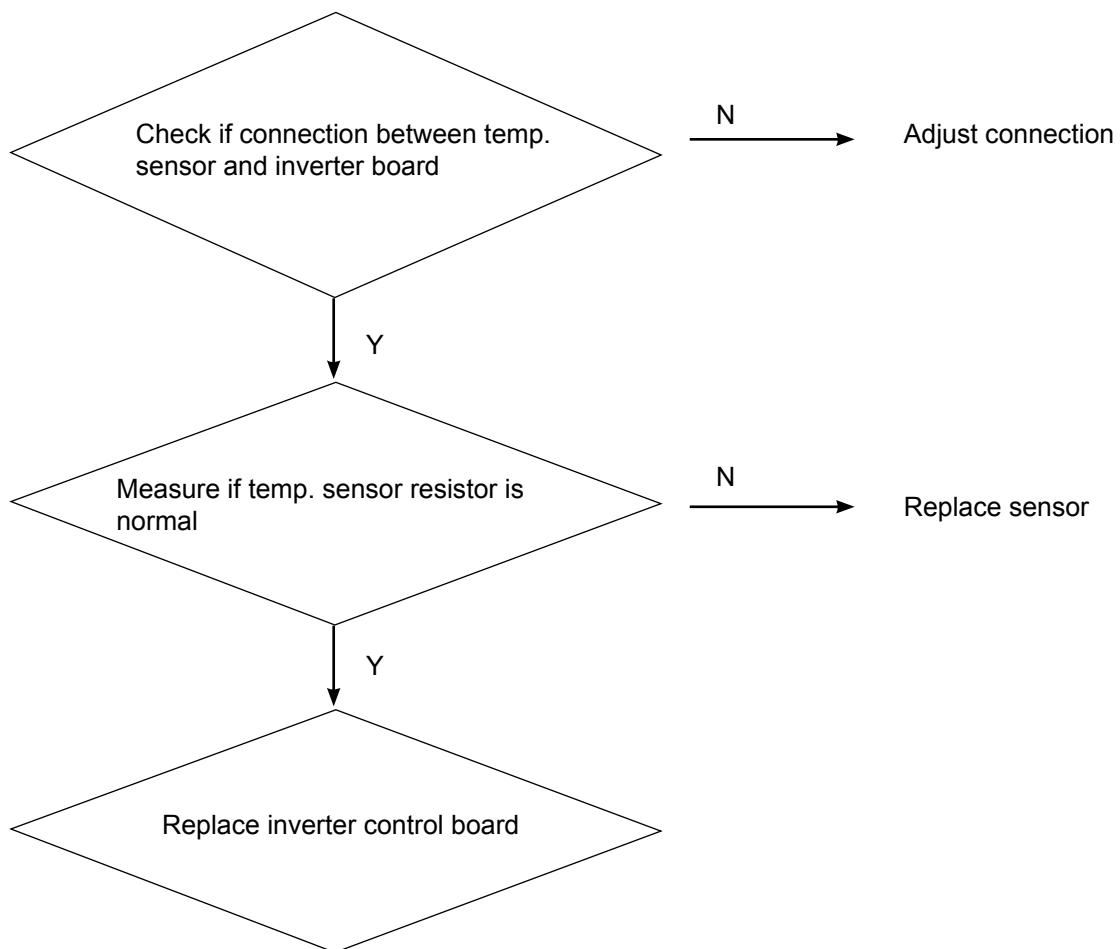
[120] Power supply of transducer abnormal



[121] Power supply of inverter board is abnormal



[122] Radiator temp. sensor of transducer abnormal



22. APPENDIX Sensor Resistance Table

NO.	Model	Name	Characteristic
1	AU082FRCRA(HW) AU112FRCRA(HW) AU162FRCRA(HW)	TAO ambient temp. sensor	R25=10KΩ
2		TD compressor discharge temp. sensor	R80=50KΩ
3		TE1 defrosting temp. sensor	R25=10KΩ
4		TS compressor suction temp. sensor	R25=10KΩ
5		THI in refrigerant temp. sensor	R25=10KΩ
6		THO out refrigerant temp. sensor	R25=10KΩ
7		TWI in water temp. sensor	R25=10KΩ
8		TWO out water temp. sensor	R25=10KΩ

R80=50kΩ±3% B25/80=4450K±3%					
Temp	Resistance (kΩ)			% (Resist. Tol)	
(°C)	Rmax	R (t) Normal	Rmin	MAX (+)	MIN (-)
0	1749.014	1921.993	2094.972	9	9
1	1651.431	1813.265	1975.099	8.93	8.93
2	1560.165	1711.646	1863.127	8.85	8.85
3	1474.737	1616.593	1758.449	8.78	8.78
4	1394.709	1527.611	1660.513	8.7	8.7
5	1319.683	1444.25	1568.817	8.63	8.63
6	1249.295	1366.096	1482.897	8.55	8.55
7	1183.21	1292.773	1402.336	8.48	8.48
8	1121.124	1223.935	1326.746	8.4	8.4
9	1062.756	1159.265	1255.774	8.33	8.33
10	1007.85	1098.474	1189.098	8.25	8.25
11	956.167	1041.293	1126.419	8.18	8.18
12	907.491	987.477	1067.463	8.1	8.1
13	861.621	936.799	1011.977	8.03	8.03
14	818.372	889.052	959.732	7.95	7.95
15	777.574	844.042	910.51	7.88	7.88
16	739.066	801.59	864.114	7.8	7.8
17	702.705	761.533	820.361	7.73	7.73
18	668.353	723.717	779.081	7.65	7.65
19	635.885	688.001	740.117	7.58	7.58
20	605.185	654.254	703.323	7.5	7.5
21	576.145	622.355	668.565	7.43	7.43
22	548.663	592.189	635.715	7.35	7.35
23	522.645	563.651	604.657	7.28	7.28
24	498.006	536.644	575.282	7.2	7.2
25	474.662	511.076	547.49	7.13	7.13
26	452.538	486.862	521.186	7.05	7.05
27	431.563	463.922	496.281	6.98	6.98
28	411.671	442.182	472.693	6.9	6.9
29	392.8	421.572	450.344	6.83	6.83
30	374.891	402.028	429.165	6.75	6.75
31	357.891	383.489	409.087	6.68	6.68
32	341.749	365.898	390.047	6.6	6.6
33	326.416	349.201	371.986	6.53	6.53
34	311.848	333.349	354.85	6.45	6.45
35	298.004	318.295	338.586	6.38	6.38
36	284.843	303.995	323.147	6.3	6.3

R80=50kΩ±3% B25/80=4450K±3%					
Temp	Resistance (kΩ)			% (Resist. Tol)	
(°C)	Rmax	R (t) Normal	Rmin	MAX (+)	MIN (-)
37	272.329	290.407	308.485	6.23	6.23
38	260.427	277.493	294.559	6.15	6.15
39	249.104	265.216	281.328	6.08	6.08
40	238.329	253.541	268.753	6	6
41	228.073	242.437	256.801	5.93	5.93
42	218.308	231.873	245.438	5.85	5.85
43	209.01	221.82	234.63	5.78	5.78
44	200.154	212.252	224.35	5.7	5.7
45	191.715	203.142	214.569	5.63	5.63
46	183.674	194.467	205.26	5.55	5.55
47	176.009	186.204	196.399	5.48	5.48
48	168.703	178.333	187.963	5.4	5.4
49	161.735	170.832	179.929	5.33	5.33
50	155.089	163.682	172.275	5.25	5.25
51	148.748	156.866	164.984	5.18	5.18
52	142.698	150.367	158.036	5.1	5.1
53	136.924	144.168	151.412	5.03	5.03
54	131.411	138.255	145.099	4.95	4.95
55	126.148	132.613	139.078	4.88	4.88
56	121.122	127.229	133.336	4.8	4.8
57	116.32	122.089	127.858	4.73	4.73
58	111.732	117.181	122.63	4.65	4.65
59	107.347	112.494	117.641	4.58	4.58
60	103.157	108.018	112.879	4.5	4.5
61	99.15	103.741	108.332	4.43	4.43
62	95.319	99.654	103.989	4.35	4.35
63	91.655	95.748	99.841	4.28	4.28
64	88.149	92.014	95.879	4.2	4.2
65	84.795	88.443	92.091	4.13	4.13
66	81.584	85.028	88.472	4.05	4.05
67	78.511	81.761	85.011	3.98	3.98
68	75.569	78.636	81.703	3.9	3.9
69	72.752	75.645	78.538	3.83	3.83
70	70.052	72.781	75.51	3.75	3.75
71	67.466	70.04	72.614	3.68	3.68

R80=50kΩ±3% B25/80=4450K±3%					
Temp	Resistance (kΩ)			% (Resist. Tol)	
(°C)	Rmax	R (t) Normal	Rmin	MAX (+)	MIN (-)
72	64.988	67.415	69.842	3.6	3.6
73	62.613	64.901	67.189	3.53	3.53
74	60.337	62.493	64.649	3.45	3.45
75	58.154	60.185	62.216	3.38	3.38
76	56.06	57.973	59.886	3.3	3.3
77	54.051	55.852	57.653	3.23	3.23
78	52.125	53.82	55.515	3.15	3.15
79	50.275	51.87	53.465	3.08	3.08
80	48.5	50	51.5	3	3
81	46.728	48.206	49.684	3.07	3.07
82	45.028	46.484	47.94	3.13	3.13
83	43.397	44.832	46.267	3.2	3.2
84	41.833	43.246	44.659	3.27	3.27
85	40.332	41.723	43.114	3.33	3.33
86	38.891	40.26	41.629	3.4	3.4
87	37.509	38.856	40.203	3.47	3.47
88	36.181	37.506	38.831	3.53	3.53
89	34.905	36.209	37.513	3.6	3.6
90	33.68	34.962	36.244	3.67	3.67
91	32.503	33.764	35.025	3.73	3.73
92	31.373	32.612	33.851	3.8	3.8
93	30.286	31.504	32.722	3.87	3.87
94	29.242	30.439	31.636	3.93	3.93
95	28.236	29.413	30.59	4	4
96	27.271	28.427	29.583	4.07	4.07
97	26.342	27.478	28.614	4.13	4.13
98	25.448	26.564	27.68	4.2	4.2
99	24.589	25.685	26.781	4.27	4.27
100	23.762	24.838	25.914	4.33	4.33
101	22.966	24.023	25.08	4.4	4.4
102	22.199	23.237	24.275	4.47	4.47
103	21.462	22.481	23.5	4.53	4.53
104	20.751	21.752	22.753	4.6	4.6

R80=50kΩ±3% B25/80=4450K±3%					
Temp	Resistance (kΩ)			% (Resist. Tol)	
(°C)	Rmax	R (t) Normal	Rmin	MAX (+)	MIN (-)
105	20.067	21.049	22.031	4.67	4.67
106	19.408	20.372	21.336	4.73	4.73
107	18.773	19.72	20.667	4.8	4.8
108	18.162	19.091	20.02	4.87	4.87
109	17.573	18.485	19.397	4.93	4.93
110	17.005	17.9	18.795	5	5
111	16.459	17.337	18.215	5.07	5.07
112	15.931	16.793	17.655	5.13	5.13
113	15.422	16.268	17.114	5.2	5.2
114	14.933	15.763	16.593	5.27	5.27
115	14.46	15.275	16.09	5.33	5.33
116	14.005	14.804	15.603	5.4	5.4
117	13.565	14.349	15.133	5.47	5.47
118	13.141	13.911	14.681	5.53	5.53
119	12.733	13.488	14.243	5.6	5.6
120	12.339	13.08	13.821	5.67	5.67
121	11.958	12.685	13.412	5.73	5.73
122	11.591	12.305	13.019	5.8	5.8
123	11.238	11.938	12.638	5.87	5.87
124	10.897	11.584	12.271	5.93	5.93
125	10.567	11.242	11.917	6	6
126	10.249	10.911	11.573	6.07	6.07
127	9.943	10.593	11.243	6.13	6.13
128	9.647	10.285	10.923	6.2	6.2
129	9.362	9.988	10.614	6.27	6.27
130	9.087	9.701	10.315	6.33	6.33
131	8.822	9.425	10.028	6.4	6.4
132	8.566	9.158	9.75	6.47	6.47
133	8.319	8.9	9.481	6.53	6.53
134	8.08	8.651	9.222	6.6	6.6
135	7.85	8.411	8.972	6.67	6.67
136	7.629	8.18	8.731	6.73	6.73
137	7.416	7.957	8.498	6.8	6.8
138	7.209	7.741	8.273	6.87	6.87
139	7.011	7.533	8.055	6.93	6.93
140	6.82	7.333	7.846	7	7

R25=10kΩ±3% B25/50=3700K±3%					
Temp	Resistance (kΩ)			% (Resist. Tol)	
(°C)	Rmax	R (t) Normal	Rmin	MAX (+)	MIN (-)
-30	145.819	135.018	124.217	7	7
-29	138.071	129.126	120.181	6.93	6.93
-28	131.793	123.339	114.885	6.85	6.85
-27	125.665	117.684	109.703	6.78	6.78
-26	119.706	112.18	104.654	6.71	6.71
-25	113.933	106.843	99.753	6.64	6.64
-24	108.361	101.687	95.013	6.56	6.56
-23	102.997	96.719	90.441	6.49	6.49
-22	97.847	91.946	86.045	6.42	6.42
-21	92.915	87.371	81.827	6.35	6.35
-20	88.2	82.994	77.788	6.27	6.27
-19	83.702	78.815	73.928	6.2	6.2
-18	79.417	74.832	70.247	6.13	6.13
-17	75.342	71.041	66.74	6.05	6.05
-16	71.471	67.437	63.403	5.98	5.98
-15	67.798	64.015	60.232	5.91	5.91
-14	64.316	60.769	57.222	5.84	5.84
-13	61.017	57.692	54.367	5.76	5.76
-12	57.895	54.778	51.661	5.69	5.69
-11	54.942	52.019	49.096	5.62	5.62
-10	52.149	49.409	46.669	5.55	5.55
-9	49.51	46.941	44.372	5.47	5.47
-8	47.016	44.607	42.198	5.4	5.4
-7	44.659	42.4	40.141	5.33	5.33
-6	42.433	40.315	38.197	5.25	5.25
-5	40.332	38.345	36.358	5.18	5.18
-4	38.346	36.482	34.618	5.11	5.11
-3	36.472	34.723	32.974	5.04	5.04
-2	34.7	33.059	31.418	4.96	4.96
-1	33.027	31.487	29.947	4.89	4.89
0	31.445	30	28.555	4.82	4.82
1	29.951	28.594	27.237	4.75	4.75
2	28.538	27.264	25.99	4.67	4.67
3	27.202	26.006	24.81	4.6	4.6
4	25.938	24.815	23.692	4.53	4.53

R25=10kΩ±3% B25/50=3700K±3%					
Temp	Resistance (kΩ)			% (Resist. Tol)	
(°C)	Rmax	R (t) Normal	Rmin	MAX (+)	MIN (-)
5	24.742	23.687	22.632	4.45	4.45
6	23.61	22.619	21.628	4.38	4.38
7	22.538	21.607	20.676	4.31	4.31
8	21.522	20.647	19.772	4.24	4.24
9	20.559	19.737	18.915	4.16	4.16
10	19.646	18.874	18.102	4.09	4.09
11	18.779	18.054	17.329	4.02	4.02
12	17.958	17.276	16.594	3.95	3.95
13	17.177	16.537	15.897	3.87	3.87
14	16.436	15.834	15.232	3.8	3.8
15	15.731	15.166	14.601	3.73	3.73
16	15.061	14.53	13.999	3.65	3.65
17	14.424	13.925	13.426	3.58	3.58
18	13.817	13.349	12.881	3.51	3.51
19	13.24	12.8	12.36	3.44	3.44
20	12.69	12.277	11.864	3.36	3.36
21	12.166	11.778	11.39	3.29	3.29
22	11.666	11.302	10.938	3.22	3.22
23	11.189	10.848	10.507	3.15	3.15
24	10.734	10.414	10.094	3.07	3.07
25	10.3	10	9.7	3	3
26	9.898	9.604	9.31	3.06	3.06
27	9.514	9.226	8.938	3.13	3.13
28	9.147	8.864	8.581	3.19	3.19
29	8.796	8.519	8.242	3.25	3.25
30	8.459	8.188	7.917	3.31	3.31
31	8.137	7.871	7.605	3.38	3.38
32	7.828	7.568	7.308	3.44	3.44
33	7.532	7.277	7.022	3.5	3.5
34	7.248	6.999	6.75	3.56	3.56
35	6.977	6.733	6.489	3.63	3.63
36	6.716	6.477	6.238	3.69	3.69
37	6.466	6.232	5.998	3.75	3.75
38	6.227	5.998	5.769	3.81	3.81
39	5.997	5.773	5.549	3.88	3.88
40	5.776	5.557	5.338	3.94	3.94
41	5.564	5.35	5.136	4	4

R25=10kΩ±3% B25/50=3700K±3%					
Temp	Resistance (kΩ)			% (Resist. Tol)	
(°C)	Rmax	R (t) Normal	Rmin	MAX (+)	MIN (-)
42	5.36	5.151	4.942	4.06	4.06
43	5.166	4.961	4.756	4.13	4.13
44	4.978	4.778	4.578	4.19	4.19
45	4.799	4.603	4.407	4.25	4.25
46	4.625	4.434	4.243	4.31	4.31
47	4.46	4.273	4.086	4.38	4.38
48	4.301	4.118	3.935	4.44	4.44
49	4.148	3.969	3.79	4.5	4.5
50	4.001	3.826	3.651	4.56	4.56
51	3.86	3.689	3.518	4.63	4.63
52	3.724	3.557	3.39	4.69	4.69
53	3.594	3.431	3.268	4.75	4.75
54	3.468	3.309	3.15	4.81	4.81
55	3.349	3.193	3.037	4.88	4.88
56	3.233	3.081	2.929	4.94	4.94
57	3.123	2.974	2.825	5	5
58	3.015	2.87	2.725	5.06	5.06
59	2.913	2.771	2.629	5.13	5.13
60	2.815	2.676	2.537	5.19	5.19
61	2.721	2.585	2.449	5.25	5.25
62	2.63	2.497	2.364	5.31	5.31
63	2.543	2.413	2.283	5.38	5.38
64	2.459	2.332	2.205	5.44	5.44
65	2.379	2.255	2.131	5.5	5.5
66	2.301	2.18	2.059	5.56	5.56
67	2.228	2.109	1.99	5.63	5.63
68	2.156	2.04	1.924	5.69	5.69
69	2.088	1.974	1.86	5.75	5.75
70	2.021	1.91	1.799	5.81	5.81
71	1.958	1.849	1.74	5.88	5.88
72	1.897	1.791	1.685	5.94	5.94
73	1.839	1.735	1.631	6	6
74	1.782	1.68	1.578	6.06	6.06
75	1.728	1.628	1.528	6.13	6.13

R25=10kΩ±3% B25/50=3700K±3%					
Temp	Resistance (kΩ)			% (Resist. Tol)	
(°C)	Rmax	R (t) Normal	Rmin	MAX (+)	MIN (-)
76	1.676	1.578	1.48	6.19	6.19
77	1.626	1.53	1.434	6.25	6.25
78	1.578	1.484	1.39	6.31	6.31
79	1.531	1.439	1.347	6.38	6.38
80	1.486	1.396	1.306	6.44	6.44
81	1.443	1.355	1.267	6.5	6.5
82	1.401	1.315	1.229	6.56	6.56
83	1.362	1.277	1.192	6.63	6.63
84	1.323	1.24	1.157	6.69	6.69
85	1.285	1.204	1.123	6.75	6.75
86	1.249	1.169	1.089	6.81	6.81
87	1.214	1.136	1.058	6.88	6.88
88	1.181	1.104	1.027	6.94	6.94
89	1.148	1.073	0.998	7	7
90	1.116	1.042	0.968	7.06	7.06
91	1.085	1.013	0.941	7.13	7.13
92	1.056	0.985	0.914	7.19	7.19
93	1.026	0.957	0.888	7.25	7.25
94	0.998	0.93	0.862	7.31	7.31
95	0.971	0.904	0.837	7.38	7.38
96	0.944	0.879	0.814	7.44	7.44
97	0.918	0.854	0.79	7.5	7.5
98	0.893	0.83	0.767	7.56	7.56
99	0.867	0.806	0.745	7.63	7.63
100	0.843	0.783	0.723	7.69	7.69
101	0.819	0.76	0.701	7.75	7.75
102	0.796	0.738	0.68	7.81	7.81
103	0.772	0.716	0.66	7.88	7.88
104	0.749	0.694	0.639	7.94	7.94
105	0.727	0.673	0.619	8	8

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