

TROPICAL AIR-COOLED SCREW CHILLER



TRUST AIR CONDITIONING EQUIPMENT CO.
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توجه:

شرکت تراست حق تغییر مشخصات دستگاه ها را در جهت بهبود و ارتقای
کیفیت برای خود محفوظ می دارد.

2017

I. Troubleshooting

1. List of failures

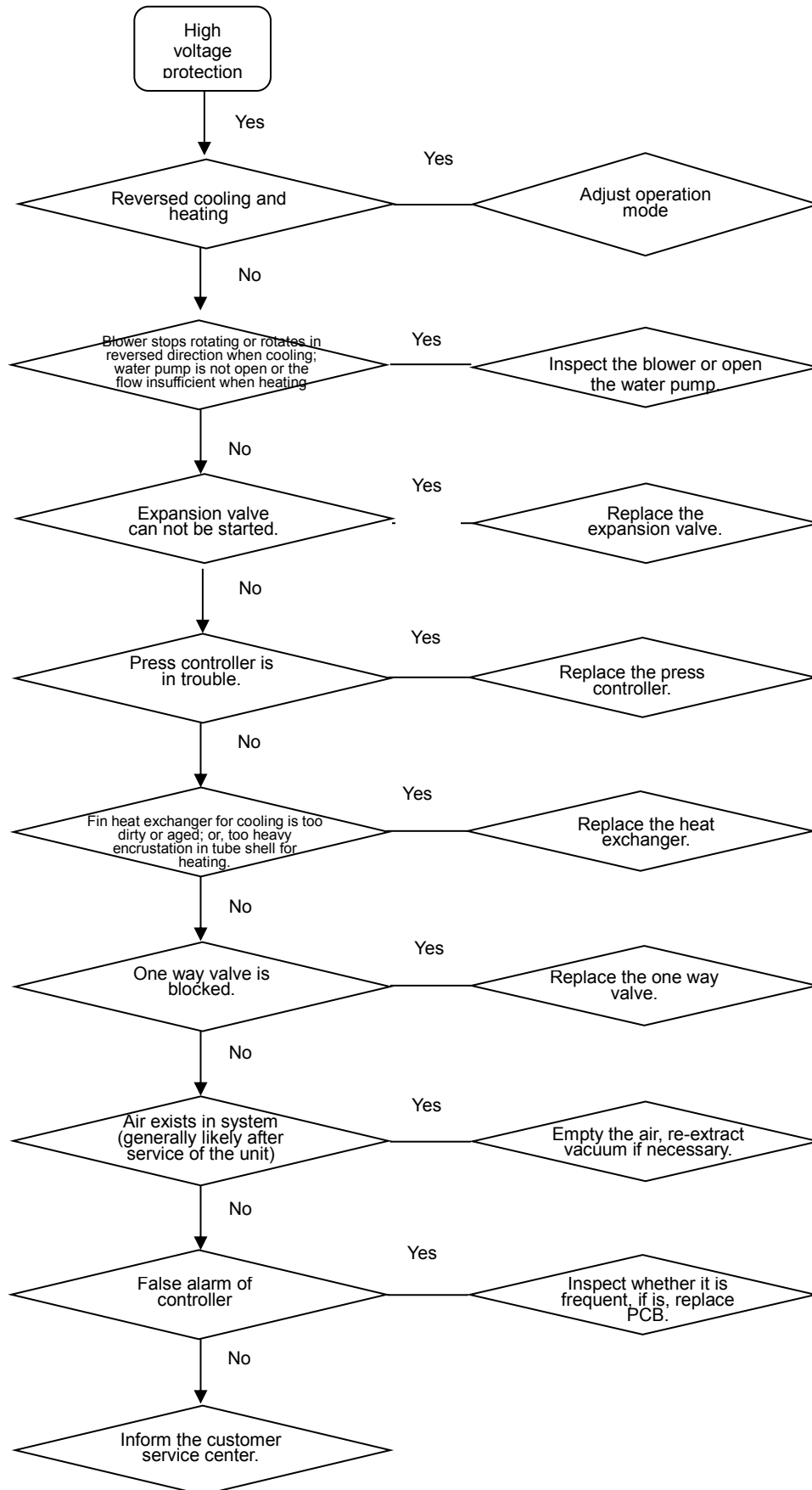
Failure display	Name of failure	Source of failure	Control logic
Flow switch failure	Flow switch failure	Flow switch	The flow switch will be detected in 3 minutes of pump running. If the flow switch of unit module is off all the time for 5S successively, it shall be reported for flow switch protection. Execute this failure unit in the failure stop procedure; save the content of failure. Confirm this failure manually on touch screen as required after resetting the flow switch (detection will not be carried out in the period of stop, nor started until the pump runs for 3 minutes)
Freeze protection	Freeze alarm	Antifreeze Switch	When leaving water temperature in a unit modular unit is less than or equal to 3℃ and the mechanical antifreeze switch is switched off, report freeze protection, immediately stop this unit in the failure stop procedure, and save the content of failure. Save the content of failure. Do not switch on the unit modular unit (to be detected during both stop and running) in accordance with the conditions of temperature and time until this failure is confirmed manually on touch screen as required after failure is eliminated.
High-pressure alarm	High-pressure alarm	High-pressure switch	To be detected during both stop and running. Switch off the high-pressure switch when discharge pressure of the system is higher than 20Bar, report high-pressure protection, stop the module immediately in the failure stop procedure, and save the content of failure. Reset will not be allowed until system pressure is lower than the setting value after protection occurs. Do not switch on the units in accordance with the conditions of temperature and time until this failure is confirmed manually on touch screen as required after failure is eliminated.
Low-pressure alarm	Low-pressure alarm	Low-pressure switch	To be detected during both stop and running. Switch off the low-pressure switch when discharge pressure of the system is lower than 1Bar, report low-pressure protection, stop the module immediately in the failure stop procedure, and save the content of failure.
Compressor internal protection	Compressor internal protection	Motor protector	To be detected during both stop and running. Switch off the protection switch in compressor in the case of high temperature of compressor winding, or high compressor discharge temperature, or phase sequence error of compressor power, or phase lack. Stop the units immediately in the failure stop procedure and save the content of failure. Do not switch on the units in accordance with the conditions of temperature and time until this failure is confirmed manually on touch screen as required after failure is eliminated.
Oil level protection	Oil level protection	Oil level switch	To be continuously monitored prior to start, report oil level protection in case of continuous switch-off of oil level switch for 3S, and start of compressor is not allowed; to be detected in running, switch off the oil level switch in case of continuous switch-off of oil level switch of compressor for 60S during running of compressor. Then report oil level switch protection. Immediately stop the units in the failure stop procedure, and save the content of failure.
Oil differential pressure protection	Oil differential pressure protection	Oil differential pressure switch	To be detected in running, switch off the oil differential pressure switch when the difference between oil pressure and discharge pressure of compressor is higher than the setting value during running of compressor. The indicator of oil differential pressure switch in input interface will be out. Do not switch on the units in accordance with the conditions of temperature and time until this failure is confirmed manually on touch screen as required after switch resetting.
Contactor failure	Contactor failure	Contactor	To be detected after start of master, report the contactor failure in case of incorrect pull-in of contactor. Do not switch on the units in accordance with the conditions of temperature and time until this

			failure is confirmed manually on touch screen as required after switch resetting.
Compress or overload	Compress or overload	Compressor overload relay	Report compressor overload protection when the current value of unit compressor is greater than the setting value and energy accumulated to result in thermo relay trip. Stop the module immediately in the failure stop procedure, and save the content of failure. Do not switch on the units in accordance with the conditions of temperature and time until this failure is confirmed manually on touch screen as required after failure is eliminated.
Fans overload	Fans overload	Fans overload relay	Report fans motor overload protection when the current value of unit fans is greater than the setting value and energy accumulated to result in thermo relay trip. Stop the compressors and fans (simultaneously) immediately for this module, and save the content of failure. Do not switch on the units in accordance with the conditions of temperature and time until this failure is confirmed manually on touch screen as required after switch resetting.
Power Failure	Power Failure	Phase sequence protector	To be detected at any time, report power failure in cases of high / low voltage of power or phase unbalance and phase lack. Failure will be eliminated after power gets right. Notes: phase lack / phase stagger of power will be detected during both initial stage of power-on and unit running.
High Fin temp.	High Fin temp.	Fin temp. sensor	To be detected in running, the fin temperature of the system is higher than 65°C, and the failure record indicates that the fin temperature is too high.
High Discharge temp.	High Discharge temp.	Discharge temp. sensor	To be detected in running, the discharge temperature of the system is higher than 110°C, and the failure record indicates that the discharge temperature is too high.
Leaving water temp. sensor failure	Leaving water temp. sensor failure	Leaving water temp. sensor	<p>Switch off compressors in case of failure of the sensor itself. Switch-off of pump and fans will be delayed. The failure indicator of display board will be on, and a corresponding alarm mark will be displayed in "Failure Query". The compressors will not be restarted until the failure of sensor is eliminated, and the failure signal must be cleared manually, otherwise it cannot be cleared.</p>
Entering water temp. sensor failure	Entering water temp. sensor failure	Entering water temp. sensor	
Fin temp. sensor failure	Fin temp. sensor failure	Fin temp. sensor	
Ambient temp. sensor failure	Ambient temp. sensor failure	Ambient temp. sensor	
Discharge temp. sensor failure	Discharge temp. sensor failure	Discharge temp. sensor	
Suction temp. sensor failure	Suction temp. sensor failure	Suction temp. sensor	
Low-pressure alarm	Low-pressure alarm	Low-pressure switch	
High-pressure alarm	High-pressure alarm	High-pressure switch	Do not restart the units until confirming manually on touch screen as required when the discharge pressure detected by the system is lower than the setting value for continuously 1s.

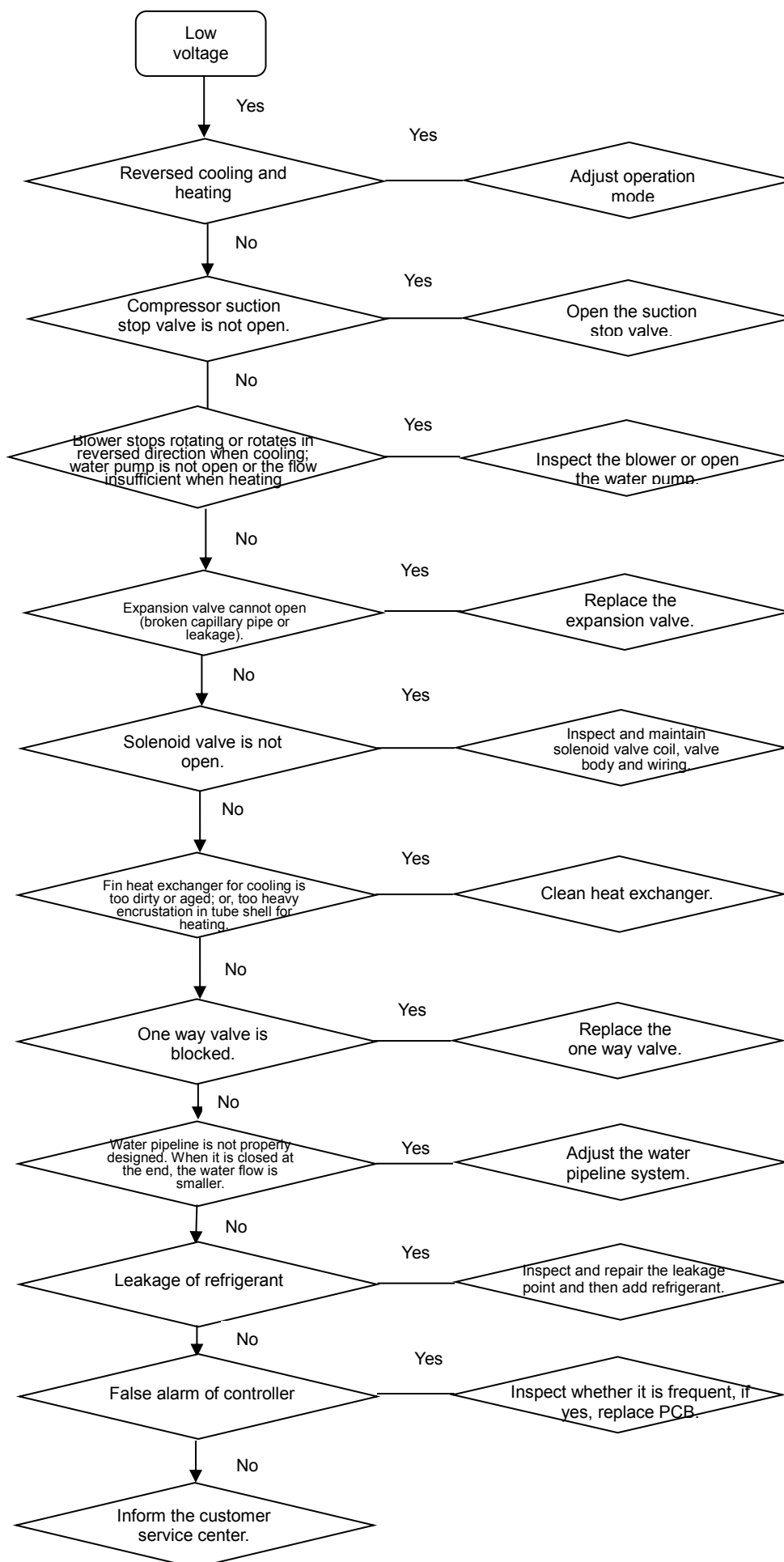
Differential pressure alarm	Differential pressure alarm	Differential pressure switch	To be detected in running. Currently, there are two modes, one is direct use of differential pressure switch, namely that when the difference between high pressure and low pressure of the system is smaller than the setting value of 4Bar, the differential pressure switch will be switched off, and the indicator of differential pressure switch of input interface will be out. The other is PLC calculation, namely that an alarm will be given if the differential pressure is smaller than 4Bar.
Low Suction Pressure	Low Suction Pressure	Low-pressure sensor	To be detected in running, report protection of too low suction pressure when the refrigeration suction pressure is lower than 1Bar, and the units will not be restarted until it is confirmed manually on touch screen as required.
High Discharge Pressure	High Discharge Pressure	High-pressure sensor	To be detected in running, report protection of high discharge pressure when the discharge pressure is higher than 20Bar, and the units will not be restarted until it is confirmed manually on touch screen as required.
Beyond the operation range	Beyond the operation range	Ambient temp. sensor, entering water temp. sensor	The system will be automatically stopped when the ambient temperature detected by the system exceeds that set by the system for continuously 5 minutes.
Mode water temp. protection	Mode water temp. protection	Entering / Leaving water temp. sensor	Detect water temperature in the refrigeration mode after start for 5 minutes, and report mode water temp. protection when leaving water temperature is not lower than entering water temperature for continuously 5s.
EXV module failure	EXV module failure	EXV Control Module	Start detection upon power-on of units, and report immediately failure of EXV module when the alarm output point of EXV control module is switched off.

2. Common troubleshooting

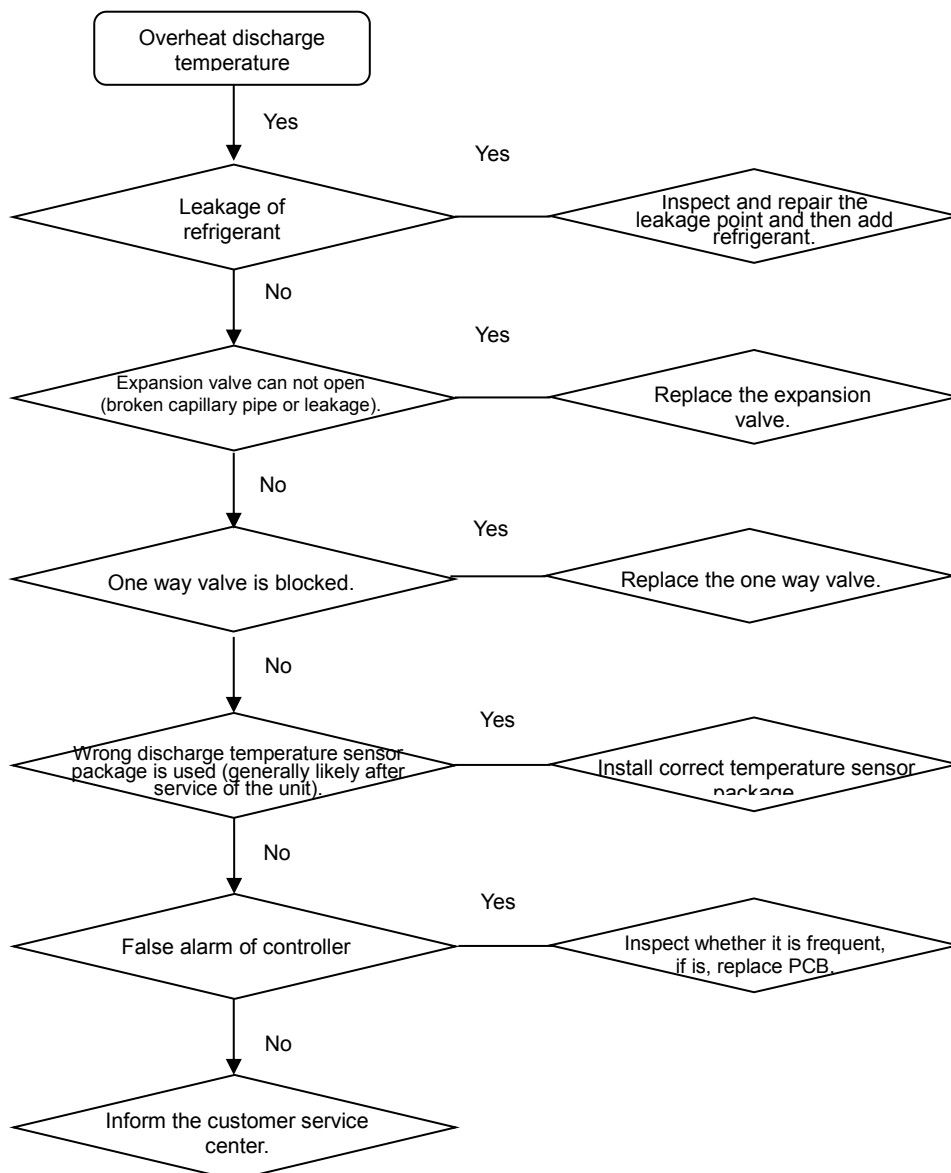
1) High voltage protection



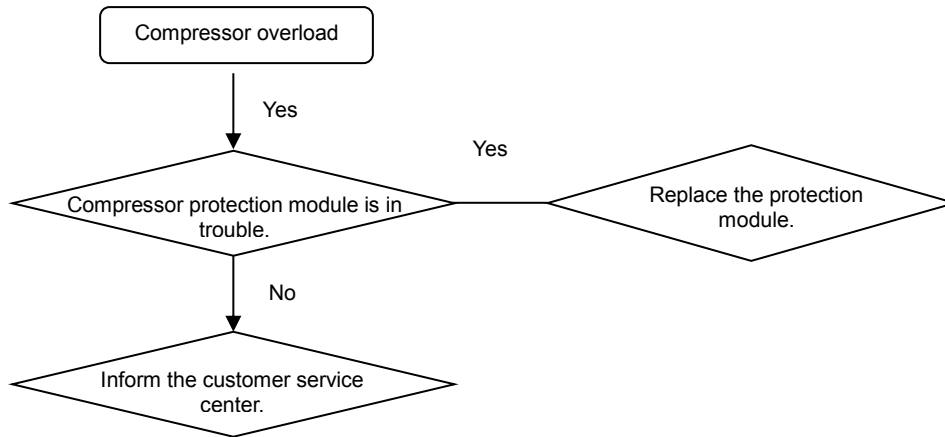
2) Low voltage protection



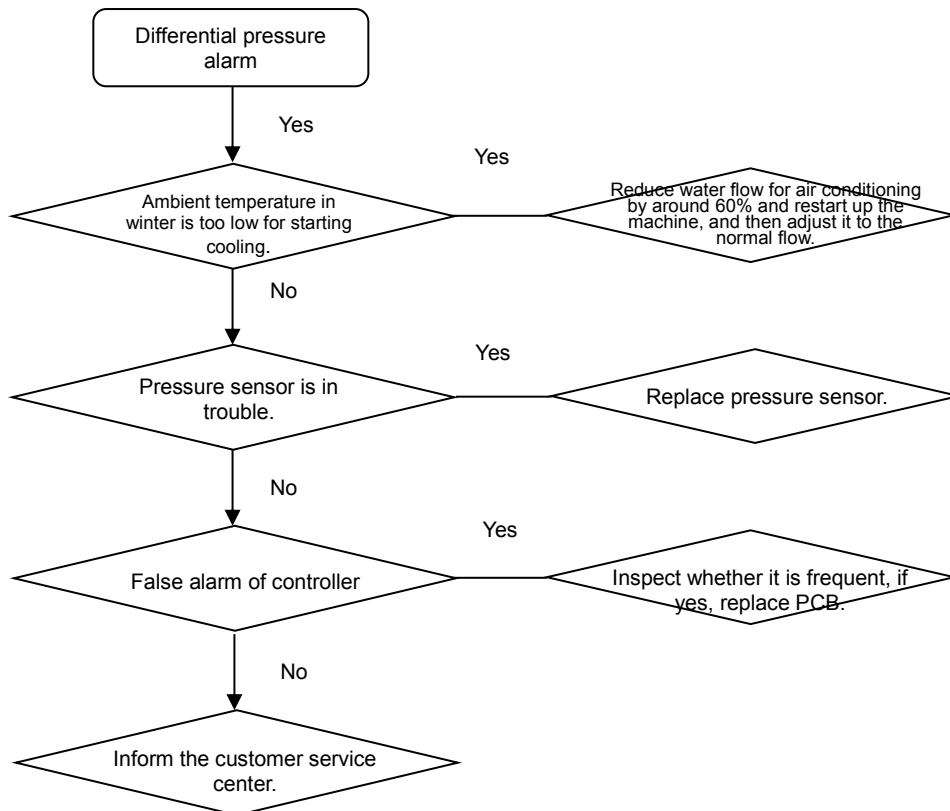
3) Overheat discharge temperature protection



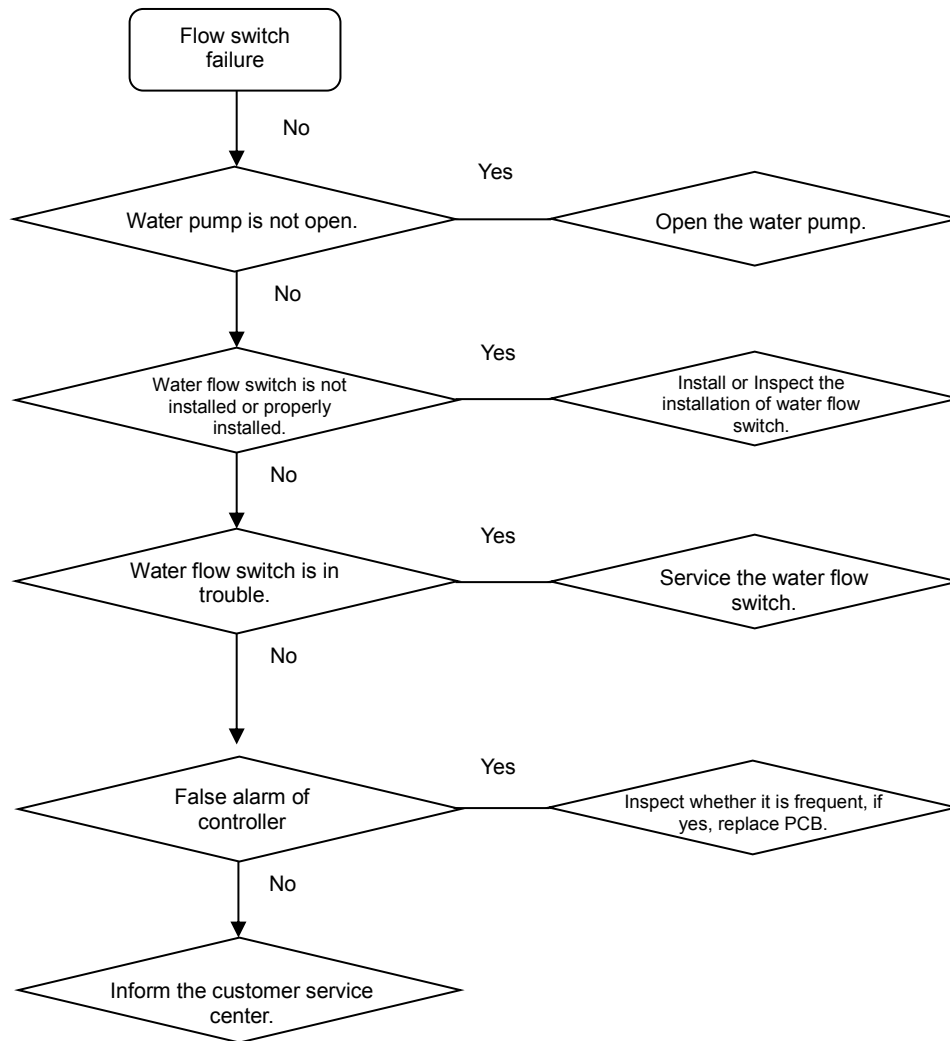
4) Compressor overload protection



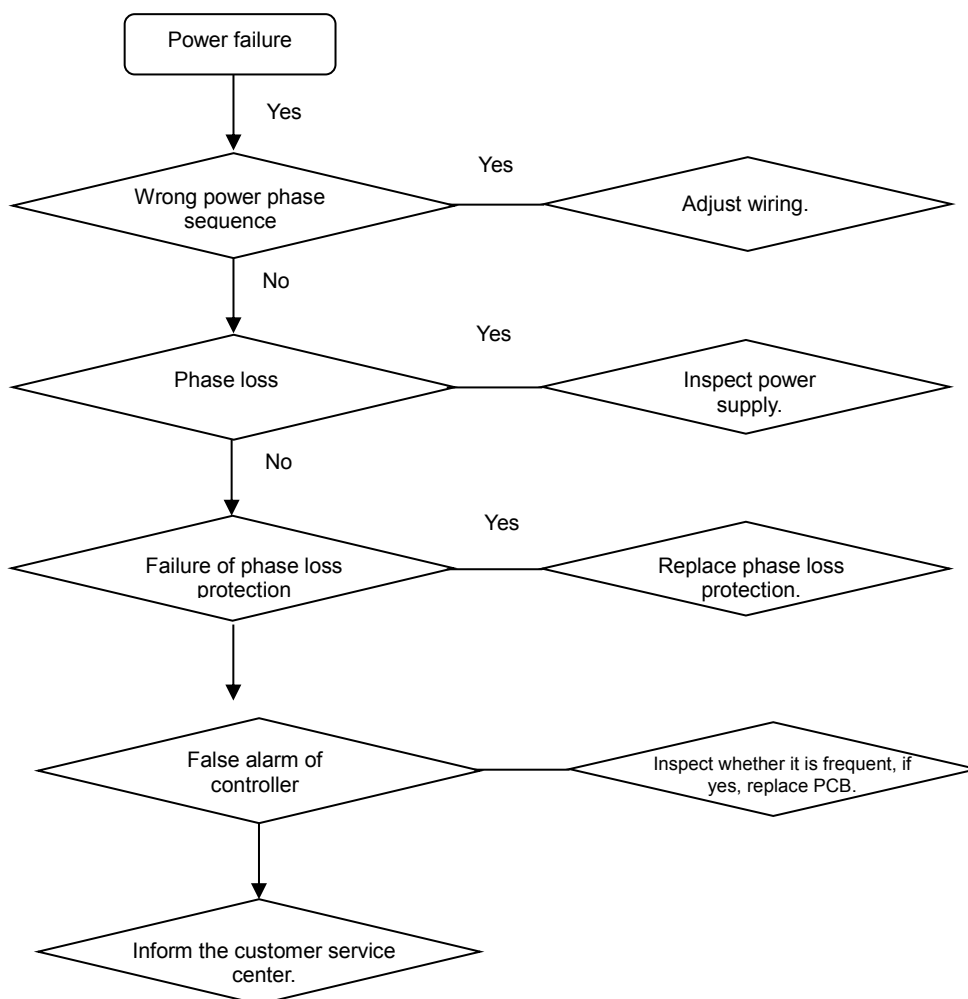
5) Differential pressure alarm



6) Flow switch failure



7) Power failure



II. Appendix 1

1. Temperature-Resistance characteristic sheet for discharge temperature sensor

NTC sensor characteristic sheet

Unit: Temp.°C--K.Ratio:KΩ, 5K@90°C

Temp.	Ratio	Temp.	Ratio	Temp.	Ratio	Temp.	Ratio
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294		
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045		
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

2. Temperature-Resistance characteristic sheet for water temp. sensor, ambient temp. sensor, oil temp. sensor.

NTC sensor characteristic sheet

Unit: Temp:°C--K . Ratio:KΩ, 10K@25°C

Temp.	Ratio	Temp.	Ratio	Temp.	Ratio	Temp.	Ratio
-20	103.882	20	12.598	60	2.383	100	0.623
-19	97.868	21	12.023	61	2.296	101	0.605
-18	92.246	22	11.478	62	2.213	102	0.587
-17	86.987	23	10.961	63	2.134	103	0.570
-16	82.065	24	10.470	64	2.057	104	0.553
-15	77.457	25	10.005	65	1.984	105	0.537
-14	73.106	26	9.564	66	1.913	106	0.521
-13	69.031	27	9.146	67	1.846	107	0.506
-12	65.211	28	8.749	68	1.781	108	0.492
-11	61.629	29	8.372	69	1.718	109	0.478
-10	58.270	30	8.013	70	1.659	110	0.464
-9	55.099	31	7.669	71	1.601		
-8	52.123	32	7.342	72	1.546		
-7	49.328	33	7.031	73	1.492		
-6	46.703	34	6.735	74	1.441		
-5	44.235	35	6.453	75	1.392		
-4	41.896	36	6.183	76	1.346		
-3	39.697	37	5.927	77	1.301		
-2	37.628	38	5.683	78	1.258		
-1	35.682	39	5.450	79	1.217		
0	33.849	40	5.228	80	1.177		
1	32.115	41	5.016	81	1.139		
2	30.483	42	4.813	82	1.101		
3	28.944	43	4.620	83	1.066		
4	27.494	44	4.436	84	1.031		
5	26.126	45	4.261	85	0.998		
6	24.833	46	4.092	86	0.966		
7	23.613	47	3.932	87	0.935		
8	22.461	48	3.778	88	0.906		
9	21.373	49	3.632	89	0.877		
10	20.344	50	3.492	90	0.850		
11	19.365	51	3.357	91	0.823		
12	18.438	52	3.229	92	0.798		
13	17.563	53	3.106	93	0.773		
14	16.734	54	2.989	94	0.749		
15	15.950	55	2.876	95	0.727		
16	15.205	56	2.769	96	0.704		
17	14.500	57	2.666	97	0.683		
18	13.831	58	2.568	98	0.662		
19	13.198	59	2.473	99	0.643		

3. Temperature-Resistance characteristic sheet for EXV temp. sensor.

NTC Sensor characteristic sheet

Unit: Temp:°C--K. Ratio:KΩ10K@25°C

Temp.	Ratio	Temp.	Ratio	Temp.	Ratio	Temp.	Ratio
-20	67.74	20	12.09	60	3.02	100	0.97
-19	64.54	21	11.63	61	2.92	101	0.94
-18	61.52	22	11.20	62	2.83	102	0.92
-17	58.66	23	10.78	63	2.75	103	0.90
-16	55.95	24	10.38	64	2.66	104	0.87
-15	53.39	25	10.00	65	2.58	105	0.85
-14	50.96	26	9.63	66	2.51	106	0.83
-13	48.65	27	9.28	67	2.43	107	0.81
-12	46.48	28	8.94	68	2.36	108	0.79
-11	44.41	29	8.62	69	2.29	109	0.77
-10	42.25	30	8.31	70	2.22	110	0.75
-9	40.56	31	8.01	71	2.16		
-8	38.76	32	7.72	72	2.10		
-7	37.05	33	7.45	73	2.04		
-6	35.43	34	7.19	74	1.98		
-5	33.89	35	6.94	75	1.92		
-4	32.43	36	6.69	76	1.87		
-3	31.04	37	6.46	77	1.81		
-2	29.72	38	6.24	78	1.76		
-1	28.47	39	6.03	79	1.71		
0	27.28	40	5.82	80	1.66		
1	67.74	41	5.63	81	1.62		
2	26.13	42	5.43	82	1.57		
3	25.03	43	5.25	83	1.53		
4	23.99	44	5.08	84	1.49		
5	22.99	45	4.91	85	1.45		
6	22.05	46	4.74	86	1.41		
7	21.15	47	4.59	87	1.37		
8	20.29	48	4.44	88	1.33		
9	19.40	49	4.30	89	1.30		
10	18.70	50	4.16	90	1.26		
11	17.96	51	4.02	91	1.23		
12	17.24	52	3.90	92	1.20		
13	16.55	53	3.77	93	1.16		
14	15.90	54	3.65	94	1.13		
15	15.28	55	3.53	95	1.10		
16	14.68	56	3.42	96	1.08		
17	14.12	57	3.31	97	1.05		
18	13.57	58	3.21	98	1.02		
19	13.06	59	3.11	99	0.99		

Temperature-Resistance characteristic sheet for EXV temp. sensor.
NTC Sensor characteristic sheet
Unit: Temp:°C--K. Ratio:KΩ 50K@25°C

Temp.	Ratio	Temp.	Ratio	Temp.	Ratio	Temp.	Ratio
-40	1630,77						
-35	1178,11						
-30	860,97						
-25	636,08						
-20	474,78						
-15	357,83						
-10	272,18						
-5	208,83						
0	161,56						
5	125,97						
10	98,96						
15	78,29						
20	62,37						
25	50,00						
30	40,34						
35	32,73						
40	26,71						
45	21,92						
50	18,08						
55	14,99						
60	12,48						
65	10,44						
70	8,78						
75	7,41						
80	6,28						
85	5,34						
90	4,56						
95	3,91						
100	3,37						
105	2,91						
110	2,52						
115	2,19						
120	1,91						
125	1,67						
130	1,46						
135	1,28						
140	1,13						
145	1,00						
150	0,89						



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