ESIE07-08

Service Manual

ERX100~140A8V3B, ERX125~250A7W1B
EKEXFCB*V3, EKEXDCB*V3, EKEXMCBV3
EKEXV40~250

Daikin Inverter Condensing Unit

www.daikineurope.com

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1 Introduction

1.1 About This Manual

Target group

This service manual is intended for and should only be used by qualified engineers.

Purpose of this manual

This service manual contains all the information you need to do the necessary repair and maintenance tasks for the Daikin Inverter Condensing Unit and option kits in pair application with a non Daikin airhandling unit.

Five parts

This service manual consists of an introduction, five parts and an index:

Introduction overview

The introduction contains the following topics:

1.2 Safety Cautions

Cautions and warnings

- Be sure to read the following safety cautions before conducting repair work.
- The caution items are classified into “**Warning**” and “**Caution**”. The “**Warning**” items are especially important since they can lead to death or serious injury if they are not followed closely. The “**Caution**” items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.
- About the pictograms

△ This symbol indicates an item for which caution must be exercised.

The pictogram shows the item to which attention must be paid.

◯ This symbol indicates a prohibited action.

The prohibited item or action is shown inside or near the symbol.

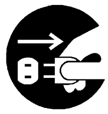
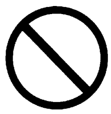
● This symbol indicates an action that must be taken, or an instruction.

The instruction is shown inside or near the symbol.

- After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer

1.2.1 Caution in Repair

Warning

Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shook. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	

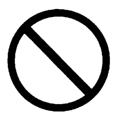
Warning	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

Caution

Caution	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.2.2 Cautions Regarding Products after Repair

Warning

Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	

Warning	
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

Cautions

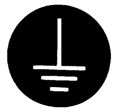
Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	For integral units only

1.2.3 Inspection after Repair

Warning

Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.	

Caution

Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 Mohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.3 Precautions on Handling New Refrigerant (R410A)

1.3.1 Outline

About Refrigerant R410A

➤ Characteristics of new refrigerant, R410A

1 Performance
Almost the same performance as R22 and R407C.

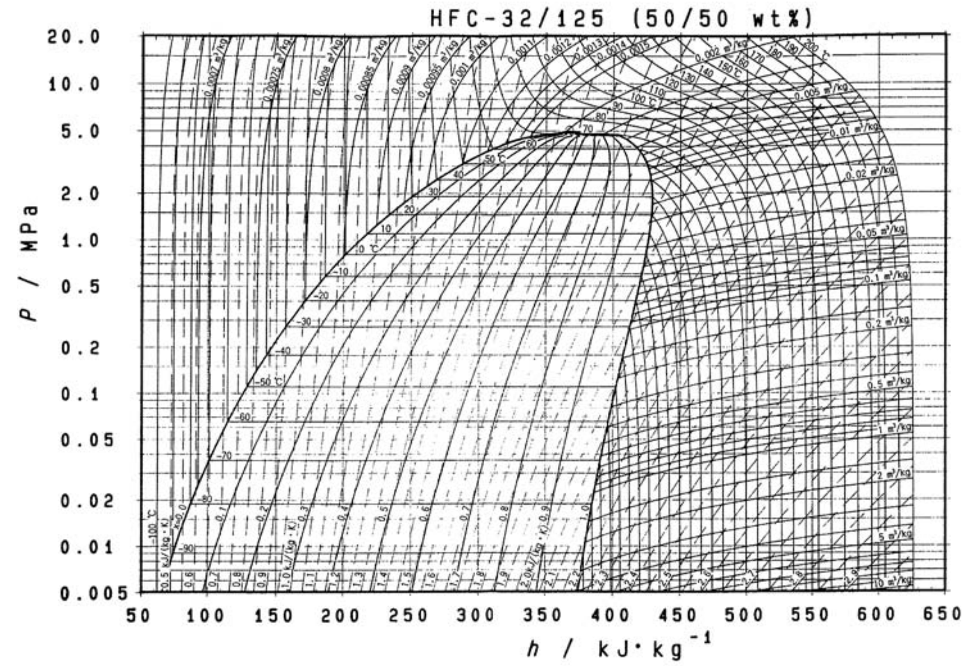
2 Pressure
Working pressure is approx. 1.4 times more than R22 and R407C.

3 Refrigerant composition
Few problems in composition control, since it is a Quasi-azeotropic mixture refrigerant.

	HFC units (Units using new refrigerants)		HCFC units
Refrigerant name	**R407C**	**R410A**	**R22**
Composing substances	Non-azeotropic mixture of HFC32, HFC125 and HFC134a (*1)	Quasi-azeotropic mixture of HFC32 and JFC125 (*1)	Single-component refrigerant
Design pressure	3.2 Mpa (gauge pressure) = 32.6 kgf/cm^2	4.15 Mpa (gauge pressure) = 42.3 kgf/cm^2	2.75Mpa (gauge pressure) = 28.0 kgf/cm^2
Refrigerant oil	Synthetic oil (Ether)		Mineral oil (Suniso)
Ozone destruction factor (ODP)	0	0	0.05
Combustibility	None	None	None
Toxicity	None	None	None

*1. Non-azeotropic mixture refrigerant: mixture of two or more refrigerants having different boiling points.
*2. Quasi-azeotropic mixture refrigerant: mixture of two or more refrigerants having similar boiling points.
*3. The design pressure is different at each product. Please refer to the installation manual for each product.

(Reference) 1 Mpa ≒ 1 0.19716 kgf / cm^2



Pressure-Enthalpy curves of HFC-32/125 (50/50wt%)

➤ Thermodynamic characteristic of R410A

DAIREP ver2.0

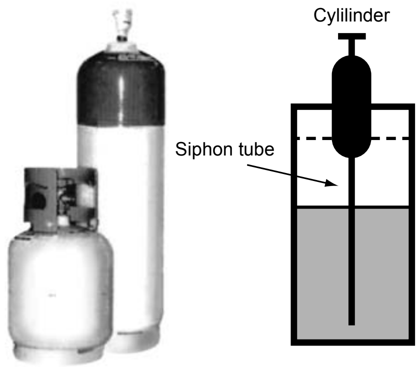
Temperature (℃)	Steam pressure (kPa)		Density (kg/m^3)		Specific heat at constant pressure (kJ/kgK)		Specific enthalpy (kJ/kg)		Specific entropy (kJ/KgK)	
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor
-70	36.13	36.11	1410.7	1.582	1.372	0.695	100.8	390.6	0.649	2.074
-68	40.83	40.80	1404.7	1.774	1.374	0.700	103.6	391.8	0.663	2.066
-66	46.02	45.98	1398.6	1.984	1.375	0.705	106.3	393.0	0.676	2.058
-64	51.73	51.68	1392.5	2.213	1.377	0.710	109.1	394.1	0.689	2.051
-62	58.00	57.94	1386.4	2.463	1.378	0.715	111.9	395.3	0.702	2.044
-60	64.87	64.80	1380.2	2.734	1.379	0.720	114.6	396.4	0.715	2.037
-58	72.38	72.29	1374.0	3.030	1.380	0.726	117.4	397.6	0.728	2.030
-56	80.57	80.46	1367.8	3.350	1.382	0.732	120.1	398.7	0.741	2.023
-54	89.49	89.36	1361.6	3.696	1.384	0.737	122.9	399.8	0.754	2.017
-52	99.18	99.03	1355.3	4.071	1.386	0.744	125.7	400.9	0.766	2.010
-51.58	101.32	101.17	1354.0	4.153	1.386	0.745	126.3	401.1	0.769	2.009
-50	109.69	109.51	1349.0	4.474	1.388	0.750	128.5	402.0	0.779	2.004
-48	121.07	120.85	1342.7	4.909	1.391	0.756	131.2	403.1	0.791	1.998
-46	133.36	133.11	1336.3	5.377	1.394	0.763	134.0	404.1	0.803	1.992
-44	146.61	146.32	1330.0	5.880	1.397	0.770	136.8	405.2	0.816	1.987
-42	160.89	160.55	1323.5	6.419	1.401	0.777	139.6	406.2	0.828	1.981
-40	176.24	175.85	1317.0	6.996	1.405	0.785	142.4	407.3	0.840	1.976
-38	192.71	192.27	1310.5	7.614	1.409	0.792	145.3	408.3	0.852	1.970
-36	210.37	209.86	1304.0	8.275	1.414	0.800	148.1	409.3	0.864	1.965
-34	229.26	228.69	1297.3	8.980	1.419	0.809	150.9	410.2	0.875	1.960
-32	249.46	248.81	1290.6	9.732	1.424	0.817	153.8	411.2	0.887	1.955
-30	271.01	270.28	1283.9	10.53	1.430	0.826	156.6	412.1	0.899	1.950
-28	293.99	293.16	1277.1	11.39	1.436	0.835	159.5	413.1	0.911	1.946
-26	318.44	317.52	1270.2	12.29	1.442	0.844	162.4	414.0	0.922	1.941
-24	344.44	343.41	1263.3	13.26	1.448	0.854	165.3	414.9	0.934	1.936
-22	372.05	370.90	1256.3	14.28	1.455	0.864	168.2	415.7	0.945	1.932
-20	401.34	400.06	1249.2	15.37	1.461	0.875	171.1	416.6	0.957	1.927
-18	432.36	430.95	1242.0	16.52	1.468	0.886	174.1	417.4	0.968	1.923
-16	465.20	463.64	1234.8	17.74	1.476	0.897	177.0	418.2	0.980	1.919
-14	499.91	498.20	1227.5	19.04	1.483	0.909	180.0	419.0	0.991	1.914
-12	536.58	534.69	1220.0	20.41	1.491	0.921	182.9	419.8	1.003	1.910
-10	575.26	573.20	1212.5	21.86	1.499	0.933	185.9	420.5	1.014	1.906
-8	616.03	613.78	1204.9	23.39	1.507	0.947	189.0	421.2	1.025	1.902
-6	658.97	656.52	1197.2	25.01	1.516	0.960	192.0	421.9	1.036	1.898
-4	704.15	701.49	1189.4	26.72	1.524	0.975	195.0	422.6	1.048	1.894
-2	751.64	748.76	1181.4	28.53	1.533	0.990	198.1	423.2	1.059	1.890
0	801.52	798.41	1173.4	30.44	1.543	1.005	201.2	423.8	1.070	1.886
2	853.87	850.52	1165.3	32.46	1.552	1.022	204.3	424.4	1.081	1.882
4	908.77	905.16	1157.0	34.59	1.563	1.039	207.4	424.9	1.092	1.878
6	966.29	962.42	1148.6	36.83	1.573	1.057	210.5	425.5	1.103	1.874
8	1026.5	1022.4	1140.0	39.21	1.584	1.076	213.7	425.9	1.114	1.870
10	1089.5	1085.1	1131.3	41.71	1.596	1.096	216.8	426.4	1.125	1.866
12	1155.4	1150.7	1122.5	44.35	1.608	1.117	220.0	426.8	1.136	1.862
14	1224.3	1219.2	1113.5	47.14	1.621	1.139	223.2	427.2	1.147	1.859
16	1296.2	1290.8	1104.4	50.09	1.635	1.163	226.5	427.5	1.158	1.855
18	1371.2	1365.5	1095.1	53.20	1.650	1.188	229.7	427.8	1.169	1.851
20	1449.4	1443.4	1085.6	56.48	1.666	1.215	233.0	428.1	1.180	1.847
22	1530.9	1524.6	1075.9	59.96	1.683	1.243	236.4	428.3	1.191	1.843
24	1615.8	1609.2	1066.0	63.63	1.701	1.273	239.7	428.4	1.202	1.839
26	1704.2	1697.2	1055.9	67.51	1.721	1.306	243.1	428.6	1.214	1.834
28	1796.2	1788.9	1045.5	71.62	1.743	1.341	246.5	428.6	1.225	1.830
30	1891.9	1884.2	1034.9	75.97	1.767	1.379	249.9	428.6	1.236	1.826
32	1991.3	1983.2	1024.1	80.58	1.793	1.420	253.4	428.6	1.247	1.822
34	2094.5	2086.2	1012.9	85.48	1.822	1.465	256.9	428.4	1.258	1.817
36	2201.7	2193.1	1001.4	90.68	1.855	1.514	260.5	428.3	1.269	1.813
38	2313.0	2304.0	989.5	96.22	1.891	1.569	264.1	428.0	1.281	1.808
40	2428.4	2419.2	977.3	102.1	1.932	1.629	267.8	427.7	1.292	1.803
42	2548.1	2538.6	964.6	108.4	1.979	1.696	271.5	427.2	1.303	1.798
44	2672.2	2662.4	951.4	115.2	2.033	1.771	275.3	426.7	1.315	1.793
46	2800.7	2790.7	937.7	122.4	2.095	1.857	279.2	426.1	1.327	1.788
48	2933.7	2923.6	923.3	130.2	2.168	1.955	283.2	425.4	1.339	1.782
50	3071.5	3061.2	908.2	138.6	2.256	2.069	287.3	424.5	1.351	1.776
52	3214.0	3203.6	892.2	147.7	2.362	2.203	291.5	423.5	1.363	1.770
54	3361.4	3351.0	875.1	157.6	2.493	2.363	295.8	422.4	1.376	1.764
56	3513.8	3503.5	856.8	168.4	2.661	2.557	300.3	421.0	1.389	1.757
58	3671.3	3661.2	836.9	180.4	2.883	2.799	305.0	419.4	1.403	1.749
60	3834.1	3824.2	814.9	193.7	3.191	3.106	310.0	417.6	1.417	1.741
62	4002.1	3992.7	790.1	208.6	3.650	3.511	315.3	415.5	1.433	1.732
64	4175.7	4166.8	761.0	225.6	4.415	4.064	321.2	413.0	1.450	1.722

1.3.2 Refrigerant Cylinders

Cylinder specifications

➤ The cylinder is painted refrigerant color (pink).

➤ The cylinder valve is equipped with a siphon tube.



➤ Note:

1 Refrigerant can be charged in liquid state with cylinder in upright position.

2 Do not lay cylinder on its side during charging, since it causes refrigerant in gas state to enter the system.

Handling of cylinders

1 Laws and regulations
R410A is liquefied gas, and the High-Pressure Gas Safety Law must be observed in handling them. Before using, refer to the High-Pressure Gas Safety Law.
The Law stipulates standards and regulations that must be followed to prevent accidents with high-pressure gases. Be sure to follow the regulations.

2 Handing of vessels
Since R410A is high-pressure gas, it is contained in high-pressure vessels.
Although those vessels are durable and strong, careless handling can cause damage that can lead to unexpected accidents. Do not drop vessels, let them fall, apply impact or roll them on the ground.

3 Storage
Although R410A is not flammable, it must be stored in a well-ventilated, cool, and dark place in the same way as any other high-pressure gases.
It should also be noted that high-pressure vessels are equipped with safety devices that releases gas when the ambient temperature reaches more than a certain level (fusible plug melts) and when the pressure exceeds a certain level (spring-type safety valve operates).

1.3.3 Service Tools

R410A is used under higher working pressure, compared to previous refrigerants (R22,R407C). Furthermore, the refrigerating machine oil has been changed from Suniso oil to Ether oil, and if oil mixing is occurred, sludge results in the refrigerants and causes other problems. Therefore, gauge manifolds and charge hoses that are used with a previous refrigerant (R22,R407C) can not be used for products that use new refrigerants.

Be sure to use dedicated tools and devices.

➤ Tool compatibility

Tool	Compatibility			Reasons for change
	HFC		HCFC	
	R410A	R407C	R22	
Gauge manifold Charge hose	X			➤ Do not use the same tools for R22 and R410A. ➤ Thread specification differs for R410A and R407C.
Charging cylinder	X		O	➤ Weighting instrument used for HFCs.
Gas detector	O		X	➤ The same tool can be used for HFCs.
Vacuum pump (pump with reverse flow preventive function)	O			➤ To use existing pump for HFCs, vacuum pump adaptor must be installed.
Weighting instrument	O			
Charge mouthpiece	X			➤ Seal material is different between R22 and HFCs. ➤ Thread specification is different between R410A and others.
Flaring tool (Clutch type)	O			➤ For R410A, flare gauge is necessary.
Torque wrench	O			➤ Torque-up for 1/2 and 5/8
Pipe cutter	O			
Pipe expander	O			
Pipe bender	O			
Pipe assembling oil	X			➤ Due to refrigerating machine oil change. (No Suniso oil can be used.)
Refrigerant recovery device	Check your recovery device.			
Refrigerant piping	See the chart below.			➤ Only ϕ19.1 is changed to 1/2H material while the previous material is "O".

As for the charge mouthpiece and packing, 1/2UNF20 is necessary for mouthpiece size of charge hose.

Copper tube material and thickness

Pipe size	R407C		R410A	
	Material	Thickness tmmj	Material	Thickness tmmj
ϕ6.4	O	0.8	O	0.8
ϕ9.5	O	0.8	O	0.8
ϕ12.7	O	0.8	O	0.8
ϕ15.9	O	1.0	O	1.0
ϕ19.1	O	1.0	1/2H	1.0
ϕ22.2	1/2H	1.0	1/2H	1.0
ϕ25.4	1/2H	1.0	1/2H	1.0
ϕ28.6	1/2H	1.0	1/2H	1.0
ϕ31.8	1/2H	1.2	1/2H	1.1
ϕ38.1	1/2H	1.4	1/2H	1.4
ϕ44.5	1/2H	1.6	1/2H	1.6

* O: Soft (Annealed)
H: Hard (Drawn)

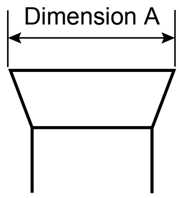
Flaring tool

Flare gauge

➤ Specifications
• Dimension A

Nominal size	Tube O.D.	$A^{+0}_{-0.4}$	
	Do	**Class-2 (R410A)**	**Class-1 (Conventional)**
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	24.0	23.3

➤ Differences
• Change of dimension A



For class-1: R407C
For class-2: R410A

Conventional flaring tools can be used when the work process is changed. (change of work process)

Previously, a pipe extension margin of 0 to 0.5mm was provided for flaring. For R410A air conditioners, perform pipe flaring with a pipe extension margin of **1.0 to 1.5 mm**. (For clutch type only)

Conventional tool with pipe extension margin adjustment can be used.

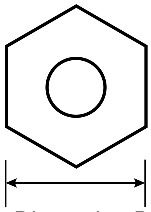
Torque wrench

➤ Specifications
- Dimension B   Unit:mm

Nominal size	Class-1	Class-2	Previous
1/2	24	26	24
5/8	27	29	27

No change in tightening torque
No change in pipes of other sizes

➤ Differences
- Change of dimension B
  Only 1/2", 5/8" are extended



For class-1: R407C
For class-2: R410A

Vacuum pump with check valve

Vacuum pump adaptor
(Reverse flow preventive vacuum adaptor)

➤ Specifications
- Discharge speed
  50 l/min (50Hz)
  60 l/min (60Hz)
- Suction port UNF7/16-20(1/4 Flare)
  UNF1/2-20(5/16 Flare) with adaptor
- Maximum degree of vacuum
  –100.7 kpa (5 torr – 755 mmHg)

➤ Differences
- Equipped with function to prevent reverse oil flow
- Previous vacuum pump can be used by installing adaptor.

Leak tester

- ➤ Specifications
- • Hydrogen detecting type, etc.
- • Applicable refrigerants
  R410A, R407C, R404A, R507A, R134a, etc.
- ➤ Differences
- • Previous testers detected chlorine. Since HFCs do not contain chlorine, new tester detects hydrogen.

Refrigerant oil (Air compal)

- ➤ Specifications
- • Contains synthetic oil, therefore it can be used for piping work of every refrigerant cycle.
- • Offers high rust resistance and stability over long period of time.
- ➤ Differences
- • Can be used for R410A and R22 units.

Gauge manifold for R410A

➤ Specifications
- High pressure gauge
  - 0.1 to 5.3 MPa (-76 cmHg to 53 kg/cm^2)
- Low pressure gauge
  - 0.1 to 3.8 MPa (-76 cmHg to 38 kg/cm^2)
- 1/4" → 5/16" (2min → 2.5min)
- No oil is used in pressure test of gauges.
  → For prevention of contamination
- Temperature scale indicates the relationship between pressure and temperature in gas saturated state.

➤ Differences
- Change in pressure
- Change in service port diameter

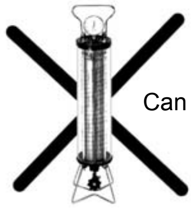
Charge hose for R410A

(Hose with ball valve)

➤ Specifications
- Working pressure 5.08 MPa (51.8 kg/cm^2)
- Rupture pressure 25.4 MPa (259 kg/cm^2)
- Available with and without hand-operate valve that prevents refrigerant from outflow.

➤ Differences
- Pressure proof hose
- Change in service port diameter
- Use of nylon coated material for HFC resistance

Charging cylinder



- ➤ Specifications
- Use weigher for refrigerant charge listed below to charge directly from refrigerant cylinder.
- ➤ Differences
- The cylinder can not be used for mixed refrigerant since mixing ratio is changed during charging.

  When R410A is charged in liquid state using charging cylinder, foaming phenomenon is generated inside charging cylinder.

Weigher for refrigerant charge

- ➤ Specifications
- High accuracy
  TA101A (for 10-kg cylinder) = ± 2g
  TA101B (for 20-kg cylinder) = ± 5g
- Equipped with pressure-resistant sight glass to check liquid refrigerant charging.
- A manifold with separate ports for HFCs and previous refrigerants is equipped as standard accessories.
- ➤ Differences
- Measurement is based on weight to prevent change of mixing ratio during charging.

Charge mouthpiece

- ➤ Specifications
- For R410A, 1/4"→ 5/16" (2min → 2.5min)
- Material is changed from CR to H-NBR.
- ➤ Differences
- Change of thread specification on hose connection side (For the R410A use)
- Change of sealer material for the HFCs use.

1.4 Combination Overview: Outdoor Units of the ERX-series

System A

The table below shows the Combination table control box.

Outdoor unit				Control box				
		Class	Model	EKEXDCBV3	EKEXFCBV3	EKEXDCBAV3	EKEXFCBAV3	EKEXMCBV3
System A (C/O)	3 ph	125	ERX125A7W1B	P	P	-	-	
		200	ERX200A7W1B	-	-	P	P	
		250	ERX250A7W1B	-	-	P	P	
System A (C/O)	1 ph	100	ERX100A8V3B	P	P	P	P	
		125	ERX125A8V3B	P	P	P	P	
		140	ERX140A8V3B	P	P	P	P	

The table below shows the Combination table valve kit

Outdoor unit				Valve kit							
		Class	Model name	EKEXV50	EKEXV63	EKEXV80	EKEXV100	EKEXV125	EKEXV140	EKEXV200	EKEXV250
System A (C/O)	3 ph	125	ERX125A7W1B	-	P	P	P	P	P	-	-
		200	ERX200A7W1B	-	-	-	P	P	P	P	P
		250	ERX250A7W1B	-	-	-	-	P	P	P	P
System A (C/O)	1 ph	100	ERX100A8V3B	-	P	P	P	P	-	-	-
		125	ERX125A8V3B	-	P	P	P	P	P	-	-
		140	ERX140A8V3B	-	-	P	P	P	P	-	-

System B

The table below shows the Combination table control box.

Outdoor unit				Control box		
		Class	Model	EKEXDCBAV3	EKEXFCBAV3	EKEXMCBV3
System B (C/O)	3 ph	5 hp	RXQ5D7W1B			n
		8hp	RXQ8D7W1B			n
		10 hp	RXQ10D7W1B			n
		12 hp	RXQ12D7W1B			n
		14 hp	RXQ14D7W1B			n
		16 hp	RXQ16D7W1B			n
		18 hp	RXQ18D7W1B			n

The table below shows the Combination table valve kit

Outdoor unit				Valve kit							
		Class	Model name	EKEXV50	EKEXV63	EKEXV80	EKEXV100	EKEXV125	EKEXV140	EKEXV200	EKEXV250
System B (C/O)	3 ph	5 hp	RXQ5D7W1B	n	n	n	n	n	n	n	n
		8hp	RXQ8D7W1B	n	n	n	n	n	n	n	n
		10 hp	RXQ10D7W1B	n	n	n	n	n	n	n	n
		12 hp	RXQ12D7W1B	n	n	n	n	n	n	n	n
		14 hp	RXQ14D7W1B	n	n	n	n	n	n	n	n
		16 hp	RXQ16D7W1B	n	n	n	n	n	n	n	n
		18 hp	RXQ18D7W1B	n	n	n	n	n	n	n	n

Notes

In the tables in this section:

- "P" stands for pair combination. Combination depending on AHU coil volume (details: see Installation manual and Capacity table)
- "n " stands for Quantity determined by connection ration or maximum number of indoor units. (In combination with VRV-outdoor, the EKEXV-kit is considered as one of the indoor units.)

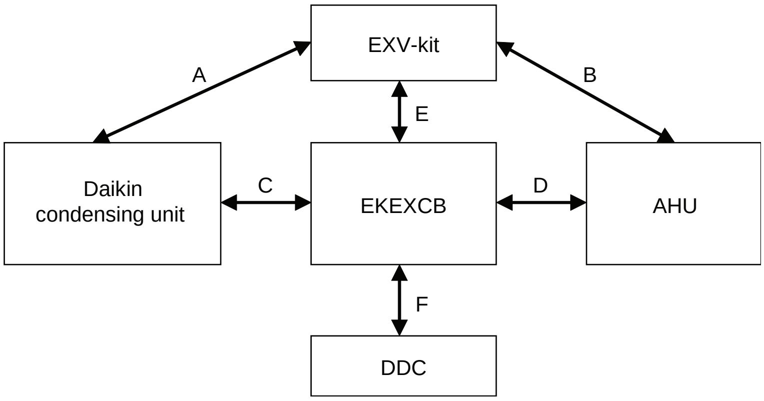
Options

Option name	ERX*A7W1			ERX*A8V3		
	125	200	250	100	125	140
Central drain plug	KKPJ5180			–		
Central drain pan kit	–			KWC26B160	KWC26B280	

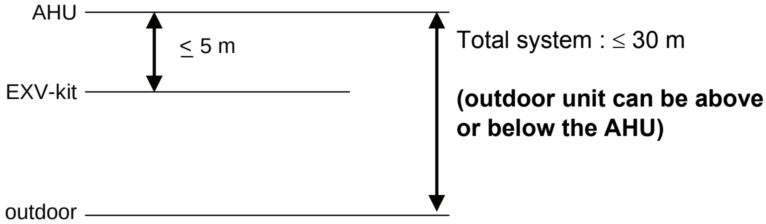
1.5 Physical Limitations and Limits of Operation

Distance between components system A

The illustrations and table below show the limitations.



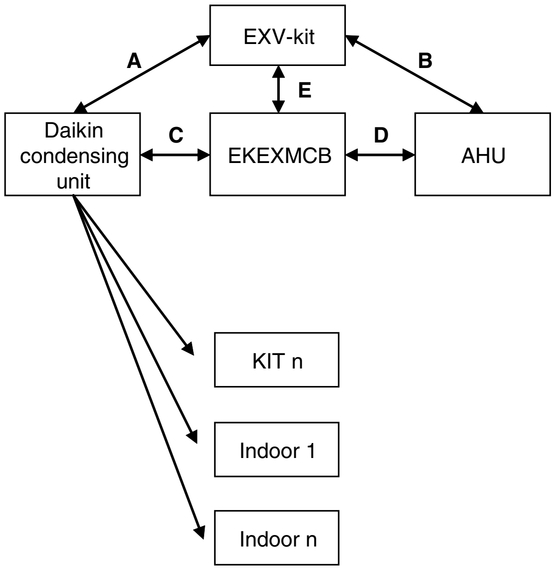
Allowable heigth:



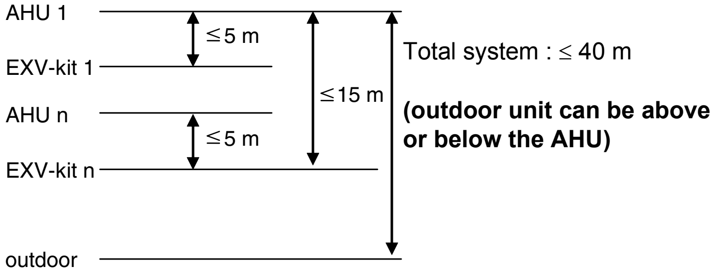
	Piping		Communication			
	A	B	C	D	E	F
ERX125~250A7W1B ERX100~140A8V3B	length: 5 < **A** ≤ 50m	length: ≤ **5 m**	≤ 100 m	≤ 20 m	≤ 20 m	depend on DDC

Distance between components system B

The illustrations and table below show the limitations of a multi VRVIII-system.



Allowable heigth:



		Piping		Communication		
		A+B	**B**	**C**	**D**	**E**
VRVIII	C/O 5~18 Hp	consider same as 1 indoor unit	length: ≤ **5 m**	follow std. VRV wiring length policy	≤ 50 m	≤ 50 m

1.6 External Appearance Outdoor Units

ERX125~250A7W1B

ERX125A7W1B	ERX200~250A7W1B
	

ERX100~140A8V3B

ERX100~140A8V3B


Part 1
System Outline

What is in this part?

This part contains the following chapters:

1 General Outline: Outdoor Units

1.1 What Is in This Chapter?

Introduction

This chapter contains the following information on the outdoor units:

➤ Functional parts layout

General outline

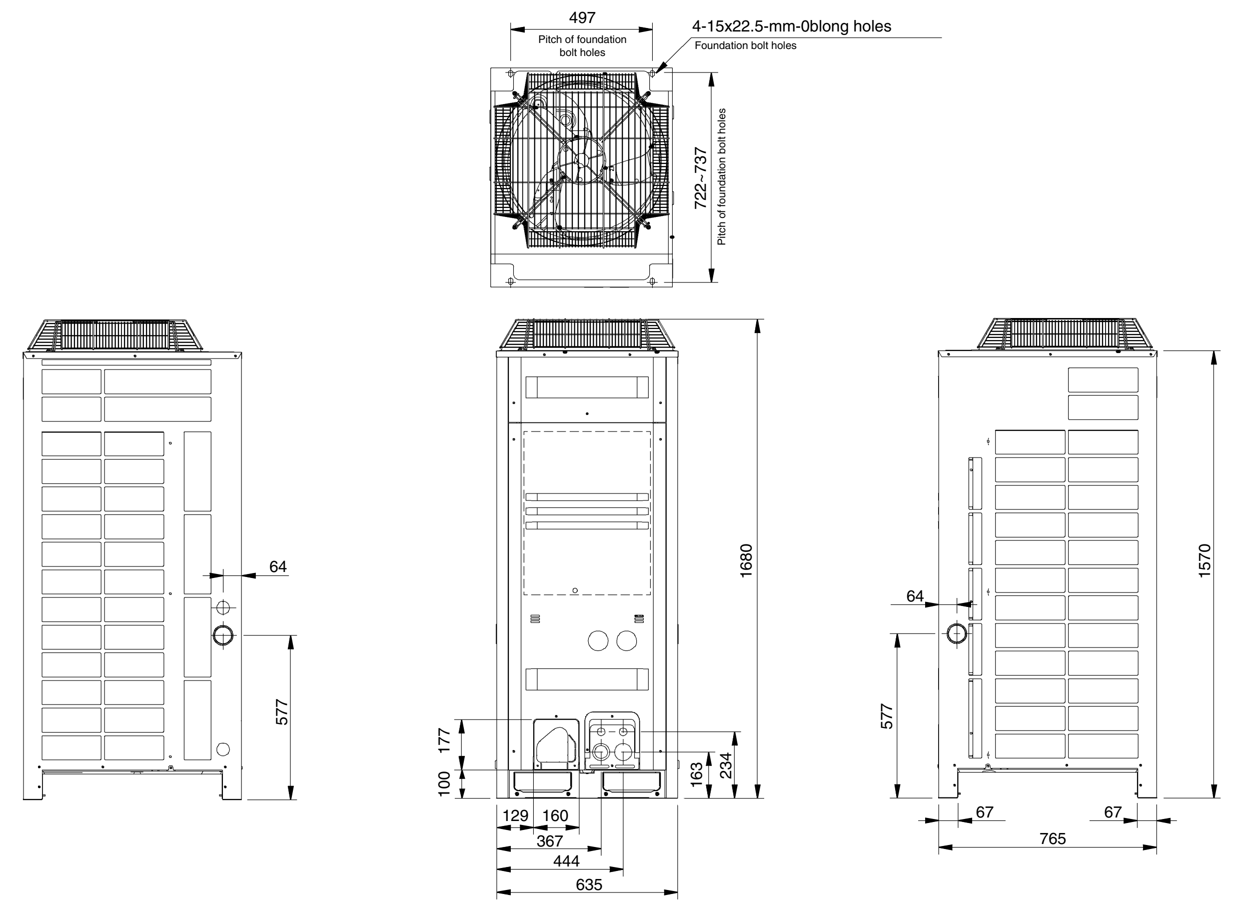
This chapter contains the following general outlines:

1

1.2 ERX125A7W1B: Outlook, Dimensions and Components

Outlook and dimensions

The illustration below shows the outlook and the dimensions of the unit (mm).



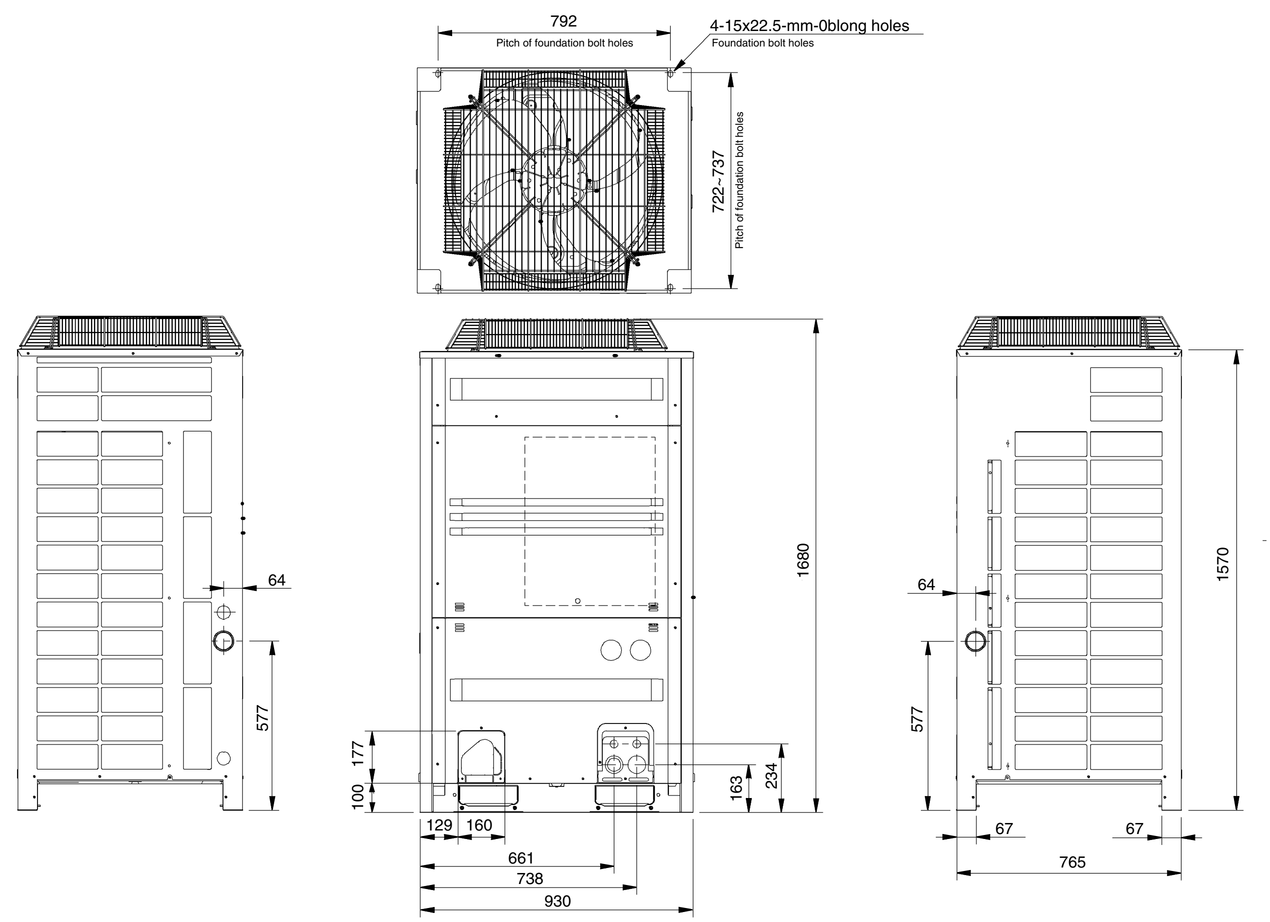
Installation and service space

See page 1–17.

1.3 ERX200-250A7W1B: Outlook, Dimensions and Components

Outlook and dimensions

The illustration below shows the outlook and the dimensions of the unit (mm).



Installation and service space

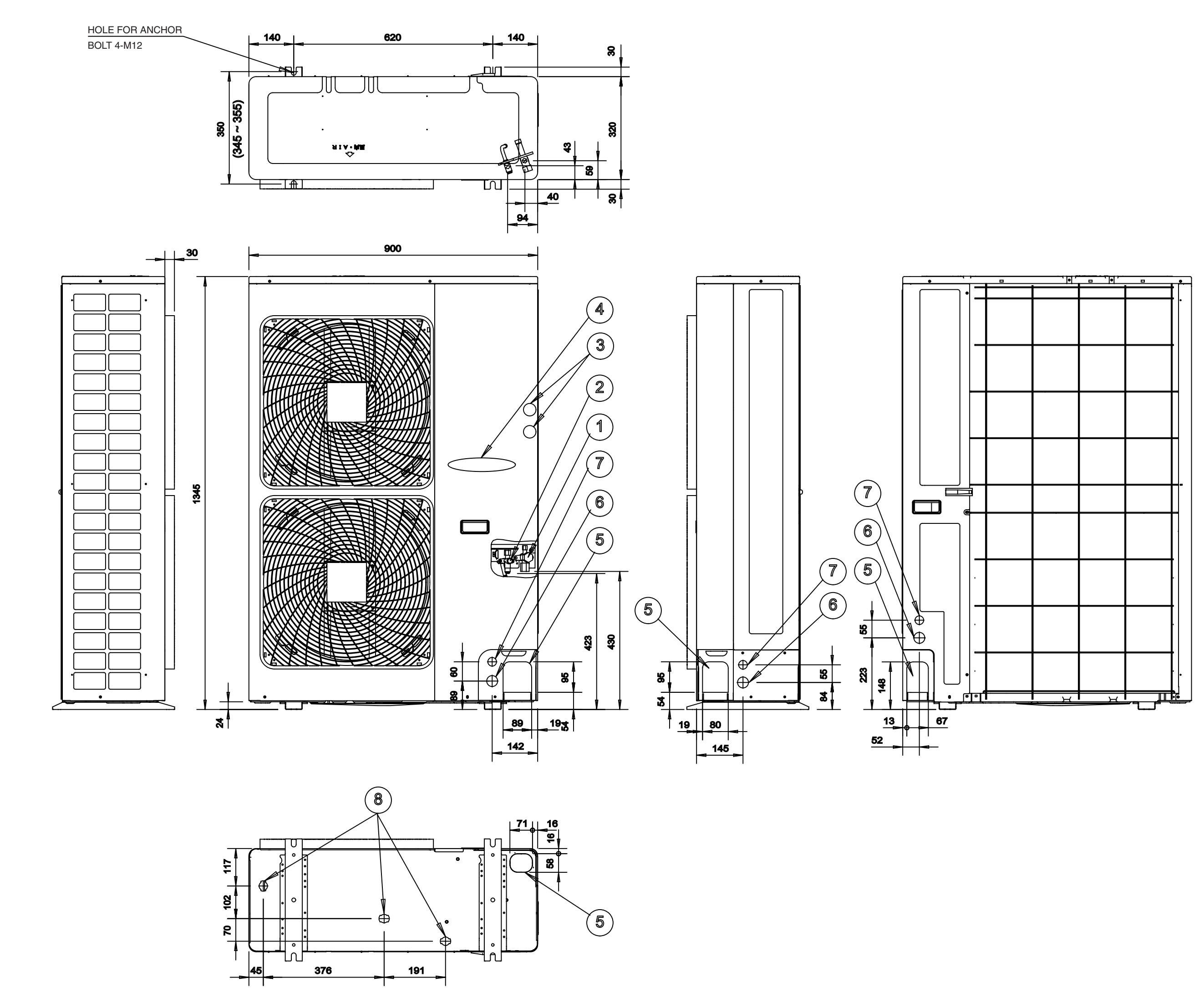
See page 1–17.

1

1.4 ERX100~140A8V3B: Outlook, Dimensions and Components

Outlook and dimensions

The illustration below shows the outlook and the dimensions of the unit (mm).



Installation and service space

See page 1–21.

Components

The table below contains the different components of the unit.

No.	Component
1	Gas pipe connection A
2	Liquid connection pipe ϕ9.5 flare
3	Service port (in the unit) (2x)
4	Electronic connection and grounding terminal M5 (in switch box)
5	Refrigerant piping intake
6	Power supply wiring intake
7	Control wiring intake
8	Drain outlet

Gas pipe connections

The table below contains the gas pipe connections for the following models.

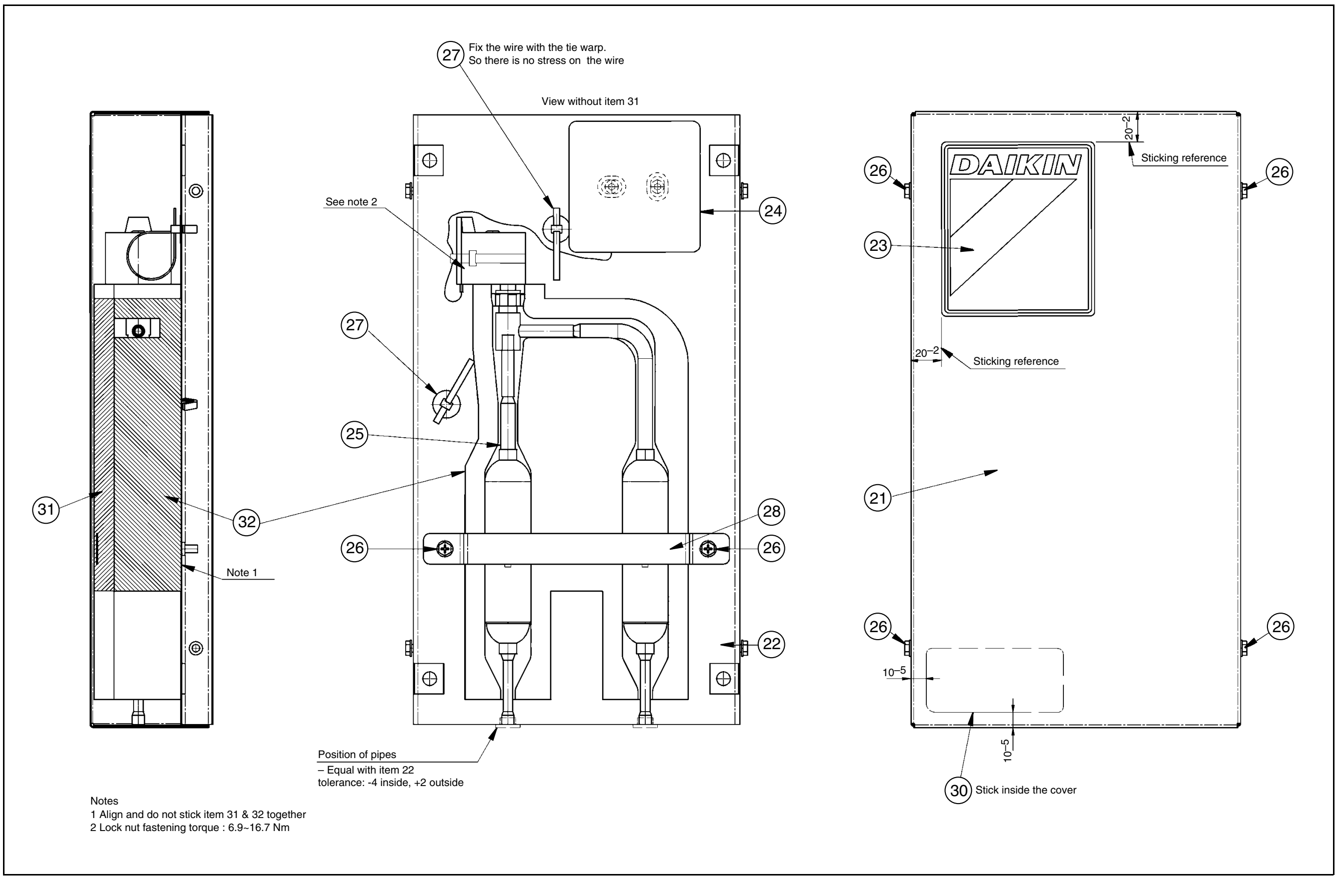
Model	A
ERX100A8V3B	ϕ15.9 flare
ERX125A8V3B	ϕ15.9 flare
ERX140A8V3B	ϕ19.1 flare

1

1.5 ERKEXV50~250: Functional Parts Layout

Functional parts layout

The illustration below shows the functional parts layout of the unit (mm).



Components

The table below contains the different components of the unit.

No.	Component
21	Cover
22	Baseplate
23	Daikin logo
24	Electrical box assy
25	Pipe assy
26	Hexagon head tapping screw
27	Tie wrap with clip
28	Support
30	Name plate entry table
31	Lower sealing
32	Upper sealing

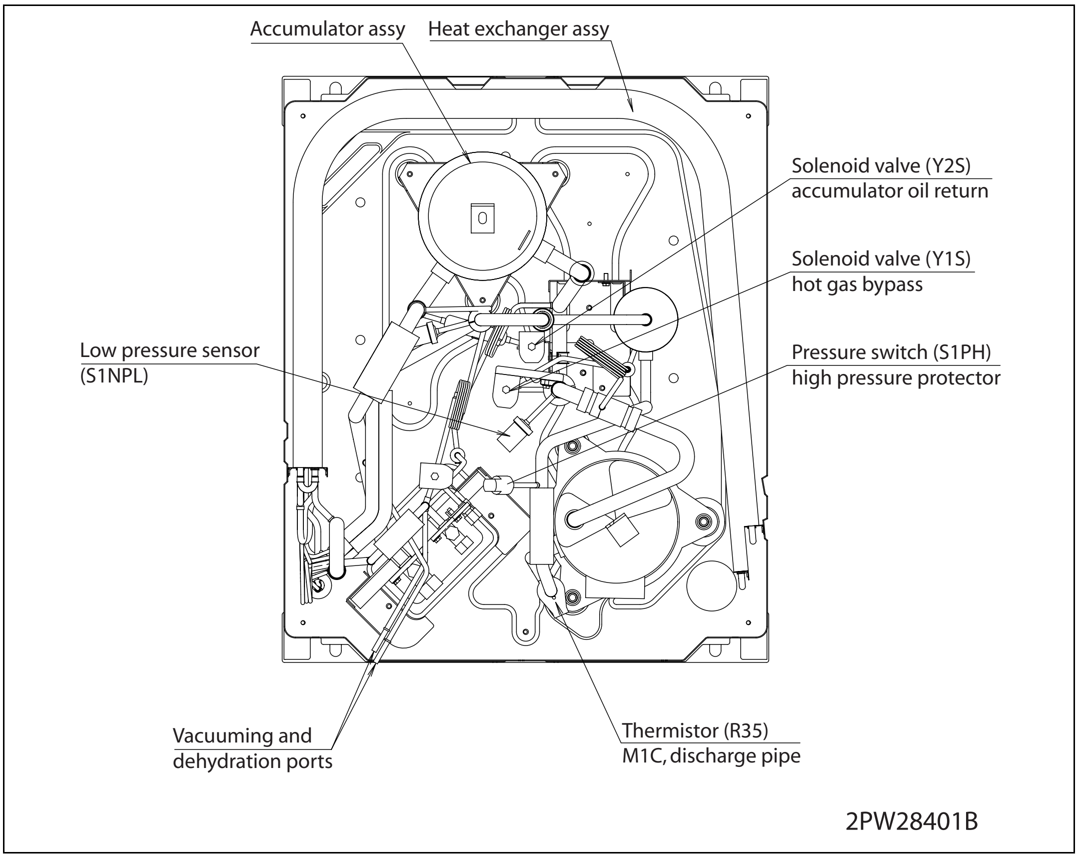
Notes

1. Align and do not stick item 31 & 32 together.
2. Lock nut fastening torque: 6.9~16.7 Nm.

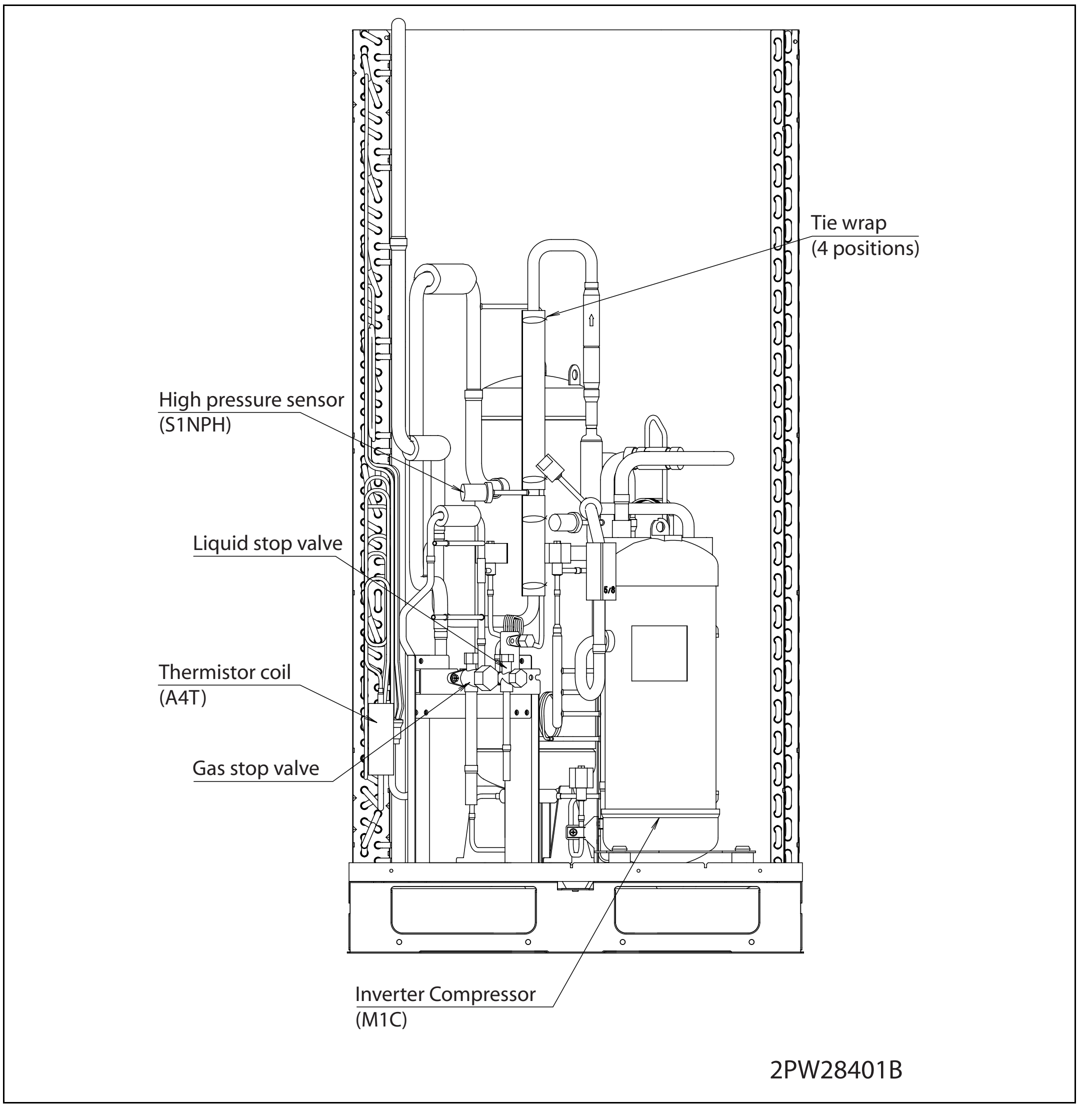
1

1.6 ERX125A7W1B: Functional Parts Layout

Plan



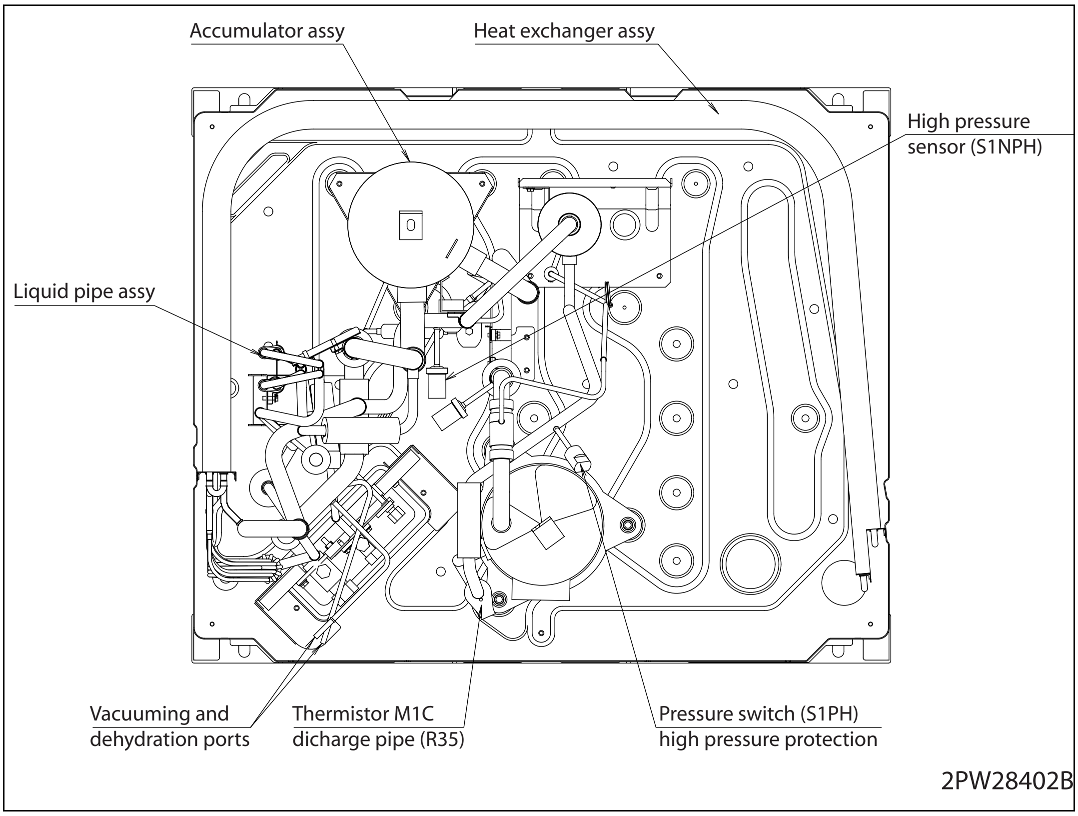
Front view


Tie wrap
(4 positions)
High pressure sensor
(S1NPH)
Liquid stop valve
Thermistor coil
(A4T)
Gas stop valve
Inverter Compressor
(M1C)
2PW28401B

1

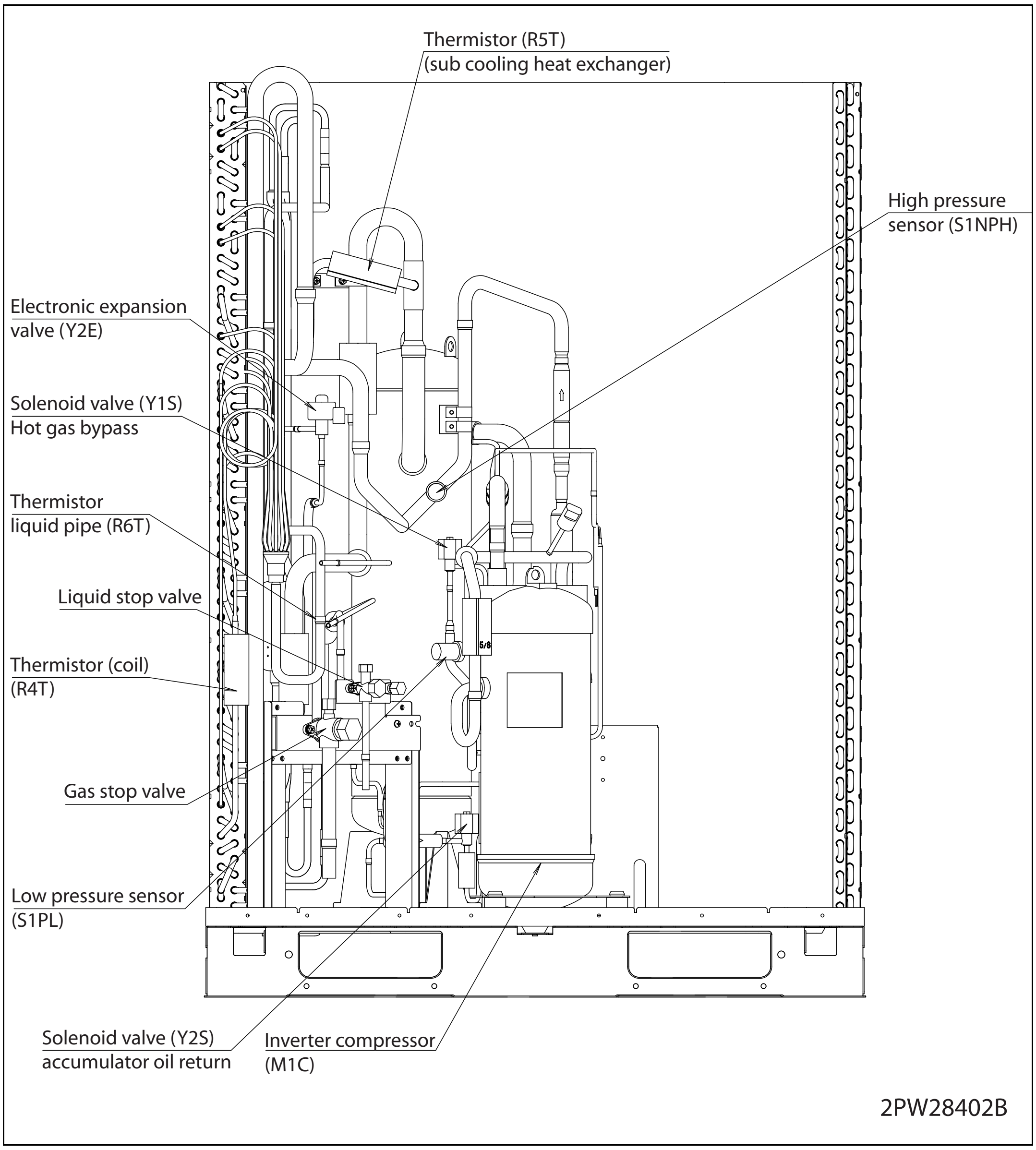
1.7 ERX200A7W1B: Functional Parts Layout

Plan



1

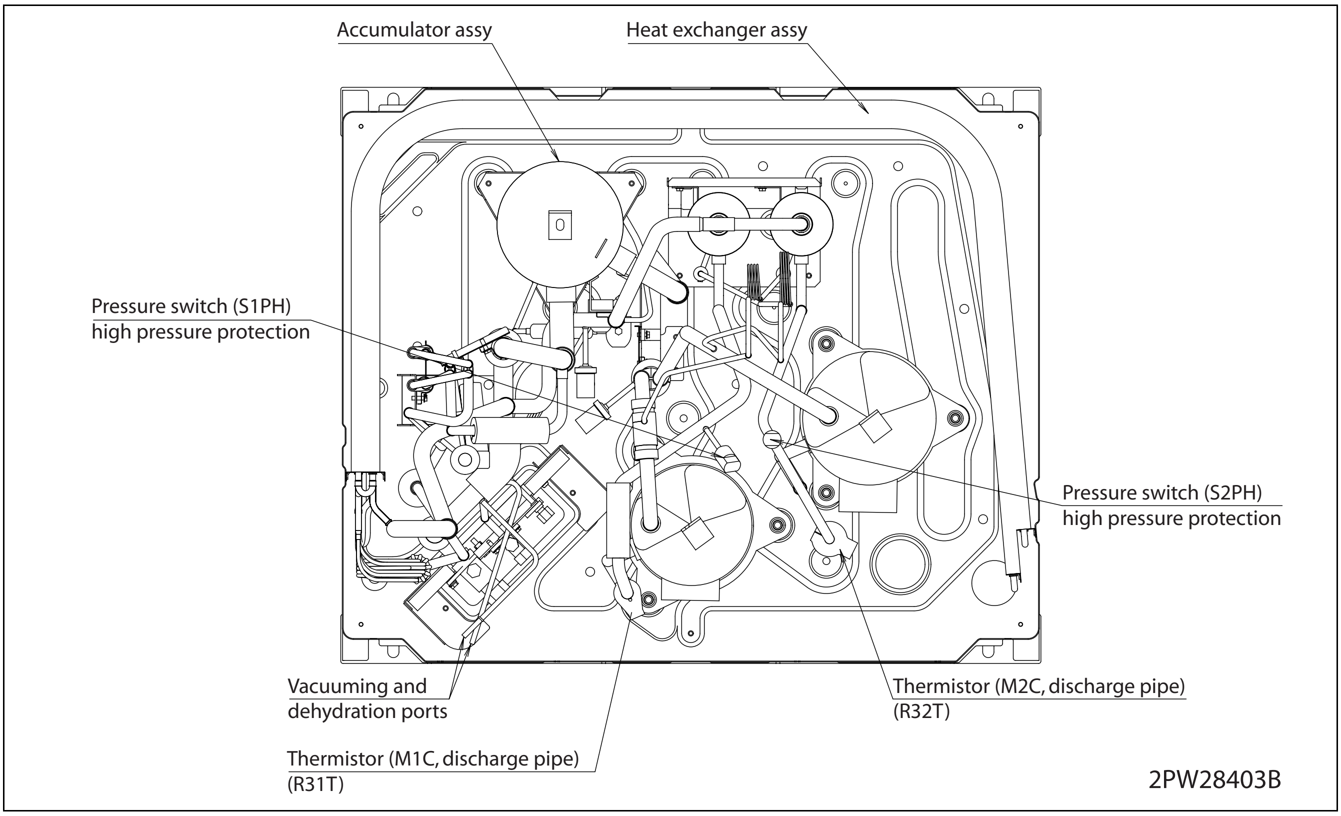
Front view


Thermistor (R5T)
(sub cooling heat exchanger)
High pressure
sensor (S1NPH)
Electronic expansion
valve (Y2E)
Solenoid valve (Y1S)
Hot gas bypass
Thermistor
liquid pipe (R6T)
Liquid stop valve
Thermistor (coil)
(R4T)
Gas stop valve
Low pressure sensor
(S1PL)
Solenoid valve (Y2S)
accumulator oil return
Inverter compressor
(M1C)
2PW28402B

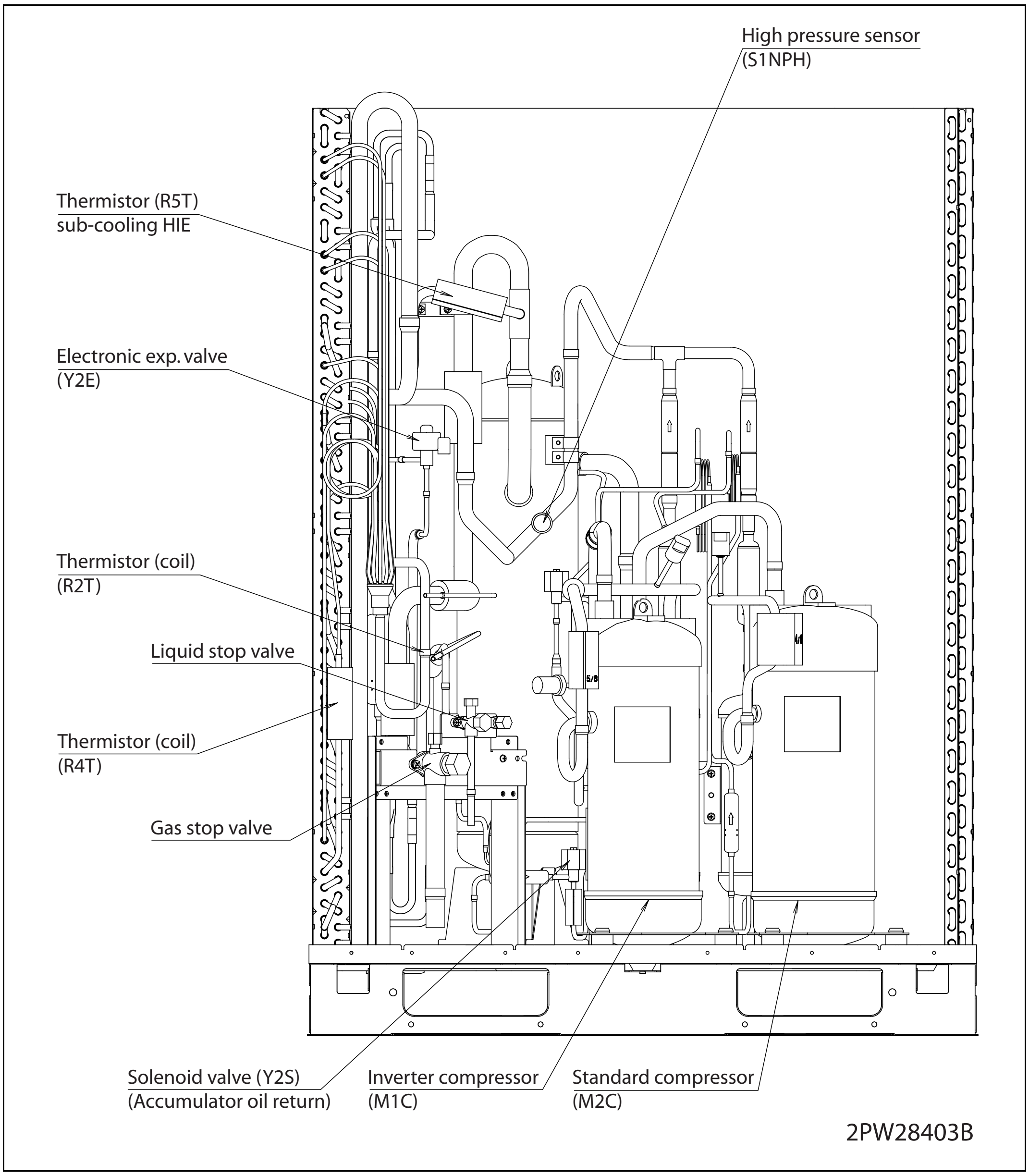
1

1.8 ERX250A7W1B: Functional Parts Layout

Plan



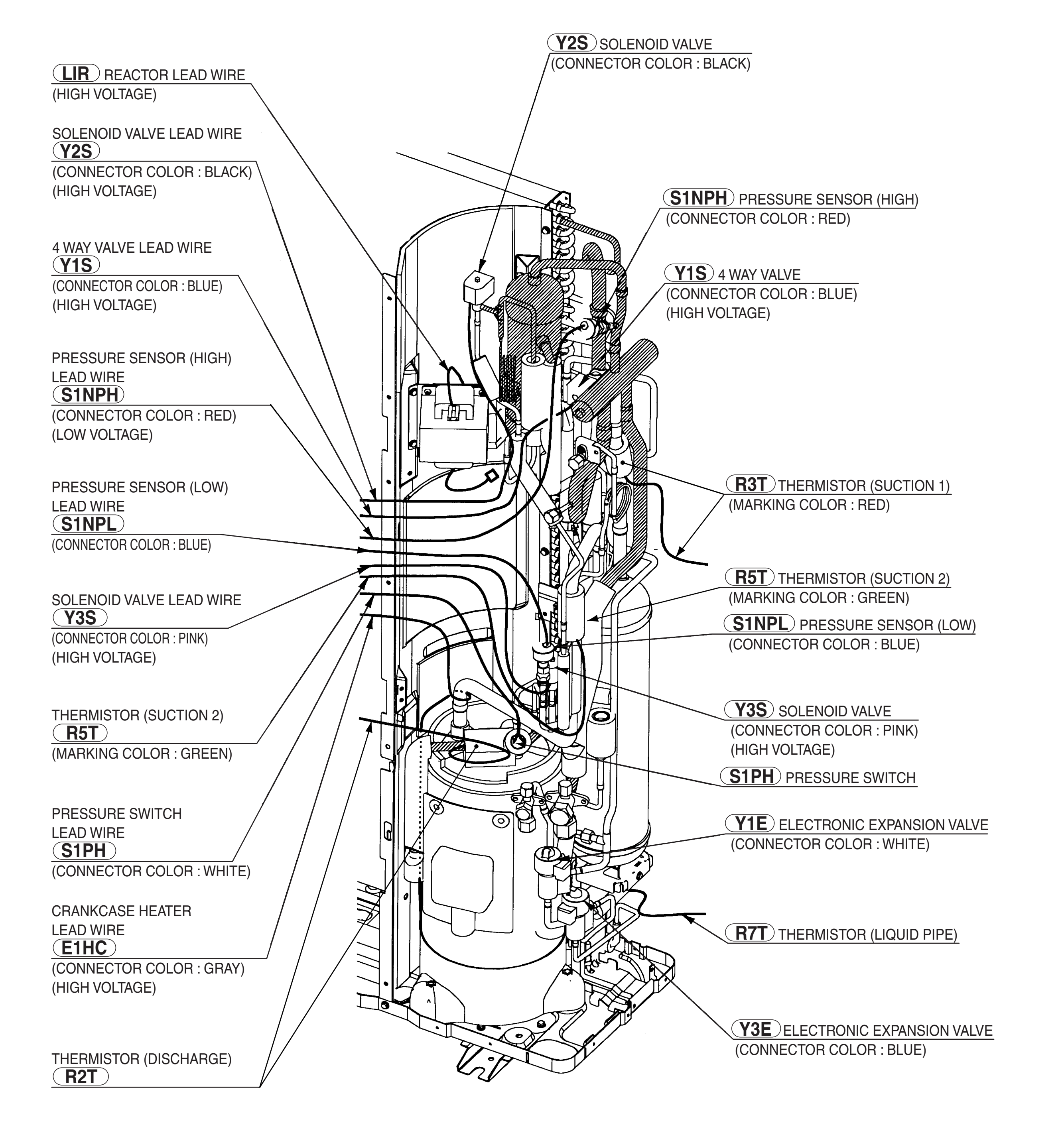
Front view


High pressure sensor
(S1NPH)
Thermistor (R5T)
sub-cooling HIE
Electronic exp. valve
(Y2E)
Thermistor (coil)
(R2T)
Liquid stop valve
Thermistor (coil)
(R4T)
Gas stop valve
Solenoid valve (Y2S)
(Accumulator oil return)
Inverter compressor
(M1C)
Standard compressor
(M2C)
2PW28403B

1

1.9 ERX100~140A8V3B: Functional Parts Layout

Birds-eye view



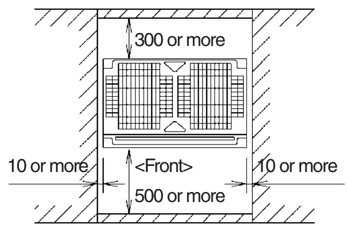
1.10 ERX125~250A7W1B: Installation and Service Space

Overview

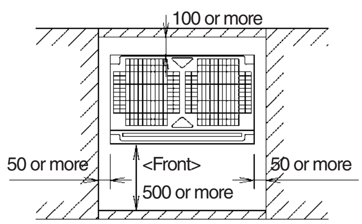
Topic	See page
1.10.1–Single Unit Installation	1–17
1.10.2–Installation in Rows	1–18
1.10.3–Centralized Group Layout	1–19

1.10.1 Single Unit Installation

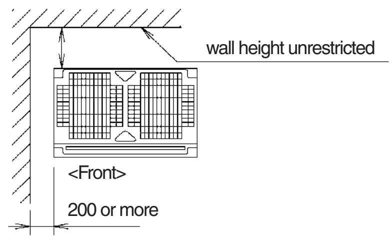
Pattern 1



Pattern 2



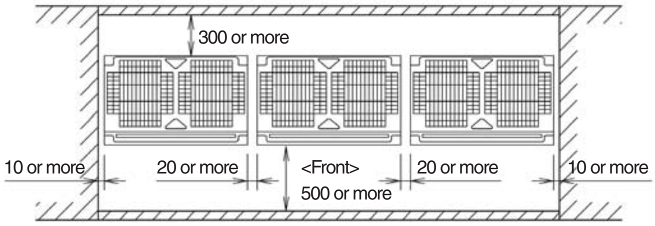
Pattern 3



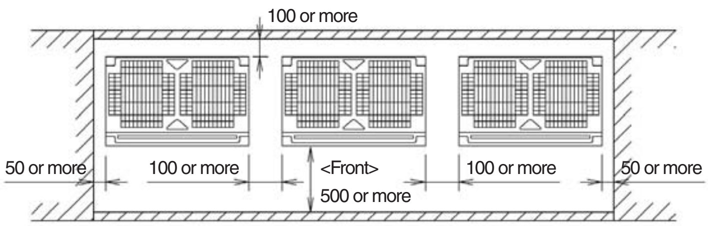
1

1.10.2 Installation in Rows

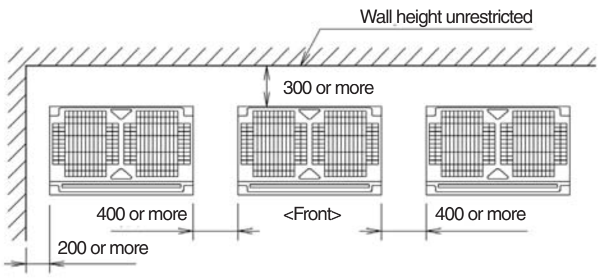
Pattern 1



Pattern 2



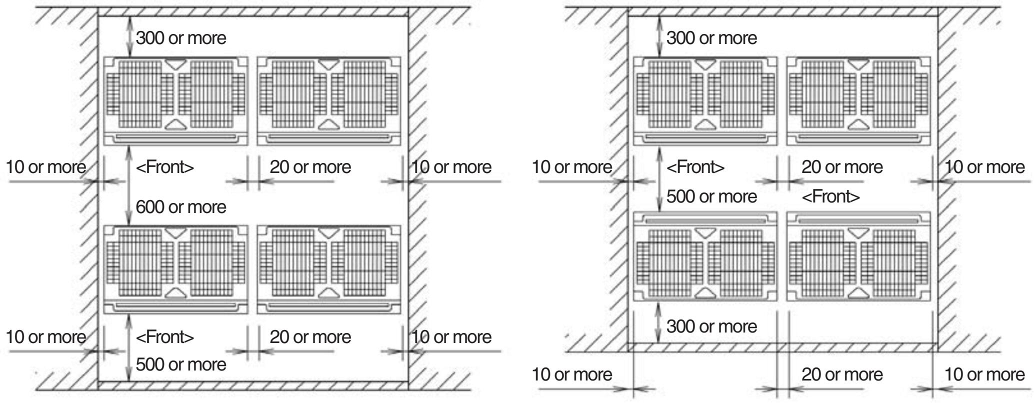
Pattern 3



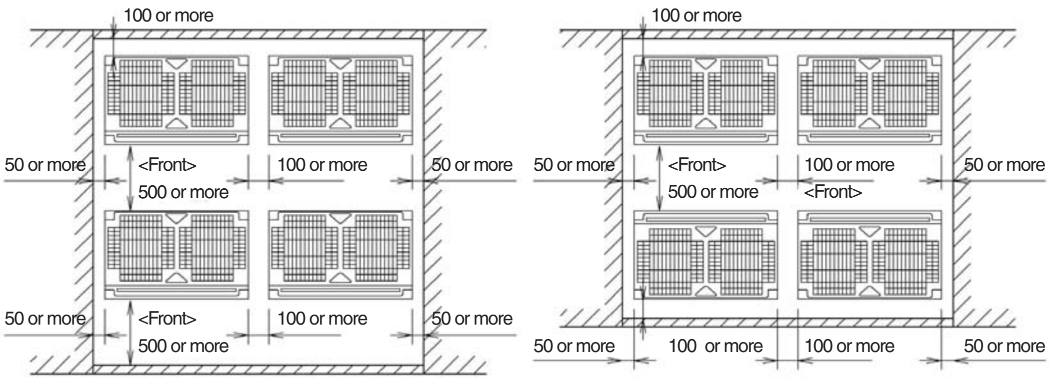
1

1.10.3 Centralized Group Layout

Pattern 1



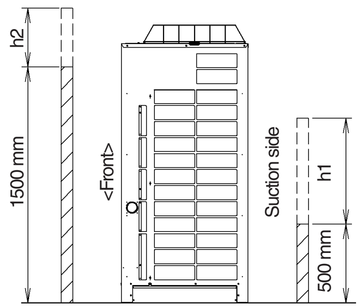
Pattern 2



1

Notes

1 Heights of walls in case of Patterns 1 and 2:
Front= 1500mm
Suction side: 500mm
Side: Height unrestricted,
Installation space to be shown in this drawing is based on the cooling operation at 35 degrees outdoor air temperature. When the design outdoor air temperature exceeds 35 degrees or the load exceeds maximum ability because of much generation load of heat in all outdoor unit, take the suction side space more broadly than the space to be shown in this drawing.



2 If the above wall heights are exceeded then h2/2 and h1/2 should be added to the front and suction side service spaces respectively as shown in the figure below.

3 When installing the units most appropriate pattern should be selected from those shown above in order to obtain the best fit in the space available always bearing in mind the need to leave enough space for a person to pass between units and wall and for the air to circulate freely.
(If more units are to be installed than are catered for in the above patterns your layout should take account of the possibility of short circuits.)

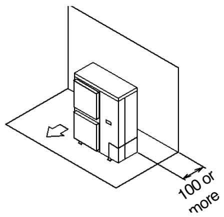
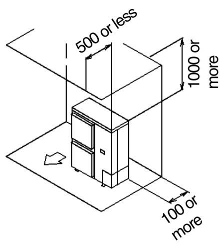
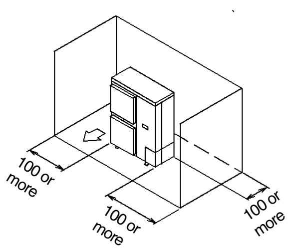
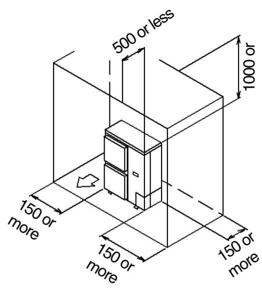
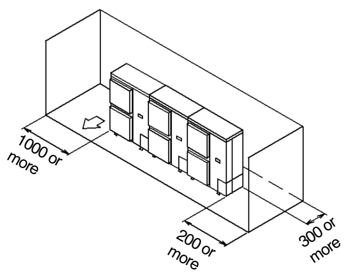
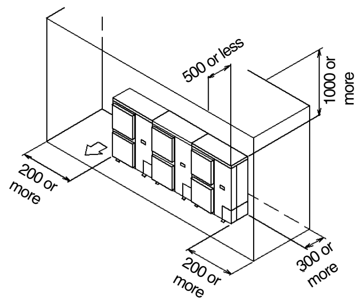
4 The units should be installed to leave sufficient space at the front for the on site refrigerant piping work to be carried out comfortably

1.11 ERX100~140A8V3B: Installation and Service Space

Overview

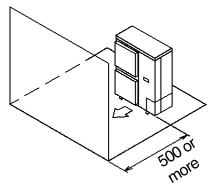
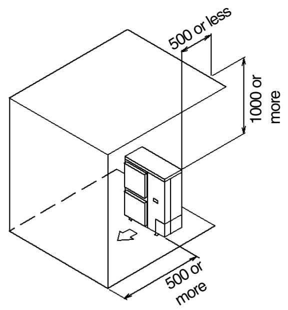
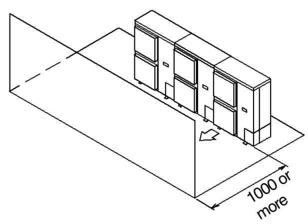
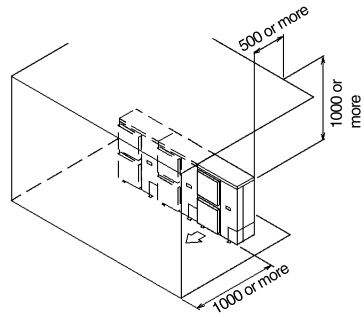
1

1.11.1 Obstacle on Suction Side

<table>
<tr><th>No obstacle above</th><th>Obstacle above, too</th></tr>
<tr><td colspan="2">1. Stand-alone installation</td></tr>
<tr><td>➤ Obstacle on the suction side only

</td><td>➤ Obstacle on the suction side, too

</td></tr>
<tr><td>➤ Obstacle on both sides

</td><td>➤ Obstacle on the suction side and both sides

</td></tr>
<tr><td colspan="2">2. Series installation (2 or more):</td></tr>
<tr><td>➤ Obstacle on both sides

</td><td>➤ Obstacle on the suction side and both sides

</td></tr>
</table>

1

1.11.2 Obstacle on Discharge Side

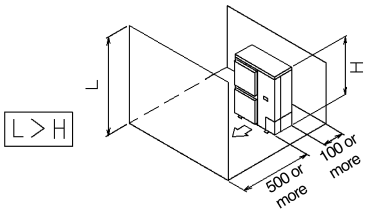
No obstacle above	Obstacle above, too
1. Stand-alone installation	
	
2. Series installation (2 or more)	
	

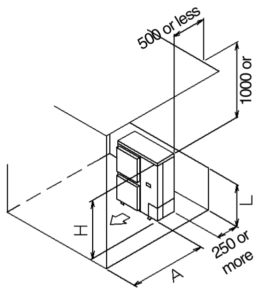
1

1.11.3 Obstacles on Both Suction and Discharge Sides

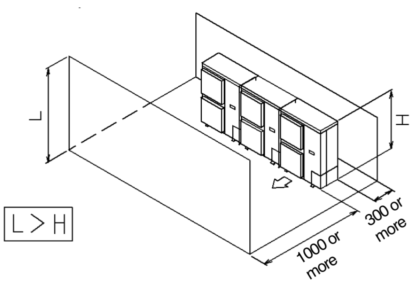
Pattern 1

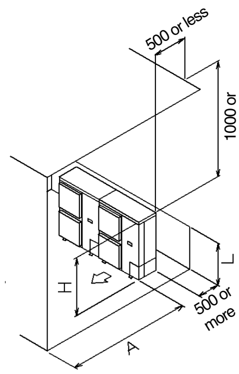
When the obstacles on the discharge side is higher than the unit:
(There is no height limit for obstructins on the intake side)

<table>
<tr><th>No obstacle above</th><th>Obstacle above, too</th></tr>
<tr><th colspan="2">1. Stand-alone installation</th></tr>
<tr><td>
</td><td>Close the bottom of the installation frame to prevent the discharged air from being bypassed.



The relations between H, A and L are as follows:

<table>
<tr><th></th><th>L</th><th>A</th></tr>
<tr><td rowspan="2">L ≤ H</td><td>0 < L ≤ 1 / 2H</td><td>750</td></tr>
<tr><td>1 / 2 < L ≤ H</td><td>1000</td></tr>
<tr><td>H < L</td><td colspan="2">Set the stand as: L ≤ H</td></tr>
</table></td></tr>
<tr><th colspan="2">2. Series installation (2 or more)</th></tr>
<tr><td>
</td><td>Close the bottom of the installation frame to prevent the discharged air from being bypassed.



The relations between H, A and L are as follows:

<table>
<tr><th></th><th>L</th><th>A</th></tr>
<tr><td rowspan="2">L ≤ H</td><td>0 < L ≤ 1 / 2H</td><td>1000</td></tr>
<tr><td>1 / 2 < L ≤ H</td><td>1250</td></tr>
<tr><td>H < L</td><td colspan="2">Set the stand as: L ≤ H</td></tr>
</table></td></tr>
</table>

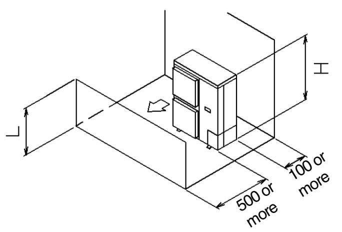
Pattern 2

When the obstacles on the discharge side is lower than the unit:
(There is no height limit for obstructins on the intake side)

No obstacle above	Obstacle above, too

1. Stand-alone installation

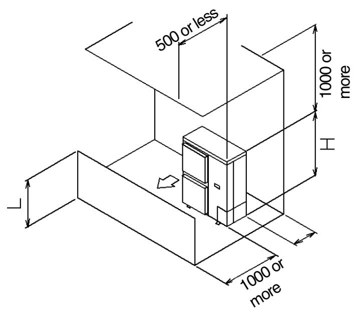
No obstacle above



L ≤ H

Obstacle above, too

Close the bottom of the installation frame to prevent the discharged air from being bypassed.

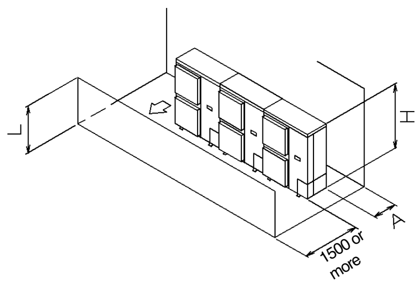


The relations between H, A and L are as follows:

	L	A
L ≤ H	0 < L ≤ 1 / 2H	100
	1 / 2 < L ≤ H	200
H < L	Set the stand as: L ≤ H	

2. Series installation (2 or more)

No obstacle above

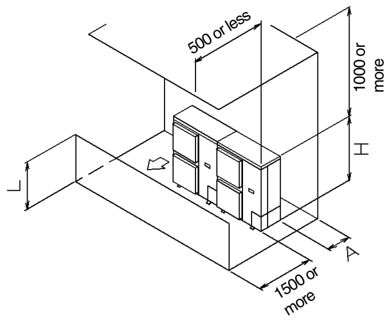


The relations between H, A and L are as follows:

L	A
0 < L ≤ 1 / 2 H	250
1 / 2 H < L ≤ H	300

Obstacle above, too

Close the bottom of the installation frame to prevent the discharged air from being bypassed.

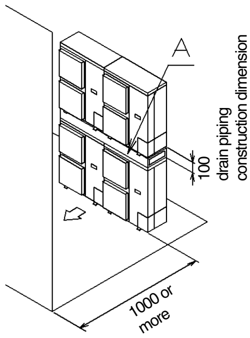
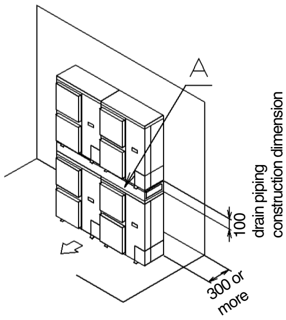


The relations between H, A and L are as follows:

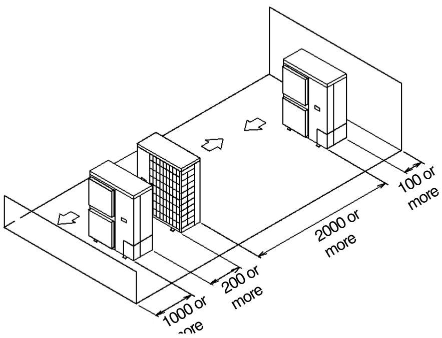
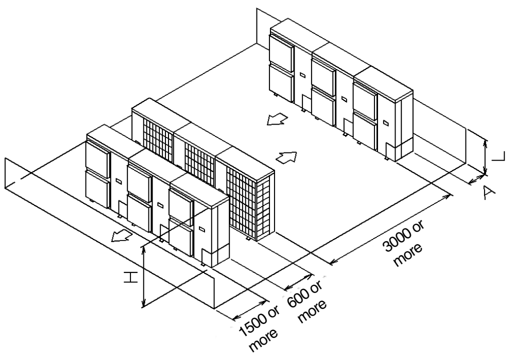
	L	A
L ≤ H	0 < L ≤ 1 / 2H	250
	1 / 2 < L ≤ H	300
H < L	Set the stand as: L ≤ H	

1

1.11.4 Double-decker Installation

Obstacle on the discharge side	
Close the gap A (the gap between the upper and lower outdoor units) to prevent the discharged air from being bypassed. Do not stack more than two unit.	
	

1.11.5 Multiple Rows of Series Installation (on the Rooftop, etc.)

1. One row of stand-alone installation	2. Rows of series installation (2 or more):
	 The relations between H, A and L are as follows:

	L	A
L ≤ H	0 < L ≤ 1 / 2H	250
	1 / 2 < L ≤ H	300
H < L	cannot be installed	

2 Specifications

2.1 What Is in This Chapter?

Introduction

This chapter contains the following information:

- ➤ Technical specifications
- ➤ Electrical specifications

Outdoor units

This chapter contains the following specifications:

1

2.2 Specifications for DAIKIN Inverter Condensing Unit ERX125~250A7W1B

Technical specifications

The table below contains the technical specifications

				ERX125A7W1B	ERX200A7W1B	ERX250A7W1B
Nominal capacity	Cooling		kW	14.0	22.4	28.0
COP	Cooling		--	3.98	4.03	3.77
Nominal input	Cooling		kW	3.52	5.56	7.42
PED Category				2		
Casing	Colour			Daikin white		
	Material			Painted galvanised steel		
Dimensions	Unit	Height	mm	1680		
		Width	mm	635	930	
		Depth	mm	765		
	Packing	Height	mm	1855		
		Width	mm	796	1055	
		Depth	mm	860		
Weight	Unit		kg	157	185	238
	Packed unit		kg	180	215	271
Packing information	Carton		kg	3.80	4.02	
	Wood		kg	19.15	20.85	
	Plastic		kg	0.215	0.265	
Heat exchanger	Specifications	Length	mm	1483	1778	
		N° of rows		54		
		Fin pitch		2.00		
		N° of passes		8	18	
		Face area	m²	1.762	2.112	
		N° of stages		2		
		Empty tubeplate hole		0		
	Tube type			HI-XSS (8)		
	Fin	Type		Non-symmetric waffle louvre		
		Treatment		Hydrophylic and anti corrosion resistant		
Fan	Type			Propeller		
	Quantity			1		
	Air flow rate (nominal at 230V)	Cooling	m³/min	95	171	185
	External static pressure		Pa	78 Pa in high static pressure		
	Discharge direction			Vertical		
	Motor	Quantity		1		
		Model		Brushless DC		
		Output		350	750	
Compressor	Quantity			1		2
	Motor	Quantity		1		
		Model		Inverter		
		Speed	rpm	6300	7980	6300
		Motor output	kW	2.8	3.8	1.2
		Type		Hermetically sealed scroll compressor		
		Crankcase heater	W	33		
		Quantity		0		1
		Model		-	-	ON - OFF
		Speed	rpm	-	-	2900
		Motor output	kW	-	-	4.5
		Type		-	-	Hermetically sealed scroll compressor
		Crankcase heater	W	-	-	33
Operation range	Cooling	Minimum	°CDB	-5.0		
		Maximum	°CDB	43.0		
Sound level(nominal)	Sound power		dBA	72	78	
	Sound pressure		dBA	54	57	58

				ERX125A7W1B	ERX200A7W1B	ERX250A7W1B
Refrigerant	Type			R410A		
	Charge		kg	6.2	7.7	8.4
	Control			Electronic expansion valve		
	N° of circuits			1		
Refrigerant oil	Type			Synthetic (ether) oil		
	Charged volume		l	0 + 1.7	0.4 + 1.7	1 + 1.7 + 1.6
Piping connections	Liquid	Type		Brazing connection		
		Diameter (OD)	mm	9.5		
		Type		Brazing connection		
		Diameter (OD)	mm	15.9	19.1	22.2
	Heat insulationvt			Both liquid and gas		
Capacity control method				Inverter controlled		
Capacity control			%	50~100		
Safety devices				High pressure switch		
				Fan driver overload protector		
				Overcurrent relay		
				Inverter overload protector		
				PC board fuse		
Standard accessories	Item			Installation manual		
	Quantity			1		
Standard accessories	Item			Operation manual		
	Quantity			1		
Standard accessories	Item			Connection pipes		
	Quantity			4		

Notes

1. Nominal cooling capacities are based on:
   - ➤ evaporating temperature of 6°C
   - ➤ outdoor temperature: 35°CDB
   - ➤ equivalent refrigerant piping: 7,5m
   - ➤ level difference: 0m.
2. Sound power level is an absolute value that a sound generates.
3. Sound pressure level is a relative value, depending on the distance and acoustic environment. For more details, please refer to sound level drawings.
4. Sound values are measured in a semi-anechoic room.
5. Compressor output: is a compressor at nominal point.

Electrical specifications

The table below contains the electrical specifications.

				ERX125A7W1B	ERX200A7W1B	ERX250A7W1B
Power supply	Name			W1		
	Phase			3N-		
	Frequency		Hz	50		
	Voltage		V	400		
Current	Nominal running current (RLA)	Cooling	A	5.1	7.5	11.3
	Starting current (MSC)		A			74
	Z_{max}			no requirements		0.23 + j0.15
	Minimum circuit amps (MCA)		A	11.9	18.5	21.6
	Maximum fuse amps (MFA)		A	16	25	
	Total overcurrent amps (TOCA)		A	15.6	16.5	31.5
	Full load amps (FLA)		A	0.4	0.7	0.9
Voltage range			V	400 ±10%		
Wiring connections	For power supply	Quantity		5		
		Remark		Earth wire include		
	For connection with indoor	Quantity		2		
		Remark		F1 - F2		
Power supply intake				Both indoor and outdoor unit		

Notes

1. MCA/MFA: MCA = 1.25 x maximum RLA + other RLA + EA FLA, MFA is smaller than or equal to 2.25 x maximum RLA + other RLA + EA FLA, next lower standard fuse rating minimum 16A.
2. MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker).
3. MSC means the maximum current during start up of the compressor.
4. Maximum allowable voltage range variation between phases is 2%.
5. RLA is based on following conditions:
   - indoor temperature: 27° CDB/19° CWB
   - outdoor temperature: 35° CDB
6. Select wire size based on the value of MCA or TOCA.
7. TOCA means the total value of each OC set.
8. Voltage range: units are suitable for use on electrical systems where voltage supplied to unit terminal is not below or above listed range limits.
9. FLA means the full load amps of the fan motor.

2.3 Specifications for DAIKIN Inverter Condensing Unit ERX100~140A8V3B

Technical specifications

The table below contains the technical specifications.

				ERX100A8V3B	ERX125A8V3B	ERX140A8V3B
Nominal Capacity	Cooling		kW	11.8	14.2	15.8
Power input	Cooling		kW	3.52	4.33	4.98
EER	Cooling			3.35	3.28	3.17
Maximum numbers of indoors				1	1	1
Casing	Colour			Daikin white	Daikin white	Daikin white
	Material			Painted galvanised steel	Painted galvanised steel	Painted galvanised steel
Dimensions	Packing	Height	mm	1524	1524	1524
		Width	mm	980	980	980
		Depth	mm	420	420	420
	Unit	Height	mm	1345	1345	1345
		Width	mm	900	900	900
		Depth	mm	320	320	320
Weight	Unit		kg	125	125	125
	Packed unit		kg	130	130	130
Heat exchanger	Specifications	Length	mm	857	857	857
		N° of rows		2	2	2
		Fin pitch	mm	2	2	2
		N° of passes		10	10	10
		Face area	mm	1.131	1.131	1.131
		N° of stages		60	60	60
		Empty tubeplate hole		0	0	0
	Tube type			Hi-XSS(8)	Hi-XSS(8)	Hi-XSS(8)
	Fin	Type		Non-symmetric waffle	Non-symmetric waffle	Non-symmetric waffle
		Treatment		Corrosion resistant	Corrosion resistant	Corrosion resistant
Fan	Type			Propeller	Propeller	Propeller
	Quantity			2	2	2
	Air flow rate (nominal at ...)	Cooling	m³/min	106	106	106
		Heating	m³/min	102	105	105
	Discharge direction			Horizontal	Horizontal	Horizontal
	Motor	Quantity		2	2	2
		Model		Brushless DC motor	Brushless DC motor	Brushless DC motor
	Speed (nominal)	Cooling - 850/815	rpm	850/815	850/815	850/815
		Heating - 820/785	rpm	820/785	840/805	840/805
		Drive		Direct drive	Direct drive	Direct drive
		Output	W	70	70	70
Compressor	Quantity			1	1	1
	Motor	Quantity		1	1	1
		Model		JT100G-VDL@T2	JT100G-VDL@T2	JT100G-VDL@T2
		Type		Hermetically sealed scroll compressor	Hermetically sealed scroll compressor	Hermetically sealed scroll compressor
		Speed	rpm	6480	6480	6480
		Motor output	kW	2.5	3.0	3.5
		Starting method		Direct on line	Direct on line	Direct on line
		Crankcase heater	W	33	33	33
Operation range	Cooling	Minimum	°CDB	-5	-5	-5
		Maximum	°CDB	46	46	46
Sound level (nominal)	Cooling	Sound power	dBA	66	67	69
		Sound pressure	dBA	50	51	53
Refrigerant	Type			R410A	R410A	R410A
	Charged		kg	4.00	4.00	4.00
	Control			Expansion valve (electronic type)	Expansion valve (electronic type)	Expansion valve (electronic type)
	N° of circuits			1	1	1

1

				ERX100A8V3B	ERX125A8V3B	ERX140A8V3B
Refrigerant oil	Type			Daphne FVC68D	Daphne FVC68D	Daphne FVC68D
	Charged volume		l	1.5	1.5	1.5
Piping connections	Liquid	Type		Flare connection	Flare connection	Flare connection
		Diameter (OD)	mm	9.52	9.52	9.52
	Gas	Type		Flare connection	Flare connection	Braze connection
		Diameter (OD)	mm	15.9	15.9	19.1
	Drain	Quantity		3	3	3
		Diameter (OD)	mm	26 x 3	26 x 3	26 x 3
	Heat insulation			Both liquid and gas pipes	Both liquid and gas pipes	Both liquid and gas pipes
	Maximum total length		m	50	50	50
Capacity control method				Inverter controlled	Inverter controlled	Inverter controlled
Capacity control			%	24 to 100	24 to 100	24 to 100
Safety devices				HPS	HPS	HPS
Safety devices				Fan motor thermal protection	Fan motor thermal protection	Fan motor thermal protection
Safety devices				Inverter overload protector	Inverter overload protector	Inverter overload protector
Safety devices				PC board fuse	PC board fuse	PC board fuse
Standard accessoires	Item			Installation manual	Installation manual	Installation manual
	Quantity			1	1	1
Standard accessoires	Item			Operation manual	Operation manual	Operation manual
	Quantity			1	1	1
Standard accessoires	Item					Connection pipes
	Quantity					3

Notes

1. Nominal cooling capacities are based on:
   - indoor temperature: 27° CDB, 19° CWB
   - outdoor temperature: 35° CDB
   - equivalent regrigerant piping: 7.5m
   - level difference: 0m
   - 100% evaporator load.
2. Sound power level is an absolute value that a sound source generates.
3. Sound pressure level is a relative value, depending on the distance and acoustic environment. For more details, please refer to sound level drawings.
4. Sound values are measure in a semi-anechoic room.

Electrical specifications

The table below contains the electrical specifications.

				ERX100A8V3B	ERX125A8V3B	ERX140A8V3B
Power supply	Name			V3		
	Phase			1 ~		
	Frequency		Hz	50		
	Voltage		V	230		
Current	Nominal running current (RLA)		A	15.9	20.2	22.2
	Starting current (MSC)		A	15.9	20.2	22.2
	Z_{max}	List		No requirements		
	Minimum circuit amp (MCA)		A	27.0		
	Maximum fuse amps (FLA)		A	32.0		
	Total overcurrent amps (TOCA)		A	27.0		
	Full load amps (FLA)		A	0.3 + 0.3 (Fan motor)		
Voltage	Minimum		V	-10%		
	Maximum		V	+10%		
Wiring connections	For power supply	Quantity		3		
		Remark		Earth wire included		
	For connection with control box	Quantity		2		
		Remark		F1 + F3		
Power supply intake				Both outdoor unit and control box		

Symbols

MCA : Min. Circuit Amps
TOCA : Total Over-current Amps
MFA : Maximum Fuse Amps (see note 6)
RLA : Rated Load Amps
FLA : Full Load Amps
MSC : Starting Current (see note 7)

Notes

1. RLA based on the following conditions:
   - Indoor temperature: 27° CDB/19° CWB
   - outdoor temperature: 35°CDB.
2. Toca means the total value of each OC set.
3. Voltage range; Units are suitable for use on electrical systems where the voltage supplied to the unit terminals is not below or above the listed range limits.
4. Maximum allowable voltage unbalance between phases is 2%;
5. Select wire size based on the larger value of MCA or TOCA.
6. Instead of fuse, use circuit breaker. MFA is used to select circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker).
7. MSC means the maximum current during start up of the compressor.

1

2.4 Specifications for EKEXFCB(A)V3B, EKEXDCB(A)V3B and EKEXMCBV3B

Technical specifications

The table below contains the technical specifications.

				EKEXFCBV3B	EKEXDCBV3B	EKEXFCBAV3B	EKEXDCBAV3B	EKEXMCBV3B
Casing	Colour			White grey				
	Material			Resin				
Dimensions	Unit	Height	mm	132				
		Width	mm	400				
		Depth	mm	200				
	Packing	Height	mm	215				
		Width	mm	495				
		Depth	mm	310				
Weight	Unit		kg	3.8	3.5	3.8	3.5	3.5
	Packed unit		kg	4.8	4.5	4.8	4.5	4.5
Packing	Material			Carton / EPS / Plastic				
	Weight		kg	0.38 / 0.24 / 0.09				
Operation range	Cooling	Minimum	° CDB	-5				
		Maximum	° CDB	46				
Standard accessories	Item			Thermistor (R1T)				
	Quantity			0	1	0	1	1
	Item			Thermistor (R2T / R3T)				
	Quantity			2	2	2	2	2
	Item			Insulation sheet				
	Quantity			2	2	2	2	2
	Item			Rubber sheet				
	Quantity			2	2	2	2	2
	Item			Wire to wire splice				
	Quantity			4	6	4	6	6
	Item			Installation and operation manual				
	Quantity			1	1	1	1	1
	Item			Screw nut				
	Quantity			6	8	6	8	9
	Item			Tie wrap				
	Quantity			6	6	6	6	6
	Item			Capacity setting adaptor				
	Quantity			5	5	7	7	8
	Item			Stopper (closing cup)				
	Quantity			2	0	2	0	0

1

Electrical specifications

The table below contains the electrical specifications.

				EKEXFCBV3B	EKEXDCBV3B	EKEXFCBAV3B	EKEXDCBAV3B	EKEXMCBV3B
Power supply	Name			V3				
	Phase			1				
	Frequency		Hz	50				
	Voltage		V	230				
	Voltage range	Minimum	V	207				
		Maximum	V	253				
Wiring connections	For power supply	Quantity		3				
		Remark		Earth wire included				
	For connection with indoor	Quantity		2				
		Remark		F1 - F2				
	For remote controller	Quantity		2(*)	2	2(*)	2	2
		Remark		P1, P2(*)	P1, P2	P1, P2(*)	P1, P2	P1, P2
	For expansion valve kit	Quantity		6				
		Remark		Y1 ~ Y6				
	Thermistors liquid pipe	Quantity		2				
		Remark		R1, R2				
	Thermistors gas pipe	Quantity		2				
		Remark		R3, R4				
	Thermistor air	Quantity		---	2	---	2	2
		Remark		---	R5, R6	---	R5, R6	R5, R6
	ON / OFF	Quantity		2				
		Remark		T1, T2				
	Error signal	Quantity		2	---	2	---	---
		Remark		C1, C2	---	C1, C2	---	---
	Operation signal	Quantity		2	---	2	---	---
		Remark		C3, C4	---	C3, C4	---	---
	Capacity step	Quantity		2	---	2	---	---
		Remark		C5, C6	---	C5, C6	---	---
Power supply intake				Bottom				

remark (*) for service

1

2.5 Specifications for EKEXV50~250

Technical specifications

The table below contains the technical specifications.

Specification		EKEXV50	EKEXV63	EKEXV80	EKEXV100	EKEXV125	EKEXV140	EKEXV200	EKEXV250
Casing	Colour	Ivory							
	Material	Metal							
Dimensions	Packing Height	457							
	Packing Width	270							
	Packing Depth	120							
	Unit Height	401							
	Unit Width	215							
	Unit Depth	78							
Weight	Machine weigth	2.9							
	Gross weight	3.4							
Packing	Material	Carton/EPS							
	Weight	0.29 kg/0.066 kg							
Operation range	Cooling minimum	-5 °CDB							
	Cooling maximum	46 °CDB							
Sound level (nominal)		45 dBA (Max at 10 cm from motor)							
Standard accessories	Liquid type	Braze connection							
	Liquid diameter (OD)	6.4 m	9.52 m						
	Piping length minimum	See manual (depend on outdoor unit)							
	Piping length maximum	See manual (depend on outdoor unit)							
	Piping length equivalent	See manual (depend on outdoor unit)							
	Piping length chargeless	See manual (depend on outdoor unit)							
	Installation maximum height difference	See manual (depend on outdoor unit)							
	Maximum interunit level difference	See manual (depend on outdoor unit)							
	Heat insulation	Both inlet and outlet							

3 Functional Diagrams

3.1 What Is in This Chapter?

Introduction

This chapter contains the following information:

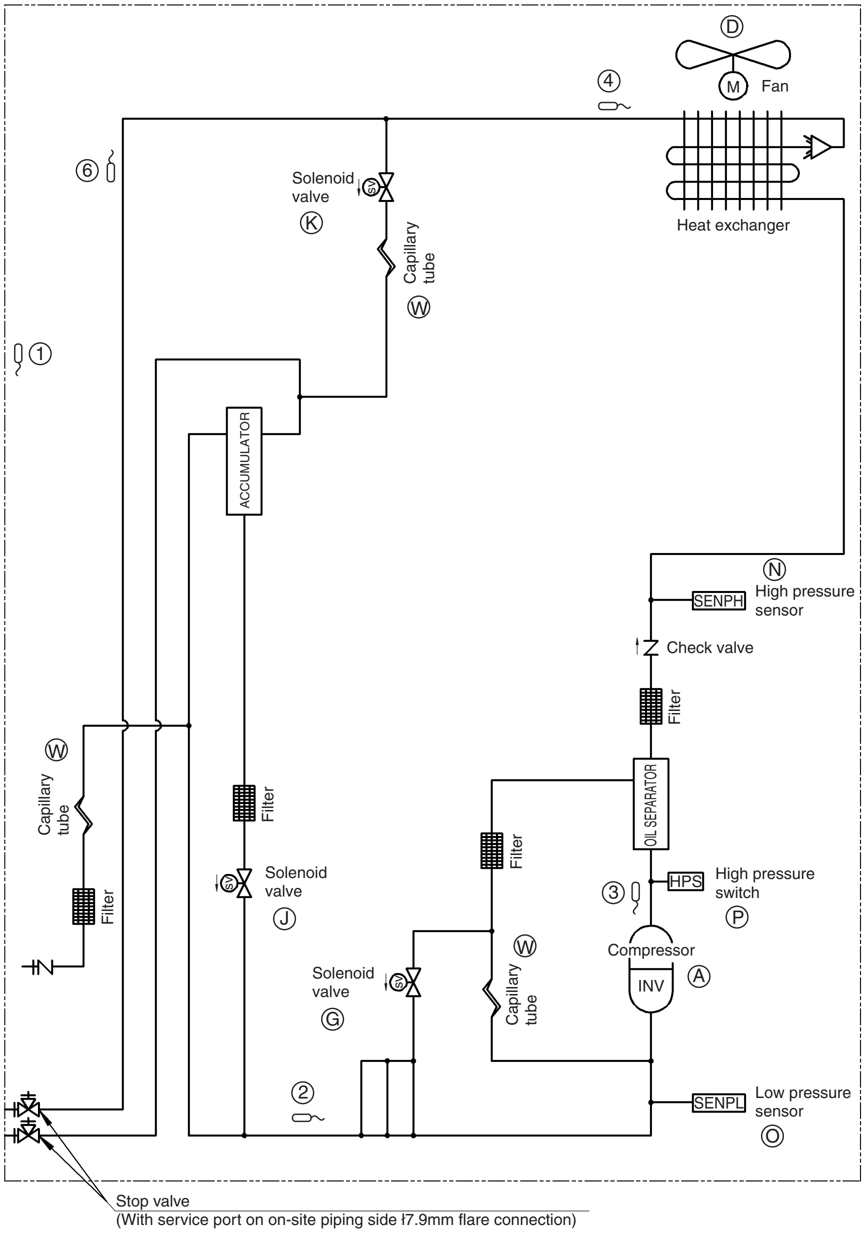
- Refrigerant circuit
- Pipe connection diameters

Functional diagrams

This chapter contains the following functional diagrams:

1

3.2 Refrigerant Circuit ERX125A7W1B



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Components

The table below contains the different components of the functional diagrams.

No.	Symbol	Name	Function / remark
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 188Hz by using the inverter. The number of operating steps is as follows when Inverter compressor is operated. ERX125: 18 steps
D	M1F	Inverter fan	Since the system is of air heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
G	Y1S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
J	Y2S	Solenoid valve (Oil return: SVO)	Used to return oil from the accumulator to the compressor.
K	Y4S	Solenoid valve (Injection) SVT	Used to cool the compressor by injecting refrigerant when the compressor discharge temperature is high.
N	S1NPH	High pressure sensor	Used to detect high pressure.
O	S1NPL	Low pressure sensor	Used to detect low pressure.
P	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
W	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the compressor.
1	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (Suction pipe: Ts)	Used to detect suction pipe temperature.
3	R3T	Thermistor (INV discharge pipe: Tdi)	Used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
4	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger and others.
5	R6T	Thermistor (Liquid pipe Tl)	Used to detect liquid pipe temperature.
6	R7T	Thermistor (Accumulator inlet Ts1)	Used to detect gas pipe temperature at the accumulator inlet, and others.

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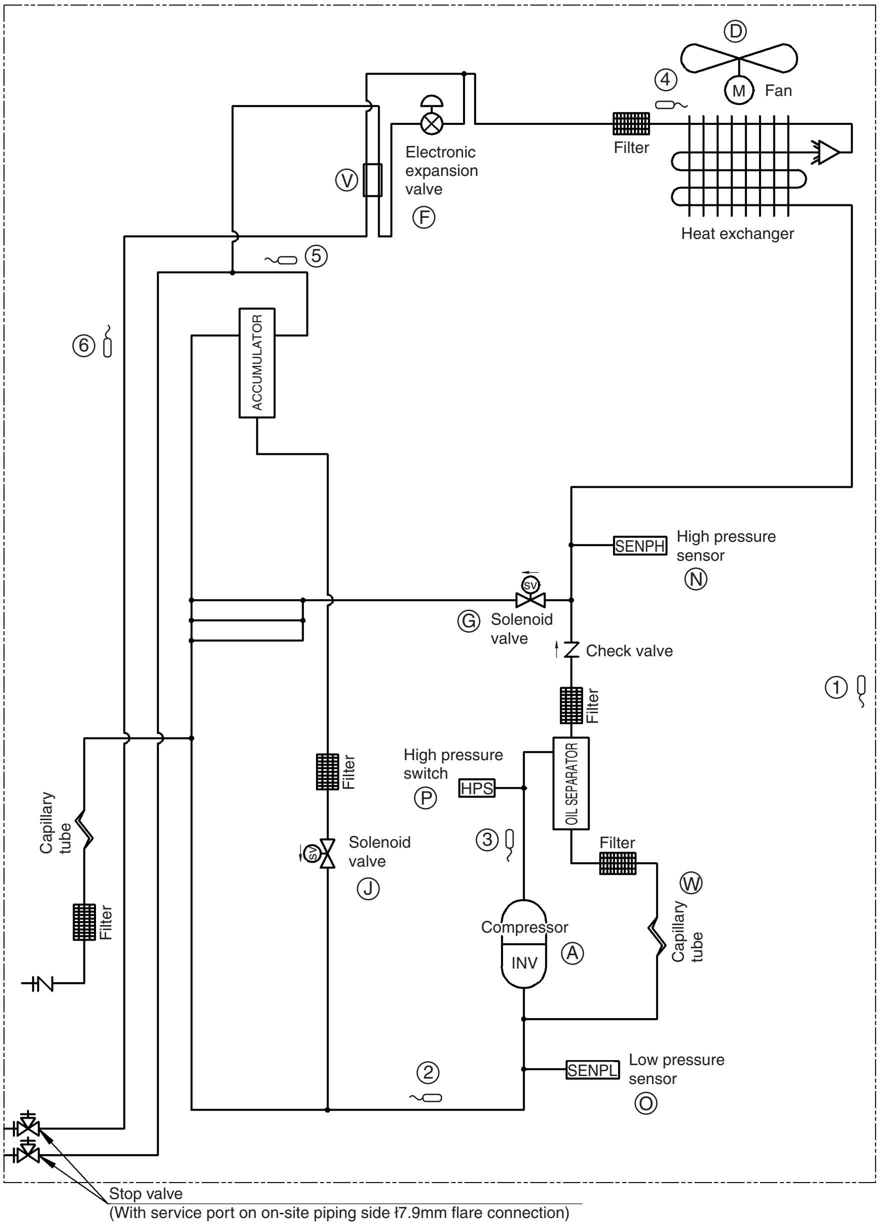
3.3 Refrigerant Circuit ERX200A7W1B



4TW27315-1A

Components The table below contains the different components of the functional diagrams.

No.	Symbol	Name	Function / remark
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 266Hz by using the inverter, while Standard compressor is operated with commercial power supply only. The number of operating steps is as follows when Inverter compressor is operated in combination with Standard compressor. ERX200: 24 steps
D	M1F	Inverter fan	Since the system is of air heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
F	Y2E	Electronic expansion valve (Subcool: EV2)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
G	Y1S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
J	Y2S	Solenoid valve (Oil return: SVO)	Used to return oil from the accumulator to the compressor.
N	S1NPH	High pressure sensor	Used to detect high pressure.
O	S1NPL	Low pressure sensor	Used to detect low pressure.
P	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
V	—	Subcooling heat exchanger	Used to subcool liquid refrigerant from the electronic expansion valve (cooling).
W	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV compressor.
1	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (Suction pipe: Ts)	Used to detect suction pipe temperature.
3	R3T	Thermistor (INV discharge pipe: Tdi)	Used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
4	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger and others.
5	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Used to detect gas pipe temperature on the evaporation side of subcooling heat exchanger, keep the superheated degree at the outlet of subcooling heat exchanger constant, and others.
6	R6T	Thermistor (Receiver outlet liquid pipe: Tl)	Used to detect receiver outlet liquid pipe temperature.
7	R7T	Thermistor (Accumulator inlet)	Used to detect gas pipe temperature at the accumulator inlet, and others.

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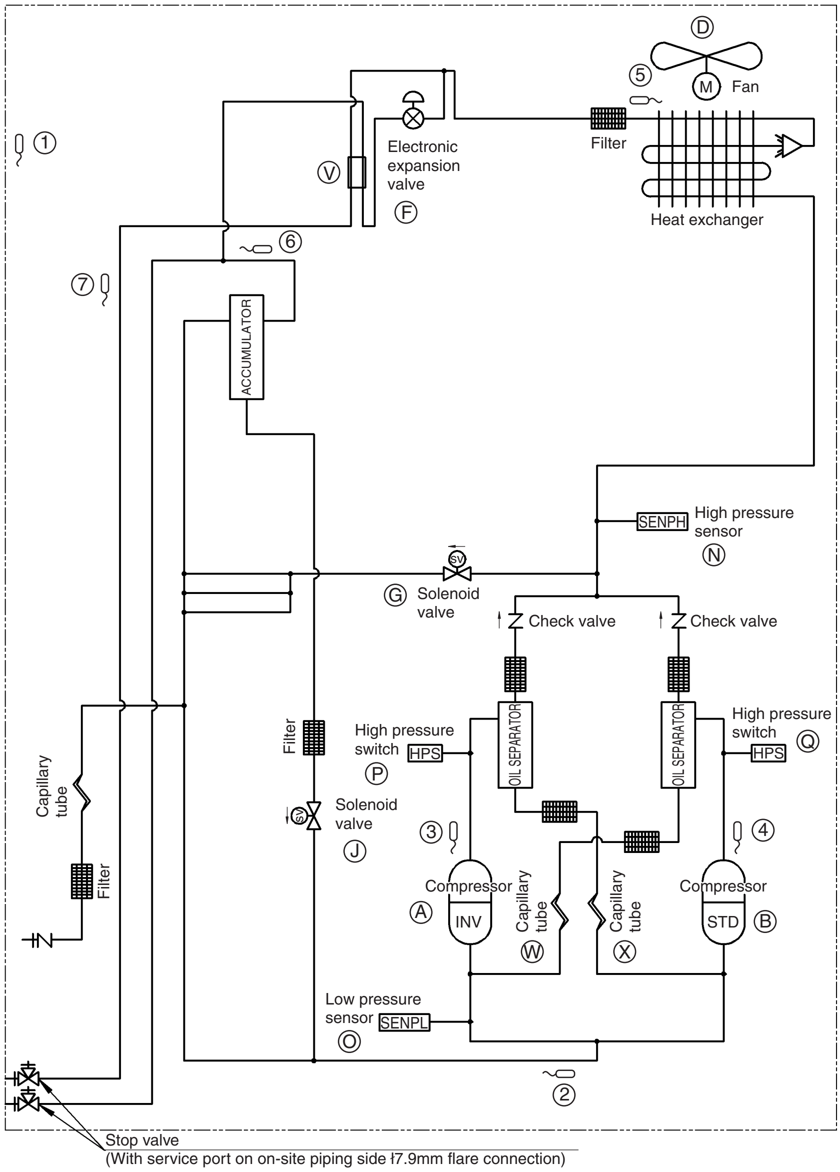
3.4 Refrigerant Circuit ERX250A7W1B



4TW27325-1A

Components The table below contains the different components of the functional diagrams.

No.	Symbol	Name	Function / remark
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 210Hz by using the inverter, while Standard compressor is operated with commercial power supply only. The number of operating steps is as follows when Inverter compressor is operated in combination with Standard compressor. ERX250: 37 steps
B	M2C	Standard compressor 1 (STD1)	
D	M1F	Inverter fan	Since the system is of air heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
F	Y2E	Electronic expansion valve (Subcool: EV3)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
G	Y1S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
J	Y2S	Solenoid valve (Oil return: SVO)	Used to return oil from the accumulator to the compressor.
N	S1NPH	High pressure sensor	Used to detect high pressure.
O	S1NPL	Low pressure sensor	Used to detect low pressure.
P	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
Q	S2PH	HP pressure switch (For STD compressor 1)	
V	—	Subcooling heat exchanger	Used to subcool liquid refrigerant from the electronic expansion valve (cooling).
W	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV compressor.
X	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the STD1 compressor.
1	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (Suction pipe: Ts)	Used to detect suction pipe temperature.
3	R31T	Thermistor (INV discharge pipe: Tdi)	Used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
4	R32T	Thermistor (STD1 discharge pipe: Tds1)	
5	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger and others.
6	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Used to detect gas pipe temperature on the evaporation side of subcooling heat exchanger, keep the superheated degree at the outlet of subcooling heat exchanger constant, and others.
7	R6T	Thermistor (Liquid pipe: Tl)	Used to detect liquid pipe temperature.
8	R7T	Thermistor (Accumulator inlet)	Used to detect gas pipe temperature at the accumulator inlet, and others.

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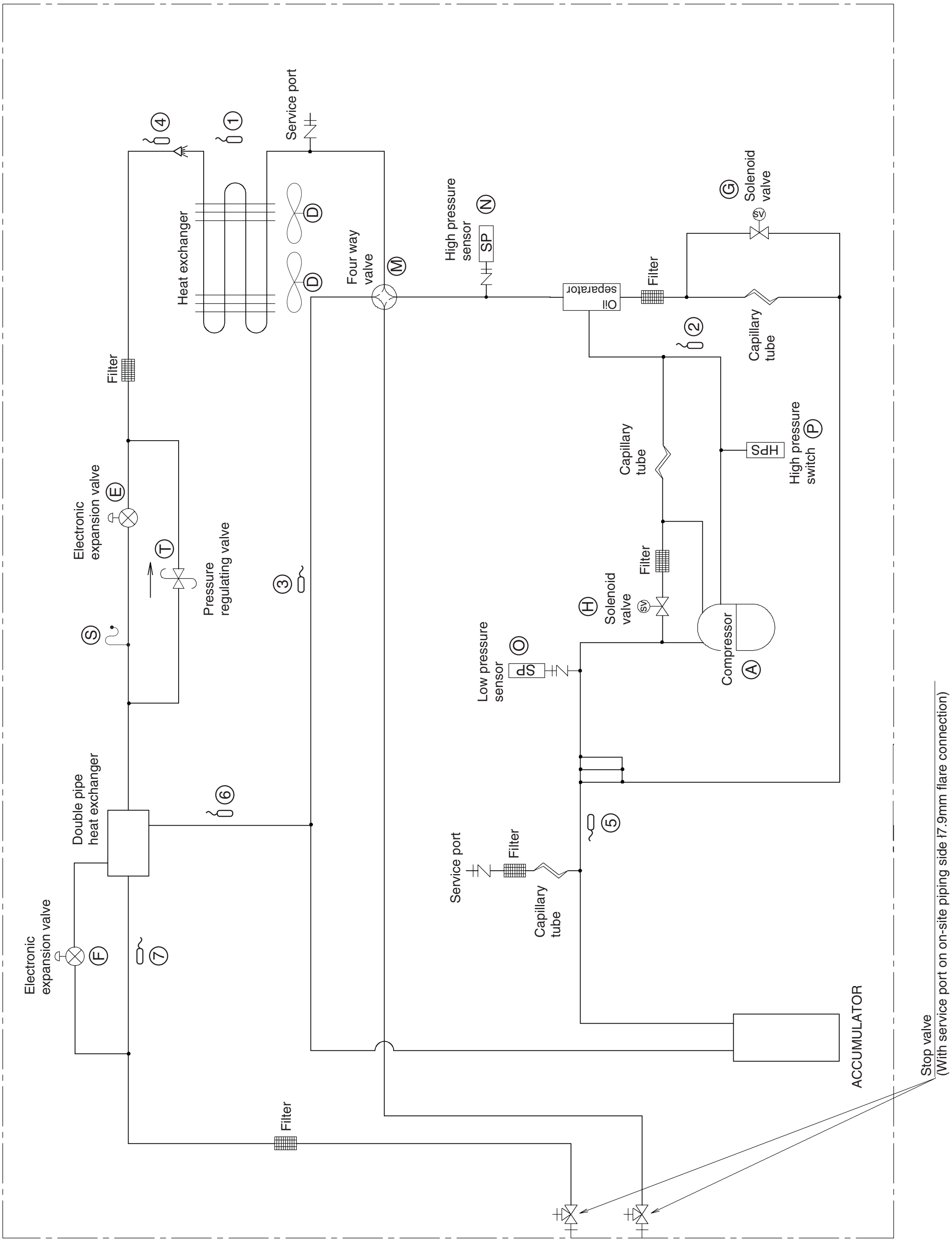
3.5 Refrigerant Circuit ERX100~140A8V3B



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Components The table below contains the different components of the functional diagrams.

No.	Symbol	Name	Function / remark
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 36 Hz and 195 Hz by using the inverter. 31 steps
D	M1F M2F	Inverter fan	Since the system is of air heat exchanging type, the fan is operated at 8-step rotation speed by using the inverter.
E	Y1E	Electronic expansion valve (Main: EV1)	Fully open during cooling.
F	Y3E	Electronic expansion valve (Subcool: EV3)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
G	Y2S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
H	Y3S	Solenoid valve (Unload circuit SVUL)	Used to the unloading operation of compressor.
M	Y1S	Four way valve	Used to switch the operation mode between cooling and heating.
N	S1NPH	High pressure sensor	Used to detect high pressure.
O	S1NPL	Low pressure sensor	Used to detect low pressure.
P	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
S	—	Fusible plug	In order to prevent the increase of pressure when abnormal heating is caused by fire or others, the fusible part of the plug is molten at a temperature of 70 to 75°C to release the pressure into the atmosphere.
T	—	Pressure regulating valve 1 (Receiver to discharge pipe)	This valve opens at a pressure of 4.0 MPa for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage.
1	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (INV discharge pipe: Tdi)	used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
3	R3T	Thermistor (Suction pipe1: Ts1)	used to detect suction pipe temperature, and others.
4	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger, and others.
5	R5T	Thermistor (Suction pipe2: Ts2)	Used to the calculation of an internal temperature of compressor etc.
6	R6T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Used to control of subcooling electronic expansion valve.
7	R7T	Thermistor (Liquid pipe: Tl)	Used to detect refrigerant over charge in check operation, and others.

1

3.6 Pipe Connection Diameters

Outdoor units - 3 phase

The table below contains the refrigerant pipe connection diameters.

Model	**∅ Gas pipe (brazing)**	**∅ Liquid pipe (brazing)**
ERX125A7W1B	15.9 mm	9.5 mm
ERX200A7W1B	19.1 mm	
ERX250A7W1B	22.2 mm	

Outdoor units - 1 phase

The table below contains the refrigerant pipe connection diameters.

Model	**∅ Gas pipe**	**∅ Liquid pipe (flare)**
ERX100A8V3B	15.9 mm (flare)	9.5 mm
ERX125A8V3B		
ERX140A8V3B	19.1 mm (brazing)	

4 Switch Box Layout

4.1 What Is in This Chapter?

Introduction

This chapter shows the switch box components.

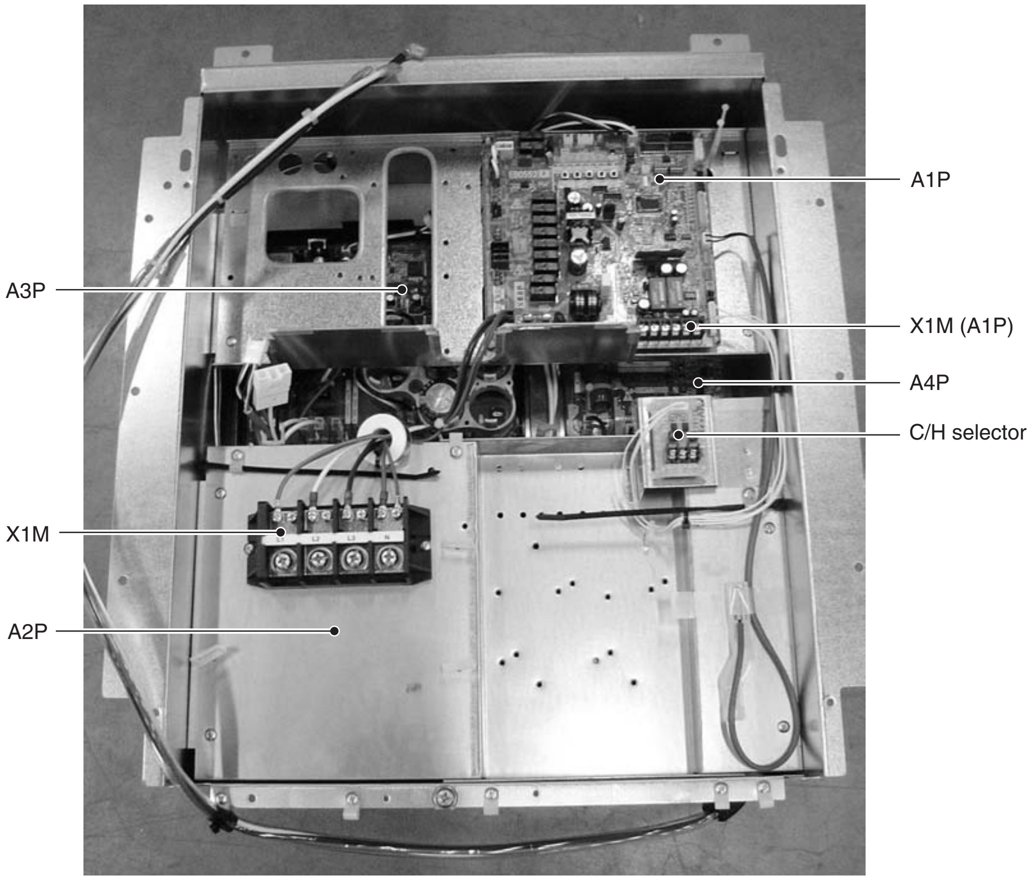
Outdoor units

This chapter contains the following switch box layouts:

1

4.2 Switch Box Layout for ERX125-200A7W1B

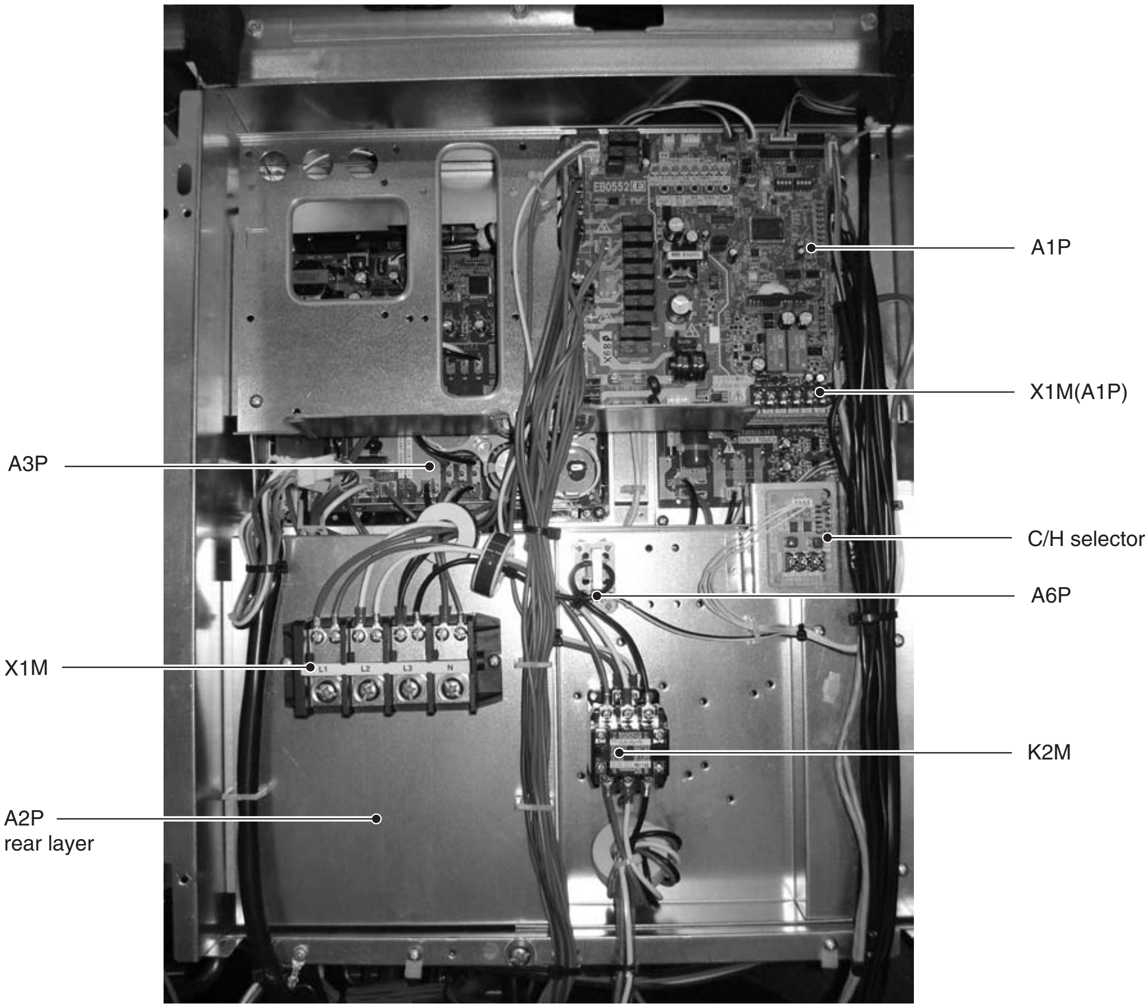
The illustration below shows the switch box layout:



Item	Description
A1P	Printed circuit board (main) - front layer
A2P	Printed circuit board (noise filter) - rear layer
A3P	Printed circuit board (inverter) - rear layer
A4P	Printed circuit board (fan) - rear layer
X1M (A1P)	Terminal strip (control - A1P)
X1M	Terminal strip (power supply)
C/H selector	Not used

4.3 Switch Box Layout for ERX250A7W1B

The illustration below shows the switch box layout:

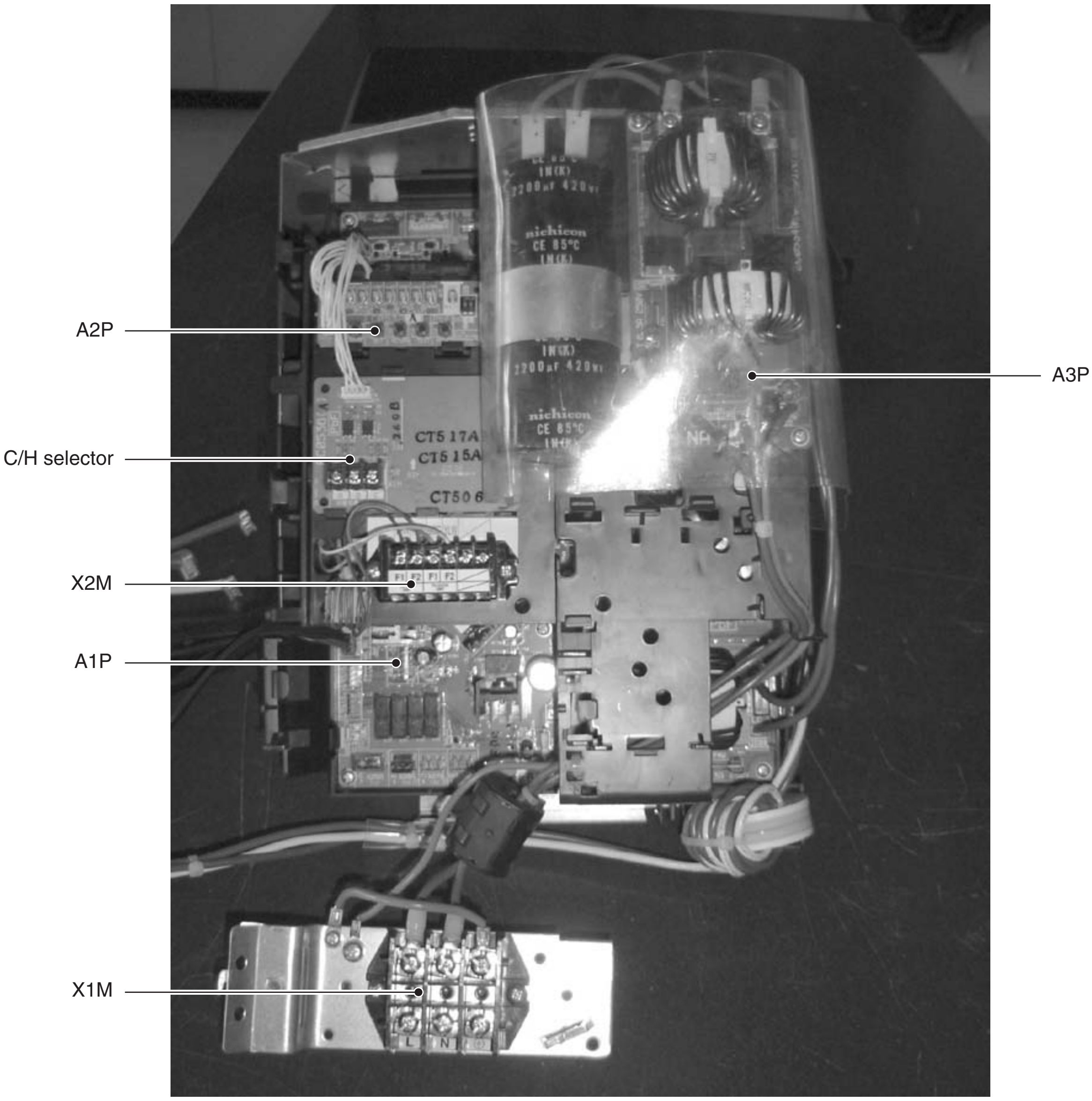


Item	Description
A1P	Printed circuit board (main) - front layer
A2P	Printed circuit board (noise filter) - rear layer
A3P	Printed circuit board (inverter) - rear layer
A4P	Printed circuit board (fan) - rear layer
A6P	Printed circuit board (current sensor) - front layer
K2M	Magnetic contactor
X1M (A1P)	Terminal strip (control - A1P)
X1M	Terminal strip (power supply)
C/H selector	Not used

1

4.4 Switch Box Layout for ERX100~140A8V3B

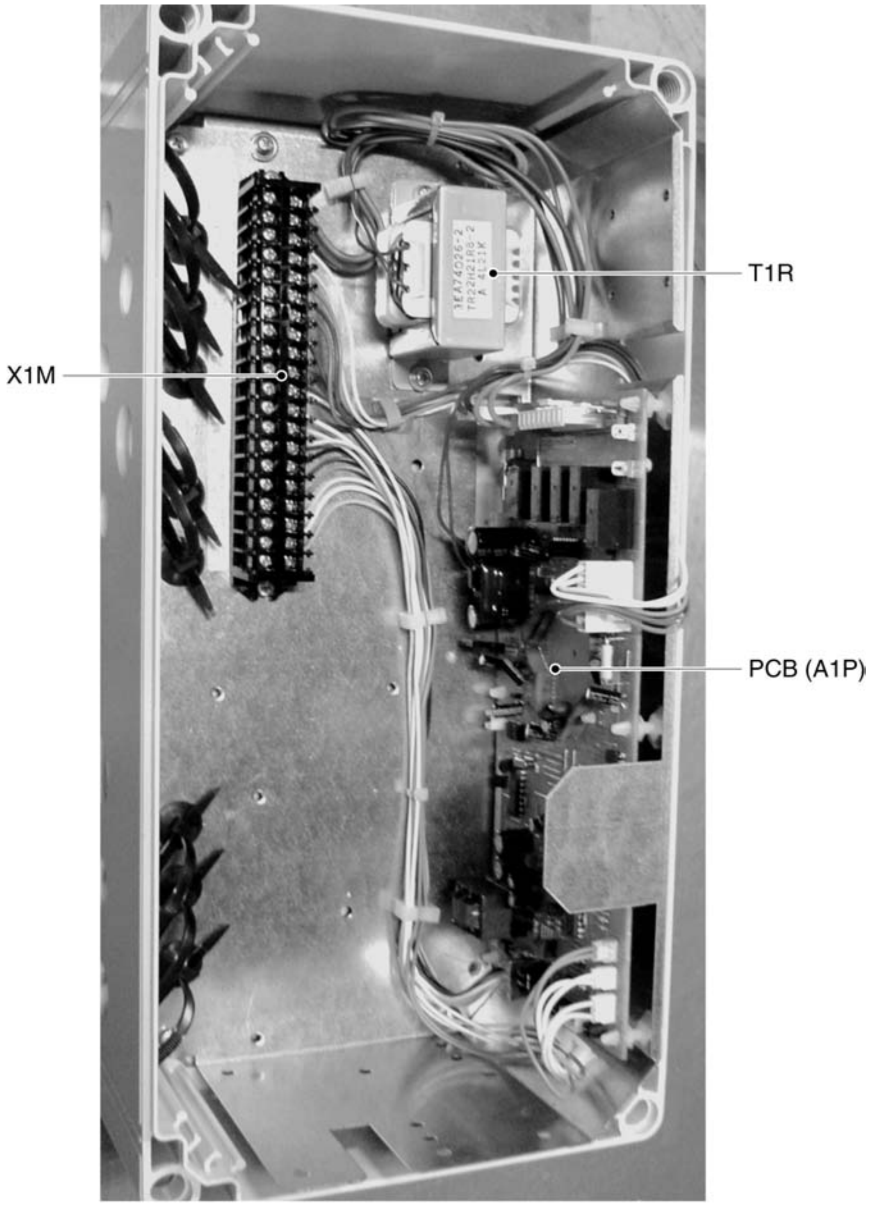
The illustration below shows the switch box layout:



Item	Description
PCB (A1P)	Printed circuit board (main)
PCB (A2P)	Printed circuit board (inverter)
PCB (A3P)	Printed circuit board (noise filter)
CH selector	Not used
X1M	Terminal strip (power supply)
X2M	Terminal strip (control)
C4	Capacitor

4.5 Switch Box Layout for EKEXDCB(A)V3B

The illustration below shows the switch box layout:

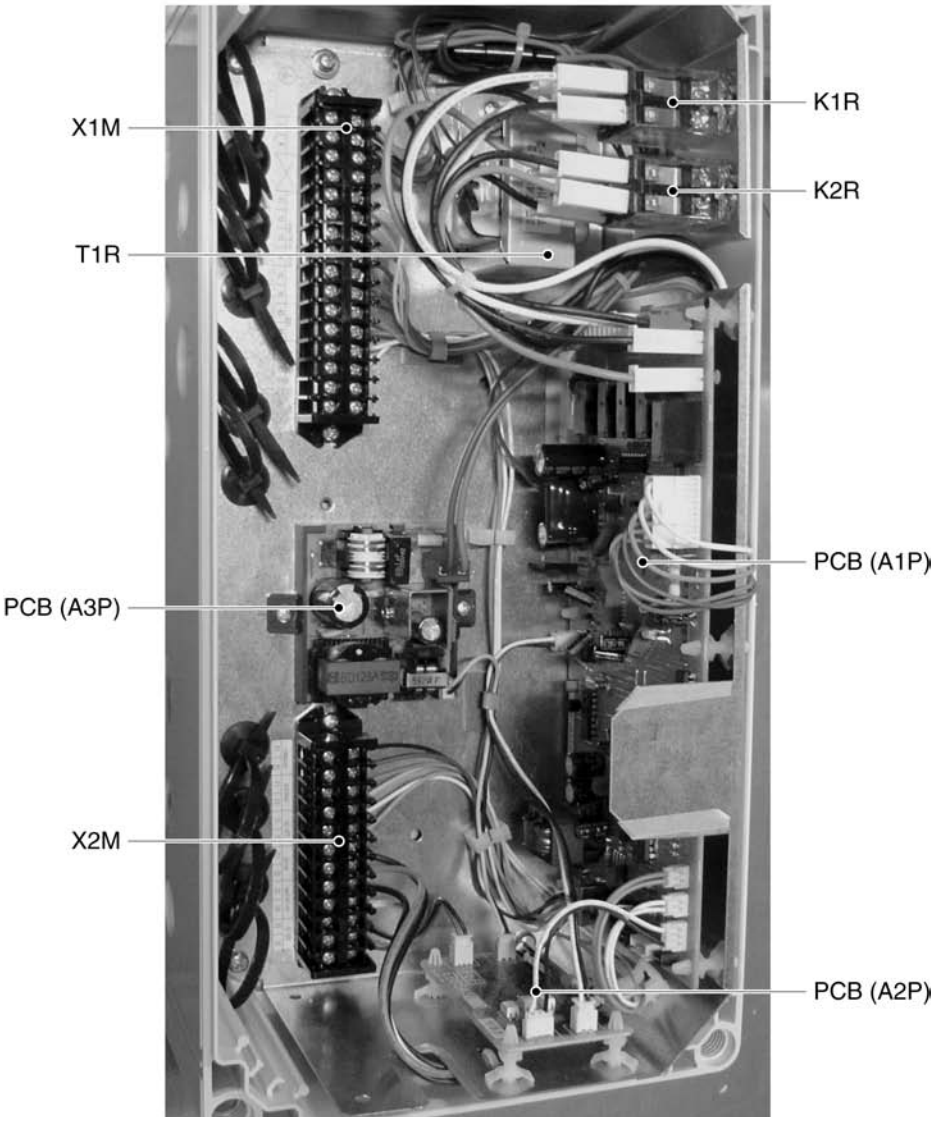


Item	Description
PCB (A1P)	Printed circuit board
T1R	Transformer (220V/21.8V)
X1M	Terminal strip: power supply & interconnection wiring

1

4.6 Switch Box Layout for EKEXFCB(A)V3B

The illustration below shows the switch box layout:



Item	Description
PCB (A1P)	Printed circuit board
PCB (A2P)	Printed circuit board (for voltage conversion)
PCB (A3P)	Printed circuit board (power supply)
K1R	Magnetic relay (operation / compressor on/off)
K2R	Magnetic relay (error status)
T1R	Transformer (220V/21.8V)
X1M	Terminal strip: power supply & electronic expansion valve
X2M	Terminal strip: interconnection wiring

5 Wiring Diagrams: Outdoor Units

5.1 What Is in This Chapter?

Introduction

This chapter contains the wiring diagrams of the outdoor units (3 phase and 1 phase).

Outdoor units:

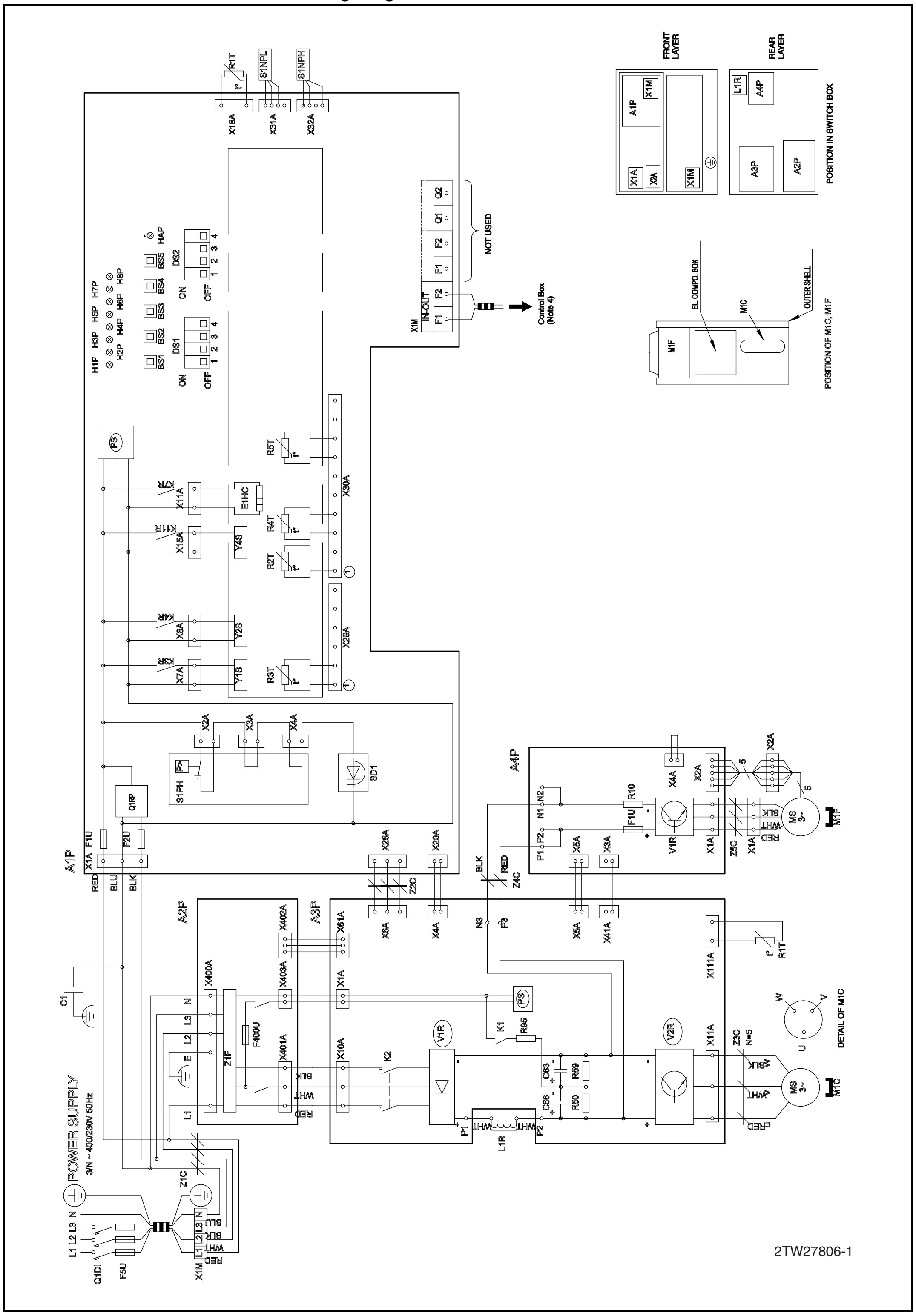
This chapter contains the following wiring diagrams:

1

5.2 Wiring Diagram for ERX125A7W1B

Wiring diagram

The illustration below shows the wiring diagram of the unit.



A1P	Printed circuit board (Main)
A2P	Printed circuit board (Noise filter)
A3P	Printed circuit board (Inv)
A4P	Printed circuit board (Fan)
BS1~BS5	Push button switch (Mode, set, return, test, reset)
C1	Capacitor
C63, C66	Capacitor
DS1, DS2	Dip switch
E1HC	Crankcase heater
F1U	Fuse (8A, 250V) (A4P)
F1U, F2U	Fuse (T, 3.15A, 250V) (A1P)
F400U	Fuse (T, 6.3A, 250V) (A2P)
H1P~H8P	Pilot lamp (serv. monitor-orange) (H2P): prepare test ....flickering (H2P): Malfunction detection ....light up
HAP	Pilot lamp (Service monitor green) (A1P)
K1	Magnetic relay
K2	Magnetic contactor (M1C)
K3R	Magnetic relay (Y1S)
K4R	Magnetic relay (Y2S)
K7R	Magnetic relay (E1HC)
K11R	Magnetic relay (Y4S)
L1R	Reactor
M1C	Motor (Compressor)
M1F	Motor (Fan)

PS	Switching power supply (A1P, A3P)
Q1RP	Phase reversal detect circuit
R10	Resistor (curreent sensor) (A4P)
R50, R59	Resistor
R95	Resistor (Current limiting)
R1T	Thermistor (Air) (A1P)
R1T	Thermistor (Fin) (A3P)
R2T	Thermistor (Suction)
R3T	Thermistor (M1C discharge)
R4T	Thermistor (Heat exc. deicer))
R5T	Thermistor (Liq. pipe)
S1NPH	Pressure sensor (High)
S1NPL	Pressure sensor (Low)
S1PH	Pressure switch (High)
SD1	Safety devices input
V1R	Power module (A4P)
V1R, V2R	Power module (A3P)
X1A, X2A	Connector (M1F)
X1M	Terminal strip (Power supply)
X1M	Terminal strip (Control) (A1P)
X1M	Terminal strip (ABC I/p) (A5P)
Y1S	Solenoid valve (Hot gas)
Y2S	Solenoid valve (Oil return)
Y4S	Solenoid valve (Injection)
Z1C~Z5C	Noise filter (Ferrite core)
Z1F	Noise filter (With surge absorber)

Notes

1 This wiring diagram only applies to the outdoor unit

2 Field wiring — Indication of parts outside switchbox

3 Terminal strip — Terminal

Connector — Protective earth (screw)

4 Refer to the installation manual for connection of the F1-F2 transmission wiring and how to use BS1~BS5 and DS1, DS2 switch.

5 Do not operate the unit by short-circuiting protection device S1PH.

6 Colors: BLK = black, BLU= blue, BRN = brown, GRN = green, RED = red, WHT = white, YLW = yellow, ORG = orange, PNK = pink, GRY = grey

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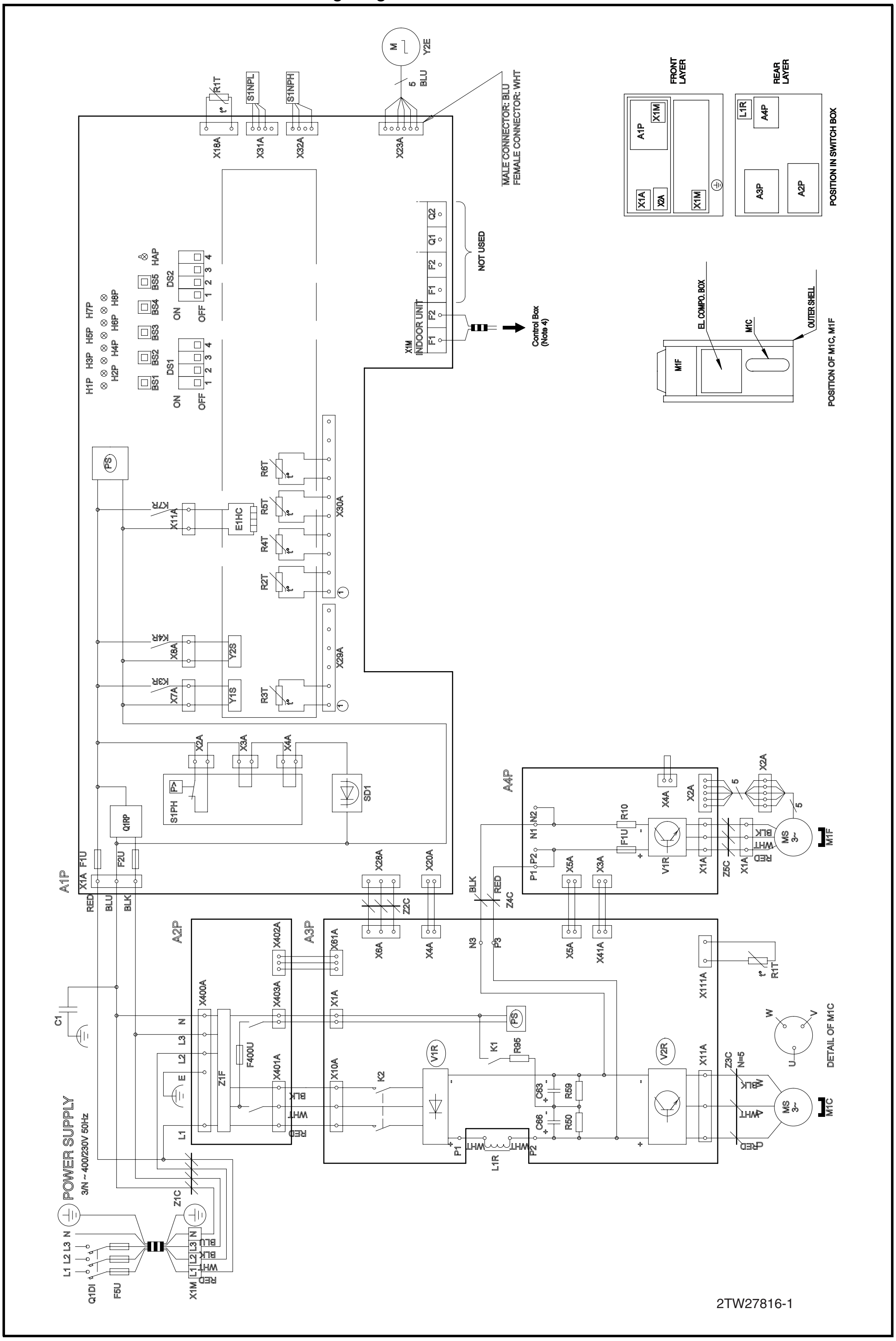
5.3 Wiring Diagram for ERX200A7W1B

Wiring diagram The illustration below shows the wiring diagram of the unit.



A1P	Printed circuit board (Main)	PS	Switching power supply (A1P, A3P)
A2P	Printed circuit board (Noise filter)	Q1RP	Phase reversal detect circuit
A3P	Printed circuit board (Inv)	R10	Resistor (current sensor) (A4P)
A4P	Printed circuit board (Fan)	R50, R59	Resistor
BS1~BS5	Push button switch (Mode, set, return, test, reset)	R95	Resistor (Current limiting)
		R1T	Thermistor (Air) (A1P) - X18A
C1	Capacitor	R1T	Thermistor (Fin) (A3P) - X111A
C63, C66	Capacitor	R2T	Thermistor (Suction)
DS1, DS2	Dip switch	R3T	Thermistor (M1C discharge)
E1HC	Crankcase heater	R4T	Thermistor (Heat exc. deicer)
FSU	Field fuse	R5T	Thermistor (Heat exc. subcool outlet)
F1U	Fuse (8A, 250V) (A4P)	R6T	Thermistor (Liq. pipe)
F1U, F2U	Fuse (T, 3.15A, 250V) (A1P)	S1NPH	Pressure sensor (High)
F400U	Fuse (T, 6.3A, 250V) (A2P)	S1NPL	Pressure sensor (Low)
H1P~H8P	Pilot lamp (serv. monitor-orange)	S1PH	Pressure switch (High)
	(H2P): prepare test ....flickering	SD1	Safety devices input
	(H2P): Malfunction detection ....light up	V1R	Power module (A4P)
HAP	Pilot lamp (Service monitor green)	V1R, V2R	Power module (A3P)
		X1A, X2A	Connector (M1F)
K1	Magnetic relay	X1M	Terminal strip (Power supply)
K2	Magnetic contactor (M1C)	X1M	Terminal strip (Control) (A1P)
K3R	Magnetic relay (Y1S)	Y2E	Electronic expansion valve (Subcool)
K4R	Magnetic relay (Y2S)	Y1S	Solenoid valve (Hot gas)
K7R	Magnetic relay (E1HC)	Y2S	Solenoid valve (Oil return)
L1R	Reactor	Z1C~Z5C	Noise filter (Ferrite core)
M1C	Motor (Compressor)	Z1F	Noise filter (With surge absorber)
M1F	Motor (Fan)		

Notes

1. This wiring diagram only applies to the outdoor unit
2. Field wiring — Indication of parts outside switchbox
3. Terminal strip — Terminal

   Connector — Protective earth (screw)
4. Refer to the installation manual for connection of the F1-F2 transmission wiring and how to use BS1~BS5 and DS1, DS2 switch.
5. Do not operate the unit by short-circuiting protection device S1PH.
6. Colors: BLK = black, BLU = blue, BRN = brown, GRN = green, RED = red, WHT = white, YLW = yellow, ORG = orange, PNK = pink, GRY = grey

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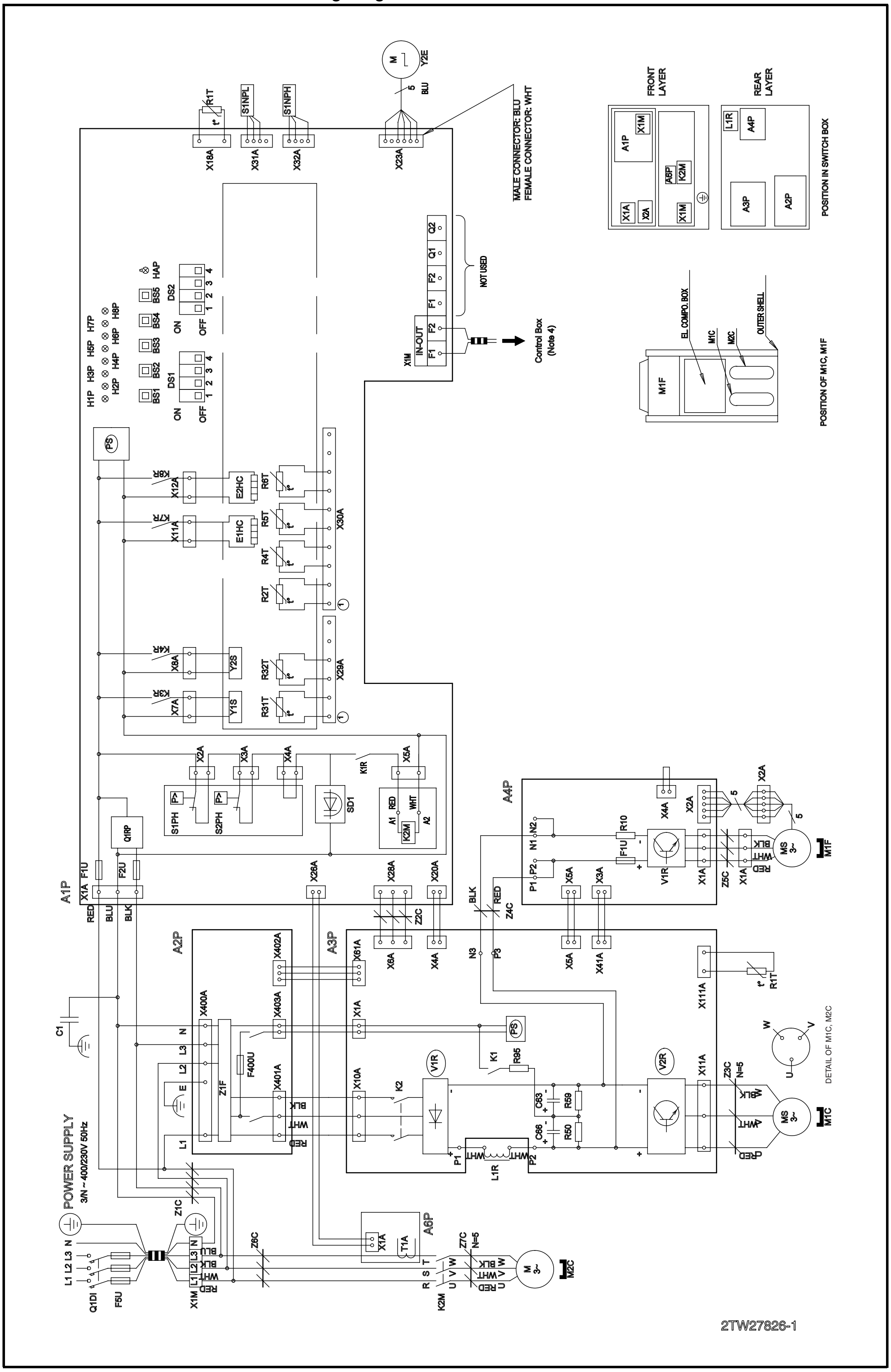
5.4 Wiring Diagram for ERX250A7W1B

Wiring diagram

The illustration below shows the wiring diagram of the unit.



A1P	Printed circuit board (Main)	M1F	Motor (Fan)
A2P	Printed circuit board (Noise filter)	PS	Switching power supply (A1P, A3P)
A3P	Printed circuit board (Inv)	Q1RP	Phase reversal detect circuit
A4P	Printed circuit board (Fan)	R10	Resistor (current sensor) (A4P, A5P)
A6P	Printed circuit board (Current sensor)	R50, R59	Resistor
BS1~BS5	Push button switch (Mode, set, return, test, reset)	R95	Resistor (Current limiting)
		R1T	Thermistor (Air) (A1P) - X18A
C1	Capacitor	R1T	Thermistor (Fin) (A3P) - X111A
C63, C66	Capacitor	R2T	Thermistor (Suction)
DS1, DS2	Dip switch	R31T, R32T	Thermistor (M1C, M2C discharge)
E1HC, E2HC	Crankcase heater	R4T	Thermistor (Heat exc. deicer)
FSU	Field fuse	R5T	Thermistor (Heat exc. subcool outlet)
F1U	Fuse (8A, 250V) (A4P)	R6T	Thermistor (Liq. pipe)
F1U, F2U	Fuse (T, 3.15A, 250V) (A1P)	S1NPH	Pressure sensor (High)
F400U	Fuse (T, 6.3A, 250V) (A2P)	S1NPL	Pressure sensor (Low)
H1P~H8P	Pilot lamp (serv. monitor-orange)	S1PH, S2PH	Pressure switch (High)
	(H2P): prepare test ....flickering	T1A	Current sensor (A6P)
	(H2P): Malfunction detection ....light up	SD1	Safety devices input
HAP	Pilot lamp (Service monitor green)	V1R	Power module (A4P)
		V1R, V2R	Power module (A3P)
K1	Magnetic relay	X1A, X2A	Connector (M1F)
K2	Magnetic contactor (M1C)	X1M	Terminal strip (Power supply)
K2M	Magnetic contactor (M2C)	X1M	Terminal strip (Control) (A1P)
K1R	Magnetic relay (K2M)	Y2E	Electronic expansion valve (Subcool)
K3R	Magnetic relay (Y1S)	Y1S	Solenoid valve (Hot gas)
K4R	Magnetic relay (Y2S)	Y2S	Solenoid valve (Oil return)
K7R	Magnetic relay (E1HC)	Z1C~Z7C	Noise filter (Ferrite core)
K8R	Magnetic relay (E2HC)	Z1F	Noise filter (With surge absorber)
L1R	Reactor		
M1C, M2C	Motor (Compressor)		

Notes

1 This wiring diagram only applies to the outdoor unit

2 Field wiring — Indication of parts outside switchbox

3 Terminal strip — Terminal

Connector — Protective earth (screw)

4 Refer to the installation manual for connection of the F1-F2 transmission wiring and how to use BS1~BS5 and DS1, DS2 switch.

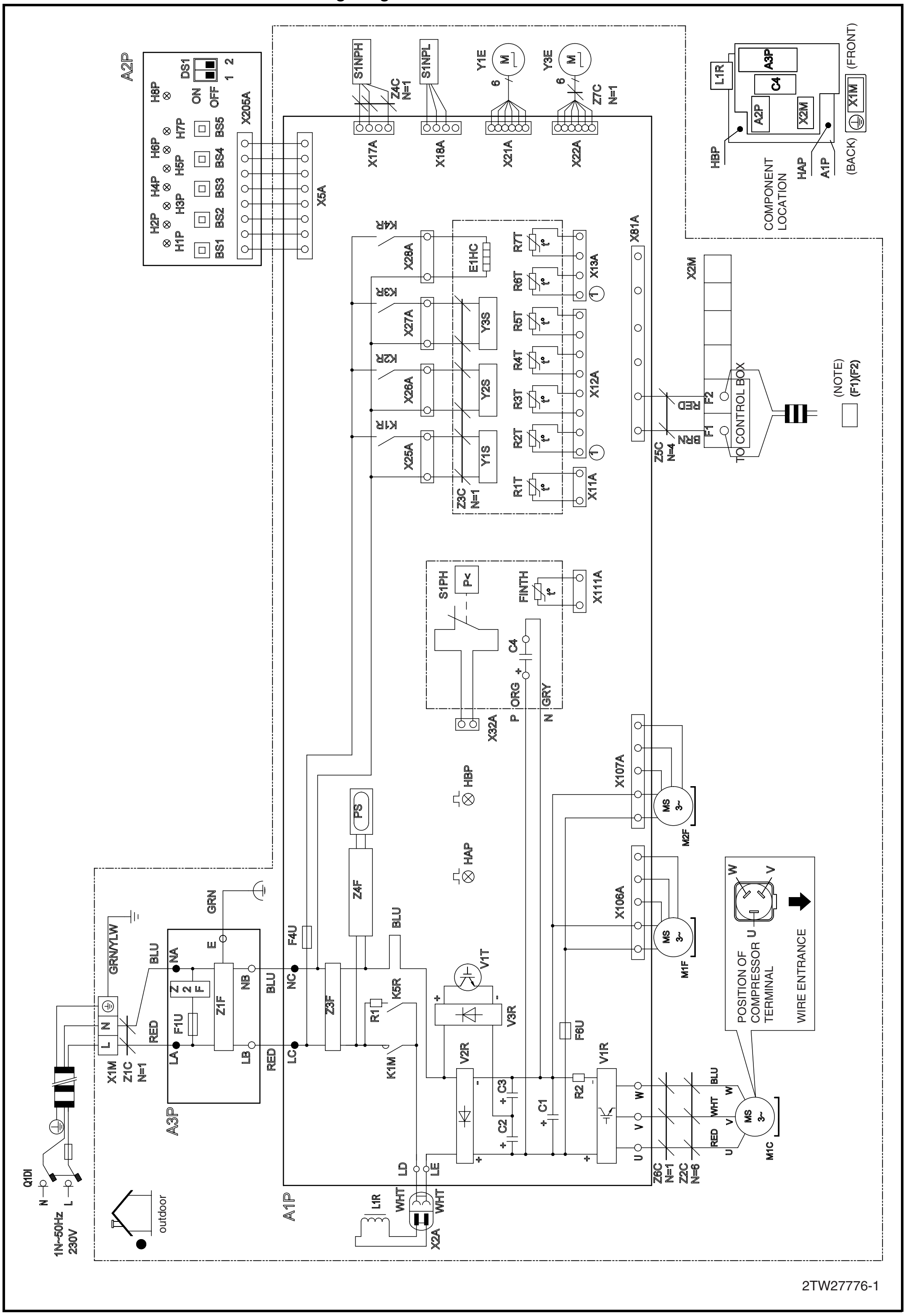
5 Do not operate the unit by short-circuiting protection device S1PH.

6 Colors: BLK = black, BLU= blue, BRN = brown, GRN = green, RED = red, WHT = white, YLW = yellow, ORG = orange, PNK =pink, GRY = grey

5.5 Wiring Diagram for ERX100~140A8V3B

Wiring diagram

The illustration below shows the wiring diagram of the unit.



A1P	Printed circuit board (Main)	M2F	Motor (Fan) (lower)
A2P	Printed circuit board (INV.)	PS	Power supply (switching)
A3P	Printed circuit board (Noise filter)	R1	Resistor
BS1~BS5	Push button switch (Mode, set, return, test, reset)	R2	Resistor
		R1T	Thermistor (Air)
C1~C4	Capacitor	R2T	Thermistor (M1C discharge)
DS1	Dip switch	R3T	Thermistor (Suction1)
E1HC	Crankcase heater	R4T	Thermistor (Coil)
FINTH	Thermistor (fin)	R5T	Thermistor (Suction 2)
F1U, F4U	Fuse (T 6.3A/250V)	R6T	Thermistor (Subcool)
F6U	Fuse (T 5.0A/250V)	R7T	Thermistor (Liquid pipe)
H1P~H8P	Pilot lamp (serv. monitor-orange)	S1NPH	Pressure sensor (High)
	(H2P): prepare test ....flickering	S1NPL	Pressure sensor (Low)
	(H2P): Malfunction detection ....light up	S1PH	Pressure switch (High)
HAP	Light emitting diode (Service monitor green) (A1P)	V1R	Power module
		V2R, V3R	Diode module
HBP	INV pilot lamp (Service monitor green) (A1P)	V1T	IGBT
		X1M	Terminal strip (Power supply)
K1M	Magnetic contactor (M1C)	X1M	Terminal strip (C/H selector X4AP)
K1R	Magnetic relay (Y1S)	X2M	Terminal strip (Control)
K2R	Magnetic relay (Y2S)	Y1E	Electronic expansion valve (Main)
K3R	Magnetic relay (Y3S)	Y3E	Electronic expansion valve (Subcool)
K4R	Magnetic relay (E1HC)	Y1S	Solenoid valve (4 way valve)
K5R	Magnetic relay	Y2S	Solenoid valve (Hot gas)
L1R	Reactor	Y3S	Solenoid valve (U/L circuit)
M1C	Motor (Compressor)	Z1C~Z7C	Noise filter (Ferrity core)
M1F	Motor (Fan) (upper)	Z1F~Z4F	Noise filter

Notes

1 This wiring diagram only applies to the outdoor unit

2 L: live, N: neutral

Field wiring

3 Terminal strip

Relay connector

Connector

Noiseless earth

Connection

Terminal

Protective earth (screw)

4 Refer to the manual on how to use BS1~BS5 and DS1, DS2 swith.

5 Do not operate the unit by short-circuiting protection device S1PH.

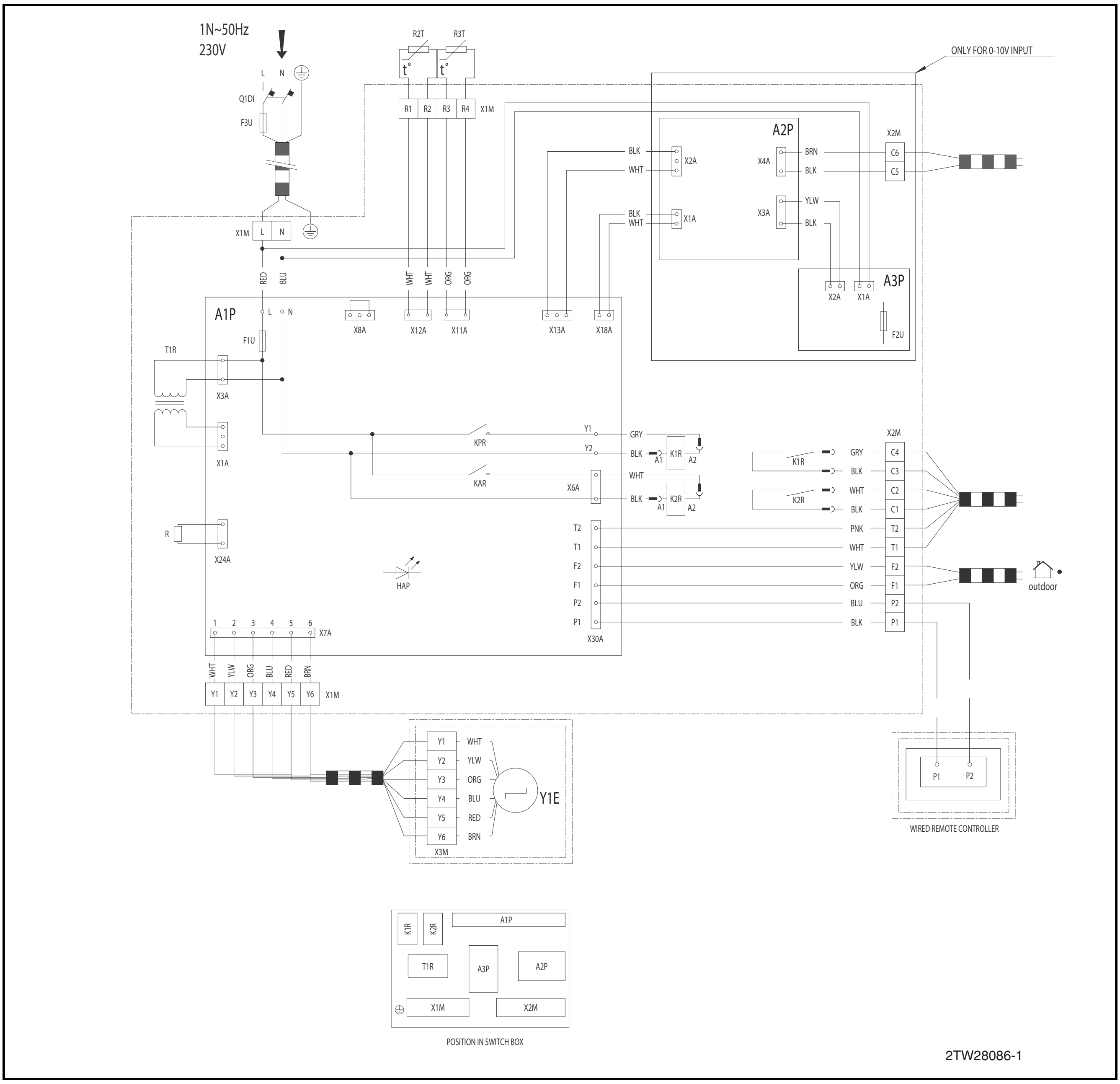
6 Colors: BLU= blue, BRN = brown, GRN = green, RED = red, WHT = white, YLW = yellow, ORG = orange

7 Refer to the installation manual for connection wiring to control bow.

1

5.6 Wiring Diagram for EKEXFCB(A)V3B

Wiring diagram The illustration below shows the wiring diagram of the unit.



A1P	Printed circuit board	X1M	Terminal block
F1U	Fuse (250V, F5A) (A1P)	X3M	Terminal block
F3U	Field fuse	Y1E	Electronic expansion valve
HAP	Light emitting diode (Service monitor green)	X1M-R1/R2	Thermistor (Liquid)
		X1M-R3/R4	Thermistor (Gas)
Q1DI	Earth leakage breaker	X1M-R5/R6	Thermistor (Air)
R1T	Thermistor (Air)	X1M-Y1~Y6	Expansion valve
R2T	Thermistor (Liquid)	X2M-P1/P2	Communication remote controller
R3T	Thermistor (Gas)	X2M-T1/T2	Input: ON/OFF
T1R	Transformer (220V/21.8V)	X2M-F1/F2	Communication outdoor

Notes

1. Use copper conductors only.
2. BLK = black, BLU = blue, BRN = brown, GRN = green, RED = red, WHT = white, YLW = yellow, ORG = orange, GRY = grey, PINK = pink, N = neutral, L = live

Connector

Separate component

Connector

Optional Accesory

Wire lamp

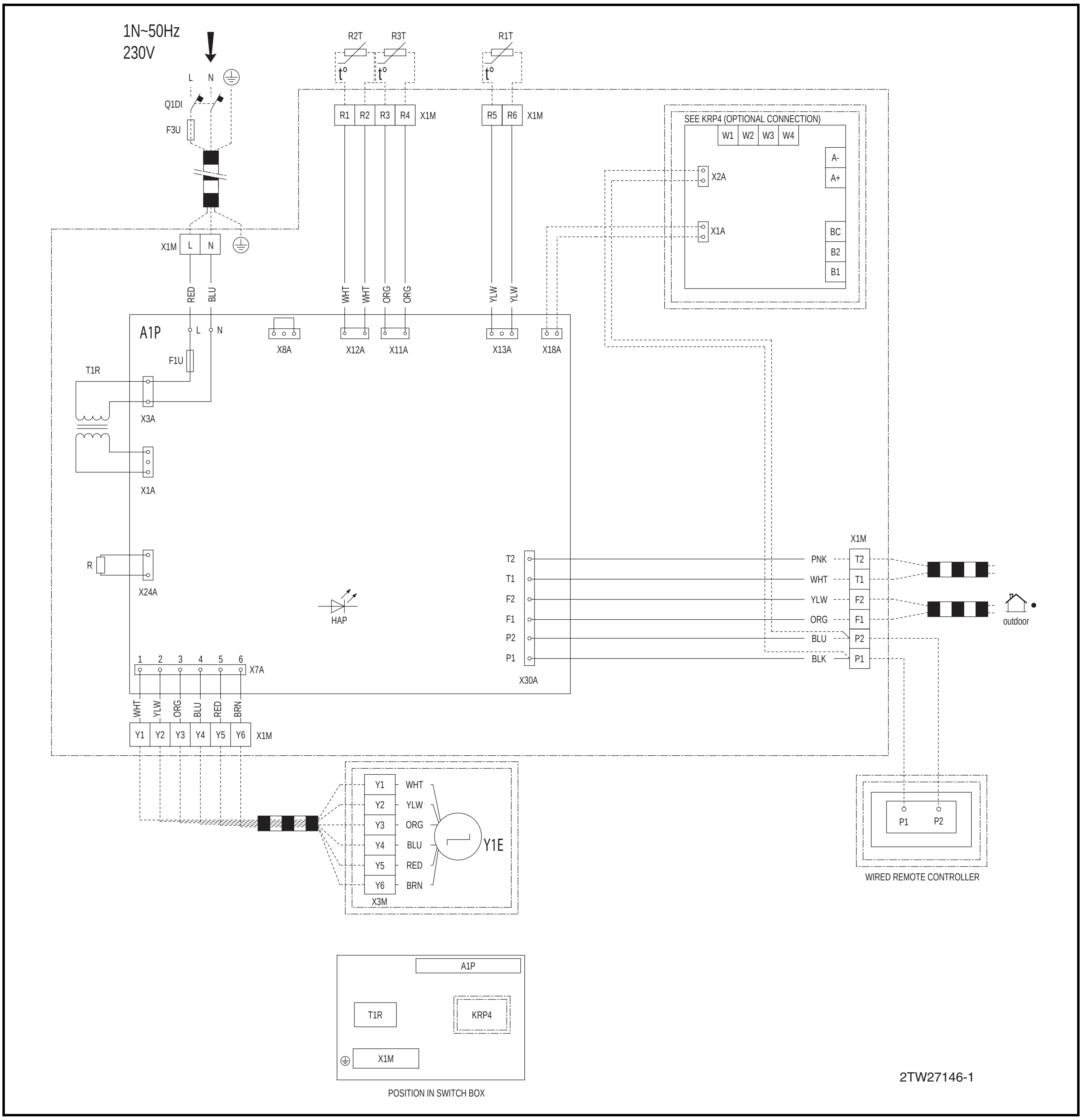
Field wiring

Protective earth (screw)

1

5.7 Wiring Diagram for EKEXDCB(A)V3B and EKEXMCBV3B

Wiring diagram The illustration below shows the wiring diagram of the unit.



A1P	Printed circuit board	T1R	Transformer (220V/21.8V)
A2P	Printed circuit board (for voltage conversion)	X1M	Terminal block
A3P	Printed circuit board (Power supply)	X2M	Terminal block
F1U	Fuse (250V, F5A) (A1P)	X3M	Terminal block
F2U	Fuse (250V, T1A) (A3P)	Y1E	Electronic expansion valve
F3U	Field fuse	X1M-R1/R2	Thermistor (Liquid)
HAP	Light emitting diode (Service monitor green)	X1M-R3/R4	Thermistor (Gas)
K1R	Magnetic relay (Operation/Compressor ON/OFF)	X1M-Y1~Y6	Expansion valve
		X2M-P1/P2	Communication remote controller
K2R	Magnetic relay (Error status)	X2M-C1/C2	Output: Error status
KAR, KPR	Magnetic relay	X2M-C3/C4	Output: Operation/Compressor ON/OFF
Q1DI	Earth leakage breaker	X2M-T1/T2	Input: ON/OFF
R2T	Thermistor (Liquid)	X2M-F1/F2	Communication outdoor
R3T	Thermistor (Gas)	X2M-C5/C6	Input: 0-10V DC Capacity control

Notes

1 Use copper conductors only.

2 BLK = black, BLU = blue, BRN = brown, GRN = green, RED = red, WHT = white, YLW = yellow, ORG = orange, GRY = grey, PINK = pink, N = neutral, L = live

Connector

Separate component

Connector

Optional Accesory

Wire lamp

Field wiring

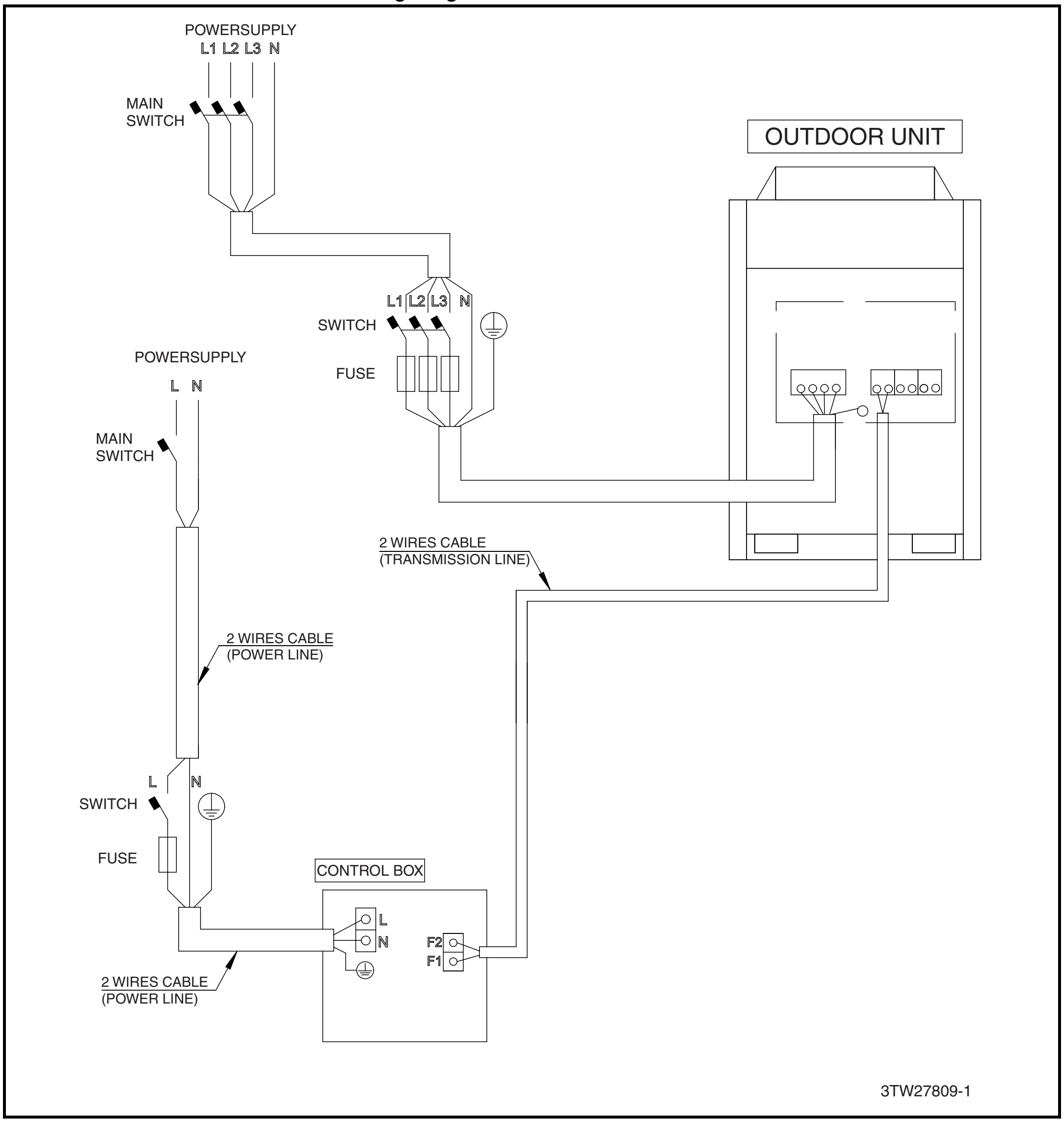
Protective earth (screw)

1

5.8 Field Wiring for ERX125~250A7W1B

Field wiring

The illustration below shows the wiring diagram of the unit.



Notes

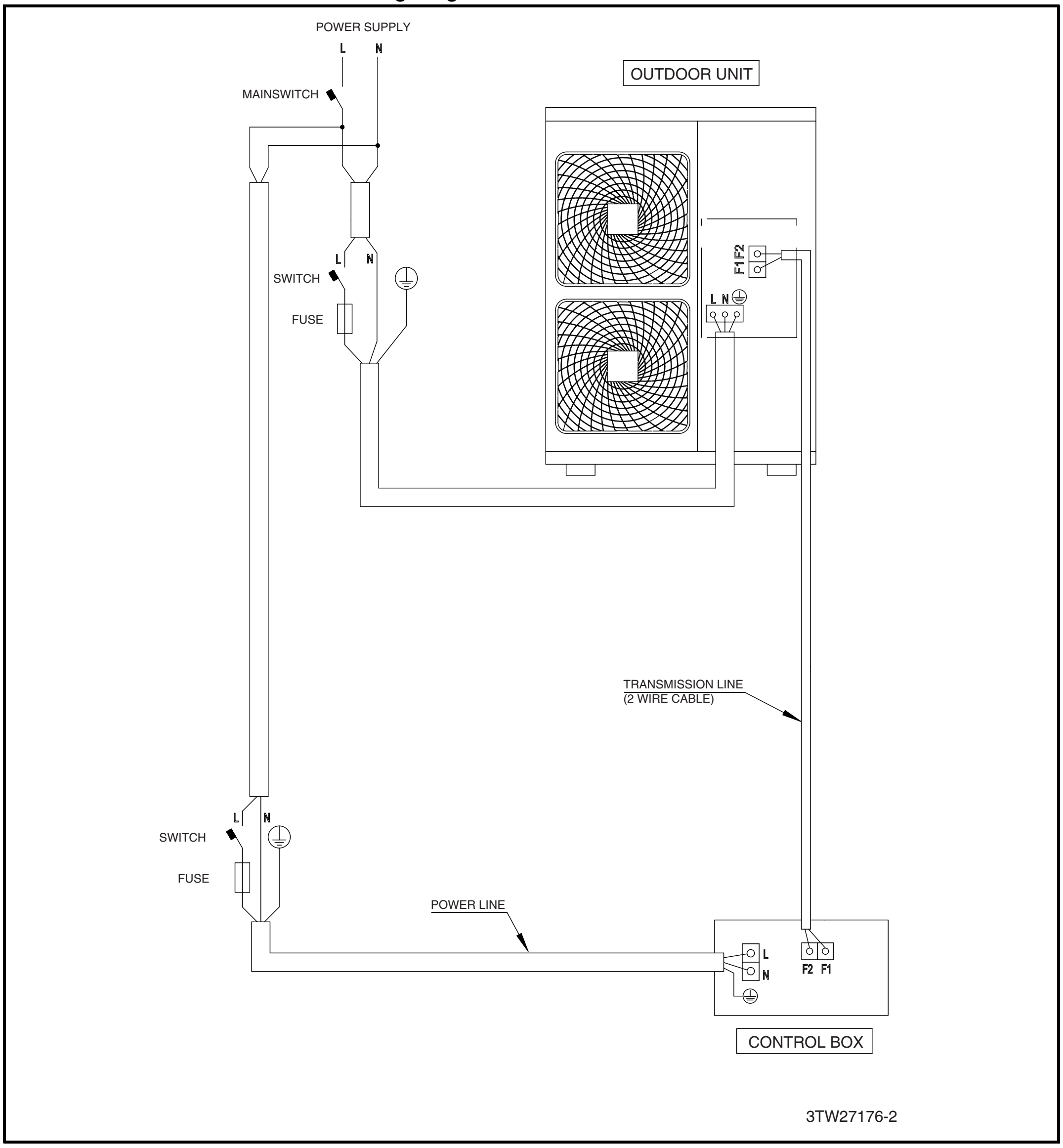
1. All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. As for details, see wiring diagram.
4. Install circuit breaker for safety.
5. All field wiring and components must be provided by licensed electrician.
6. Unit shall be grounded in compliance with the applicable local and national codes.
7. Wiring shown general points-of -connection guides only and are not intended for or to include all details for a specific installation.
8. Be sure to install the switch and the fuse to the power line of each equipment.
9. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10. If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally.
11. For detailed control box side connection, see control box manual and wiring diagram.

1

5.9 Field Wiring for ERX100~140A8V3B

Field wiring

The illustration below shows the wiring diagram of the unit.



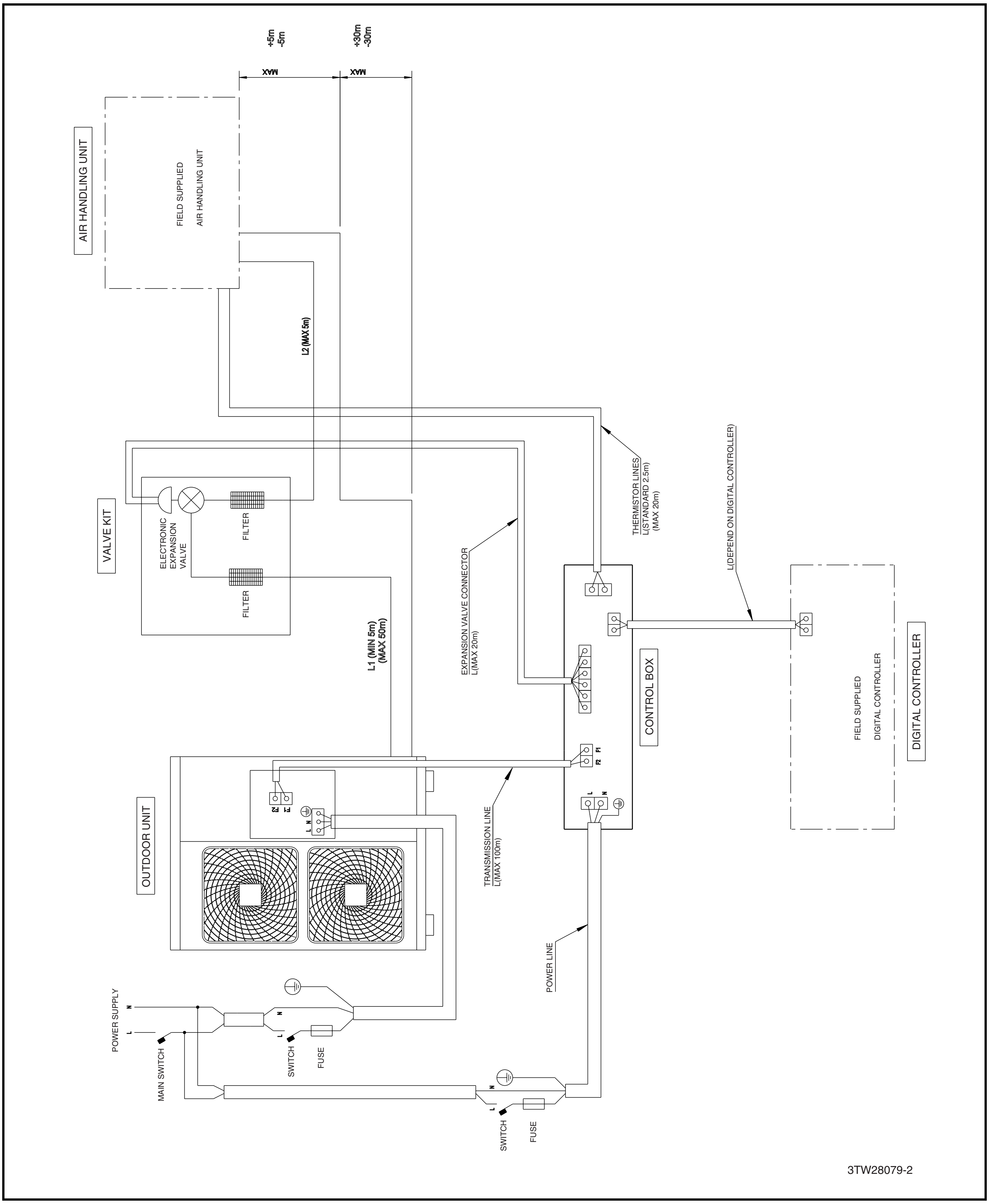
Notes

1. All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. As for details, see wiring diagram.
4. Install circuit breaker for safety.
5. All field wiring and components must be provided by licensed electrician.
6. Unit shall be grounded in compliance with the applicable local and national codes.
7. Wiring shown general points-of -connection guides only and are not intended for or to include all details for a specific installation.
8. Be sure to install the switch and the fuse to the power line of each equipment.
9. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10. For detailed control box side connection, see control box manual and wiring diagram.

1

5.10 Field Wiring for EKEXFCB(A)V3B

Field wiring The illustration below shows the wiring diagram of the unit.



Notes

1. All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. For details, see wiring diagram.
4. Install a circuit breaker for safety.
5. All field wiring and components must be provided by a licensed electrician.
6. Unit shall be grounded in compliance with the applicable local and national codes.
7. Wiring shown are general points-of -connection guides only and are not intended for or to include all details for a specific installation.
8. Be sure to install the switch and the fuse to the power line of each equipment.
9. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10. For detailed control box side connection, see control box manual and wiring diagram.
11. For detailed pipe connections and limitations, see manuals.

Symbols

Wiring

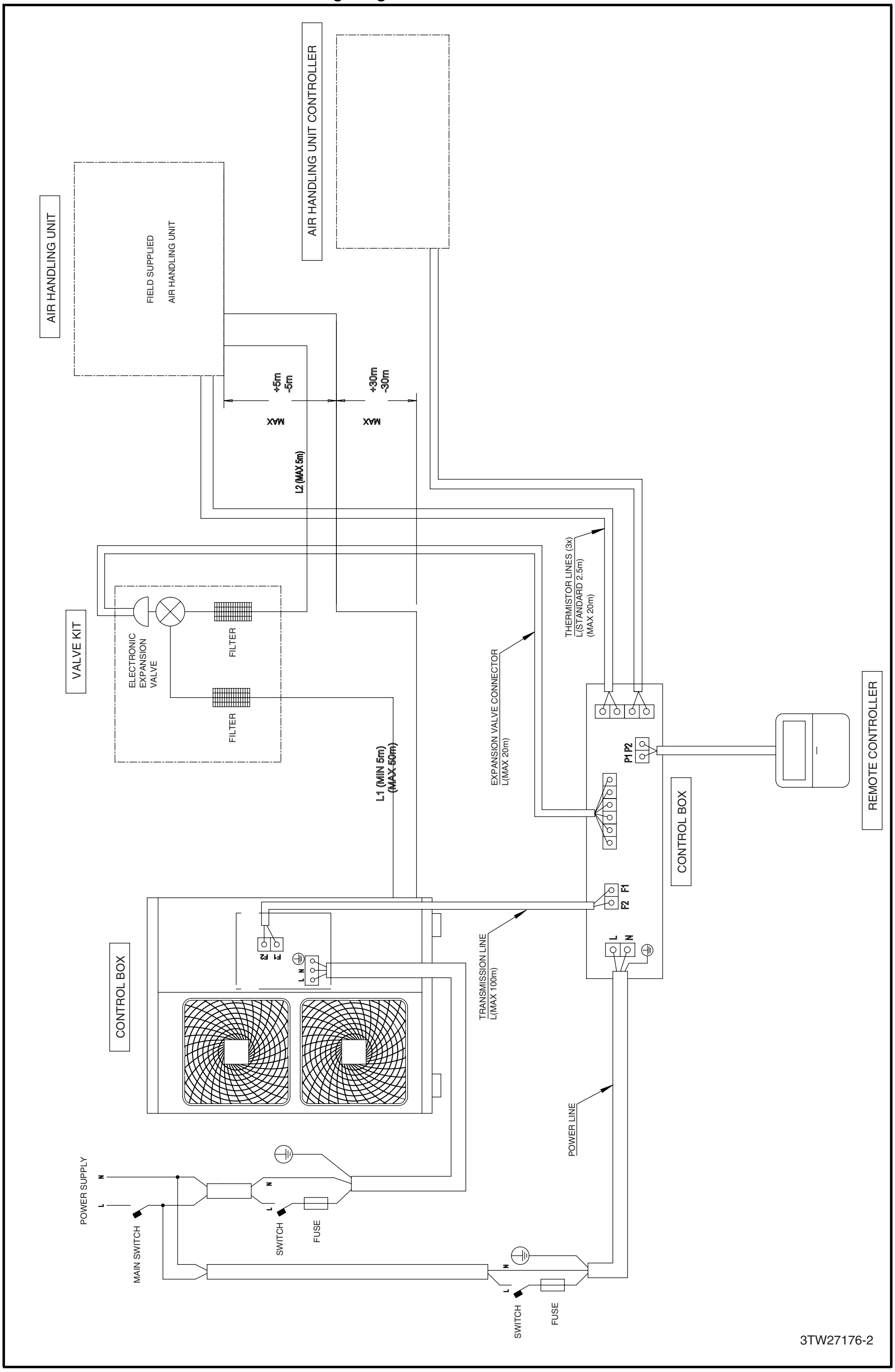
Refrigerant piping

1

5.11 Field Wiring for EKEXDCB(A)V3B

Field wiring

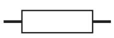
The illustration below shows the wiring diagram of the unit.



Notes

1. All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. For details, see wiring diagram.
4. Install a circuit breaker for safety.
5. All field wiring and components must be provided by a licensed electrician.
6. Unit shall be grounded in compliance with the applicable local and national codes.
7. Wiring shown are general points-of -connection guides only and are not intended for or to include all details for a specific installation.
8. Be sure to install the switch and the fuse to the power line of each equipment.
9. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10. For detailed control box side connection, see control box manual and wiring diagram.
11. For detailed pipe connections and limitations, see manuals.

Symbols

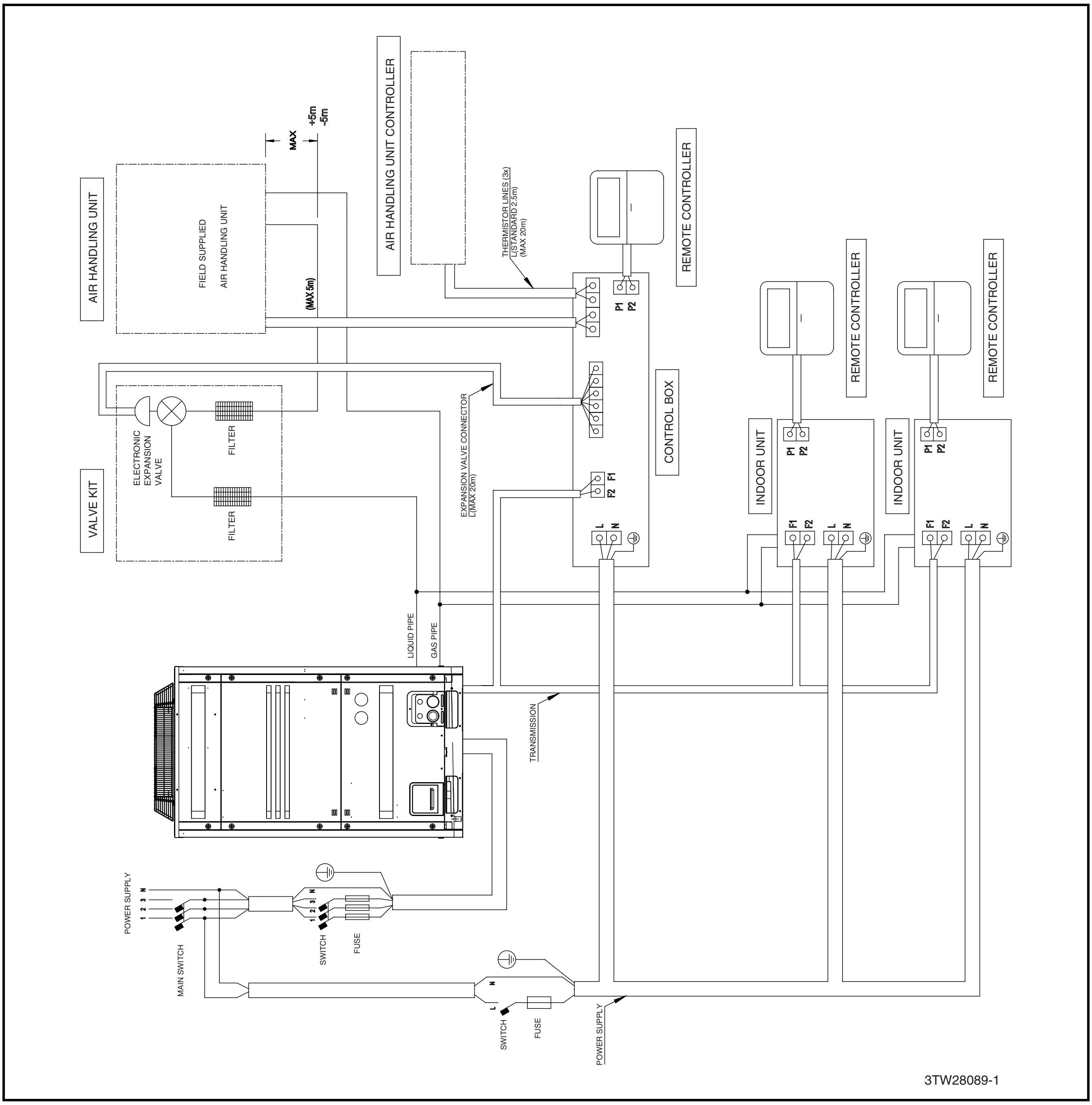
 Wiring

Refrigerant piping

1

5.12 Field Wiring for EKEXMCBV3B

Field wiring The illustration below shows the wiring diagram of the unit.



Notes

1. All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. For details, see wiring diagram.
4. Install a circuit breaker for safety.
5. All field wiring and components must be provided by a licensed electrician.
6. Unit shall be grounded in compliance with the applicable local and national codes.
7. Wiring shown are general points-of -connection guides only and are not intended for or to include all details for a specific installation.
8. Be sure to install the switch and the fuse to the power line of each equipment.
9. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10. For detailed control box side connection, see control box manual and wiring diagram.
11. For detailed pipe connections and limitations, see manuals.
12. Connection appliance can be standard indoor unit or free choice of air handling unit.

Symbols

Wiring

Refrigerant piping

6 PCB Layout

6.1 What Is in This Chapter?

Introduction

This chapter contains the following information:

- ➤ It describes which unit uses which PCB types
- ➤ It shows the PCB connectors.

Outdoor units

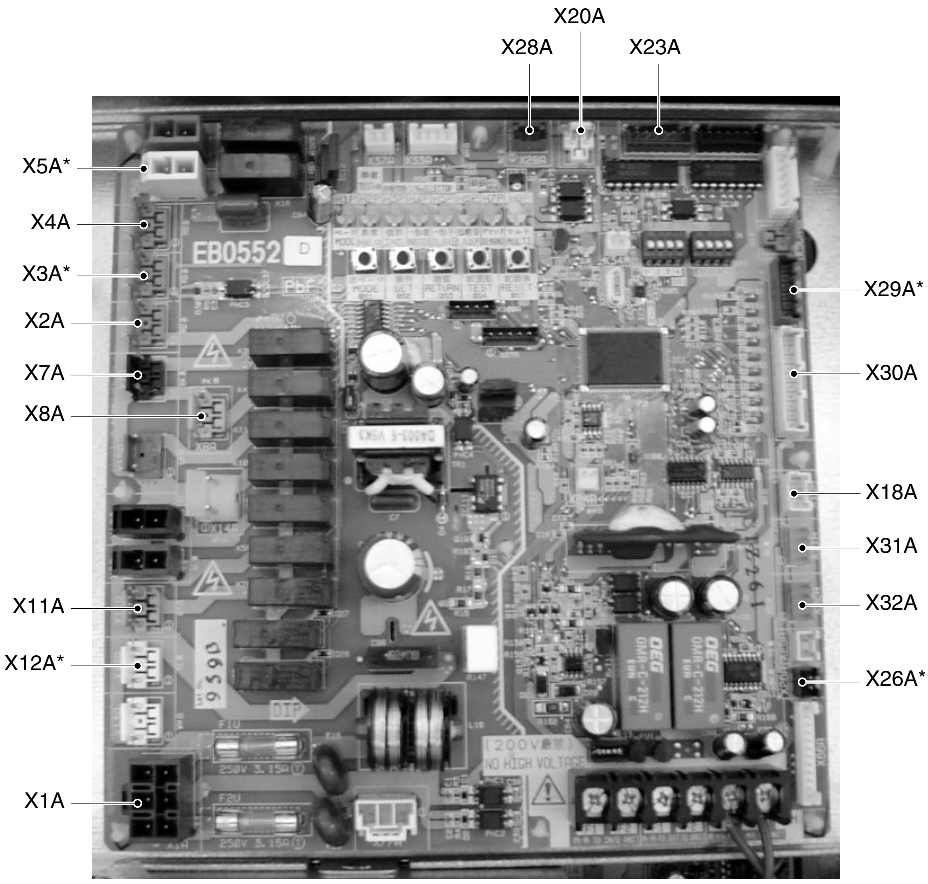
This chapter contains the following PCB layouts:

1

6.2 PCB Layout for ERX125~250A7W1B

Main PCB (A1P)

The illustration below shows the PCB connectors.



Connectors

The table below describes the PCB connectors.

Connector	Connected to	Description
X1A	X1M	Terminal strip (power supply)
X2A	S1PH	High pressure sensor switch (for INV compressor)
X3A	bridge	
X4A	bridge	
X7A	Y1S	Solenoid valve (hot gas)
X8A	Y2S	Solenoid valve (oil return)
X11A	E1HC	Crankcase heater
X18A	R1T	Air thermistor
X20A	X4A (A3P)	Electronic exp. valve
X23A	Y2E	HPS signal
X29A	X6A (A3P)	M1C discharge thermistor
X30A	R2T	Suction thermistor
	R4T	Heat exch. driver thermistor
	R5T	Heat exch. outlet thermistor
	R6T	Liquid pipe thermistor
X31A	S1NPL	Pressure sensor low
X32A	S1NPH	Pressure sensor high

Extra connectors only for ERX250A7W1B

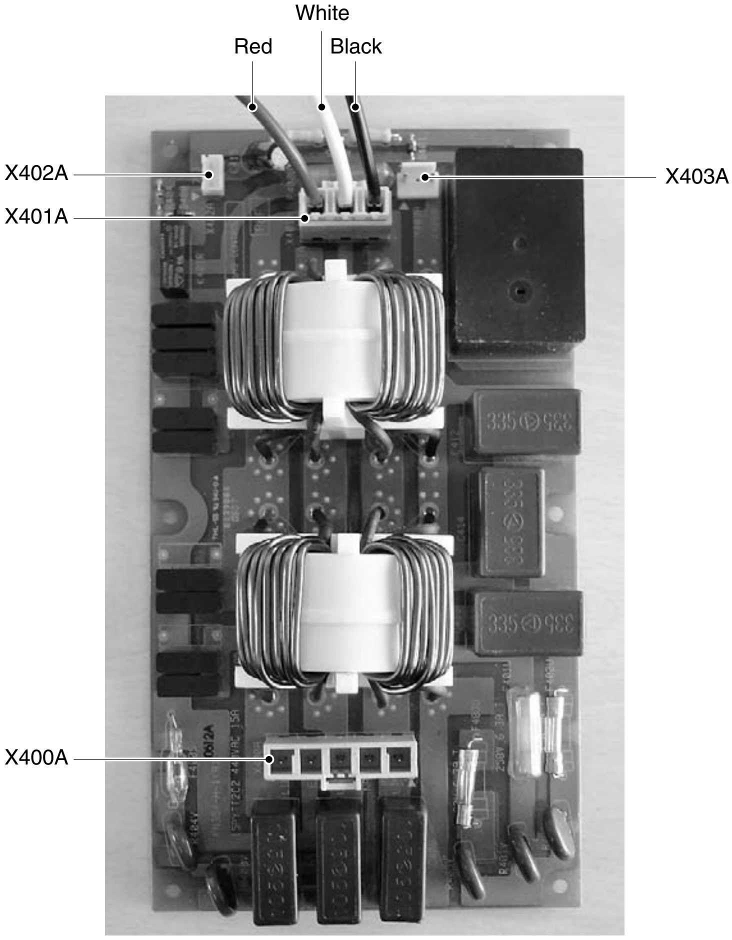
The table below describes the extra PCB connectors for ERX250A7W1B.

Connector	Connected to	Description
X3A*	S2PH	Pressure switch high
X5A*	K2M	Magnetic contactor (M2C)
X12A*	E2HC	Crankcase heater
X26A*	X1A (A6P)	Current sensor
X29A*	R32T	M2C discharge thermistor

1

Noise filter PCB (A2P)

The illustration below shows the PCB connectors.



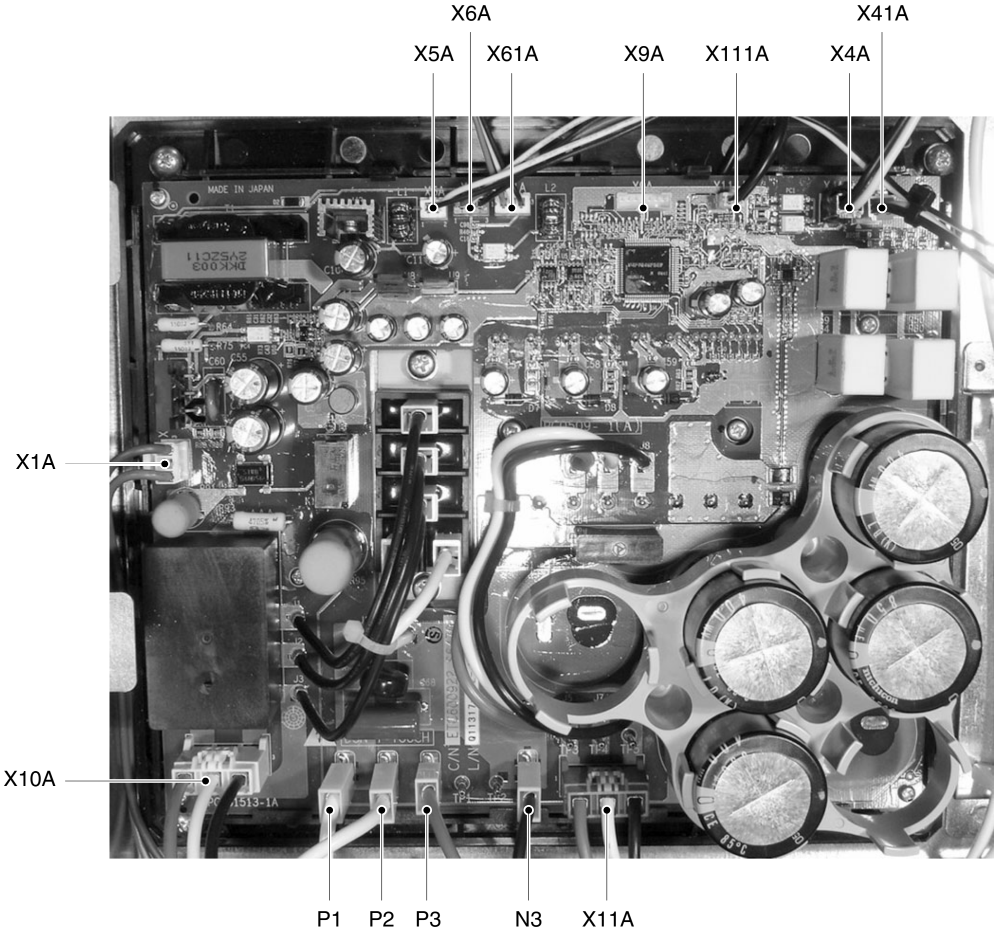
Connectors

The table below describes the PCB connectors.

Connector	Connected to	Description
X400A	X1M	Power supply (terminal strip)
X401A	X10A	Power supply
X402A	X61A	+15V output
X403A	X1A	Inverter control power input

Inverter PCB (A3P)

The illustration below shows the PCB connectors.



Connectors

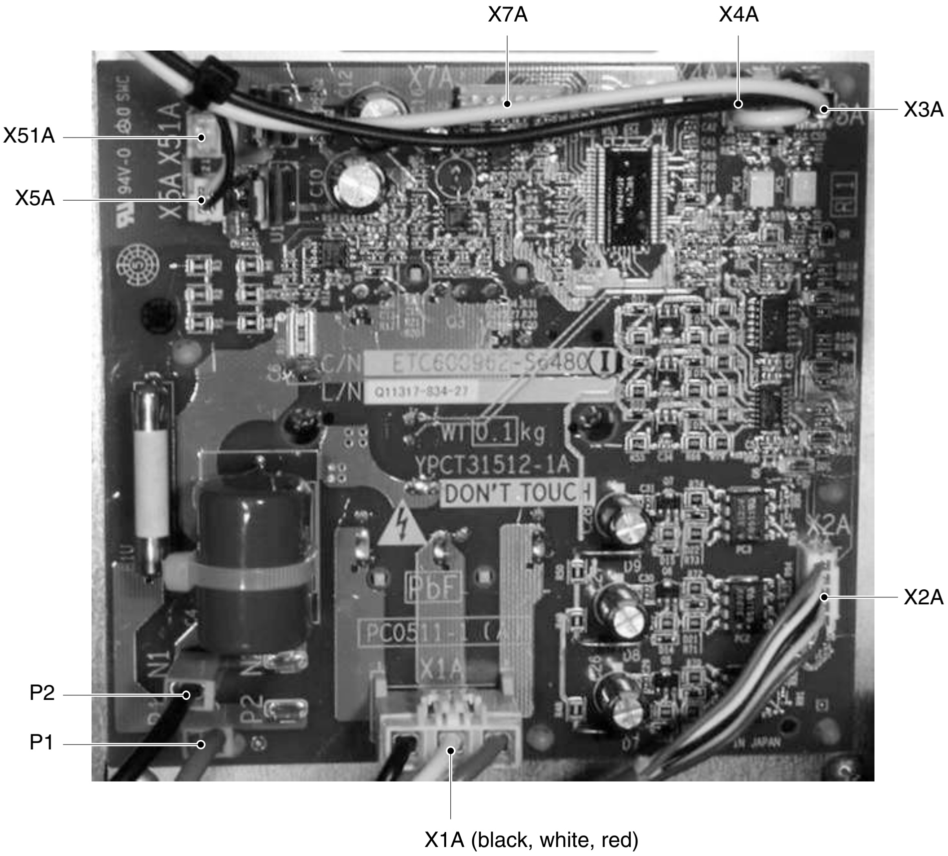
The table below describes the PCB connectors.

Connector	Connected to	Description
X1A	X403A (A2P)	Inverter control power input
X4A	X20A (A1P)	ACS communication
X5A	X5A (A4P)	Fan power
X6A	X28A (A1P)	HPS signal
X9A	Not used	
X10A	X401A (A2P)	Power supply
X11A	UVW	Compressor
X41A	X3A (A4P)	ACS communication
X61A	X402A (A2P)	+15V output
X111A	R1T	Fin thermistor
P1	L1R (white)	Reactor
P2	L1R (white)	Reactor
P3	Z4C (A3P) (red)	Fan driver
N3	Z4C (A3P) (black)	Fan driver

1

Fan PCB (A4P)

The illustration below shows the PCB connectors.



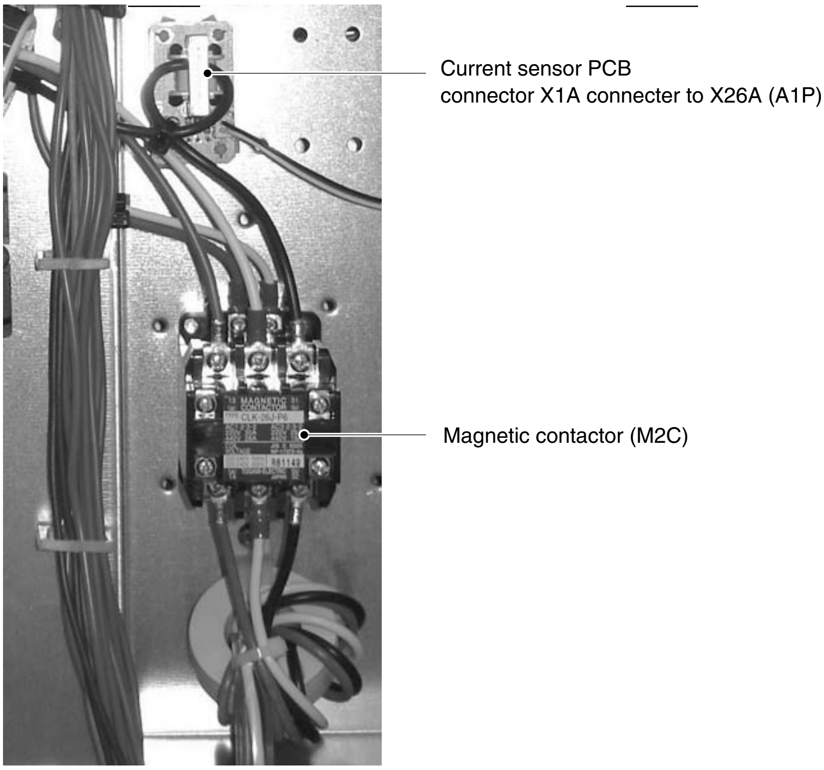
Connectors

The table below describes the PCB connectors.

Connector	Connected to	Description
X1A	X1A	Fan motor
X2A	X2A	Fan motor
X3A	X41A (A3P)	ACS communication
X4A	bridge	
X5A	X5A (A3P)	Fan power
X7A	Not used	
X51A	Not used	
P1	P3 (A3P)	Fan driver
N1	N3 (A3P)	Fan driver

Current sensor PCB (A6P) + magnetic contactor (only for ERX250A7W1B)

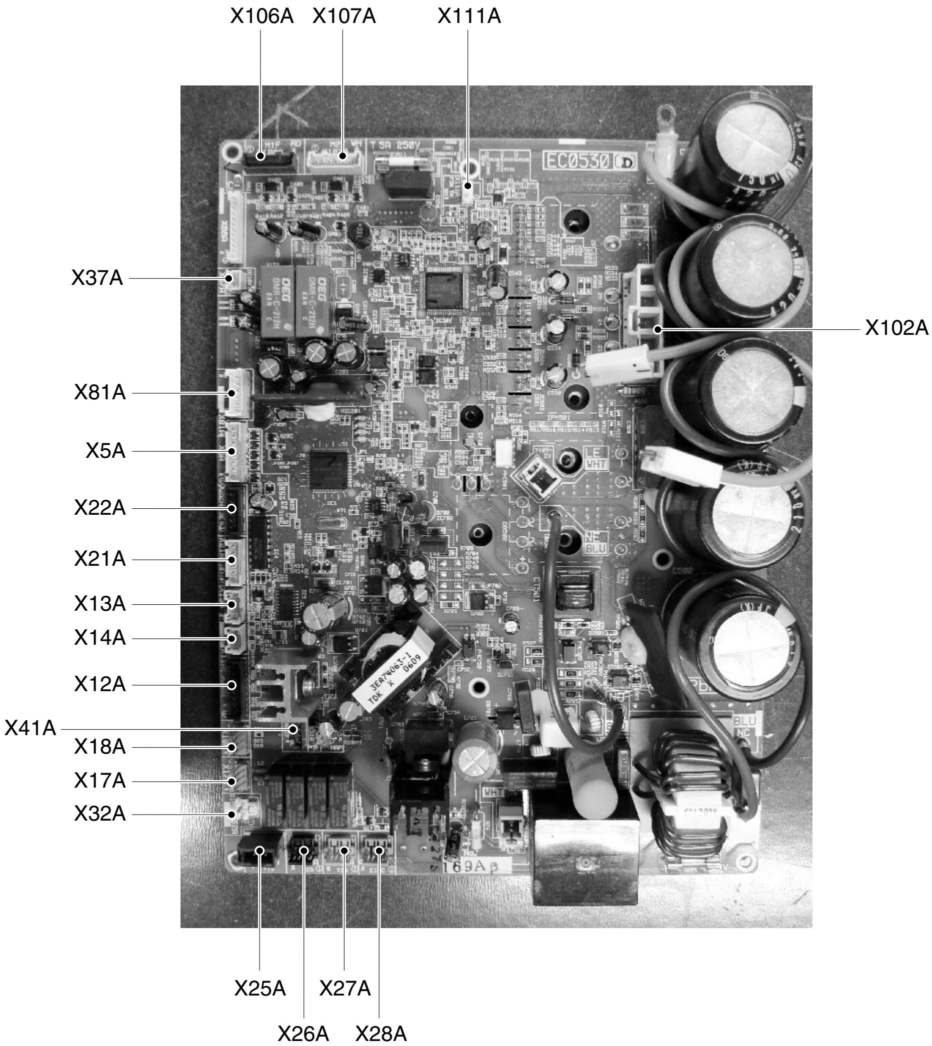
The illustration below shows the PCB connectors for ERX250A7W1B.



1

6.3 PCB Layout for ERX100~140A8V3B

Control PCB



Connectors

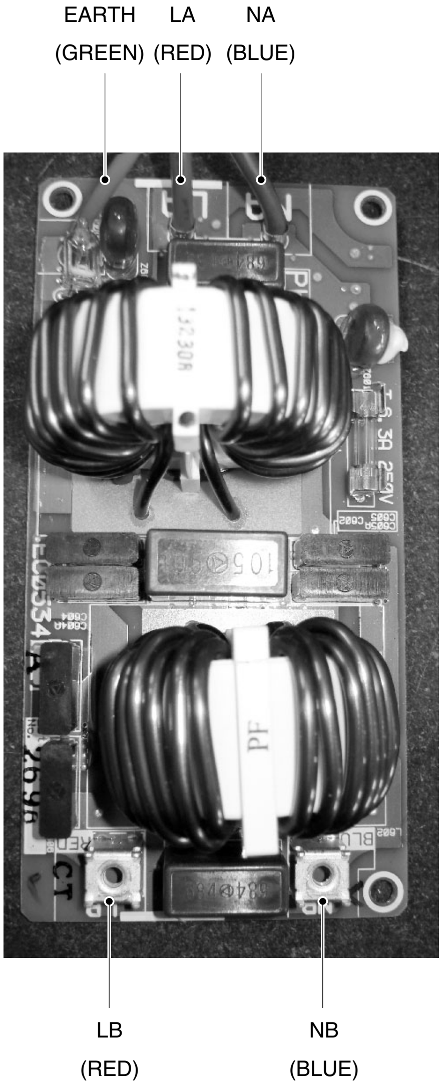
The table below describes the PCB connectors.

Connector	Connected to	Description
X5A	X205A	Service PCB
X11A	R1T	Thermistor air
X12A	R2T	Thermistor (discharge)
	R3T	Thermistor (suction 1)
	R4T	Thermistor (heat exchanger)
	R5T	Thermistor (suction 2)
X13A	R6T	Thermistor (subcooling heat exchanger)
	R7T	Thermistor (liquid pipe)
X17A	S1NPH	Pressure sensor high
X18A	S1NPL	Pressure sensor low
X21A	Y1E	Electronic expansion valve (main)
X22A	Y3E	Electronic expansion valve (subcool)
X25A	Y1S	Solenoid valve (4-way valve)
X26A	Y2S	Solenoid valve (hot gas)
X27A	Y3S	Solenoid valve (U/L circuit)
X28A	E1HC	Crankcase heater
X32A	S1PH	Pressure switch high
X41A	–	Connection for rom-monitor
X81A	X2M	Terminal strip (control)
UVW	M1C	Motor (compressor)
X106A	M1F	Motor fan (upper)
X107A	M2F	Motor fan (lower)
X111A	FINTH	Thermistor (fin)

1

Noise filter PCB

The illustration below shows the PCB connectors.



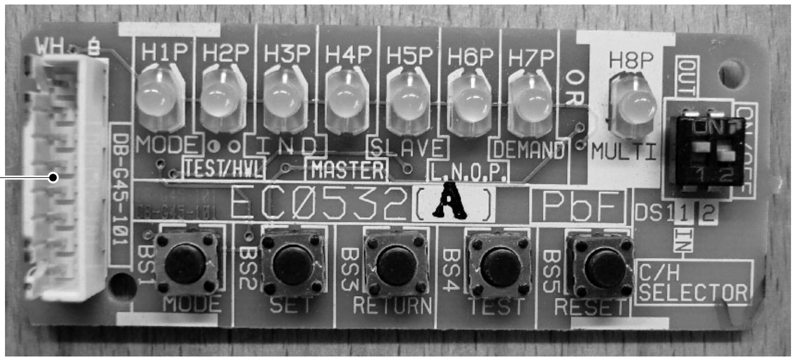
Connectors

The table below describes the PCB connectors.

Connector	Connected to	Description
NA/LA	Power supply	1N - 50Hz 230V
LB/NB	A1P LC/NC	Main PCB
GRN	Earth	1N - 50Hz 230 V

Service PCB

The illustration below shows the PCB connectors.



Connectors

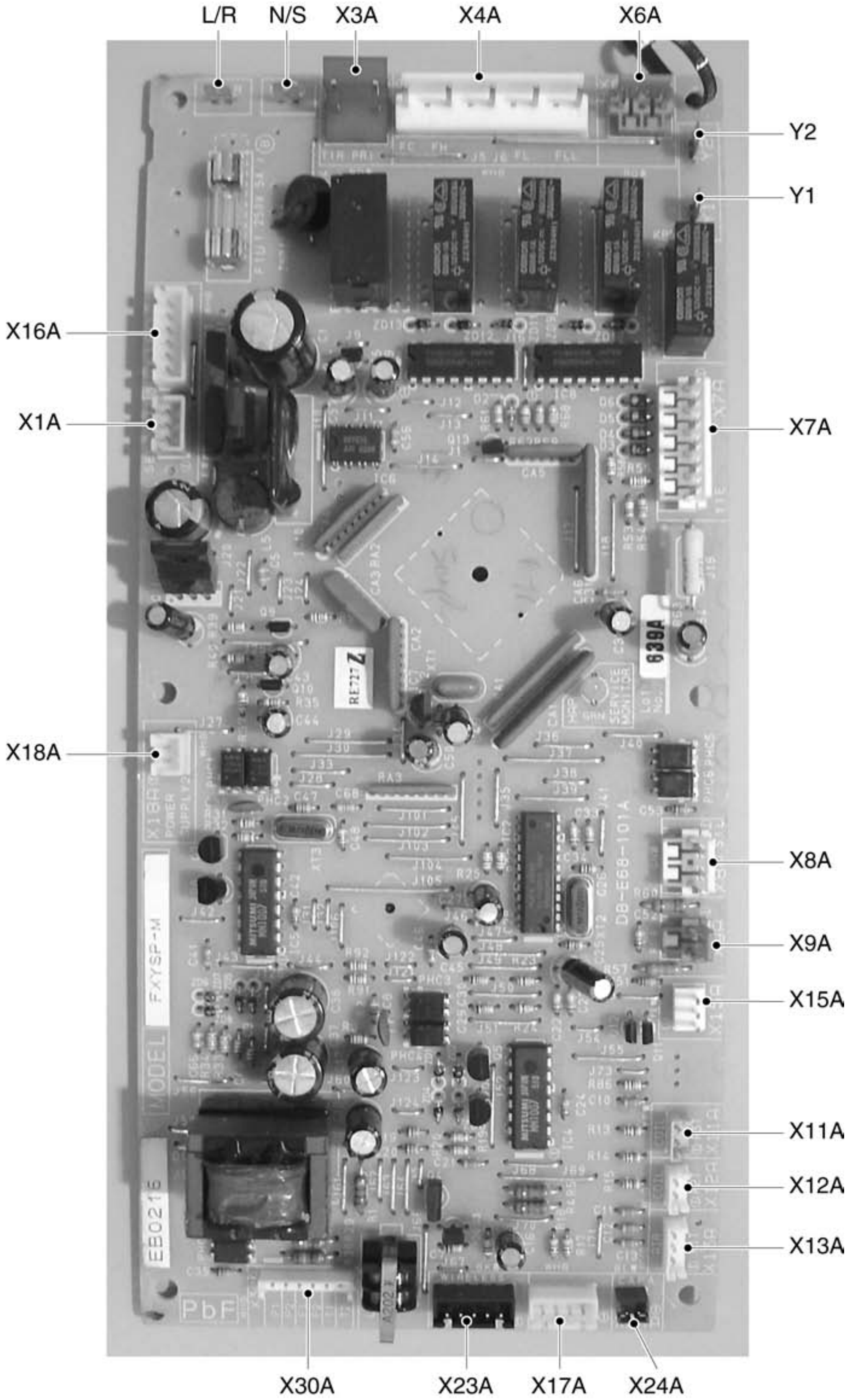
The table below describes the PCB connectors.

Connector	Connected to	Description
X205A	X5A	Main PCB

6.4 PCB Layout for EKEXDCB(A)V3B, EKEXFCB(A)V3B and EKEXMCBV3B

Control PCB

The illustration below shows the PCB connectors.



1

Connectors

The table below describes the PCB connectors for EKEXDCBV3.

Connector	Connected to	Description
X1A	T1R	Transformer (220V/21.8V)
X3A	T1R	Transformer (220V/21.8V)
X4A		Not Applicable
X6A		Not Applicable
X7A	Y1E	Electronic Expansion Valve
X8A		Not Applicable(need to be short cut)
X9A		Not Applicable
X11A	R3T	Thermistors (Gas)
X12A	R2T	Thermistors (Liquid)
X13A	R1T	Thermistors (Air)
X15A		Not Applicable
X16A		Not Applicable
X17A		Not Applicable
X18A	KRP4(X2A)	Optional Connection
X23A		Not Applicable
X24A	Capacity adaptor	To Set Capacity Class
X30A	X1M	Terminal Strip: T1/T2 - F1/F2 - P1/P2
Y1-Y2		Not Applicable
L/R-N/S	Power Supply	1N~50Hz 230V

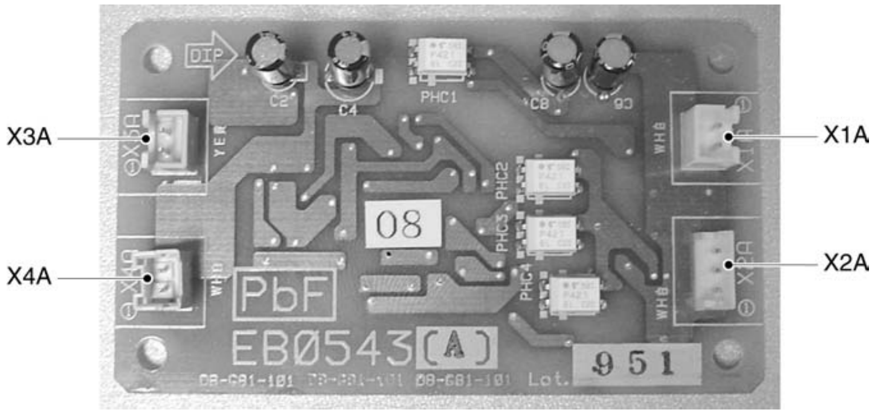
The table below describes the PCB connectors for EKEXFCBV3.

Connector	Connected to	Description
X1A	T1R	Transformer (220V/21.8V)
X3A	T1R	Transformer (220V/21.8V)
X4A		Not Applicable
X6A	K2R	Magnetic Relay (Error Status)
X7A	Y1E	Electronic Expansion Valve
X8A		Not Applicable(need to be short cut)
X9A		Not Applicable
X11A	R3T	Thermistors (Gas)
X12A	R2T	Thermistors (Liquid)
X13A	A2P(X2A)	Printed Circuit Board (For Voltage Conversion)
X15A		Not Applicable
X16A		Not Applicable
X17A		Not Applicable
X18A	A2P(X1A)	Printed Circuit Board (For Voltage Conversion)
X23A		Not Applicable
X24A	Capacity adaptor	To Set Capacity Class
X30A	X2M	Terminal Strip: T1/T2 - F1/F2 - P1/P2
Y1-Y2	K1R	Magnetic Relay (Operation / Compressor on/off)
L/R-N/S	Power Supply	1N~50Hz 230V

1

Voltage conversion PCB

The illustration below shows the PCB connectors.



Connectors

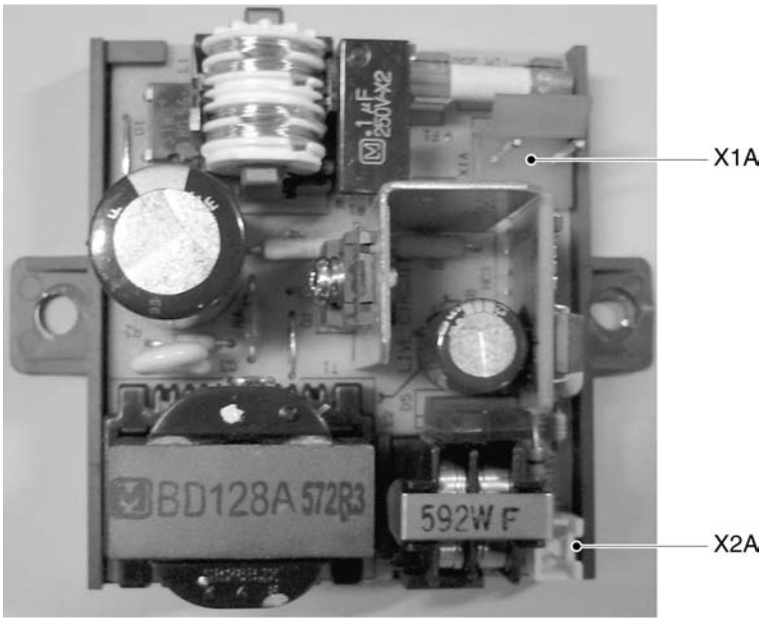
The table below describes the PCB connectors.

Connector	Connected to	Description
X1A	A1P(X18A)	Printed Circuit Board
X2A	A1P(X13A)	Printed Circuit Board
X3A	A3P(X2A)	Printed Circuit Board (Power Supply)
X4A	X2M	Terminal Strip: DC Capacity Control

1

Power supply PCB

The illustration below shows the PCB connectors.



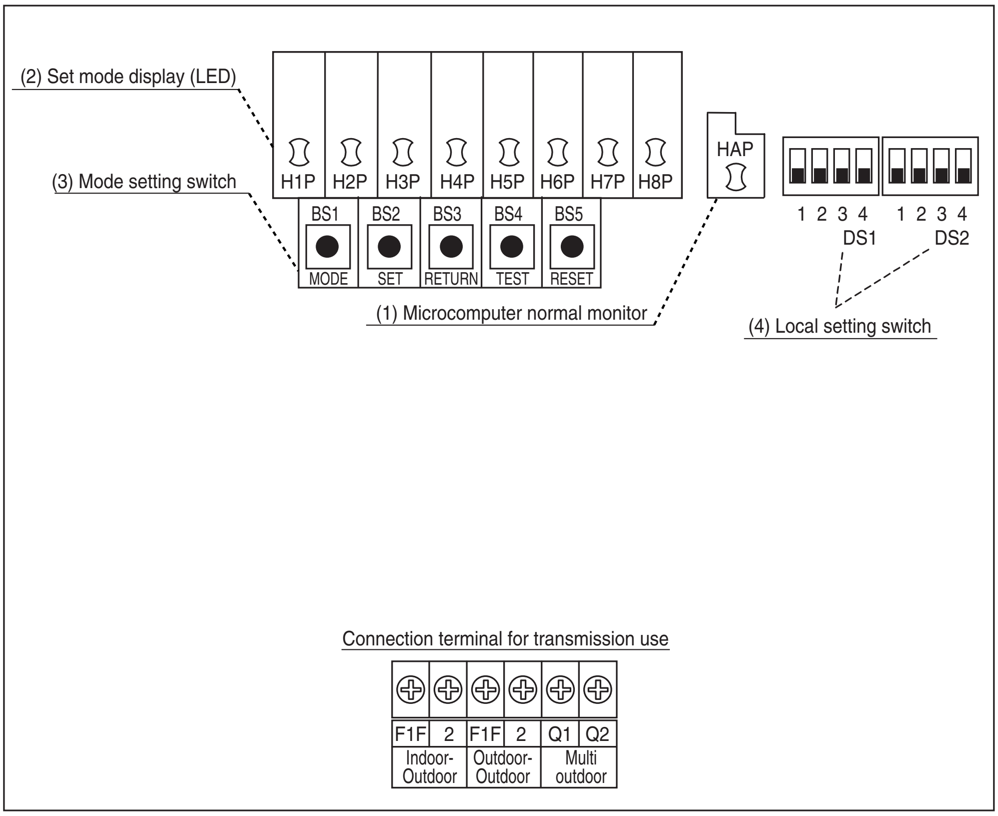
Connectors

The table below describes the PCB connectors.

Connector	Connected to	Description
X1A	Power Supply	1N~50Hz 230V
X2A	A2P(X3A)	Printed Circuit Board (For Voltage Conversion)

1

6.5 Outdoor Unit PC Board for ERX125~250A7W1B



(1) Microprocessor normal monitor

This monitor blinks while in normal operation, and turns on or off when a malfunction occurs.

(2) Set mode display (LED)

LEDs dispaly mode according to the setting.

(3) Mode setting switch

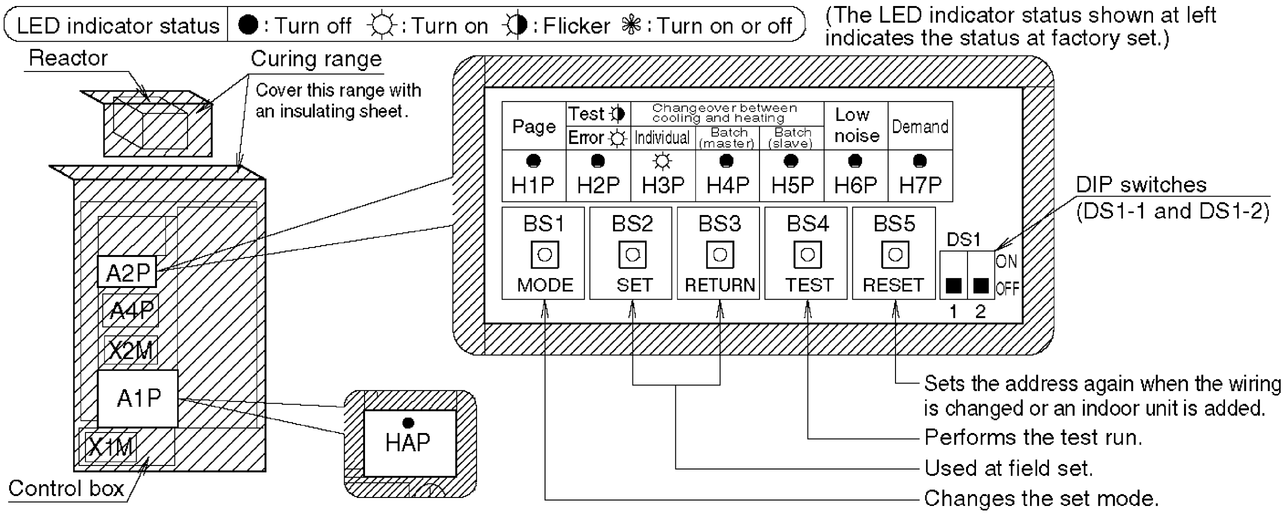
Used to change mode.

(4) Local setting switch

Used to make field settings.

1

6.6 Outdoor Unit PC Board for ERX100~140A8V3B



Caution Cover electric parts with an insulating sheet during inspection to prevent electic shock.

Part 2
Functional Description

What is in this part?

This part contains information on the functions used to control the system. Understanding these functions is vital when diagnosing a malfunction that is related to the functional control.

Overview

This part contains the following chapters:

2

1 General Functionality

1.1 What Is in This Chapter?

Overview

This chapter contains the following topics:

2

1.2 Thermistor Resistance / Temperature Characteristics

Outdoor unit thermistor R1T

Outdoor unit for fin thermistor R1T

Indoor unit	For air suction		R1T
	For liquid pipe		R2T
	For gas pipe		R3T
Outdoor unit	For outdoor air		R1T
	For suction pipe 1		R3T
	For heat exchanger		R4T
	For suction pipe 2		R5T
	For Subcooling heat exchanger outlet		R6T
	For Liquid pipe		R7T

T°C	0.0
-10	-
-8	-
-6	88.0
-4	79.1
-2	71.1
0	64.1
2	57.8
4	52.3
6	47.3
8	42.9
10	38.9
12	35.3
14	32.1
16	29.2
18	26.6
20	24.3
22	22.2
24	20.3
26	18.5
28	17.0
30	15.6
32	14.2
34	13.1
36	12.0
38	11.1
40	10.3
42	9.5
44	8.8
46	8.2
48	7.6
50	7.0
52	6.7
54	6.0
56	5.5
58	5.2
60	4.79
62	4.46
64	4.15
66	3.87
68	3.61
70	3.37
72	3.15
74	2.94
76	2.75
78	2.51
80	2.41
82	2.26
84	2.12
86	1.99
88	1.87
90	1.76
92	1.65
94	1.55
96	1.46

(kΩ)

T°C	0.0	0.5	T°C	0.0	0.5
-20	197.81	192.08	30	16.10	15.76
-19	186.53	181.16	31	15.43	15.10
-18	175.97	170.94	32	14.79	14.48
-17	166.07	161.36	33	14.18	13.88
-16	156.80	152.38	34	13.59	13.31
-15	148.10	143.96	35	13.04	12.77
-14	139.94	136.05	36	12.51	12.25
-13	132.28	128.63	37	12.01	11.76
-12	125.09	121.66	38	11.52	11.29
-11	118.34	115.12	39	11.06	10.84
-10	111.99	108.96	40	10.63	10.41
-9	106.03	103.18	41	10.21	10.00
-8	100.41	97.73	42	9.81	9.61
-7	95.14	92.61	43	9.42	9.24
-6	90.17	87.79	44	9.06	8.88
-5	85.49	83.25	45	8.71	8.54
-4	81.08	78.97	46	8.37	8.21
-3	76.93	74.94	47	8.05	7.90
-2	73.01	71.14	48	7.75	7.60
-1	69.32	67.56	49	7.46	7.31
0	65.84	64.17	50	7.18	7.04
1	62.54	60.96	51	6.91	6.78
2	59.43	57.94	52	6.65	6.53
3	56.49	55.08	53	6.41	6.53
4	53.71	52.38	54	6.65	6.53
5	51.09	49.83	55	6.41	6.53
6	48.61	47.42	56	6.18	6.06
7	46.26	45.14	57	5.95	5.84
8	44.05	42.98	58	5.74	5.43
9	41.95	40.94	59	5.14	5.05
10	39.96	39.01	60	4.96	4.87
11	38.08	37.18	61	4.79	4.70
12	36.30	35.45	62	4.62	4.54
13	34.62	33.81	63	4.46	4.38
14	33.02	32.25	64	4.30	4.23
15	31.50	30.77	65	4.16	4.08
16	30.06	29.37	66	4.01	3.94
17	28.70	28.05	67	3.88	3.81
18	27.41	26.78	68	3.75	3.68
19	26.18	25.59	69	3.62	3.56
20	25.01	24.45	70	3.50	3.44
21	23.91	23.37	71	3.38	3.32
22	22.85	22.35	72	3.27	3.21
23	21.85	21.37	73	3.16	3.11
24	20.90	20.45	74	3.06	3.01
25	20.00	19.56	75	2.96	2.91
26	19.14	18.73	76	2.86	2.82
27	18.32	17.93	77	2.77	2.72
28	17.54	17.17	78	2.68	2.64
29	16.80	16.45	79	2.60	2.55
30	16.10	15.76	80	2.51	2.47

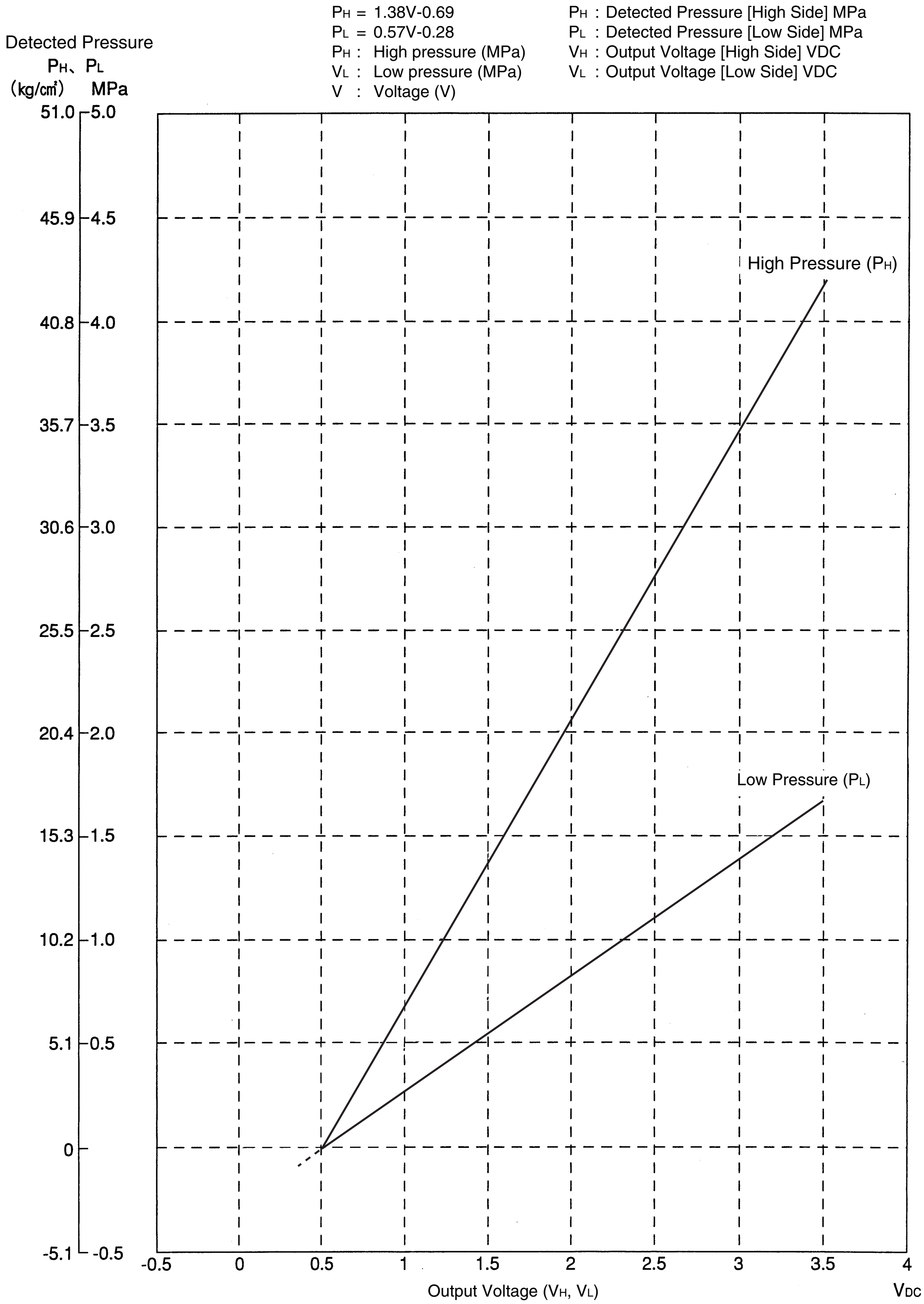
Outdoor unit thermistors for discharge pipe (R2T, ERX100~140A8V3B) (R3T, R31~33T, ERX125~250A7W1B)

(kΩ))

T°C	0.0	0.5	T°C	0.0	0.5	T°C	0.0	0.5
0	640.44	624.65	50	72.32	70.96	100	13.35	13.15
1	609.31	594.43	51	69.64	68.34	101	12.95	12.76
2	579.96	565.78	52	67.06	65.82	102	12.57	12.38
3	552.00	538.63	53	64.60	63.41	103	12.20	12.01
4	525.63	512.97	54	62.24	61.09	104	11.84	11.66
5	500.66	488.67	55	59.97	58.87	105	11.49	11.32
6	477.01	465.65	56	57.80	56.75	106	11.15	10.99
7	454.60	443.84	57	55.72	54.70	107	10.83	10.67
8	433.37	423.17	58	53.72	52.84	108	10.52	10.36
9	413.24	403.57	59	51.98	50.96	109	10.21	10.06
10	394.16	384.98	60	49.96	49.06	110	9.92	9.78
11	376.05	367.35	61	48.19	47.33	111	9.64	9.50
12	358.88	350.62	62	46.49	45.67	112	9.36	9.23
13	342.58	334.74	63	44.86	44.07	113	9.10	8.97
14	327.10	319.66	64	43.30	42.54	114	8.84	8.71
15	312.41	305.33	65	41.79	41.06	115	8.59	8.47
16	298.45	291.73	66	40.35	39.65	116	8.35	8.23
17	285.18	278.80	67	38.96	38.29	117	8.12	8.01
18	272.58	266.51	68	37.63	36.98	118	7.89	7.78
19	260.60	254.72	69	36.34	35.72	119	7.68	7.57
20	249.00	243.61	70	35.11	34.51	120	7.47	7.36
21	238.36	233.14	71	33.92	33.35	121	7.26	7.16
22	228.05	223.08	72	32.78	32.23	122	7.06	6.97
23	218.24	213.51	73	31.69	31.15	123	6.87	6.78
24	208.90	204.39	74	30.63	30.12	124	6.69	6.59
25	200.00	195.71	75	29.61	29.12	125	6.51	6.42
26	191.53	187.44	76	28.64	28.16	126	6.33	6.25
27	183.46	179.57	77	27.69	27.24	127	6.16	6.08
28	175.77	172.06	78	26.79	26.35	128	6.00	5.92
29	168.44	164.90	79	25.91	25.49	129	5.84	5.76
30	161.45	158.08	80	25.07	24.66	130	5.69	5.61
31	154.79	151.57	81	24.26	23.87	131	5.54	5.46
32	148.43	145.37	82	23.48	23.10	132	5.39	5.32
33	142.37	139.44	83	22.73	22.36	133	5.25	5.18
34	136.59	133.79	84	22.01	21.65	134	5.12	5.05
35	131.06	128.39	85	21.31	20.97	135	4.98	4.92
36	125.79	123.24	86	20.63	20.31	136	4.86	4.79
37	120.76	118.32	87	19.98	19.67	137	4.73	4.67
38	115.95	113.62	88	19.36	19.05	138	4.61	4.55
39	111.35	109.13	89	18.75	18.46	139	4.49	4.44
40	106.96	104.84	90	18.17	17.89	140	4.38	4.32
41	102.76	100.73	91	17.61	17.34	141	4.27	4.22
42	98.75	96.81	92	17.07	16.80	142	4.16	4.11
43	94.92	93.06	93	16.54	16.29	143	4.06	4.01
44	91.25	89.47	94	16.04	15.79	144	3.96	3.91
45	87.74	86.04	95	15.55	15.31	145	3.86	3.81
46	84.38	82.75	96	15.08	14.85	146	3.76	3.72
47	81.16	79.61	97	14.62	14.40	147	3.67	3.62
48	78.09	76.60	98	14.18	13.97	148	3.58	3.54
49	75.14	73.71	99	13.76	13.55	149	3.49	3.45
50	72.32	70.96	100	13.35	13.15	150	3.41	3.37

1.3 Pressure Sensor

Graph



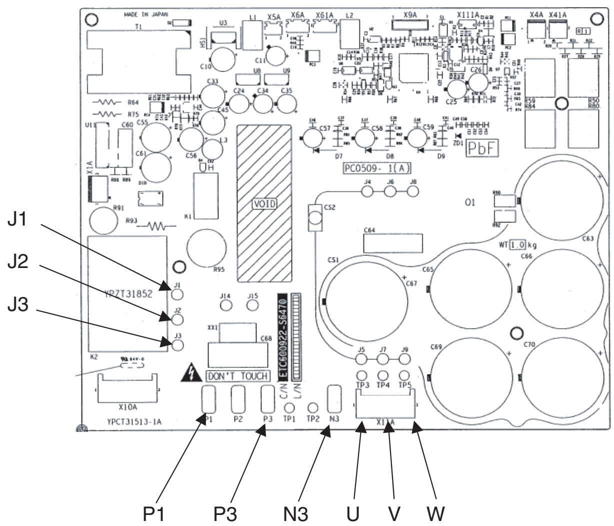
1.4 Method of Checking The Inverter's Power Transistors and Diode Modules (Only ERX125~250A7W1B)

Checking failures in power semiconductors mounted on inverter PC board

Check the power semiconductors mounted on the inverter PC board by the use of a multiple tester.

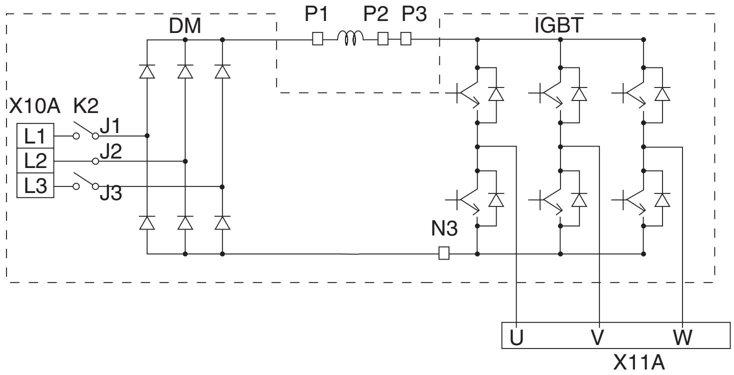
- ➤ Items to be prepared:
  - ➤ Multiple tester:
  - **1** Prepare the analog type of multiple tester.
  - **2** For the digital type of multiple tester, those with diode check function are available for the checking.
- ➤ Test points:
  - ➤ Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.
- ➤ Preparation:
  - ➤ To make measurement, disconnect all connectors and terminals.

Inverter PC board



2

Electronic circuit



- According to the checking aforementioned, it is probed that the malfunction results from the faulty inverter.The following section describes supposed causes of the faulty inverter.
  - Faulty compressor (ground leakage)
  - Faulty fan motor (ground leakage)
  - Entry of conductive foreign particles
  - Abnormal voltage (e.g. overvoltage, surge (thunder), or unbalanced voltage)

In order to replace the faulty inverter, be sure to check for the points aforementioned.

Power/diode module checking

1 Power module checking

When using the analog type of multiple tester, make measurement in resistance measurement mode in the x1kΩ range.

No.	Measuring point +	Measuring point -	Criterion	Remark
1	P3	U	2 to 15kΩ	
2	P3	V		
3	P3	W		
4	U	P3	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge or else.
5	V	P3		
6	W	P3		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	2 to 15kΩ	
11	V	N3		
12	W	N3		

When using the digital type of multiple tester, make measurement in diode check mode (→|—).

No.	Measuring point +	Measuring point -	Criterion	Remark
1	P3	U	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
2	P3	V		
3	P3	W		
4	U	P3	0.3 to 0.7V	
5	V	P3		
6	W	P3		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
11	V	N3		
12	W	N3		

2 Diode module checking

When using the analog type of multiple tester, make measurement in resistance measurement mode in the x1kΩ range.

No.	Measuring point +	Measuring point -	Criterion	Remark
1	P1	J1	2 to 15kΩ	
2	P1	J2		
3	P1	J3		
4	J1	P1	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge or else.
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3		
10	J1	N3	2 to 15kΩ	
11	J2	N3		
12	J3	N3		

When using the digital type of multiple tester, make measurement in diode check mode (→|—).

No.	Measuring point +	Measuring point -	Criterion	Remark
1	P1	J1	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
2	P1	J2		
3	P1	J3		
4	J1	P1	0.3 to 0.7V	
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3		
10	J1	N3	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
11	J2	N3		
12	J3	N3		

2

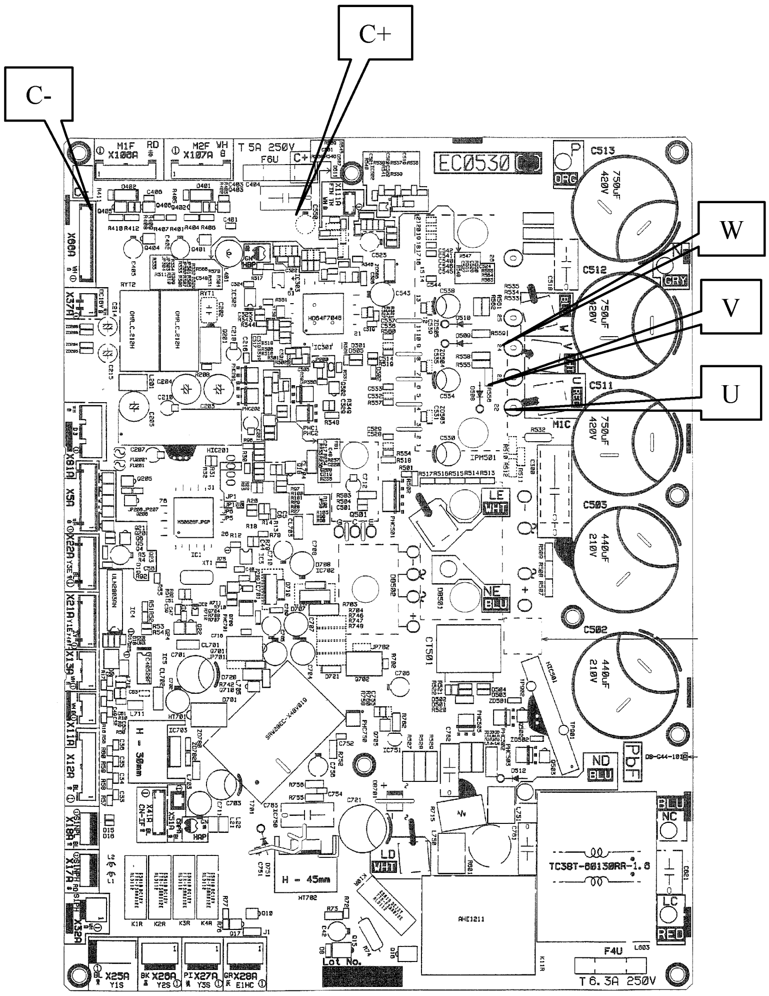
1.5 Method of Replacing the Inverter's Power Transistors Modules (Only ERX100~140A8V3B)

Checking failures in power semiconductors mounted on inverter PC board

Check the power semiconductors mounted on the inverter PC board by the use of a multiple tester.

- Items to be prepared:
  - Multiple tester:
  - **1** Prepare the digital type of multiple tester with diode check function.
- Test points:
  - Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.
- Preparation:
  - To make measurement, disconnect all connectors and terminals.

Inverter PC board



Power module checking

When using the digital type of multiple tester, make measurement in diode check mode.

Tester terminal		Criterion	Remark
+	-		
C+	U	Not less than 0.3V (including ∞)*	It may take time to determine the voltage due to capacitor charge or else.
	V		
	W		
U	C-	Not less than 0.3V (including ∞)*	
V			
W			
U	C+	0.3 to 0.7V (including ∞)*	
V			
W			
C-	U	0.3 to 0.7V (including ∞)*	
	V		
	W		

*There needs to be none of each value variation.

The following abnormalities are also doubted besides the PC board abnormality.

➤ Faulty compressor (ground fault, ground leakage)

➤ Faulty fan motor (ground leakage)

2

2 Outdoor Unit Functional Concept

2

2.1 What Is in This Chapter?

Introduction

This chapter will explain more details about the various functions that are programmed for the sky-air R410A inverter outdoor units.

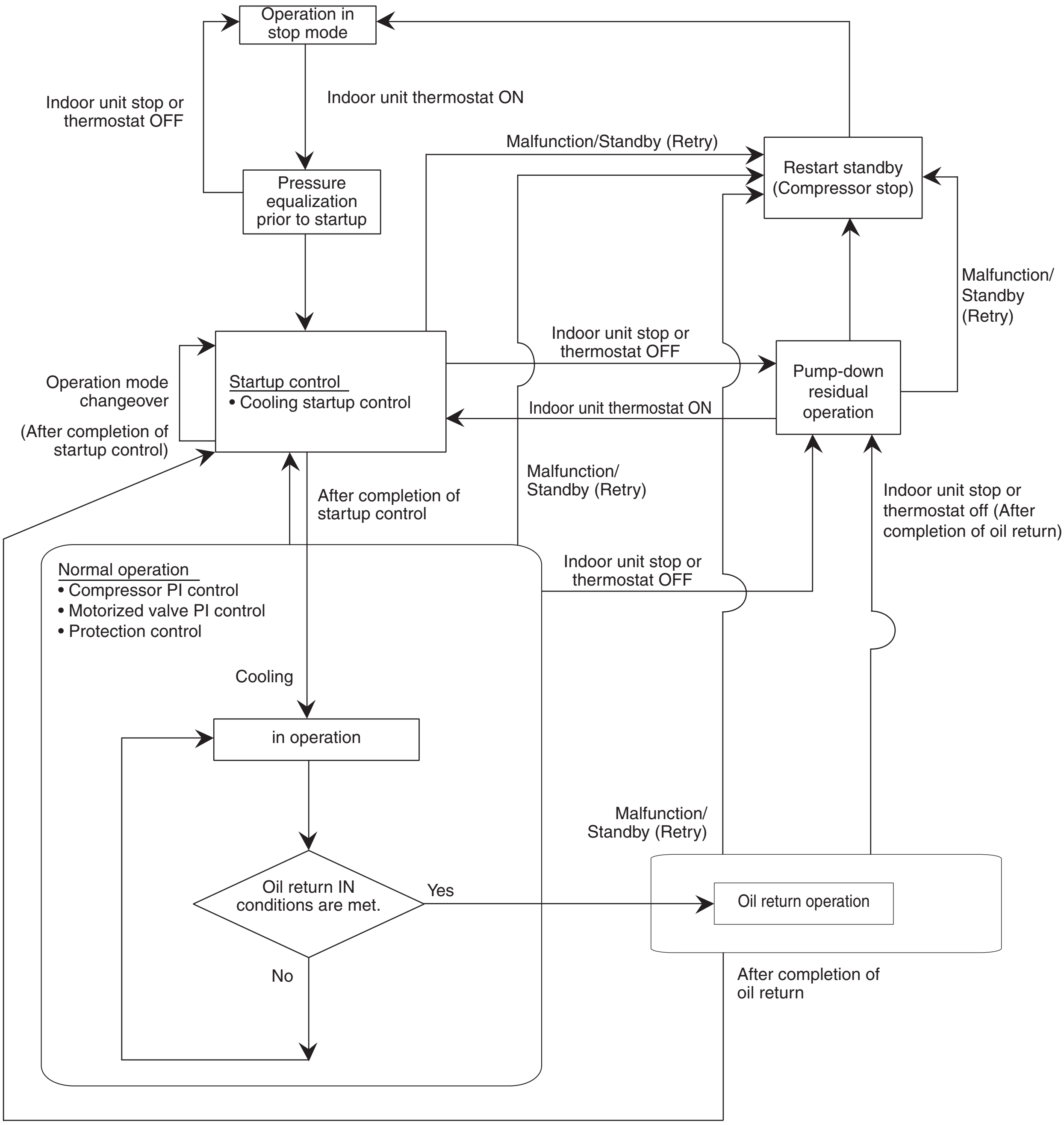
Overview

This chapter contains the following topics:

2

2.2 Operation Mode

Flow chart



Remark In the event indoor unit stops or the thermostat turns OFF while in oil return operation, pump-down residual operation is performed on completion of the oil return operation.

2.3 Basic Control

Content

2

2.3.1 List of Functions in Manual Operation

ERX125~250A7W1B

Part Name	Symbol	(Electric Symbol)	Function of Functional Part
			Normal Cooling
Compressor	—	(M1C, M2C)	PI control, High pressure protection, Low pressure protection, Td protection, INV protection,
Outdoor unit fan		(M1F)	Cooling fan control
Subcool heat exchanger electronic expansion valve	EV2	(Y2E)	PI control
Hot gas bypass valve	SVP	(Y1S)	OFF
Accumulator oil return valve	SV0	(Y2S)	ON

Indoor unit actuator		Normal cooling
Fan	Thermostat ON unit	—
	Stopping unit	—
	Thermostat OFF unit	—
Electronic expansion valve	Thermostat ON unit	Normal opening [1)]
	Stopping unit	0 pls
	Thermostat OFF unit	0 pls

1) PI control : Evaporator outlet superheated degree (SH) constant.

ERX100~140A8V3B

Actuator	Operation	Remarks
Compressor	Compressor PI control	Used for high pressure protection control, low pressure protection control, discharge pipe temperature protection control, and compressor operating frequency upper limit control with inverter protection control.
Outdoor unit fan	Cooling fan control	—
Four way valve	OFF	—
Main electronic expansion valve (EV1)	480 pls	—
Subcooling electronic expansion valve (EV3)	PI control	—
Hot gas bypass valve (SVP)	OFF	This valve turns on with low pressure protection control.

2.3.2 Compressor PI Control

General

Carries out the compressor capacity PI control to maintain Te at constant during cooling operation to ensure stable unit performance.

Cooling operation

Controls compressor capacity to adjust Te to achieve target value (TeS).

Te set value (Make this setting while in Setting mode 2.)

Te setting

L	M (Normal) (factory setting)	H
3	6	9

Te : Low pressure equivalent saturation temperature (°C)

TeS : Target Te value (Varies depending on Te setting, operating frequency, etc.)

2.3.3 Compressor Step Control

General

Compressor operations vary with the following steps according to information in "Compressor PI Control".

2

ERX125~250A7W1B

ERX125A7W1B	
STEP No.	**INV (Inverter compressor)**
1	52 Hz
2	56 Hz
3	62 Hz
4	68 Hz
5	74 Hz
6	80 Hz
7	88 Hz
8	96 Hz
9	104 Hz
10	110 Hz
11	116 Hz
12	124 Hz
13	132 Hz
14	144 Hz
15	158 Hz
16	166 Hz
17	176 Hz
18	188 Hz

ERX200A7W1B	
STEP No.	**INV (Inverter compressor)**
1	52 Hz
2	56 Hz
3	62 Hz
4	68 Hz
5	74 Hz
6	80 Hz
7	88 Hz
8	96 Hz
9	104 Hz
10	110 Hz
11	116 Hz
12	124 Hz
13	132 Hz
14	144 Hz
15	158 Hz
16	166 Hz
17	176 Hz
18	188 Hz
19	202 Hz
20	210 Hz
21	218 Hz
22	232 Hz
23	248 Hz
24	266 Hz

ERX250A7W1B		
STEP No.	**INV (Inverter compressor)**	**STD1 (Standard compressor1)**
1	52 Hz	OFF
2	56 Hz	OFF
3	62 Hz	OFF
4	68 Hz	OFF
5	74 Hz	OFF
6	80 Hz	OFF
7	88 Hz	OFF
8	96 Hz	OFF
9	104 Hz	OFF
10	110 Hz	OFF
11	116 Hz	OFF
12	124 Hz	OFF
13	132 Hz	OFF
14	144 Hz	OFF
15	158 Hz	OFF
16	166 Hz	OFF
17	176 Hz	OFF
18	188 Hz	OFF
19	202 Hz	OFF
20	210 Hz	OFF
21	52 Hz	ON
22	62 Hz	ON
23	68 Hz	ON
24	74 Hz	ON
25	80 Hz	ON
26	88 Hz	ON
27	96 Hz	ON
28	104 Hz	ON
29	116 Hz	ON
30	124 Hz	ON
31	132 Hz	ON
32	144 Hz	ON
33	158 Hz	ON
34	176 Hz	ON
35	188 Hz	ON
36	202 Hz	ON
37	210 Hz	ON

ERX100~140A8V3B

STn	INV (Fullload)	INV (Unload)
1		36.0Hz
2		39.0Hz
3		43.0Hz
4		47.0Hz
5		52.0Hz
6	52.0Hz	57.0Hz
7	57.0Hz	64.0Hz
8	62.0Hz	71.0Hz
9	68.0Hz	78.0Hz
10	74.0Hz	

STn	INV (Fullload)	INV (Unload)
11	80.0Hz	
12	86.0Hz	
13	92.0Hz	
14	98.0Hz	
15	104.0Hz	
16	110.0Hz	
17	116.0Hz	
18	122.0Hz	
19	128.0Hz	
20	134.0Hz	

STn	INV (Fullload)	INV (Unload)
21	140.0Hz	
22	146.0Hz	
23	152.0Hz	
24	158.0Hz	
25	164.0Hz	
26	170.0Hz	
27	175.0Hz	
28	180.0Hz	
29	185.0Hz	
30	190.0Hz	
31	195.0Hz	

Note

Compressors may operate in a pattern other than those listed in above tables subject to the operating conditions.

Selection of full load operation to/from unload operation is made with the unload circuit solenoid valve (Y3S=SVUL*). The full load operation is performed with the SVUL set to OFF, while the unload operation is performed with the SVUL set to ON.

*SVUL = Solenoid valve U/L circuit.

2

2.3.4 Electronic Expansion Valve PI Control

Main electronic expansion valve EV1 control

Fully open during cooling operation.

Subcooling motorized valve EV2 control

For ERX200~250A7W1B only.

Makes PI control of the motorized valve (Y2E) to keep the superheated degree of the outlet gas pipe on the evaporator side for the full use of the subcooling heat exchanger.

SH = Tsh - Te	SH :	Outlet superheated degree of evaporator (°C)
	Tsh :	Suction pipe temperature detected with the thermistor R5T (°C)
	Te :	Low pressure equivalent saturation temperature (°C)

Subcooling electronic expansion valve EV3 control

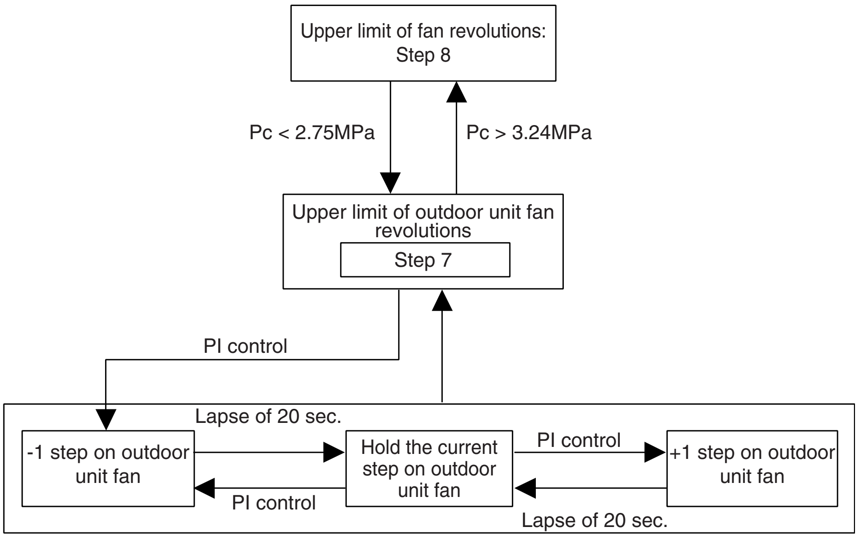
For ERX100~140A8V3B only.

Makes PI control of the electronic expansion valve (Y3E) to keep the superheated degree (SH) of the outlet gas pipe on the evaporator side for the full use of the subcooling heat exchanger.

SH = Tsh - Te	SH :	Outlet superheated degree of evaporator (°C)
	Tsh :	Suction pipe temperature detected with the thermistor R6T (°C)
	Te :	Low pressure equivalent saturation temperature (°C)

2.3.5 Outdoor Unit Fan Control in Cooling Operation

While in cooling operation, if the outdoor temperature is low, this mode provides high-pressure control using the outdoor unit fan to retain appropriate liquid pressure, thus ensuring refrigerant circulation rate to be supplied to indoor units.



Furthermore, when outdoor temperature ≥ 20°C, the compressor will run in Step 7 or higher. When outdoor temperature ≥ 18°C, it will run in Step 5 or higher.

When outdoor temperature ≥ 12°C, it will run in Step 1 or higher.

Note

- Pc: HP pressure sensor detection value.
- For fan revolutions in each step, see information on page 2-22.

2.3.6 Step Control of Outdoor Unit Fans

General

The outdoor unit fans revolutions vary with following steps listed in table below, according to the condition changes described on page page 2-21.

2

Fan revolutions ERX125~250A7W1B

STEP No.	Fan revolutions (rpm)		
	ERX125A7W1B	ERX200A7W1B	ERX250A7W1B
0	0	0	0
1	285	350	350
2	315	370	370
3	360	400	400
4	450	450	460
5	570	540	560
6	710	670	680
7	951	760	821
8	951	796	821

Fan steps ERX100~140A8V3B

Cooling	M1F	M2F
STEP0	0 rpm	0 rpm
STEP1	250 rpm	0 rpm
STEP2	400 rpm	0 rpm
STEP3	285 rpm	250 rpm
STEP4	360 rpm	325 rpm
STEP5	445 rpm	410 rpm
STEP6	580 rpm	545 rpm
STEP7	715 rpm	680 rpm
STEP8	850 rpm	815 rpm

2.4 Special Control

Content

2.4.1 Startup Control

General

This control is used to equalize the pressure in the front and back of the compressor prior to the startup of the compressor, this reducing startup loads. Furthermore, the inverter is turned ON to charge the capacitor.

In addition, to avoid stresses to the compressor due to oil return or else after the startup, the following control is made and the position of the four way valve is also determined.

2

Startup Control for ERX125~250A7W1B

Thermostat ON

	Pressure equalization control prior to startup	Startup control	
		STEP1	STEP2
Compressor	0 Hz	52 Hz + OFF + OFF	124 Hz + OFF + OFF +2 steps/20 sec. (until Pc - Pe>0.39MPa is achieved)
Outdoor unit fan	STEP4	Ta<20°C: OFF Ta≥20°C: STEP4	+1 step/15 sec. (when Pc>2.16MPa) -1 step/15 sec. (when Pc<1.77MPa)
Subcooling motorized valve (EV2) (ERX200~250 only)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Accumulator oil return valve (SVO)	OFF	OFF	OFF
Injection (SVT) (ERX125 only)	OFF	OFF	OFF
Ending conditions	A lapse of one minute	A lapse of 10 sec.	OR • A lapse of 130 sec. • Pc - Pe>0.39MPa

Startup Control for ERX100~140A8V3B

Thermostat ON

	Pressure equalization control prior to startup	Startup control	
		STEP1	STEP2
Compressor	0 Hz	57 Hz Unload	57 Hz Unload +2 steps/20 sec. (until Pc - Pe>0.39MPa is achieved)
Outdoor unit fan	STEP7	Ta<20°C: OFF Ta≥20°C: STEP4	+1 step/15 sec. (when Pc>2.16MPa) -1 step/15 sec. (when Pc<1.77MPa)
Four way valve (20S1)	Holds	OFF	OFF
Main electronic expansion valve (EV1)	0 pls	480 pls	480 pls
Subcooling electronic expansion valve (EV3)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Ending conditions	OR • Pc - Pe<0.3MPa • A lapse of 1 to 5 min.	A lapse of 10 sec.	OR • A lapse of 130 sec. • Pc - Pe>0.39MPa

2.4.2 Oil Return Operation

General

In order to prevent the compressor from running out of oil, the oil return operation is conducted to recover oil flown out from the compressor to the system side.

Start conditions

Referring to the set conditions for the following items, start the oil return operation in cooling.

- Cumulative oil feed rate
- Timer setting (Make this setting so as to start the oil return operation when the initial cumulative operating time reaches two hours after power supply is turned ON and then every eight hours.)

Furthermore, the cumulative oil feed rate is computed from Tc, Te, and compressor loads.

ERX125~250A7W1B

Outdoor unit actuator	Oil return preparation operation	Oil return operation	Post-oil-return operation
Compressor	Take the current step as the upper limit.	ERX125: 52 Hz (→ Low pressure constant control) Other models: 52 Hz + ON + ON (→ Low pressure constant control) ↓ Maintain number of compressors in oil return preparation operation ON	Same as the “oil return operation” mode.
Outdoor unit fan	Fan control (Normal cooling)	Fan control (Normal cooling)	Fan control (Normal cooling)
Subcooling motorized valve (EV2)	SH control	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Accumulator oil return valve (SVO)	ON	ON	ON
Ending conditions	20 sec.	or • 3 min. • Ts - Te<5°C	or • 3 min. • Pe<0.6MPa • HTdi>110°C

Indoor unit actuator		Cooling oil return operation
Fan	–	–
	–	–
	–	–
Electronic expansion valve	Thermostat ON unit	Normal opening
	Stopping unit	224 pls
	Thermostat OFF unit	Normal opening with forced thermostat ON

2

ERX100~140A8V3B

Outdoor unit actuator	Oil return preparation operation	Oil return operation	Post-oil-return operation
Compressor	Take the current step as the upper limit.	52 Hz Full load (→ Low pressure constant control)	Same as the “oil return operation” mode.
Outdoor unit fan	Fan control (Normal cooling)	Fan control (Normal cooling)	Fan control (Normal cooling)
Four way valve	OFF	OFF	OFF
Main electronic expansion valve (EV1)	480 pls	480 pls	480 pls
Subcooling electronic expansion valve (EV3)	SH control	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Ending conditions	20 sec.	or • 3 min. • Ts - Te<5°C	or • 3 min. • Pe<0.6MPa • HTdi>110°C

Indoor unit actuator		Cooling oil return operation
Fan	–	–
	–	–
	–	–
Electronic expansion valve	Thermostat ON unit	Normal opening
	Stopping unit	224 pls
	Thermostat OFF unit	Normal opening with forced thermostat ON

2.4.3 Pump-down Residual Operation

General

If the liquid refrigerant stays in the Evaporator at the startup of a compressor, this liquid refrigerant enters the compressor, thus resulting in diluted oil in the compressor and then degraded lubrication performance.

Consequently, in order to recover the refrigerant in the Evaporator while the compressor stops, the pump-down residual operation is conducted

ERX125~250A7W1B

Actuator	Master unit operation
Compressor	124 Hz + OFF + OFF
Outdoor unit fan	Fan control
Subcooling motorized valve (EV2)	0 pls
Hot gas bypass valve (SVP)	OFF
Accumulator oil return valve (SVO)	ON
Ending conditions	or • 5 min. • Master Unit Pe<0.49 MPa • Master Unit Td>110°C • Master Unit Pc>2.94 MPa

ERX100~140A8V3B

Actuator	Pump-down residual operation Step 1	Pump-down residual operation Step 2
Compressor	124 Hz Full load	52 Hz Full load
Outdoor unit fan	Fan control	Fan control
Four way valve	OFF	OFF
Main electronic expansion valve (EV1)	480 pls	240 pls
Subcooling electronic expansion valve (EV3)	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF
Ending conditions	2 sec.	2 sec.

2.4.4 Standby

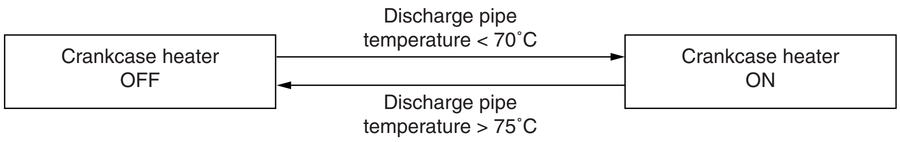
Restart standby

Used to forcedly stop the compressor for a period of minutes, in order to prevent the frequent ON/OFF of the compressor and equalize the pressure within the refrigerant system.

Actuator	Operation
Compressor	OFF
Outdoor unit fan	Ta>30°C: STEP4 Ta≤30°C: OFF
Four way valve	Holds
Main motorized valve (EV1)	0 pls
Subcooling motorized (EV2) 3P/ (EV3) 1P	0 pls
Hot gas bypass valve (SVP)	OFF
Accumulator oil return valve (SVO) 3P only	OFF
Injection (SVT) (ERX125A7W1 only)	OFF
Ending conditions	3 min. 3P / 2 min. 1P

Crankcase heater control (ERX125~250A7W1B only)

In order to prevent the refrigerant from melting in the compressor oil in the stopped mode, this mode is used to control the crankcase heater.



2.4.5 Stopping Operation

When system is in stop mode (Normal operation stop)

This mode is used to define actuator operations when the system stops.

Actuator	Operation
Compressor	OFF
Outdoor unit fan	OFF
Four way valve	Holds
Main motorized valve (EV1)	0 pls
Subcooling motorized valve (EV2) 3P/ (EV3) 1P	0 pls
Hot gas bypass valve (SVP)	OFF
Accumulator oil return valve (SVO) 3P only	OFF
Injection (SVT) (ERX125A7W1B only)	OFF
Ending conditions	Indoor unit thermostat is turned ON.

Stop due to malfunction

In order to protect compressors, if any of the following items has an abnormal value, the system will make "stop with thermostat OFF" and the malfunction will be determined according to the number of retry times.

Item		Judgment Criteria	Malfunction Code
1	Abnormal low pressure level	0.07MPa	E4
2	Abnormal high pressure level	4.0MPa	E3
3	Abnormal discharge pipe temperature level	135°C	F3
4	Abnormal power supply voltage	Reverse-phase power supply	U1
5	Abnormal inverter current level	16.1A: 260 sec. 3P / 24.9A: 260sec. 1P	L8
6	Abnormal radiator fin temperature level	93°C 3P / 83°C 1P	L4

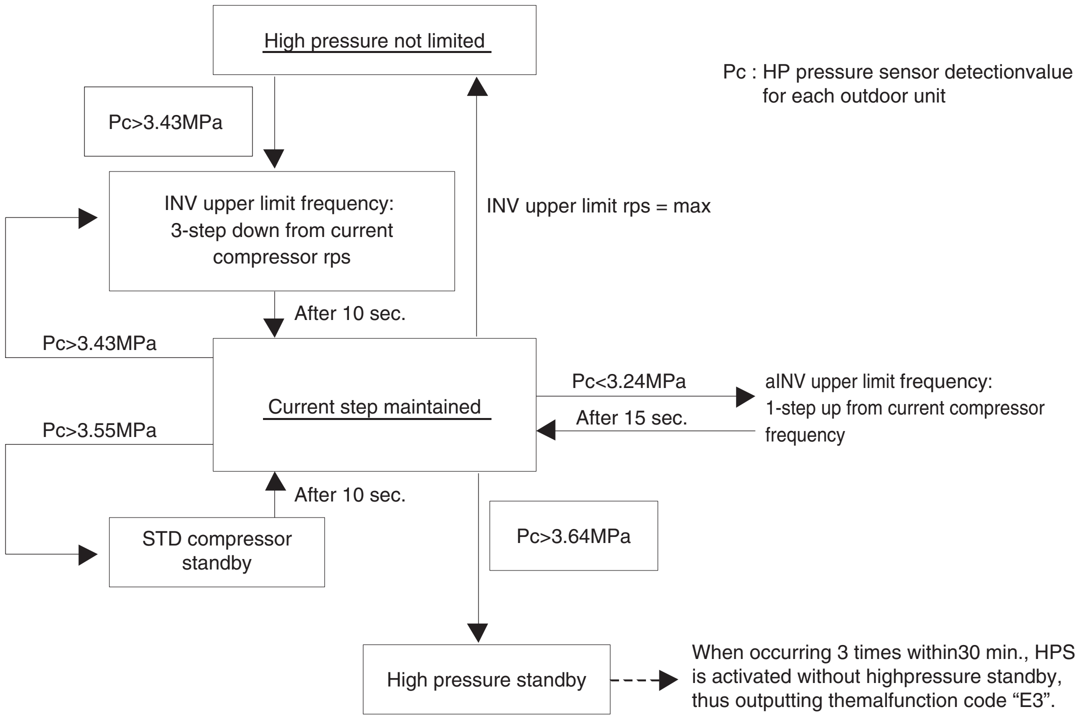
2.5 High Pressure Protection Control

General

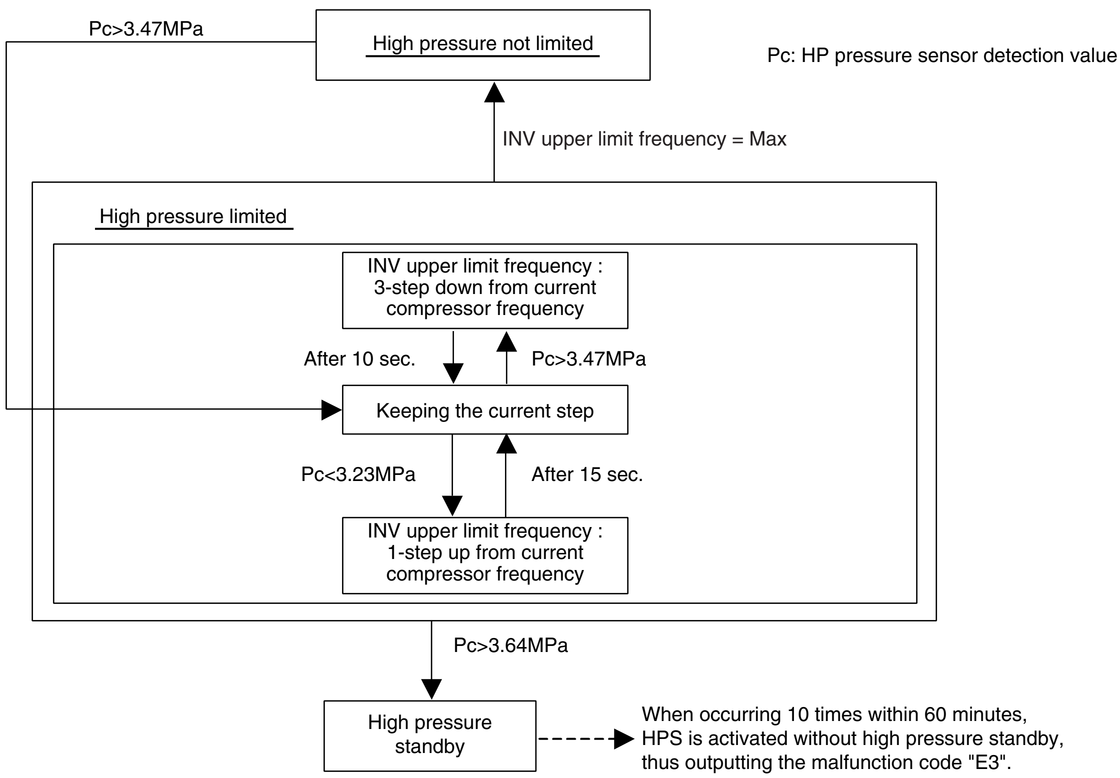
This high pressure protection control is used to prevent the activation of protection devices due to abnormal increase of high pressure and to protect compressors against the transient increase of high pressure.

2

ERX125~250A7W1B



ERX100~140A8V3B

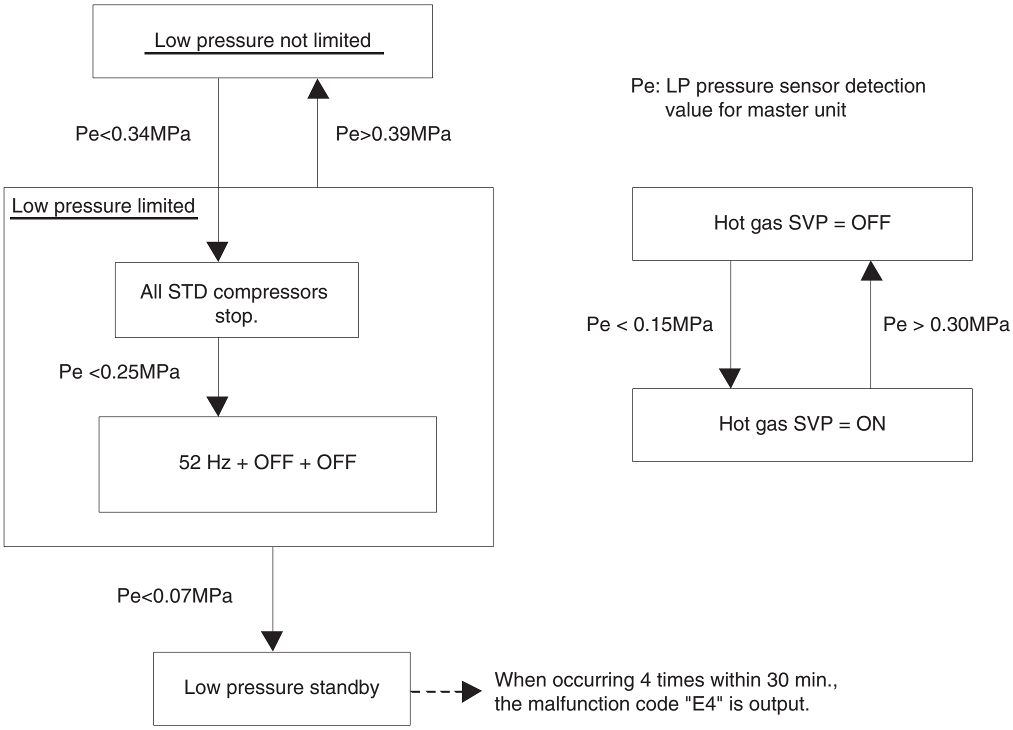


2.6 Low Pressure Protection Control

General

This low pressure protection control is used to protect compressors against the transient decrease of low pressure.

ERX125~250A7W1B



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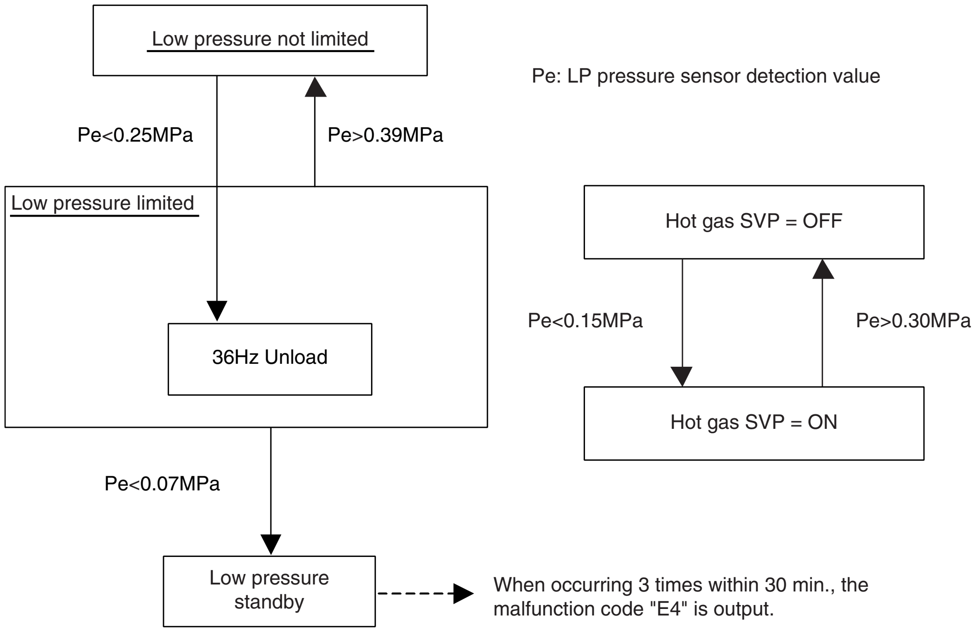
ERX100~140A8V3B



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2.7 Discharge Pipe Protection Control

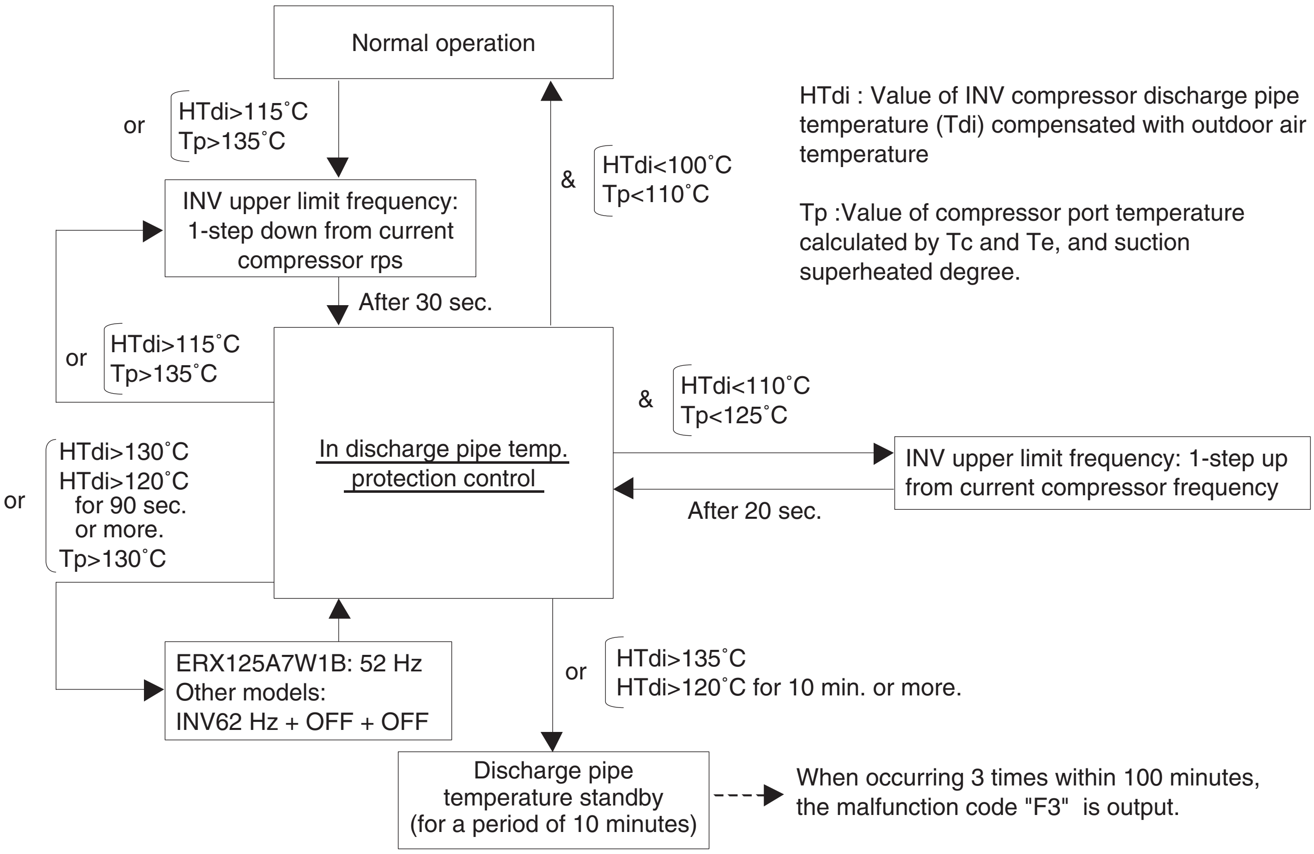
General

This discharge pipe protection control is used to protect the compressor internal temperature against a malfunction or transient increase of discharge pipe temperature.

ERX125~250A7W1B

Each compressor performs the discharge pipe temperature protection control individually in the following sequence:

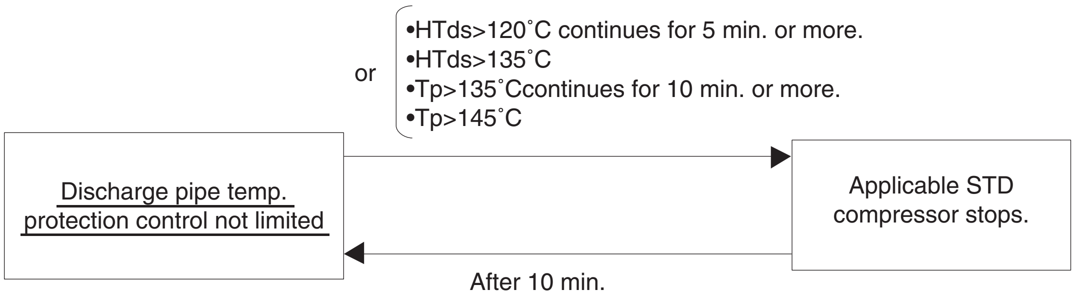
1 INV compressor



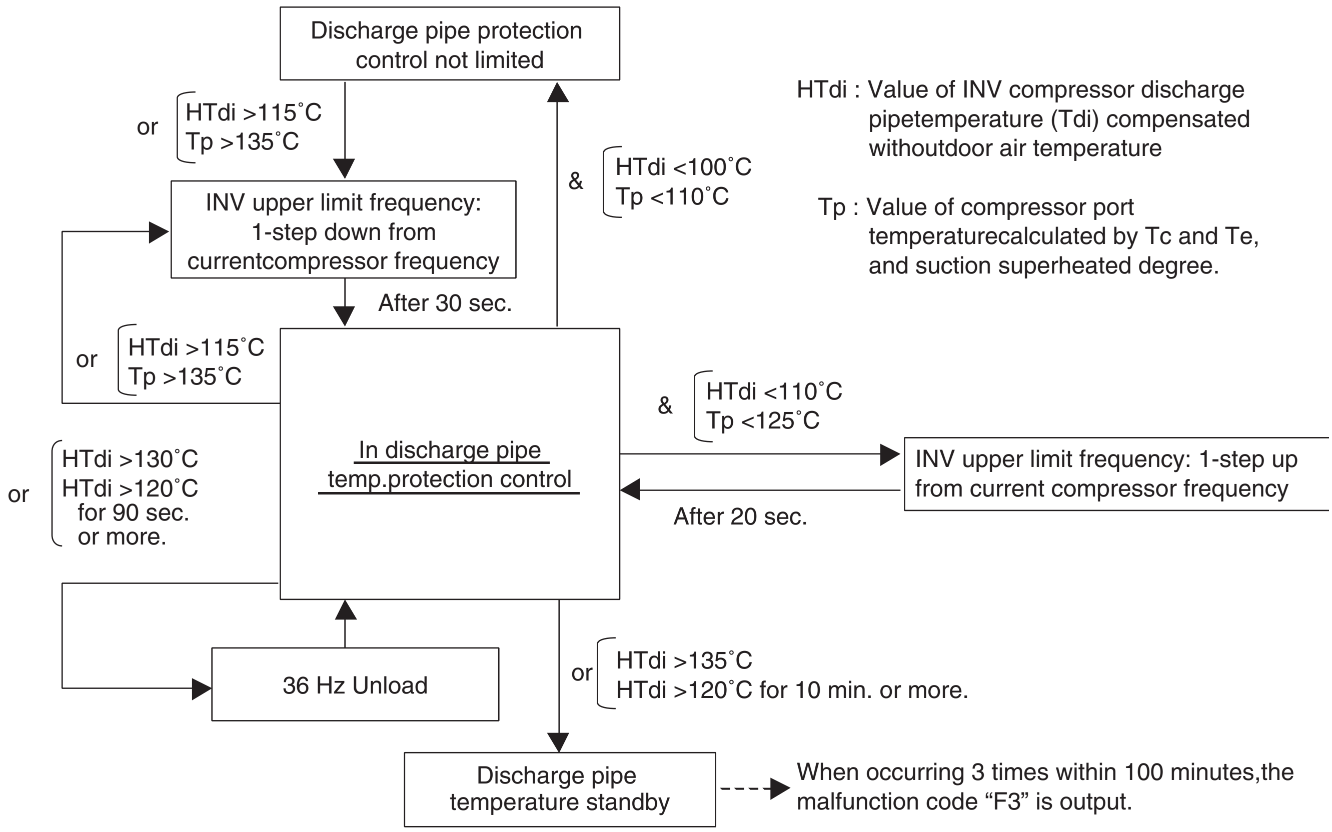
2 STD compressor

temperature (Tds) compensated with outdoor air temperature

Tp : Value of compressor port temperature calculated by Tc and Te, and suction superheated degree



ERX100~140A8V3B **INV compressor**



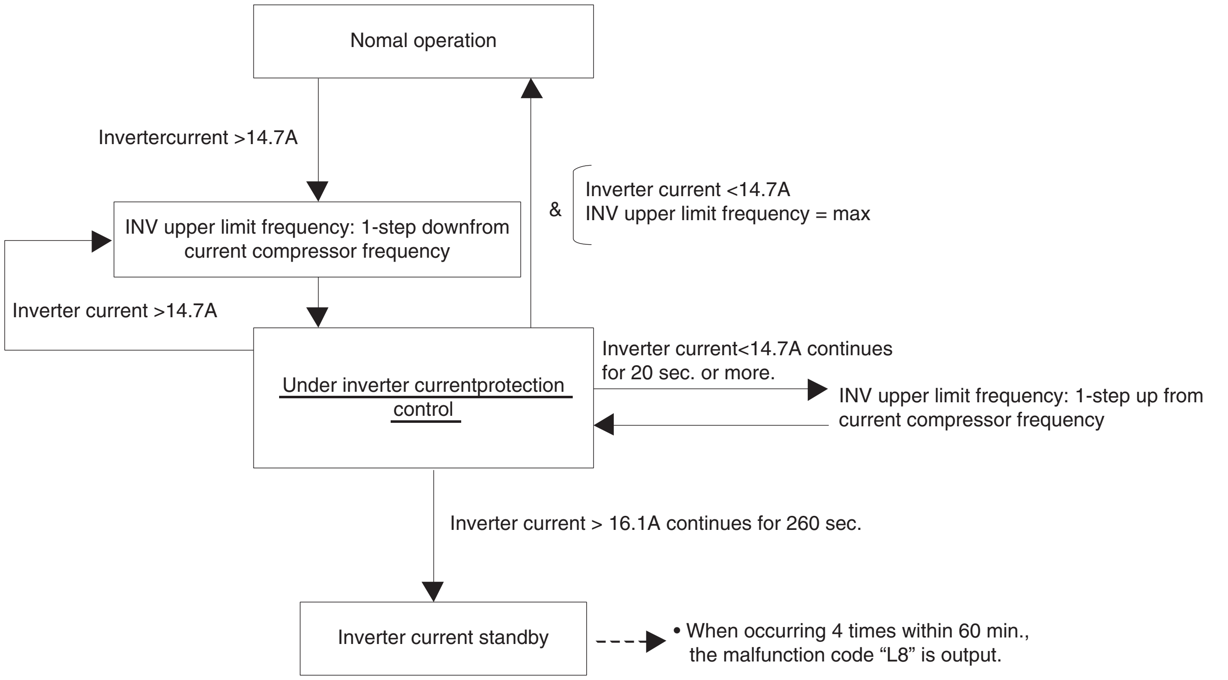
2.8 Inverter Protection Control

General

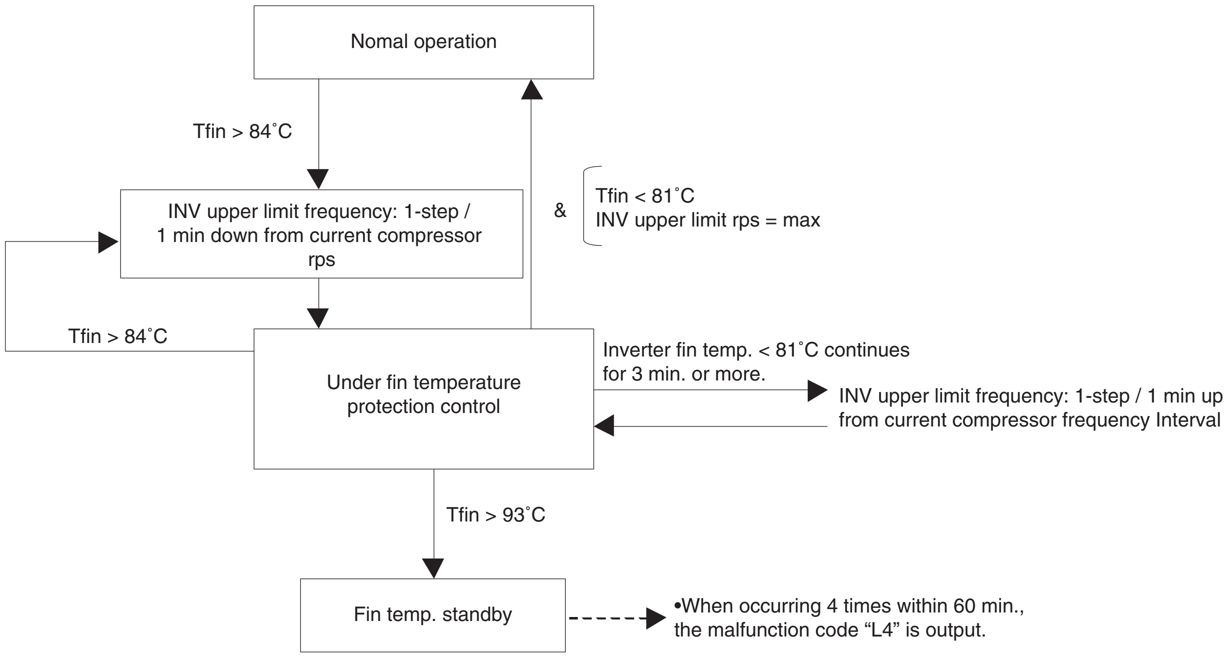
Inverter current protection control and inverter fin temperature control are performed to prevent tripping due to a malfunction, or transient inverter overcurrent, and fin temperature increase.

ERX125~250A7W1B

1 Inverter overcurrent protection control

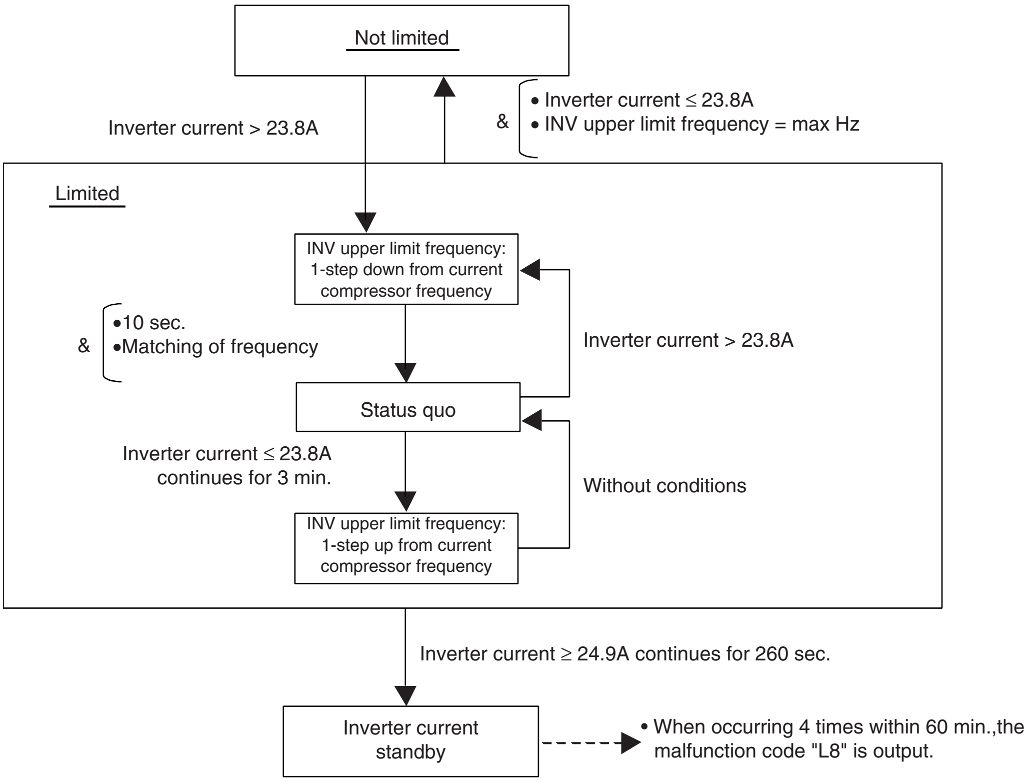


2 Inverter fin temperature control

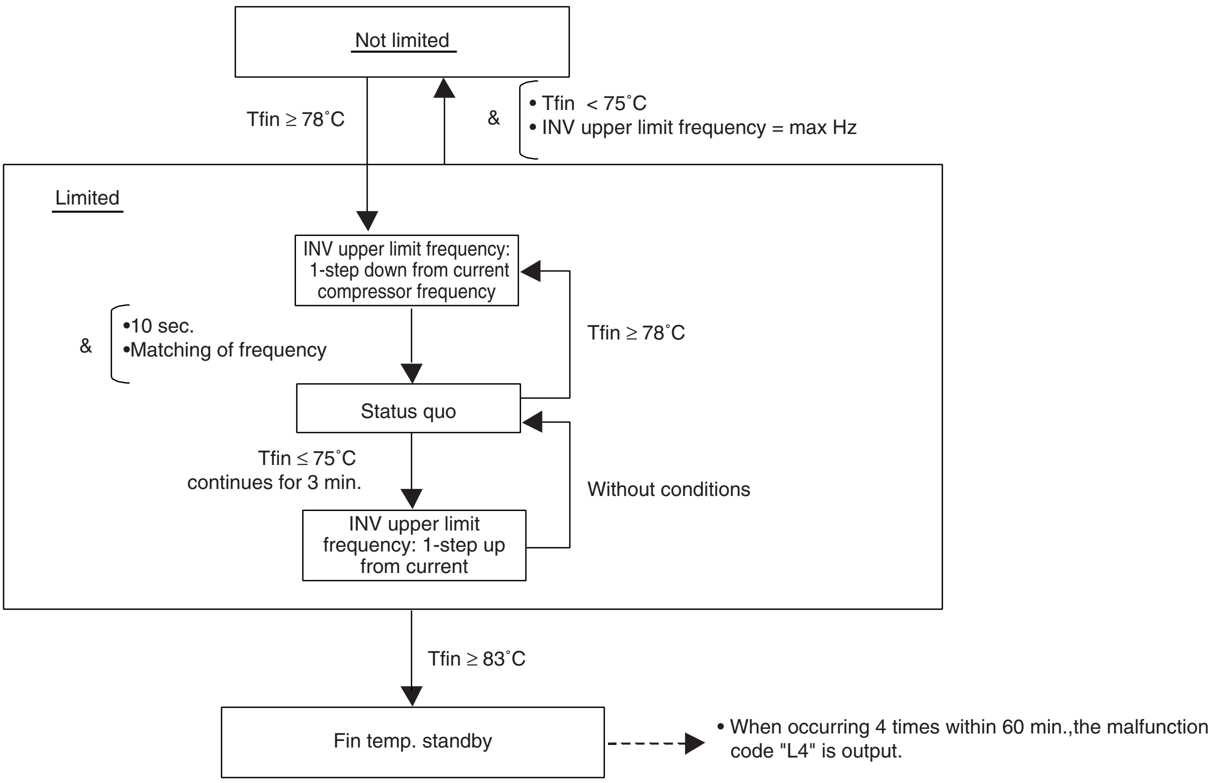


ERX100~140A8V3B

1 Inverter overcurrent protection control



2 Inverter fin temperature control

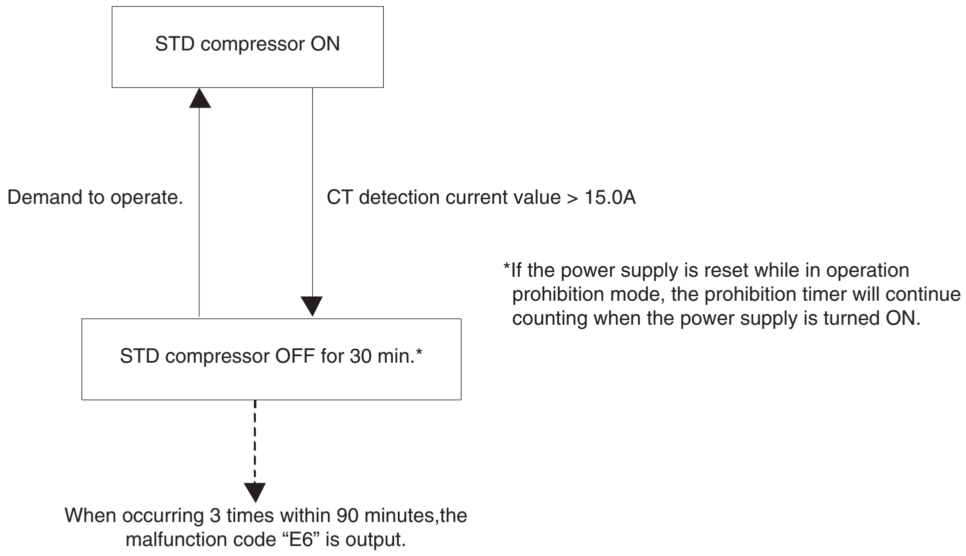


2.9 STD Compressor Overload Protection (only for ERX250A7W1B)

General

This control is used to prevent abnormal heating due to overcurrent to the compressor resulting from failures of STD compressor such as locking.

Overview

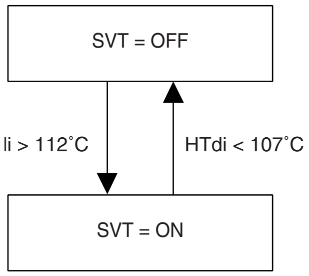


2.10 Injection Control (only for ERX125A7W1B)

General

For transitional rise in discharge pipe temperature, have the liquid refrigerant flow into the suction side to reduce the discharge pipe temperature for the compressor protection.

Overview



HTdi: Correction value of the discharge pipe temperature on the INV compressor.

2.11 Emergency Operation

General

If the compressor cannot operate, this control inhibits any applicable compressor or outdoor unit from operating to perform emergency operation only with the operative compressor or outdoor unit.

Caution

In order to disable the compressor operation due to a failure or else, be sure to do so in emergency operation mode.

NEVER attempt to disconnect power supply wires from magnetic contactors or else. (Doing so will operate compressors in combination that disables oil equalization between the compressors, thus resulting in malfunctions of other normal compressors.)

2.11.1 Restrictions for Emergency Operation

- ➤ In the case of system with 1 outdoor unit installed, only when thermostats of indoor units having a capacity of 50% or more of the outdoor unit capacity turn ON, the emergency operation is functional. (If the total capacity of indoor units with thermostat ON is small, the outdoor unit cannot operate.)
- ➤ If the emergency operation is set while the outdoor unit is in operation, the outdoor unit stops once after pump-down residual operation (a maximum of 5 minutes elapsed).

2.11.2 In the Case of 1-outdoor-unit System (ERX200~250A7W1B)

Procedure

Set the system to operation prohibition mode by compressor.

	LED display (○:ON ●:OFF ◑:Blink) H1P— — — —H7P	
➤ In order to set an INV compressor to operation prohibition mode, set No. 42 of Setting mode 2 to "EMERGENCY OPERATION".		
1 Press and hold the MODE button (BS1) for a period of 5 seconds or more.	○●●●●●●	
2 Press the SET button (BS2) 42 times.	○○●○●○●	(Factory set)
3 Press the RETURN button (BS3) once.	○●●●●●◑	
4 Press the SET button (BS2) once.	○●●●●◑●	
5 Press the RETURN button (BS3) twice.	○●●●●●●	
6 Press the MODE button (BS1) once.	●●○●●●●	

➤ In order to set STD1 and STD2 compressors to operation prohibition mode, set No. 19 of Setting mode 2 to "STD1, 2 OPERATION PROHIBITION". (ERX250A7W1)

LED display (○:ON ●:OFF ◑:Blink)
H1P————H7P

1 Press and hold the MODE button (BS1) for a period of 5 seconds or more.	○●●●●●●	
2 Press the SET button (BS2) 19 times.	○●○●●○○	
3 Press the RETURN button (BS3) once.	○●●●●●●	(Factory set)
4 Press the SET button (BS2) once.	○●●●●◑●	
5 Press the RETURN button (BS3) twice.	○●●●●●●	
6 Press the MODE button (BS1) once.	●●○●●●●	

➤ For the system with a single outdoor unit, automatic backup operation is not functional.

Note In order to forcedly clear the automatic backup operation, reset the power supply with the outdoor unit in the stopped state.

2

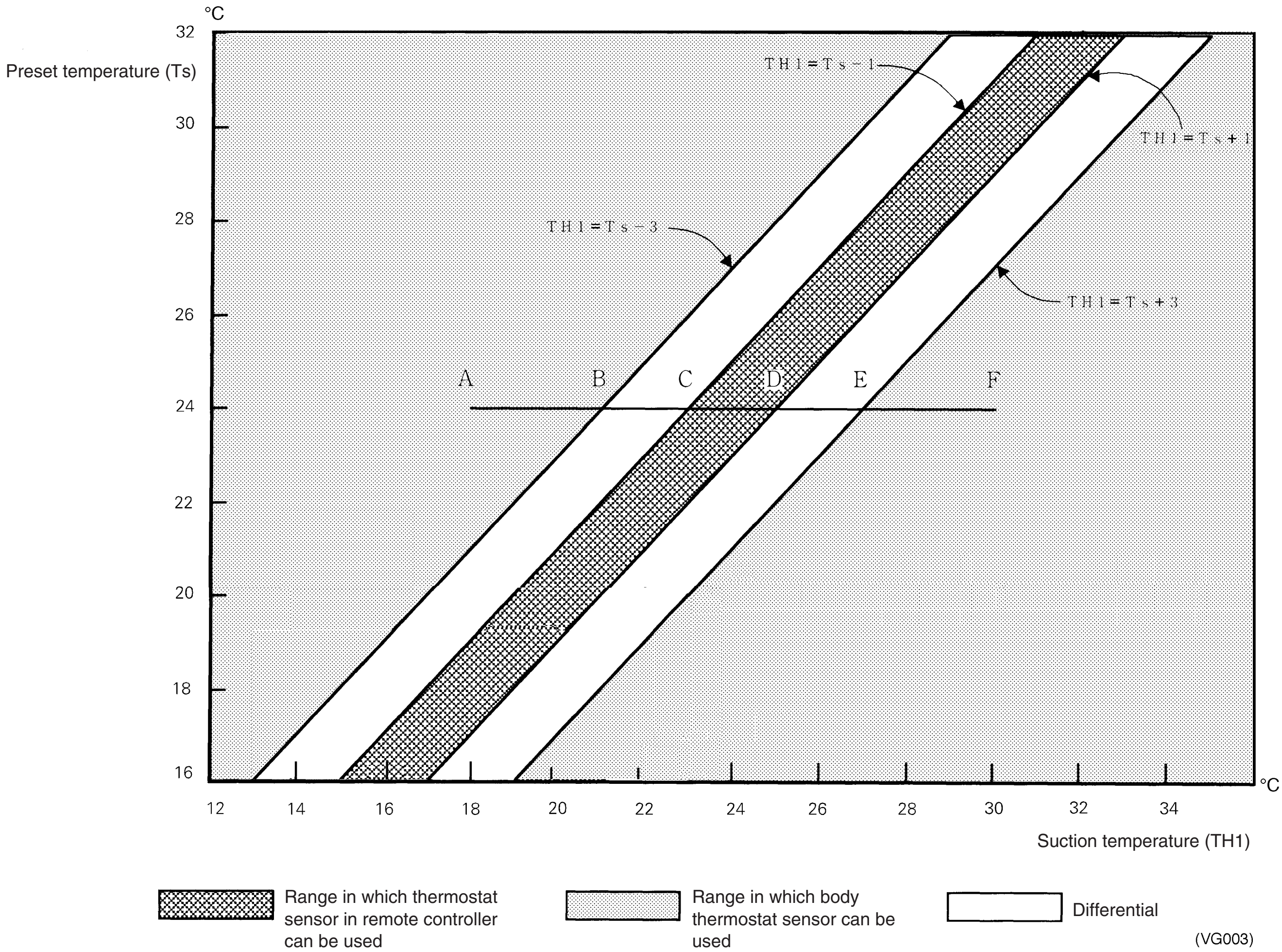
2.12 Thermostat Sensor in Remote Controller

General

Temperature is controlled by both the thermostat sensor in remote controller and air suction thermostat in the indoor unit. (This is however limited to when the field setting for the thermostat sensor in remote controller is set to “Use.”)

Graph

If there is a significant difference in the preset temperature and the suction temperature, fine adjustment control is carried out using a body thermostat sensor, or using the sensor in the remote controller near the position of the user when the suction temperature is near the preset temperature.



(VG003)

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Example

When cooling:

- Assuming the preset temperature in the figure above is 24°C, and the suction temperature has changed from 18°C to 30°C (A → F):
  (This example also assumes there are several other air conditioners, the VRV system is off, and that temperature changes even when the thermostat sensor is off.)
  - Body thermostat sensor is used for temperatures from 18°C to 23°C (A → C).
  - Remote controller thermostat sensor is used for temperatures from 23°C to 27°C (C → E).
  - Body thermostat sensor is used for temperatures from 27°C to 30°C (E → F).
- And, assuming suction temperature has changed from 30°C to 18°C (F → A):
  - Body thermostat sensor is used for temperatures from 30°C to 25°C (F → D).
  - Remote controller thermostat sensor is used for temperatures from 25°C to 21°C (D → B).
  - Body thermostat sensor is used for temperatures from 21°C to 18°C (B → A).

2.13 Electronic Expansion Valve Control

In cooling, to maximize the capacity of indoor unit heat exchanger (evaporator), operate the electronic expansion valve under PI control so that the evaporator outlet superheated degree (SH) will become constant.

Cooling $SH=TH_2-TH_1$

SH : Evaporator outlet superheated degree

TH_1: Temperature (°C) detected with the liquid thermistor

TH_2: Temperature (°C) detected with the gas thermistor

SC : Condenser outlet subcooled degree

TC : High pressure equivalent saturated temperature

Furthermore, the default value of the optimal evaporator outlet superheated degree (condenser outlet subcooled degree) is 5 deg. However, this default value varies with the operating performance.

2.14 Low Outdoor Air Temperature Protection Control

Objective

In cooling (or fan operation) or heating, if outdoor air is low in temperature, stop the fan forcibly.

Details - Cooling and fan operation

Turn OFF the fan for a period of 60 minutes at a suction temperature of 5°C or lower.

In order to monitor the outdoor air temperature, however, turn ON the fan for a period of one minute and turn OFF the fan again at a temperature of 5°C or lower after the said timer completes the operative period.

Reset the 60-minute timer when the fan stops running.

Part 3
Troubleshooting

What is in this part?

This part contains the following chapters:

3

1 Troubleshooting

1.1 What Is in This Chapter?

3

Introduction

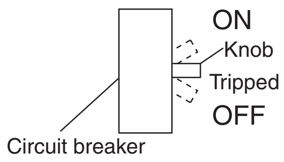
When a problem occurs, you have to check all possible malfunctions. This chapter gives a general idea of where to look for malfunctions.

Not all repair procedures are described. Some procedures are considered common practice.

Overview

This chapter contains the following topics:

1.2 Symptom-based Troubleshooting

<table>
<tr><th></th><th colspan="2">Symptom</th><th>Supposed Cause</th><th>Countermeasure</th></tr>
<tr><td rowspan="3">1</td><td colspan="2" rowspan="3">The system does not start operation at all.</td><td>Blowout of fuse(s)</td><td>Turn Off the power supply and then replace the fuse(s).</td></tr>
<tr><td>Cutout of breaker(s)</td><td>➤ If the knob of any breaker is in its OFF position, turn ON the power supply.
➤ If the knob of any circuit breaker is in its tripped position, do not turn ON the power supply.
</td></tr>
<tr><td>Power failure</td><td>After the power failure is reset, restart the system.</td></tr>
<tr><td rowspan="2">2</td><td colspan="2" rowspan="2">The system starts operation but makes an immediate stop.</td><td>Blocked air inlet or outlet of indoor or outdoor unit</td><td>Remove obstacle(s).</td></tr>
<tr><td>Clogged air filter(s)</td><td>Clean the air filter(s).</td></tr>
<tr><td rowspan="10">3</td><td colspan="2">The system does not cool or heat air well.</td><td>Blocked air inlet or outlet of indoor or outdoor unit</td><td>Remove obstacle(s).</td></tr>
<tr><td colspan="2"></td><td>Clogged air filter(s)</td><td>Clean the air filter(s).</td></tr>
<tr><td colspan="2"></td><td>Enclosed outdoor unit(s)</td><td>Remove the enclosure.</td></tr>
<tr><td colspan="2"></td><td>Improper set temperature</td><td>Set the temperature to a proper degree.</td></tr>
<tr><td colspan="2"></td><td>Airflow rate set to "LOW"</td><td>Set it to a proper airflow rate.</td></tr>
<tr><td colspan="2"></td><td>Improper direction of air diffusion</td><td>Set it to a proper direction.</td></tr>
<tr><td colspan="2"></td><td>Open window(s) or door(s)</td><td>Shut it tightly.</td></tr>
<tr><td colspan="2">[In cooling]</td><td>Direct sunlight received</td><td>Hang curtains or shades on windows.</td></tr>
<tr><td colspan="2">[In cooling]</td><td>Too many persons staying in a room</td><td rowspan="2"></td></tr>
<tr><td colspan="2">[In cooling]</td><td>Too many heat sources (e.g. OA equipment) located in a room</td></tr>
<tr><td rowspan="4">4</td><td rowspan="4">The system does not operate.</td><td>The system stops and immediately restarts operation.</td><td rowspan="2">If the OPERATION lamp on the remote controller turns ON, the system will be normal. These symptoms indicate that the system is controlled so as not to put unreasonable loads on the system.</td><td rowspan="2">Normal operation. The system will automatically start operation after a lapse of five minutes.</td></tr>
<tr><td>Pressing the TEMP ADJUST button immediately resets the system.</td></tr>
<tr><td>The remote controller displays "UNDER CENTRALIZED CONTROL", which blinks for a period of several seconds when the OPERATION button is depressed.</td><td>The system is controlled with centralized controller. Blinking display indicates that the system cannot be operated using the remote controller.</td><td>Operate the system using the COOL/HEAT centralized remote controller.</td></tr>
<tr><td>The system stops immediately after turning ON the power supply.</td><td>The system is in preparation mode of micro computer operation.</td><td>Wait for a period of approximately one minute.</td></tr>
</table>

	Symptom		Supposed Cause	Countermeasure
5	The system makes intermittent stops.	The remote controller displays malfunction codes "U4" and "U5", and the system stops but restarts after a lapse of several minutes.	The system stops due to an interruption in communication between units caused by electrical noises coming from equipment other than air conditioners.	Remove causes of electrical noises. If these causes are removed, the system will automatically restart operation.
6	COOL-HEAT selection is disabled.	The remote controller displays "UNDER CENTRALIZED CONTROL".	This remote controller has no option to select cooling operation.	Use a remote controller with option to select cooling operation.
		The remote controller displays "UNDER CENTRALIZED CONTROL", and the COOL-HEAT selection remote controller is provided.	COOL-HEAT selection is made using the COOL-HEAT selection remote controller.	Use the COOL-HEAT selection remote controller to select cool or heat.
7	The system conducts fan operation but not cooling or heating operation.	This symptom occurs immediately after turning ON the power supply.	The system is in preparation mode of operation.	Wait for a period of approximately 10 minutes.
8	The airflow rate is not reproduced according to the setting.	Even pressing the AIRFLOW RATE SET button makes no changes in the airflow rate.	In heating operation, when the room temperature reaches the set degree, the outdoor unit will stop while the indoor unit is brought to fan LL operation so that no one gets cold air. Furthermore, if fan operation mode is selected when other indoor unit is in heating operation, the system will be brought to fan LL operation. (The fan LL operation is also enabled while in oil return mode in cooling operation.)	Normal operation.
9	The airflow direction is not reproduced according to the setting.	The airflow direction is not corresponding to that displayed on the remote controller. The flap does not swing.	Automatic control	Normal operation.
10	A white mist comes out from the system.	<Indoor unit> In cooling operation, the ambient humidity is high. (This indoor unit is installed in a place with much oil or dust.)	Uneven temperature distribution due to heavy stain of the inside of the indoor unit	Clean the inside of the indoor unit.
		<Indoor unit> Immediately after cooling operation stopping, the ambient temperature and humidity are low.	Hot gas (refrigerant) flown in the indoor unit results to be vapor from the unit.	Normal operation.
		<Indoor and outdoor units> After the completion of defrosting operation, the system is switched to heating operation.	Defrosted moisture turns to be vapor and comes out from the units.	Normal operation.

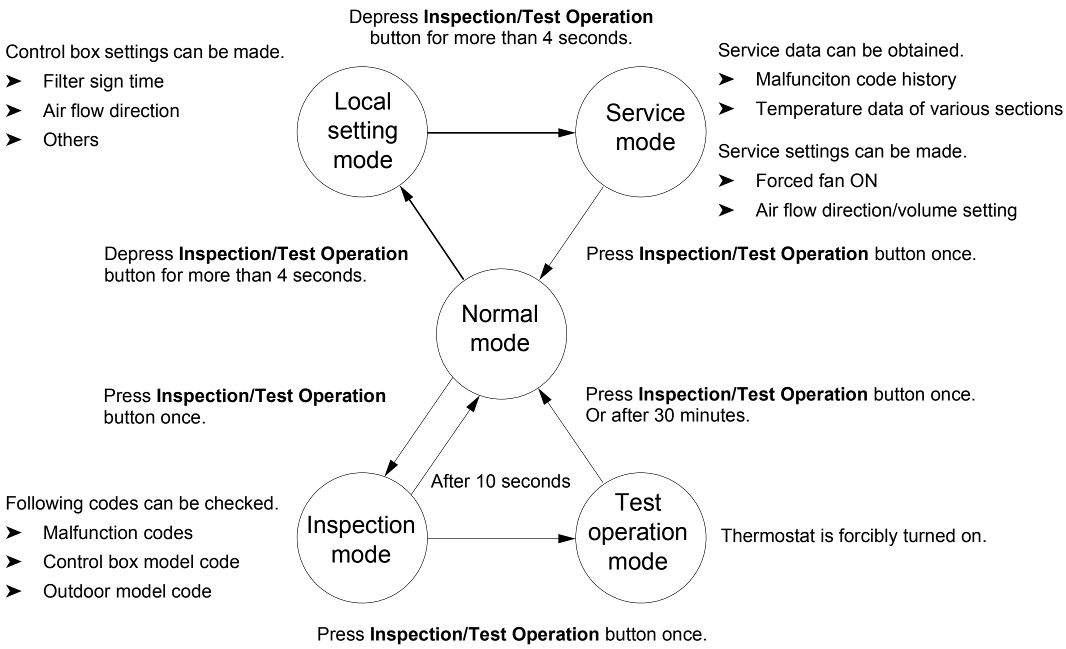
	Symptom		Supposed Cause	Countermeasure
11	The system produces sounds.	<Indoor unit> Immediately after turning ON the power supply, indoor unit produces "ringing" sounds.	These are operating sounds of the electronic expansion valve of the indoor unit.	Normal operation. This sound becomes low after a lapse of approximately one minute.
		<Indoor and outdoor units> "Hissing" sounds are continuously produced while in cooling or defrosting operation.	These sounds are produced from gas (refrigerant) flowing respectively through the indoor and outdoor units.	Normal operation.
		<Indoor and outdoor units> "Hissing" sounds are produced immediately after the startup or stop of the system, or the startup or stop of defrosting operation.	These sounds are produced when the gas (refrigerant) stops or changes flowing.	Normal operation.
		<Indoor unit> Faint sounds are continuously produced while in cooling operation or after stopping the operation.	These sounds are produced from the drain discharge device in operation.	Normal operation.
		<Indoor unit> "Creaking" sounds are produced while in heating operation or after stopping the operation.	These sounds are produced from resin parts expanding and contracting with temperature changes.	Normal operation.
		<Indoor unit> Sounds like "trickling" or the like are produced from indoor units in the stopped state.	On VRV systems, these sounds are produced when other indoor units in operation. The reason is that the system runs in order to prevent oil or refrigerant from dwelling.	Normal operation.
		<Outdoor unit> Pitch of operating sounds changes.	The reason is that the compressor changes the operating frequency.	Normal operation.
12	Dust comes out from the system.	Dust comes out from the system when it restarts after the stop for an extended period of time.	Dust, which has deposited on the inside of indoor unit, is blown out from the system.	Normal operation.
13	Odors come out from the system.	In operation	Odors of room, cigarettes or else adsorbed to the inside of indoor unit are blown out.	The inside of the indoor unit should be cleaned.
14	Outdoor unit fan does not rotate.	In operation	The reason is that fan revolutions are controlled to put the operation to the optimum state.	Normal operation.
15	LCD display "88" appears on the remote controller.	Immediately after turning ON the power supply	The reason is that the system is checking to be sure the remote controller is normal.	Normal operation. This code is displayed for a period of approximately one minute at maximum.
16	The outdoor unit compressor or the outdoor unit fan does not stop.	After stopping operation	It stops in order to prevent oil or refrigerant from dwelling.	Normal operation. It stops after a lapse of approximately 5 to 10 minutes.

	Symptom		Supposed Cause	Countermeasure
17	The outdoor gets hot.	While stopping operation	The reason is that the compressor is warmed up to provide smooth startup of the system.	Normal operation.
18	Hot air comes out from the system even though it stops.	Hot air is felt while the system stops.	On VRV systems, small quantity of refrigerant is fed to indoor units in the stopped state when other indoor units are in operation.	Normal operation.
19	The system does not cool air well.	The system is in dry operation.	The reason is that the dry operation serves not to reduce the room temperature where possible.	Change the system to cooling operation.

1.3 Troubleshooting by Remote Controller

The inspection/test button

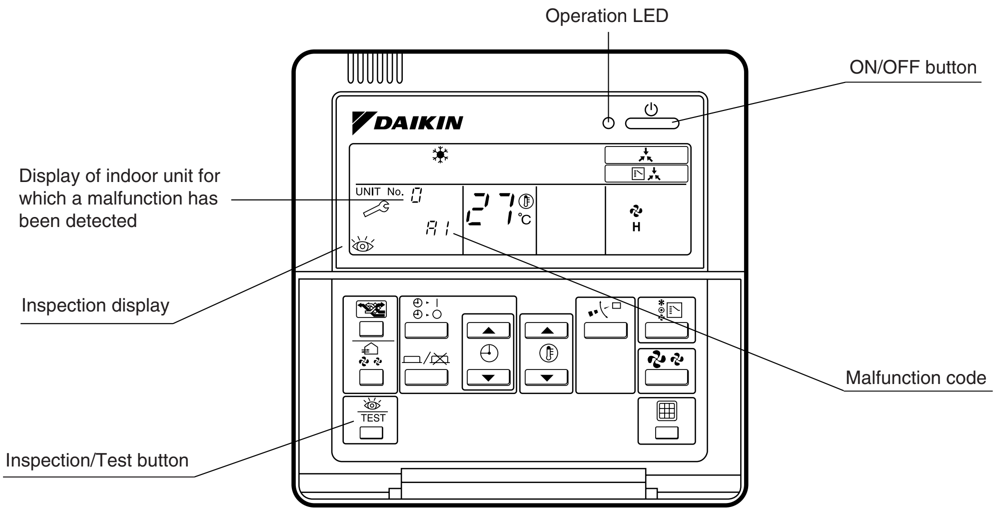
The following modes can be selected by using the [Inspection/Test Operation] button on the remote control.



1.4 Self-diagnosis by Wired Remote Controller

Explanation

If operation stops due to malfunction, the remote controller's operation LED blinks, and malfunction code is displayed. (Even if stop operation is carried out, malfunction contents are displayed when the inspection mode is entered.) The malfunction code enables you to tell what kind of malfunction caused operation to stop. See page 3-14 for malfunction code and malfunction contents.



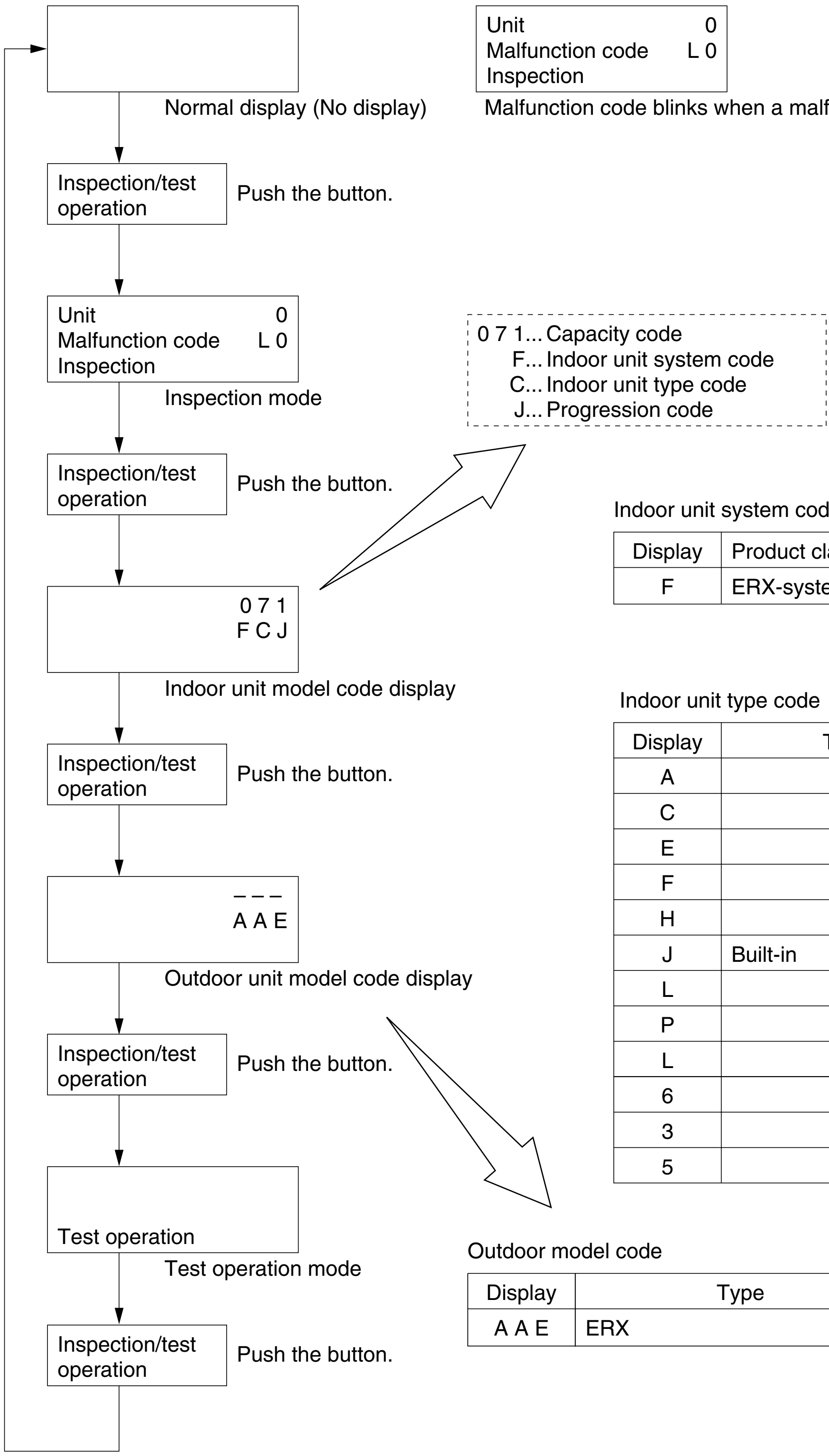
Note:

1 Pressing the INSPECTION/TEST button will blink the check indication.

2 While in check mode, pressing and holding the ON/OFF button for a period of five seconds or more will clear the failure history indication shown above. In this case, on the codes display, the malfunction code will blink twice and then change to “00” (=Normal), the Unit No. will change to “0”, and the operation mode will automatically switch from check mode to normal mode (displaying the set temperature).

3

1.5 Operation of The Remote Controller's Inspection / Test Operation Button



Example of capacity code display

Example model	Display
FXCQ25	028
FXFQ63	071

Indoor unit system code

Display	Product classification	System classification
F	ERX-system	Standard control box

Indoor unit type code

Display	Type	Model
A		N.A
C		N.A
E		N.A
F		N.A
H		N.A
J	Built-in	EKEXD-F
L		N.A
P		N.A
L		N.A
6		N.A
3		N.A
5		N.A

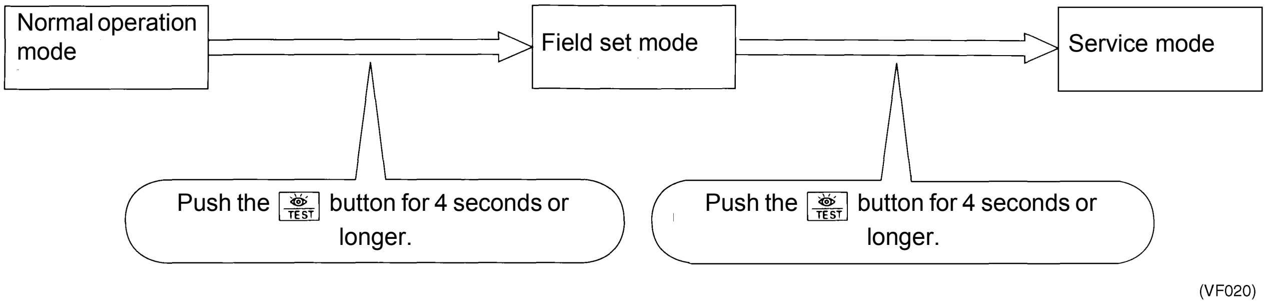
Outdoor model code

Display	Type	Model
A A E	ERX	ERXW1

(V2775)

1.6 Remote Controller Service Mode

How to enter the service mode



Service mode operation method

1 Select the mode No.

Set the desired mode No. with the button.

2 Make the settings required for each mode. (Modes 40, 41)

For details, refer to the table in next page.

3 Return to the normal operation mode.

Push the TEST button one time.

Overview table

Mode No	Function	Contents and operation method	Remote controller display example
40	Malfunction hysteresis display	Display malfunction hysteresis. The history No. can be changed with the button.	Unit 1 Malfunction code 40 2-U4 Malfunction code Hystory No: 1 - 9 1: Latest (VE007)
41	Display of sensor and address data	Display various types of data. Select the data to be displayed with the button. Sensor data **0** Thermostat sensor in remote controller. **1** Suction **2** Liquid pipe **3** Gas pipe	Sensor data display Unit No. Sensor type 1 1 41 2 7 Temperature ºC

3

1.7 Overview of Error Codes ERX125~250A7W1B

☀: Blink ☼: ON ●: OFF

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	See page
Indoor Unit	A0	☀	☀	☀	Error of external protection device	3–26
	A1	☀	☀	☀	PC board defect, E^2 PROM defect	3–27
	A9	☀	☀	☀	Malfunction of moving part of electronic expansion valve (20E)	3–28
	AJ	☀	☀	☀	Malfunction of capacity setting	3–30
	C4	☀	☀	☀	Malfunction of thermistor (R2T) for heat exchange (loose connection, disconnection, short circuit, failure)	3–31
	C5	☀	☀	☀	Malfunction of thermistor (R3T) for gas pipes (loose connection, disconnection, short circuit, failure)	3–32
	C9	☀	☀	☀	Malfunction of thermistor (R1T) for air inlet (loose connection, disconnection, short circuit, failure)	3–33
	CJ	☼	☼	☼	Malfunction of thermostat sensor in remote controller	3–35
Outdoor Unit	E1	☀	☀	☀	PC board defect, E^2 PROM defect	3–39
	E3	☀	☀	☀	Actuation of high pressure switch	3–40
	E4	☀	☀	☀	Actuation of low pressure switch	3–43
	E5	☀	☀	☀	Compressor motor lock	3–45
	E6	☀	☀	☀	Standard compressor lock or over current	3–48
	E7	☀	☀	☀	Malfunction of outdoor unit fan motor	3–50
	E9	☀	☀	☀	Malfunction of moving part of electronic expansion valve (Y1E~3E)	3–54
	F3	☀	☀	☀	Abnormal discharge pipe temperature	3–56
	F6	☀	☀	☀	Refrigerant overcharged	3–57
	H7	☀	☀	☀	Abnormal outdoor fan motor signal	3–60
	H9	☀	☀	☀	Malfunction of thermistor (R1T) for outdoor air (loose connection, disconnection, short circuit, failure)	3–62
	J2	☀	☀	☀	Current sensor malfunction	3–63
	J3	☀	☀	☀	Malfunction of discharge pipe thermistor (R3T) (loose connection, disconnection, short circuit, failure)	3–64
	J5	☀	☀	☀	Malfunction of thermistor (R2T) for suction pipe (loose connection, disconnection, short circuit, failure)	3–66
	J6	☀	☀	☀	Malfunction of thermistor (R4T) for heat exchanger (loose connection, disconnection, short circuit, failure)	3–67
	J7	☀	☀	☀	Malfunction of header thermistor	3–68
	J9	☀	☀	☀	Malfunction of receiver gas pipe thermistor (R5T)	3–69
	JA	☀	☀	☀	Malfunction of discharge pipe pressure sensor	3–70
	JC	☀	☀	☀	Malfunction of suction pipe pressure sensor	3–72
	L0	☀	☀	☀	Inverter system error	—

☀: Blink ☼: ON ●: OFF

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	See page
Outdoor Unit	L4	☀	☀	☀	Malfunction of inverter radiating fin temperature rise	3–75
	L5	☀	☀	☀	Inverter compressor motor grounding, short circuit	3–77
	L8	☀	☀	☀	Inverter current abnormal	3–80
	L9	☀	☀	☀	Inverter start up error	3–83
	LA	☀	☀	☀	Malfunction of power unit	—
	LC	☀	☀	☀	Malfunction of transmission between inverter and control PC board	3–86
	P1	☀	☀	☀	Inverter over-ripple protection	3–90
	P4	☀	☀	☀	Malfunction of inverter radiating fin temperature rise sensor	3–93
	PJ	☀	☀	☀	Faulty combination inverter and fan driver, Malfunction of capacity setting	3–95
System	U0	☼	●	☀	Low pressure drop due to refrigerant shortage or electronic expansion valve failure	3–98
	U1	☀	☀	☀	Reverse phase / open phase	3–103
	U2	☀	☀	☀	Power supply insufficient or instantaneous failure	3–104
	U3	☀	☀	☀	Check operation is not conducted.	3–109
	U4	☀	☀	☀	Malfunction of transmission between control box and outdoor units	3–110
	U5	☀	☀	☀	Malfunction of transmission between remote controller and control box	3–112
	U5	●	☼	●	Failure of remote controller PC board or setting during control by remote controller	3–112
	U8	☀	☀	●	Malfunction of transmission between master and slave remote controllers (malfunction of slave remote controller)	3–114
	UA	☀	☀	☀	Excessive number of control boxes etc.	3–115
	UH	☀	☀	☀	Malfunction of system, refrigerant system address undefined	3–117

Remark

The system operates for malfunction codes indicated in shaded squares, however, be sure to check and repair.

3

1.8 Overview of Error Codes ERX100~140A8V3B

☀: Blink ☼: ON ●: OFF

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
Indoor Unit	A0	☀	☀	☀	Error of external protection device	3–26
	A1	☀	☀	☀	PC board defect, E^2 PROM defect	3–27
	A9	☀	☀	☀	Malfunction of moving part of electronic expansion valve (20E)	3–28
	AJ	☀	☀	☀	Malfunction of capacity setting	3–30
	CA	☀	☀	☀	Malfunction of Thermistor for Discharge Air	3–34
	C4	☀	☀	☀	Malfunction of thermistor (R2T) for heat exchange (loose connection, disconnection, short circuit, failure)	3–31
	C5	☀	☀	☀	Malfunction of thermistor (R3T) for gas pipes (loose connection, disconnection, short circuit, failure)	3–32
	C9	☀	☀	☀	Malfunction of thermistor (R1T) for air inlet (loose connection, disconnection, short circuit, failure)	3–33
	CJ	☼	☀	☼	Malfunction of thermostat sensor in remote controller	3–35
Outdoor Unit	E1	☀	☀	☀	PC board defect	3–39
	E3	☀	☀	☀	Actuation of high pressure switch	3–40
	E4	☀	☀	☀	Actuation of low pressure sensor	3–43
	E5	☀	☀	☀	Compressor motor lock	3–45
	E6	☀	☀	☀	Standard compressor lock or over current	3–48
	E7	☀	☀	☀	Malfunction of outdoor unit fan motor	3–50
	E9	☀	☀	☀	Malfunction of moving part of electronic expansion valve (Y1E, Y2E)	3–54
	F3	☀	☀	☀	Abnormal discharge pipe temperature	3–56
	F6	☀	☀	☀	Refrigerant overcharged	3–59
	H3	☼	●	☀	Failure of high pressure switch	—
	H4	☀	☀	☀	Actuation of low pressure switch	—
	H7	☀	☀	☀	Abnormal outdoor fan motor signal	3–60
	H9	☀	☀	☀	Malfunction of thermistor (R1T) for outdoor air (loose connection, disconnection, short circuit, failure)	3–62
	J2	☀	☀	☀	Current sensor malfunction	—
	J3	☀	☀	☀	Malfunction of discharge pipe thermistor (R31~32T) (loose connection, disconnection, short circuit, failure)	3–64
	J5	☀	☀	☀	Malfunction of thermistor (R3T, R5T) for suction pipe (loose connection, disconnection, short circuit, failure)	3–66
	J6	☀	☀	☀	Malfunction of thermistor (R4T) for heat exchanger (loose connection, disconnection, short circuit, failure)	3–67
	J7	☀	☀	☀	Malfunction of receiver outlet liquid pipe thermistor (R7T)	3–68

◐: Blink ☼: ON ●: OFF

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
Outdoor Unit	J9	◐	◐	◐	Malfunction of subcooling heat exchanger gas pipe thermistor (R5T)	3–69
	JA	◐	◐	◐	Malfunction of discharge pipe pressure sensor	3–70
	JC	◐	◐	◐	Malfunction of suction pipe pressure sensor	3–72
	L0	◐	◐	◐	Inverter system error	—
	L1	◐	◐	◐	Malfunction of PC board	3–74
	L4	◐	◐	◐	Malfunction of inverter radiating fin temperature rise	3–75
	L5	◐	◐	◐	DC output overcurrent of inverter compressor	3–77
	L8	◐	◐	◐	Inverter current abnormal	3–80
	L9	◐	◐	◐	Inverter start up error	3–83
	LA	◐	◐	◐	Malfunction of power unit	—
	LC	◐	◐	◐	Malfunction of transmission between inverter and control PC board	3–89
	P1	◐	◐	◐	High voltage of capacitor in main inverter circuit.	3–92
	P4	☼	◐	☼	Malfunction of inverter radiating fin temperature rise sensor	3–93
System	U0	☼	●	◐	Low pressure drop due to refrigerant shortage or electronic expansion valve failure	3–100
	U1	◐	◐	◐	Reverse phase / open phase	3–103
	U2	◐	◐	◐	Power supply insufficient or instantaneous failure	3–107
	U3	◐	◐	◐	Check operation is not completed.	3–109
	U4	◐	◐	◐	Malfunction of transmission between indoor and outdoor units	3–110
	U5	◐	◐	◐	Malfunction of transmission between remote controller and indoor unit	3–112
	U5	●	☼	●	Failure of remote controller PC board or setting during control by remote controller	3–112
	U8	◐	◐	●	Malfunction of transmission between main and sub remote controllers (malfunction of sub remote controller)	3–114
	UA	◐	◐	◐	Improper combination of indoor and outdoor units, indoor units and remote controller	3–115
	UH	◐	◐	◐	Malfunction of system, refrigerant system address undefined	3–117

Remark

The system operates for malfunction codes indicated in shaded squares, however, be sure to check and repair.

1.9 Malfunction Code Indication by Outdoor Unit PCB (ERX125~250A7W1B)

<Monitor mode>

To enter the monitor mode, push the MODE (BS1) button when in “Setting mode 1”.

* Refer for Monitor mode.

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

* Refer for Monitor mode.

<Confirmation of malfunction 1>

Push the RETURN (BS3) button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET (BS2) button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>

Push the SET (BS2) button once to display "malfunction location".

Detail description on next page.

<Confirmation of malfunction 4>

Push the SET (BS2) button once to display "master or slave 1 or slave 2" and "malfunction location".

Push the RETURN (BS3) button and switches to the initial status of “Monitor mode”.

∗ Push the MODE (BS1) button and returns to “Setting mode 1”.

Contents of malfunction		Malfunction code
Abnormal discharge pressure	HPS activated	E3
Abnormal suction pressure	Abnormal Pe	E4
Compressor lock	Detection of INV compressor lock	E5
Activation of OC	Detection of STD1 compressor lock	E6
	Detection of STD2 compressor lock	
Over load, over current, abnormal lock of outdoor unit fan motor	Instantaneous over current of DC fan 1 motor	E7
	Detection of DC fan 1 motor lock	
	Instantaneous over current of DC fan 2 motor	
	Detection of DC fan 2 motor lock	
Malfunction of electronic expansion valve	EV1	E9
	EV2	
	EV3	
Abnormal position signal of outdoor unit fan motor	Abnormal position signal of DC fan 1 motor	H7
	Abnormal position signal of DC fan 2 motor	
Faulty sensor of outdoor air temperature	Faulty Ta sensor (short)	H9
	Faulty Ta sensor (open)	
Abnormal discharge pipe temperature	Abnormal Td	F3
Abnormal heat exchanger temperature	Refrigerant over charge	F6
Faulty current sensor	Faulty CT1 sensor	J2
	Faulty CT2 sensor	
Faulty sensor of discharge pipe temperature	Faulty Tdi sensor (short)	J3
	Faulty Tds1 sensor (short)	
	Faulty Tds2 sensor (short)	
	Faulty Tdi sensor (open)	
	Faulty Tds1 sensor (open)	
	Faulty Tds2 sensor (open)	
Faulty sensor of suction pipe temperature	Faulty Ts1 sensor (short)	J5
	Faulty Ts1 sensor (open)	
	Faulty Ts2 sensor (short)	
	Faulty Ts2 sensor (open)	
Faulty sensor of heat exchanger temperature	Faulty Tb sensor (short)	J6
	Faulty Tb sensor (open)	
Malfunction of the liquid pipe temperature sensor	Faulty Tl sensor (short)	J7
	Faulty Tl sensor (open)	
Faulty sensor of subcool heat exchanger temperature	Faulty Tsh sensor (short)	J9
	Faulty Tsh sensor (open)	
Faulty sensor of discharge pressure	Faulty Pc sensor (short)	JA
	Faulty Pc sensor (open)	
Faulty sensor of suction pressure	Faulty Pe sensor (short)	JC
	Faulty Pe sensor (open)	
Instantaneous power failure	∗NO display on remote controller (Judge during compressor operation)	(L2)
Inverter radiation fin temperature rising	Over heating of inverter radiation fin temperature	L4
DC output over current	Inverter instantaneous over current	L5
	IGBT malfunction	L5
Electronic thermal	Electronic thermal switch 1	L8
	Electronic thermal switch 2	
	Out-of-step	
	Speed down after startup	
	Lightening detection	
Stall prevention (Limit time)	Stall prevention (Current increasing)	L9
	Stall prevention (Faulty start up)	
	Abnormal wave form in startup	
	Out-of-step	
Transmission error between inverter and outdoor unit	Inverter transmission error	LC

☀: Blink ☼: ON ●: OFF

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
E3	☀			●	●	☀	☀	☀			●	●	☀	☀	☀			●	●	●	●	☀			●	●	*1	
E4								☀			●	☀	●	●	☀			●	●	●	●	☀			●	●		
E5								☀			●	☀	●	☀	☀			●	●	●	●	☀			●	●		
E6								☀			●	☀	☀	●	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	●	☀			●	☀		
E7								☀			●	☀	☀	☀	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	●	☀			●	☀		
															☀			●	●	●	☀	☀			●	●		
															☀			●	●	●	☀	☀			●	☀		
E9								☀			☀	●	●	☀	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	●	☀			●	☀		
															☀			●	●	●	●	☀			☀	●		
H7	☀			●	☀	●	●	☀			●	☀	☀	☀	☀			●	●	●	●	☀			●	●	*1	
															☀			●	●	●	☀	☀			●	●		
H9								☀			☀	●	●	☀	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	☀	☀			●	●		
F3	☀			●	☀	●	☀	☀			●	●	☀	☀	☀			●	●	●	●	☀			●	●	*1	
F6								☀			●	☀	☀	●	☀			●	●	●	●	☀			●	●	☀	☀
J2	☀			●	☀	☀	●	☀			●	●	☀	●	☀			●	●	●	●	☀			●	●	*1	
															☀			●	●	●	●	☀			●	☀		
J3								☀			●	●	☀	☀	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	●	☀			●	☀		
															☀			●	●	●	●	☀			☀	●		
															☀			●	●	●	☀	☀			●	●		
															☀			●	●	●	☀	☀			●	☀		
															☀			●	●	●	☀	☀			☀	●		
J5								☀			●	☀	●	☀	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	☀	☀			●	●		
															☀			●	●	●	●	☀			●	☀		
															☀			●	●	●	☀	☀			●	☀		
J6								☀			●	☀	☀	●	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	☀	☀			●	●		
J7								☀			●	☀	☀	☀	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	☀	☀			●	●		
J9								☀			☀	●	●	☀	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	☀	☀			●	●		
JA								☀			☀	●	☀	●	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	☀	☀			●	●		
JC								☀			☀	☀	●	●	☀			●	●	●	●	☀			●	●		
															☀			●	●	●	☀	☀			●	●		

◐: Blink ☼: ON ●: OFF

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
(L2)	◐			●	◐	◐	◐	◐			●	●	◐	●	◐			●	●	●	●	◐			●	●	∗1	
L4								◐			●	◐	●	●	◐			●	●	●	●	◐			●	●		
L5								◐			●	◐	●	◐	◐			●	●	●	●	◐			●	●		
L5															◐			●	●	●	●	◐			●	◐		
L8								◐			◐	●	●	●	◐			●	●	●	●	◐			●	●		
															◐			●	●	●	●	◐			●	◐		
															◐			●	●	●	●	◐			◐	●		
															◐			●	●	●	◐	◐			●	●		
L9								◐			◐	●	●	◐	◐			●	●	●	●	◐			●	●		
															◐			●	●	●	●	◐			●	◐		
															◐			●	●	●	●	◐			◐	●		
LC								◐			◐	◐	●	●	◐			●	●	●	●	◐			●	◐		

H4P–H7P of malfunction 1: Display of contents of malfunction (first digit)

H4P–H7P of malfunction 2: Display of contents of malfunction (second digit)

H4P–H7P of malfunction 3: Display 1 of malfunction in detail

H4P–H7P of malfunction 4: Display 2 of malfunction in detail

∗1

H4P	H5P	
●	●	Master
●	◐	Slave1
◐	●	Slave2
◐	◐	System

<Monitor mode>

To enter the monitor mode, push the MODE (BS1) button when in "Setting mode 1".

* Refer for Monitor mode.

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

* Refer for Monitor mode.

<Confirmation of malfunction 1>

Push the RETURN (BS3) button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET (BS2) button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>

Push the SET (BS2) button once to display "malfunction location".

Detail description on next page.

<Confirmation of malfunction 4>

Push the SET (BS2) button once to display "master or slave 1 or slave 2" and "malfunction location".

Push the RETURN (BS3) button and switches to the initial status of "Monitor mode".

* Push the MODE (BS1) button and returns to "Setting mode 1".

Contents of malfunction		Malfunction code
Open phase/Power supply imbalance	Imbalance of inverter power supply voltage	P1
Faulty temperature sensor inside switch box	Faulty thermistor of inverter box	P3
Faulty temperature sensor of inverter radiation fin	Faulty thermistor of inverter fin	P4
Incorrect combination of Inverter and fan driver	Incorrect combination of inverter	PJ
	Incorrect combination of fan driver 1	
	Incorrect combination of fan driver 2	
Gas shortage	Gas shortage alarm	U0
Reverse phase	Reverse phase error	U1
Abnormal power supply voltage	Insufficient Inverter voltage	U2
	Inverter open phase (phase T)	
	Charging error of capacitor in inverter main circuit	
No implementation of test-run		U3
Transmission error between indoor and outdoor unit	I/O transmission error	U4
	I/O transmission error	
Transmission error between outdoor units, transmission error between thermal storage units, duplication of IC address	Sequential startup ADP alarm	U7
	Sequential startup ADP malfunction	U7
	Malfunction of transmission between multi units (Multi 1)	
	Malfunction of transmission between multi units (Multi 2)	
	Abnormal multi horsepower setting	
	Abnormal multi address setting	
	Excessive multi connections	
	Multi system malfunction	
Transmission error of other system	Indoor unit system abnormal in other system or other indoor unit system abnormal in own system	U9
Erroneous field setting	System transmission malfunction	UA
	Overconnection malfunction of indoor units	
	Malfunction of field setting	
	Refrigerant abnormal	
	Multi-ID abnormal	
	Alarm of TSS field setting	UA
	Alarm of CT address setting	
Faulty system malfunction	Wiring error (Auto-address error)	UH
Transmission error in accessory devices	Malfunction of multi-level connection	UJ
	Alarm of multi-level connection	UJ
Conflict in wiring and piping, no setting for system	Conflict in wiring and piping	UF

3

◑: Blink ☼: ON ●: OFF

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
P1	◑			◑	●	●	●	◑			●	●	●	◑	◑			●	●	●	●	◑			●	●	*1	
P3								◑			●	●	◑	◑	◑			●	●	●	●	◑			●	●		
P4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●		
PJ								◑			◑	◑	●	◑	◑			●	●	●	●	◑			●	●		
															◑			●	●	●	●	◑			●	◑		
															◑			●	●	●	●	◑			◑	●		
U0	◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●	●	●	◑			●	●	◑	◑
U1								◑			●	●	●	◑	◑			●	●	●	●	◑			●	●		
U2								◑			●	●	◑	●	◑			●	●	●	●	◑			●	●		
															◑			●	●	●	●	◑			●	◑		
U3								◑			●	●	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
U4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
U7								◑			●	◑	◑	◑	◑			●	●	●	●	◑			●	◑	◑	◑
U7															◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			◑	●	◑	◑
															◑			●	●	●	●	◑			◑	◑	◑	◑
															◑			●	●	●	◑	◑			●	●	◑	◑
															◑			●	●	●	◑	◑			●	◑	◑	◑
															◑			●	●	●	◑	◑			◑	●	◑	◑
															◑			●	●	●	◑	◑			◑	◑	◑	◑
U9								◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●	◑	◑
UA								◑			◑	●	◑	●	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
															◑			●	●	●	●	◑			◑	●	◑	◑
															◑			●	●	●	◑	◑			●	●	◑	◑
															◑			●	●	●	◑	◑			●	◑	◑	◑
UA															◑			●	●	●	◑	◑			◑	●	◑	◑
															◑			●	●	●	◑	◑			◑	◑	◑	◑
UH								◑			◑	●	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑
UJ								◑			◑	◑	●	◑	◑			●	●	●	●	◑			●	●	*1	
UJ															◑			●	●	●	●	◑			●	◑		
UF								◑			◑	◑	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑

Display of contents of malfunction (first digit) (Confirmation of malfunction 1, H4P–H7P)

Display of contents of malfunction (second digit) (Confirmation of malfunction 2, H4P–H7P)

Display 1 of malfunction in detail (Confirmation of malfunction 3, H4P–H7P)

Display 2 of malfunction in detail (Confirmation of malfunction 4, H4P–H7P)

*1

H4P	H5P	
●	●	Master
●	◑	Slave1
◑	●	Slave2
◑	◑	System

1.10 Malfunction Code Indication by Outdoor Unit PCB (ERX100~140A8V3B)

<Monitor mode>

To enter the monitor mode, push the MODE (BS1) button when in "Setting mode 1".

↓

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

↓

<Confirmation of malfunction 1>

Push the RETURN (BS3) button once to display "First digit" of malfunction code.

↓

<Confirmation of malfunction 2>

Push the SET (BS2) button once to display "Second digit" of malfunction code.

↓

<Confirmation of malfunction 3>

Push the SET (BS2) button once to display "malfunction location".

Detail description on next page.

↓

<Confirmation of malfunction 4>

Push the SET (BS2) button once to display "master or slave 1 or slave 2" and "malfunction location".

↓

Push the RETURN (BS3) button and switches to the initial status of "Monitor mode".

 Push the MODE (BS1) button and returns to "Setting mode 1".

Contents of malfunction		Malfunction code
In-phase malfunction of DIII Net	Detection of DIII Net	E1
Abnormal discharge pressure	HPS activated	E3
Abnormal suction pressure	Abnormal Pe	E4
Compressor lock	Detection of INV compressor lock	E5
Over load, over current, abnormal lock of outdoor unit fan motor	Detection of DC fan 1 motor lock	E7
	Detection of DC fan 2 motor lock	
Malfunction of electronic expansion valve	EV1	E9
	EV3	
Faulty sensor of outdoor air temperature	Faulty Ta sensor (short)	H9
Abnormal discharge pipe temperature	Abnormal Td	F3
Abnormal heat exchanger temperature	Refrigerant over charge	F6
Faulty sensor of discharge pipe temperature	Faulty Tdi sensor (short)	J3
Faulty sensor of suction pipe temperature	Faulty Ts1 sensor (short)	J5
	Faulty Ts2 sensor (short)	
Faulty sensor of heat exchanger temperature	Faulty Tb sensor (short)	J6
Malfunction of the liquid pipe temperature sensor	Faulty Tl sensor (short)	J7
Faulty sensor of subcool heat exchanger temperature	Faulty Tsh sensor (short)	J9
Faulty sensor of discharge pressure	Faulty Pc sensor (short)	JA
Faulty sensor of suction pressure	Faulty Pe sensor (short)	JC
Faulty Inverter PC board	Faulty IPM	L1
	Abnormal Current sensor offset	
	Abnormal IGBT	
	Faulty Current sensor	
	Abnormal SP-PAM over-voltage	
Inverter radiation fin temperature rising	Over heating of inverter radiation fin temperature	L4
DC output over current	Inverter instantaneous over current	L5
Electronic thermal	Electronic thermal switch 1	L8
	Electronic thermal switch 2	
	Out-of-step	
	Speed down after startup	
	Lightening detection	
Stall prevention (Limit time)	Stall prevention (Current increasing)	L9
	Stall prevention (Faulty start up)	
	Abnormal wave form in startup	
	Out-of-step	
Transmission error between inverter and outdoor unit	Inverter transmission error	LC

◐: Blink ☼: ON ●: OFF

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
E1	◐			●	●	◐	◐	◐			●	●	●	◐	◐	☼	●	●	●	●	●	◐	☼	☼	●	●	◐	◐
E3								◐			●	●	◐	◐	◐			●	●	●	●	◐			●	●		
E4								◐			●	◐	●	●	◐			●	●	●	●	◐			●	●		
E5								◐			●	◐	●	◐	◐			●	●	●	●	◐			●	●		
E7								◐			●	◐	◐	◐	◐			●	●	●	●	◐			●	◐	*1	
															◐			●	●	●	◐	◐			●	◐		
E9								◐			◐	●	●	◐	◐			●	●	●	●	◐			●	●		
															◐			●	●	●	●	◐			◐	●		
H9								◐			◐	●	●	◐	◐			●	●	●	●	◐			●	●	*1	
F3	◐			●	◐	●	◐	◐			●	●	◐	◐	◐			●	●	●	●	◐			●	●	*1	
F6								◐			●	◐	◐	●	◐			●	●	●	●	◐			●	●	◐	◐
J3	◐			●	◐	◐	●	◐			●	●	◐	◐	◐			●	●	●	●	◐			●	●		
J5								◐			●	◐	●	◐	◐			●	●	●	●	◐			●	●		
															◐			●	●	●	●	◐			●	◐		
J6								◐			●	◐	◐	●	◐			●	●	●	●	◐			●	●	*1	
J7								◐			●	◐	◐	◐	◐			●	●	●	●	◐			●	●		
J9								◐			◐	●	●	◐	◐			●	●	●	●	◐			●	●		
JA								◐			◐	●	◐	●	◐			●	●	●	●	◐			●	●		
JC								◐			◐	◐	●	●	◐			●	●	●	●	◐			●	●		
L1	◐			●	◐	◐	◐	◐			●	●	●	◐	◐			●	●	●	●	◐			●	●	●	●
								◐			●	●	●	◐	◐			●	●	●	●	◐			●	●	●	◐
								◐			●	●	●	◐	◐			●	●	●	●	◐			●	●	◐	●
								◐			●	●	●	◐	◐			●	●	●	●	◐			●	●	◐	◐
								◐			●	●	●	◐	◐			●	●	●	●	◐			●	◐	●	●
L4								◐			●	◐	●	●	◐			●	●	●	●	◐			●	●		
L5								◐			●	◐	●	◐	◐			●	●	●	●	◐			●	●		
L8								◐			◐	●	●	●	◐			●	●	●	●	◐			●	●		
															◐			●	●	●	●	◐			●	◐		
															◐			●	●	●	●	◐			◐	●		
															◐			●	●	●	◐	◐			●	●	*1	
L9								◐			◐	●	●	◐	◐			●	●	●	●	◐			●	●		
															◐			●	●	●	●	◐			●	◐		
															◐			●	●	●	●	◐			◐	●		
LC								◐			◐	◐	●	●	◐			●	●	●	●	◐			●	◐		

Display of contents of malfunction (first digit) — Display of contents of malfunction (second digit) — Display 1 of malfunction in detail — Display 2 of malfunction in detail

*1

H4P	H5P	
●	●	Master
●	◐	Slave1
◐	●	Slave2
◐	◐	System

<Monitor mode>

To enter the monitor mode, push the MODE (BS1) button when in “Setting mode 1”.

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

<Confirmation of malfunction 1>

Push the RETURN (BS3) button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET (BS2) button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>

Push the SET (BS2) button once to display "malfunction location".

Detail description on next page.

<Confirmation of malfunction 4>

Push the SET (BS2) button once to display "master or slave 1 or slave 2" and "malfunction location".

Push the RETURN (BS3) button and switches to the initial status of “Monitor mode”.

Push the MODE (BS1) button and returns to “Setting mode 1”.

Contents of malfunction		Malfunction code
Open phase/Power supply imbalance	Imbalance of inverter power supply voltage	P1
Faulty temperature sensor of inverter radiation fin	Faulty thermistor of inverter fin	P4
Gas shortage	Gas shortage alarm	U0
Abnormal power supply voltage	Insufficient Inverter voltage	U2
	Faulty charge of capacitor in main inverter circuit	
	Malfunction due to SP-PAM overvoltage	
	Malfunction due to P-N short circuit	
No implementation of test-run		U3
Transmission error between indoor and outdoor unit	I/O transmission error	U4
	I/O transmission error	
Transmission error of other system	Indoor unit system abnormal in other system or other indoor unit system abnormal in own system	U9
Erroneous field setting	System transmission malfunction	UA
	Overconnection malfunction of indoor units	
	Malfunction of field setting	
	Refrigerant abnormal	
	Connection error (BP unit)	
Faulty system malfunction	Wiring error (Auto-address error)	UH
Conflict in wiring and piping, no setting for system	Conflict in wiring and piping	UF

◐: Blink ☼: ON ●: OFF

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
P1	◐			◐	●	●	●	◐			●	●	●	◐	◐			●	●	●	●	◐			●	●	∗1	
P4								◐			●	◐	●	●	◐			●	●	●	●	◐			●	●		
U0	◐			◐	●	●	◐	◐			●	●	●	●	◐			●	●	●	●	◐			●	●	◐	◐
U2								◐			●	●	◐	●	◐			●	●	●	●	◐			●	●	∗1	
															◐			●	●	●	●				●	◐		
															◐			●	●	●	●	◐			●	●	◐	●
															◐			●	●	●	●	◐			●	●	●	◐
U3								◐			●	●	◐	◐	◐			●	●	●	●	◐			●	●	◐	◐
															◐			●	●	●	●	◐			●	◐	◐	◐
U4								◐			●	◐	●	●	◐			●	●	●	●	◐			●	●	◐	◐
															◐			●	●	●	●	◐			●	◐	◐	◐
U9								◐			◐	●	●	◐	◐			●	●	●	●	◐			●	●	◐	◐
UA								◐			◐	●	◐	●	◐			●	●	●	●	◐			●	●	◐	◐
															◐			●	●	●	●	◐			●	◐	◐	◐
															◐			●	●	●	●	◐			◐	●	◐	◐
															◐			●	●	●	◐	◐			●	●	◐	◐
															◐			●	●	◐	●	◐			●	◐	◐	◐
UH								◐			◐	●	◐	◐	◐			●	●	●	●	◐			●	●	◐	◐
UF								◐			◐	◐	◐	◐	◐			●	●	●	●	◐			●	●	◐	◐
				Display of contents of malfunction (first digit)							Display of contents of malfunction (second digit)							Display 1 of malfunction in detail							Display 2 of malfunction in detail			

∗1

●	●	Master
●	◐	Slave1
◐	●	Slave2
◐	◐	System

2 Error Codes: Indoor Unit Expansion Valve Kit

2.1 What Is in This Chapter?

Introduction

In the first stage of the troubleshooting sequence, it is important to correctly interpret the error code on the remote controller display. The error code helps you to find the cause of the problem.

Shutdown

For some errors, the system only shuts down when the error occurs several times. This means that you have to wait until the system shuts down to be able to see the flashing LED on the front panel and the error code on the remote controller.

Overview

This chapter contains the following topics:

2.2 "A0" Indoor Unit: Error of External Protection Device

Error code A0

Applicable models All indoor unit models

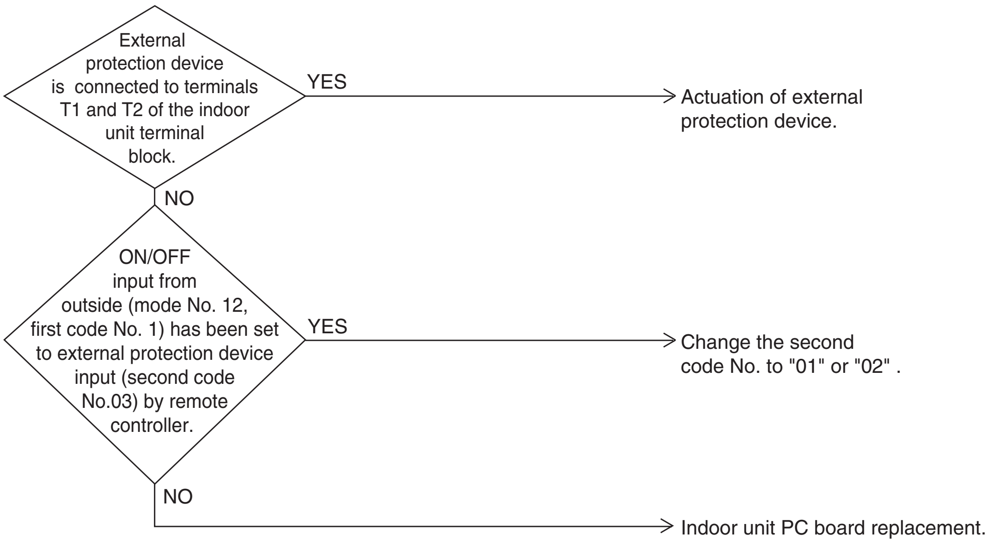
Method of malfunction detection Detect open or short circuit between external input terminals in indoor unit.

Malfunction decision conditions When an open circuit occurs between external input terminals with the remote controller set to "external ON/OFF terminal".

Supposed causes

- ➤ Actuation of external protection device
- ➤ Improper field set
- ➤ Defect of indoor unit PC board

Troubleshooting



Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

2.3 "A1" Indoor Unit: PC Board Defect

Error code

A1

Applicable models

All indoor unit models

Method of malfunction detection

Check data from E²PROM.

Malfunction decision conditions

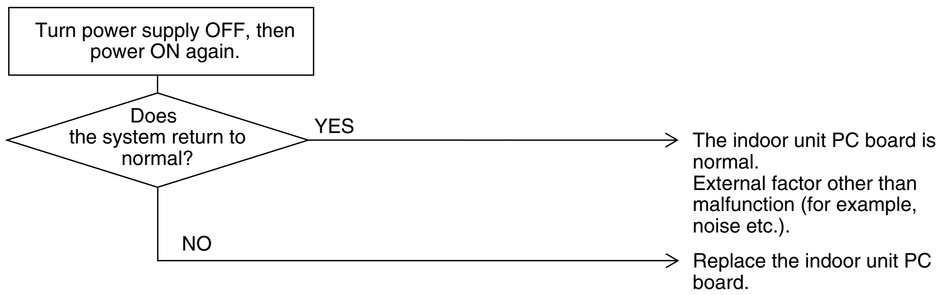
When data could not be correctly received from the E²PROM

E²PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.

Supposed causes

Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

2.4 "A9" Indoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

Error code
A9

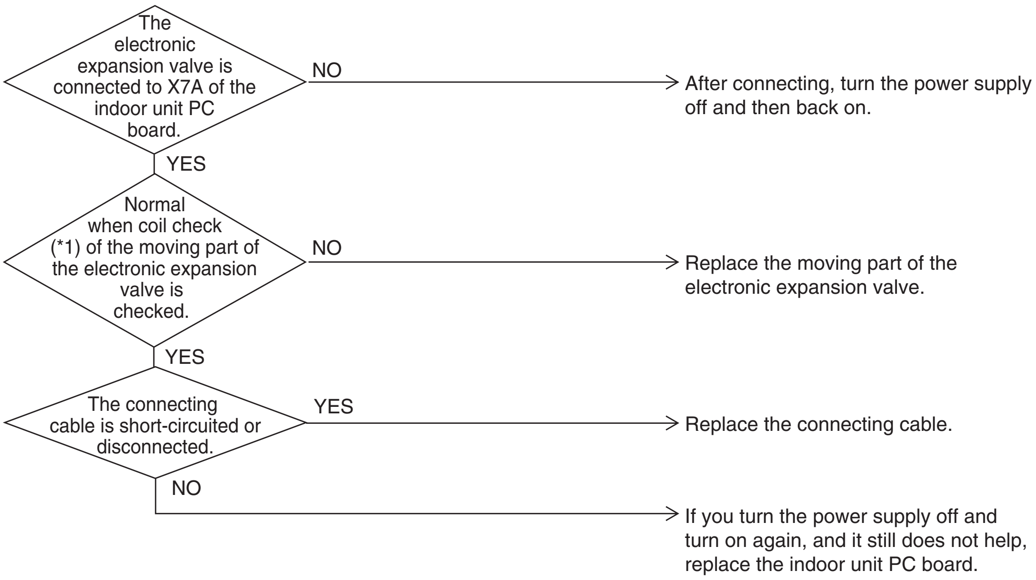
Applicable models
All indoor unit models

Method of malfunction detection
Use a microcomputer to check the electronic expansion valve for coil conditions.

Malfunction decision conditions
When the pin input of the electronic expansion valve is not normal while in the initialization of the microcomputer.

Supposed causes
- Malfunction of moving part of electronic expansion valve
- Defect of indoor unit PC board
- Defect of connecting cable

Troubleshooting



Note
∗1: Coil check method for the moving part of the electronic expansion valve
Discount the electronic expansion valve from the PC board and check the continuity between the connector pins.

Caution
Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Table

(Normal)

Pin No.	1. White	2. Yellow	3. Orange	4. Blue	5. Red	6. Brown
1. White		×	○ Approx. 300Ω	×	○ Approx. 150Ω	×
2. Yellow			×	○ Approx. 300Ω	×	○ Approx. 150Ω
3. Orange				×	○ Approx. 150Ω	×
4. Blue					×	○ Approx. 150Ω
5. Red						×
6. Brown						

○: Continuity

×: No continuity

3

2.5 "AJ" Indoor Unit: Malfunction of Capacity Determination Device

Error code

AJ

Applicable models

All indoor unit models

Method of malfunction detection

Capacity is determined according to resistance of the capacity setting adaptor and the memory inside the IC memory on the indoor unit PC board, and whether the value is normal or abnormal is determined.

Malfunction decision conditions

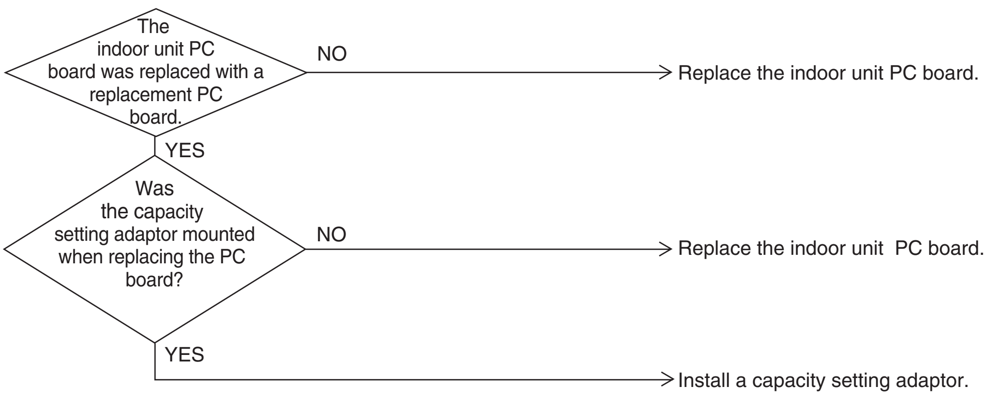
Operation and:

1. When the capacity code is not contained in the PC board's memory, and the capacity setting adaptor is not connected.
2. When a capacity that does not exist for that unit is set.

Supposed causes

- You have forgotten to install the capacity setting adaptor.
- Defect of indoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

2.6 "C4" Indoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger

Error code C4

Applicable models All indoor unit models

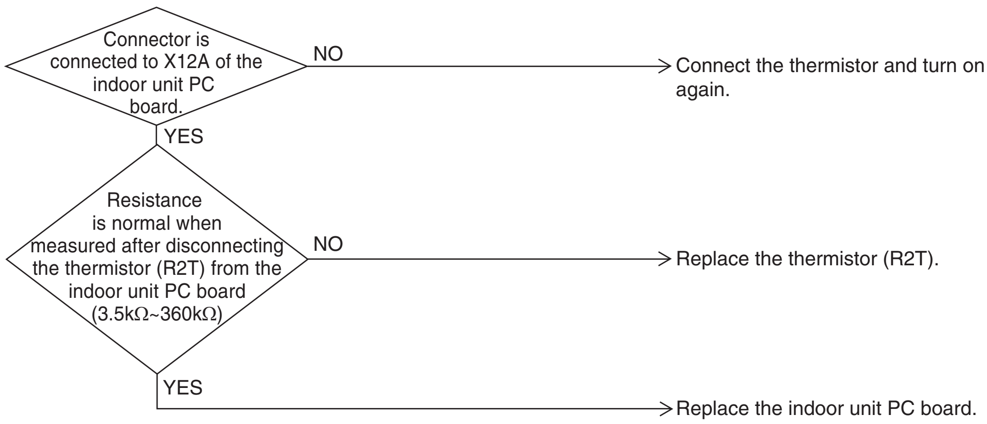
Method of malfunction detection Malfunction detection is carried out by temperature detected by heat exchanger thermistor.

Malfunction decision conditions When the heat exchanger thermistor becomes disconnected or shorted while the unit is running.

Supposed causes

- ➤ Defect of thermistor (R2T) for liquid pipe
- ➤ Defect of indoor unit PC board

Troubleshooting



* Refer to thermistor resistance / temperature characteristics table on page 2-4.

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

2.7 "C5" Indoor unit: Malfunction of Thermistor (R3T) for Gas Pipes

Error code

C5

Applicable models

All indoor unit models

Method of malfunction detection

Malfunction detection is carried out by temperature detected by gas pipe thermistor.

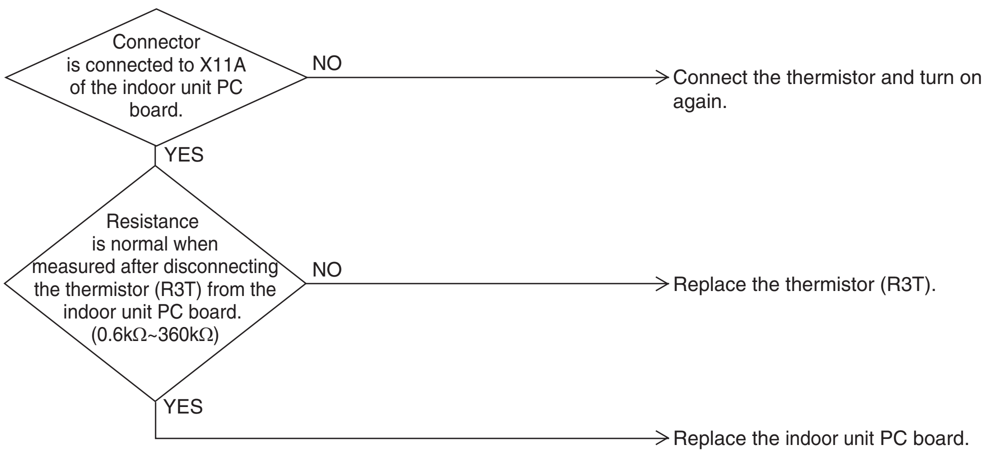
Malfunction decision conditions

When the gas pipe thermistor becomes disconnected or shorted while the unit is running.

Supposed causes

- Defect of indoor unit thermistor (R3T) for gas pipe
- Defect of indoor unit PC board

Troubleshooting



* Refer to thermistor resistance / temperature characteristics table on page 2-4.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

2.8 "C9" Indoor Unit: Malfunction of Thermistor (R1T) for Suction Air

Error code

C9

Applicable models

All indoor unit models

Method of malfunction detection

Malfunction detection is carried out by temperature detected by suction air temperature thermistor.

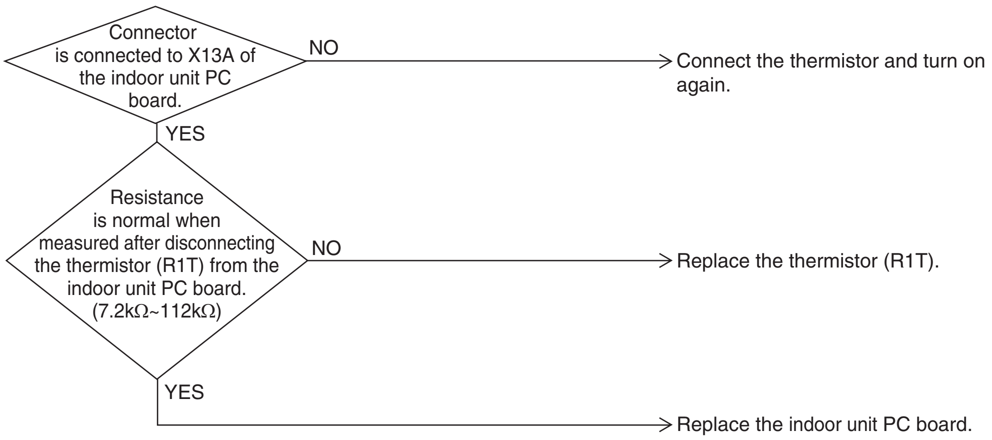
Malfunction decision conditions

When the suction air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed causes

- ➤ Defect of indoor unit thermistor (R1T) for air inlet
- ➤ Defect of indoor unit PC board

Troubleshooting



* Refer to thermistor resistance / temperature characteristics table on page 2-4.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

2.9 "CA" Indoor Unit: Malfunction of Thermistor for Discharge Air

Error code

CA

Applicable models

All indoor unit models

Method of malfunction detection

Malfunction detection is carried out by temperature detected by discharge air temperature thermistor.

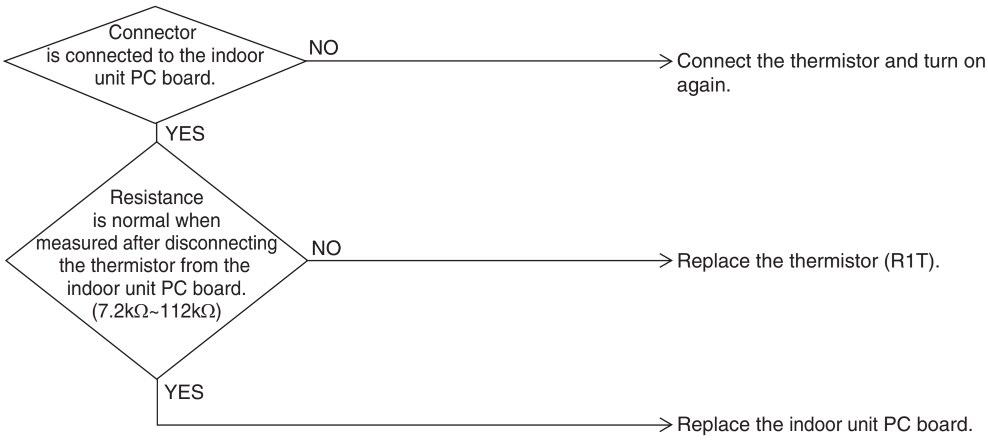
Malfunction decision conditions

When the discharge air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed causes

- Defect of indoor unit thermistor for air outlet
- Defect of indoor unit PC board

Troubleshooting



* Refer to thermistor resistance / temperature characteristics table on page 2-4.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

2.10 "CJ" Indoor Unit: Malfunction of Thermostat Sensor in Remote Controller

Error code

CJ

Applicable models

All indoor unit models.

Method of malfunction detection

Malfunction detection is carried out by temperature detected by remote controller air temperature thermistor. (Note1)

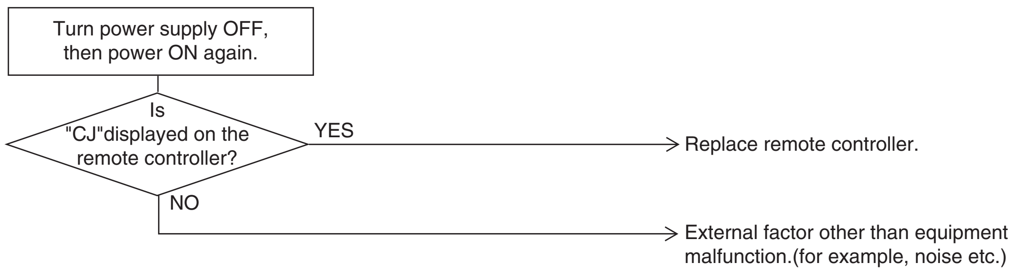
Malfunction decision conditions

When the remote controller air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed causes

- Defect of remote controller thermistor
- Defect of remote controller PC board

Troubleshooting



* Refer to thermistor resistance / temperature characteristics table on page 2-4.

Note

In case of remote controller thermistor malfunction, unit is still operable by suction air thermistor on indoor unit.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3 Error Codes: Outdoor Units

3.1 What Is in This Chapter?

Introduction

In the first stage of the troubleshooting sequence, it is important to correctly interpret the error code on the remote controller display. The error code helps you to find the cause of the problem.

Overview

This chapter contains the following topics:

3.2 "E1" Outdoor Unit: PC Board Defect

Error code

E1

Applicable models

ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Check data from E²PROM.

Malfunction decision conditions

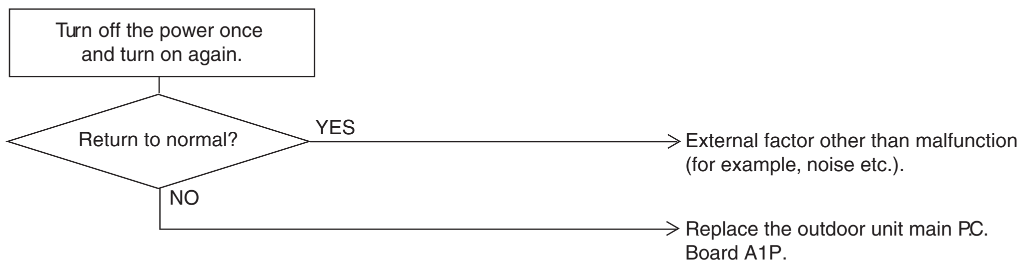
When data could not be correctly received from the E²PROM

E²PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.

Supposed causes

Defect of outdoor unit PC board (A1P)

Troubleshooting



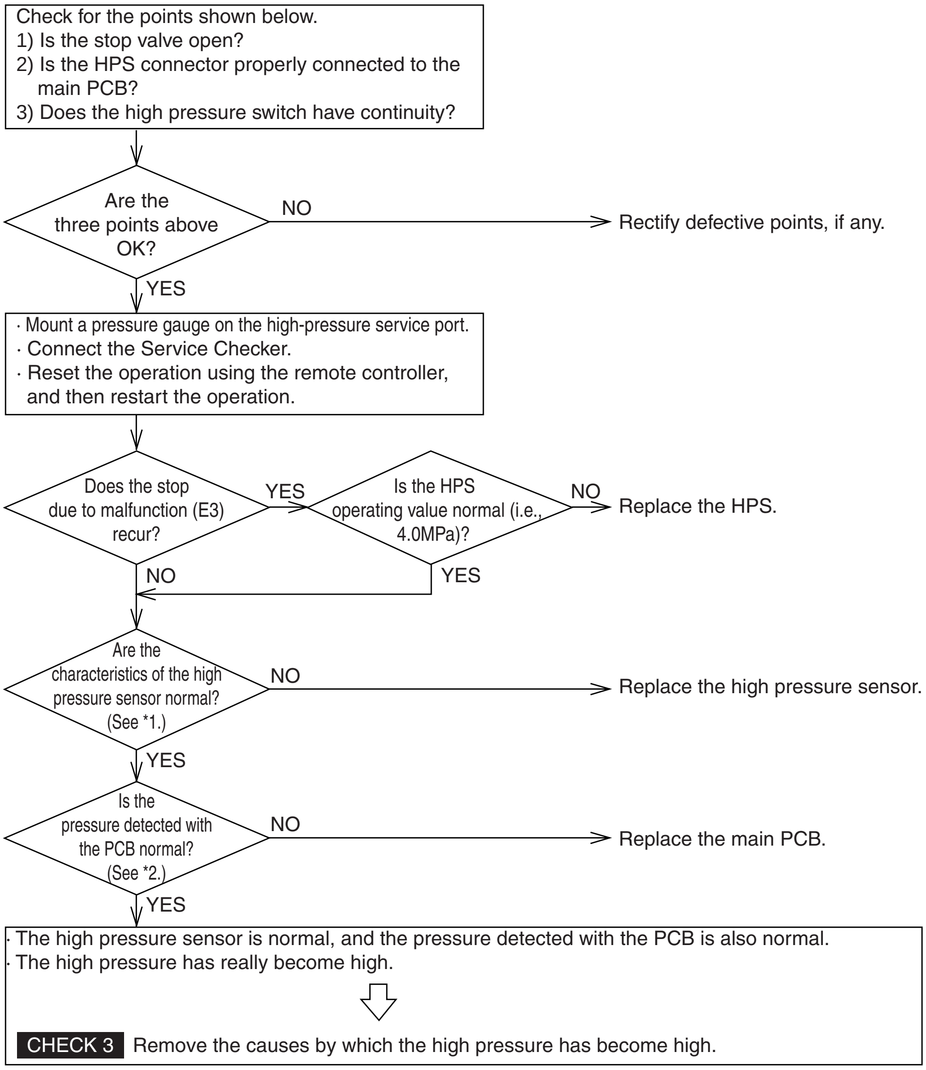
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.3 "E3" Outdoor Unit: Actuation of High Pressure Switch

Error code	E3
Applicable models	ERX125~250A7W1B, ERX100~140A8V3B
Method of malfunction detection	Abnormality is detected when the contact of the high pressure protection switch opens.
Malfunction decision conditions	Error is generated when the HPS activation count reaches the number specific to the operation mode. (Reference) Operating pressure of high pressure switch Operating pressure: 4.0MPa Reset pressure: ERX125~250A7W1B: 2.85MPa / ERX100~140A8V3B: 3.0MPa
Supposed causes	➤ Actuation of outdoor unit high pressure switch ➤ Defect of High pressure switch ➤ Defect of outdoor unit PC board ➤ Instantaneous power failure ➤ Faulty high pressure sensor

Troubleshooting



See also Check No. 3, on page 3-122.

Notes

*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge. (As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information page 2-6.)

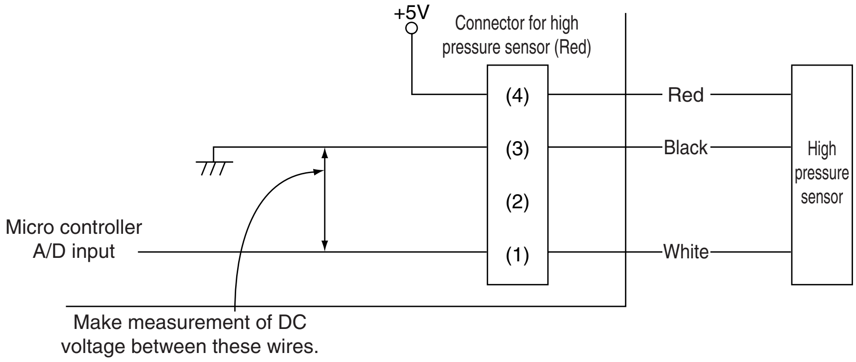
*2: Make a comparison between the high pressure value checked with the Service Checker and the voltage of the pressure sensor (see *1).

*3: Make measurement of voltage of the pressure sensor.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Graph

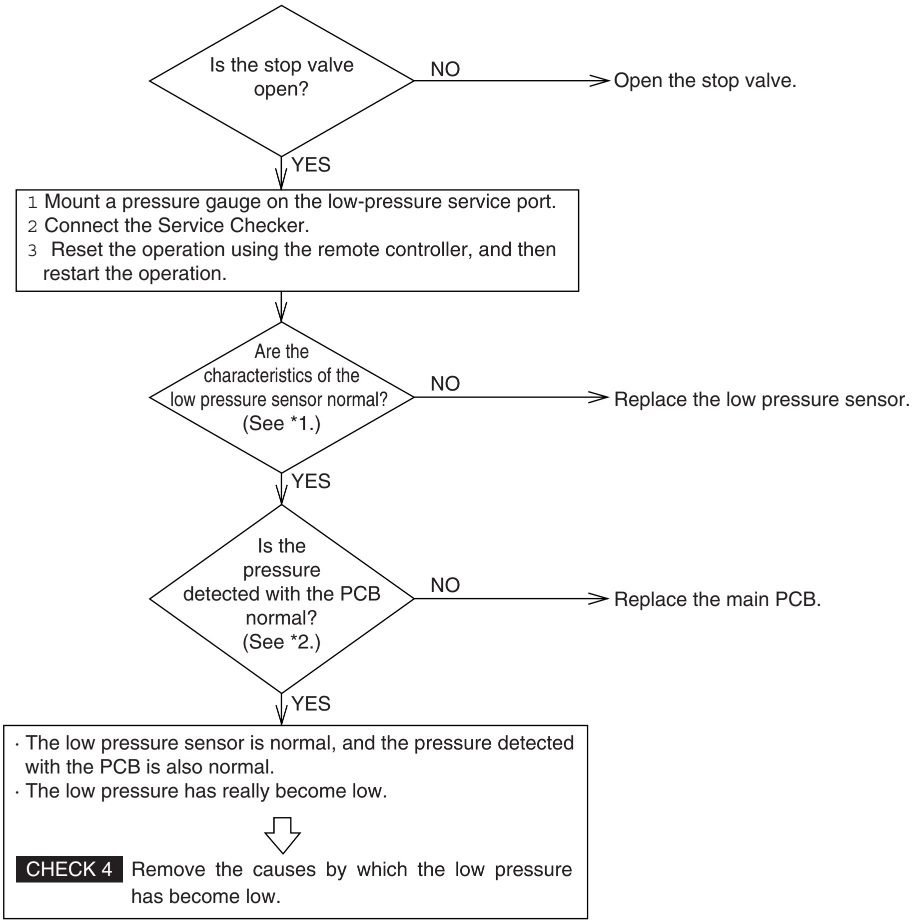

+5V
Connector for high
pressure sensor (Red)
(4)
(3)
(2)
(1)
Red
Black
White
High
pressure
sensor
Micro controller
A/D input
Make measurement of DC
voltage between these wires.

3

3.4 "E4" Outdoor Unit: Actuation of Low Pressure Sensor

Error code	E4
Applicable models	ERX125~250A7W1B, ERX100~140A8V3B
Method of malfunction detection	Abnormality is detected by the pressure value with the low pressure sensor.
Malfunction decision conditions	Error is generated when the low pressure is dropped under specific pressure. Operating pressure: 0.07MPa
Supposed causes	➤ Abnormal drop of low pressure (Lower than 0.07MPa) ➤ Defect of low pressure sensor ➤ Defect of outdoor unit PC board ➤ Stop valve is not opened.

Troubleshooting



See also Check No. 4, on page 3-123.

Notes

*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge. (As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information page 2-6)

*2: Make a comparison between the low pressure value checked with the Service Checker and the voltage of the pressure sensor (see *1).

*3: Make measurement of voltage of the pressure sensor.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

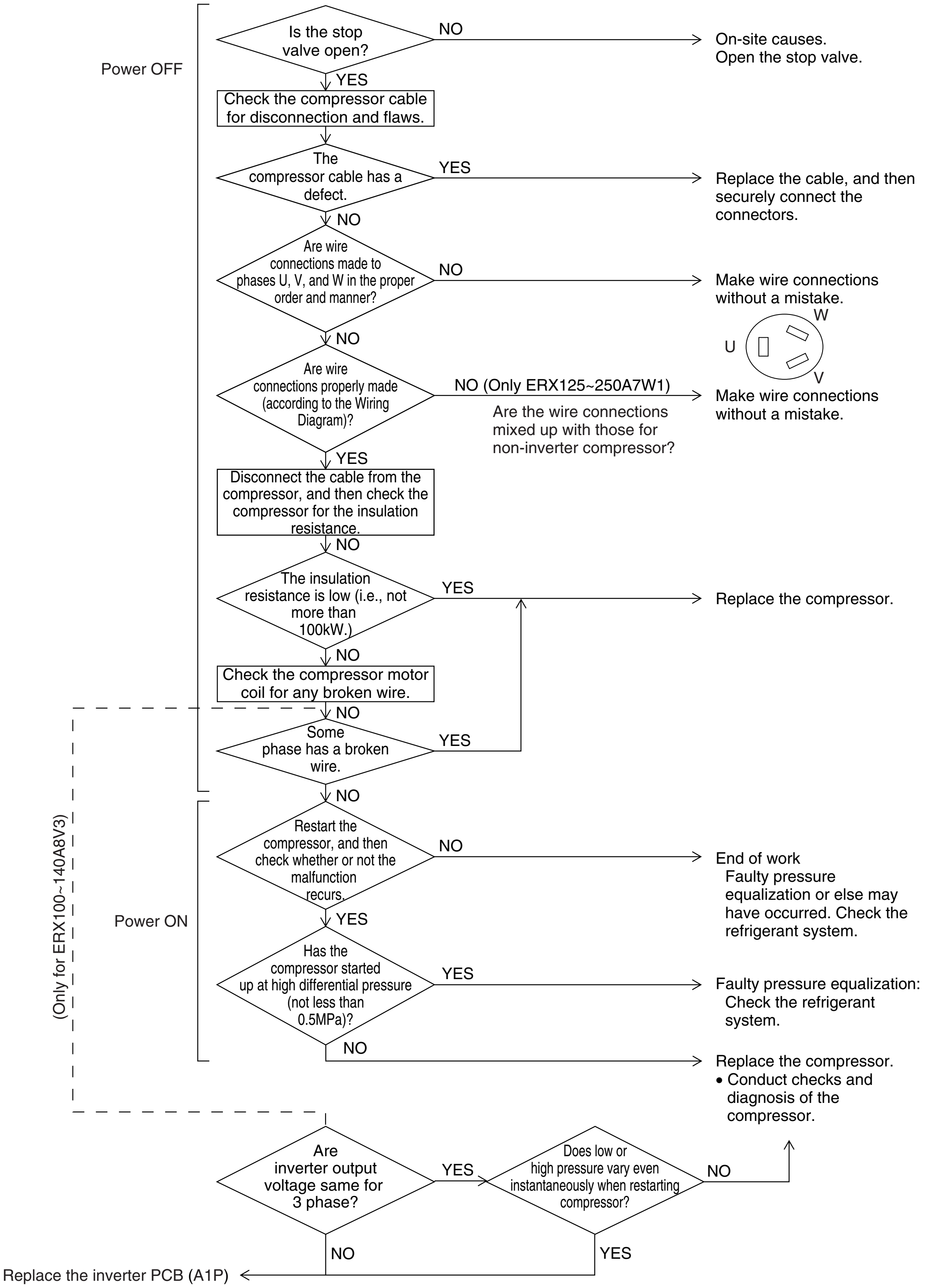
3.5 "E5" Outdoor Unit: Inverter Compressor Motor Lock

Error code	E5
Applicable models	ERX125~250A7W1B, ERX100~140A8V3B
Method of malfunction detection	Inverter PC board takes the position signal from UVW line connected between the inverter and compressor, and the malfunction is detected when any abnormality is observed in the phase-current waveform.
Malfunction decision conditions	This malfunction will be output when the inverter compressor motor does not start up even in forced startup mode.
Supposed causes	➤ Inverter compressor lock ➤ High differential pressure (0.5MPa or more) ➤ Incorrect UVW wiring ➤ Faulty inverter PC board ➤ Stop valve is left in closed.

3

3

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.6 "E6" Outdoor Unit: STD Compressor Motor Overcurrent/Lock (ERX125~250A7W1B)

Error code

E6

Applicable models

ERX125~250A7W1B

Method of malfunction detection

Detects the overcurrent with current sensor (CT).

Malfunction decision conditions

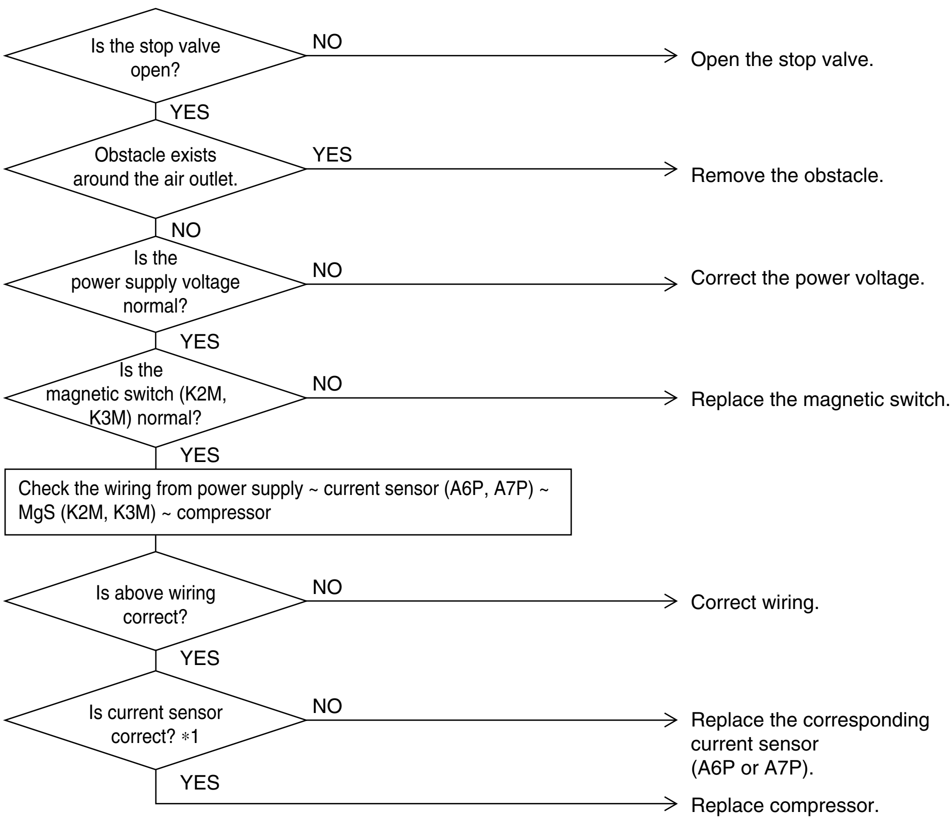
Malfunction is decided when the detected current value exceeds the below mentioned value for 2 seconds.

- 400 V unit : 15.0 A

Supposed causes

- Closed stop value
- Obstacles at the air outlet
- Improper power voltage
- Faulty magnetic switch
- Faulty compressor
- Faulty current sensor (A6P, A7P)

Troubleshooting



Note

∗1 Abnormal case

- ➤ The current sensor value is 0 during STD compressor operation.
- ➤ The current sensor value is more than 15.0A during STD compressor stop.

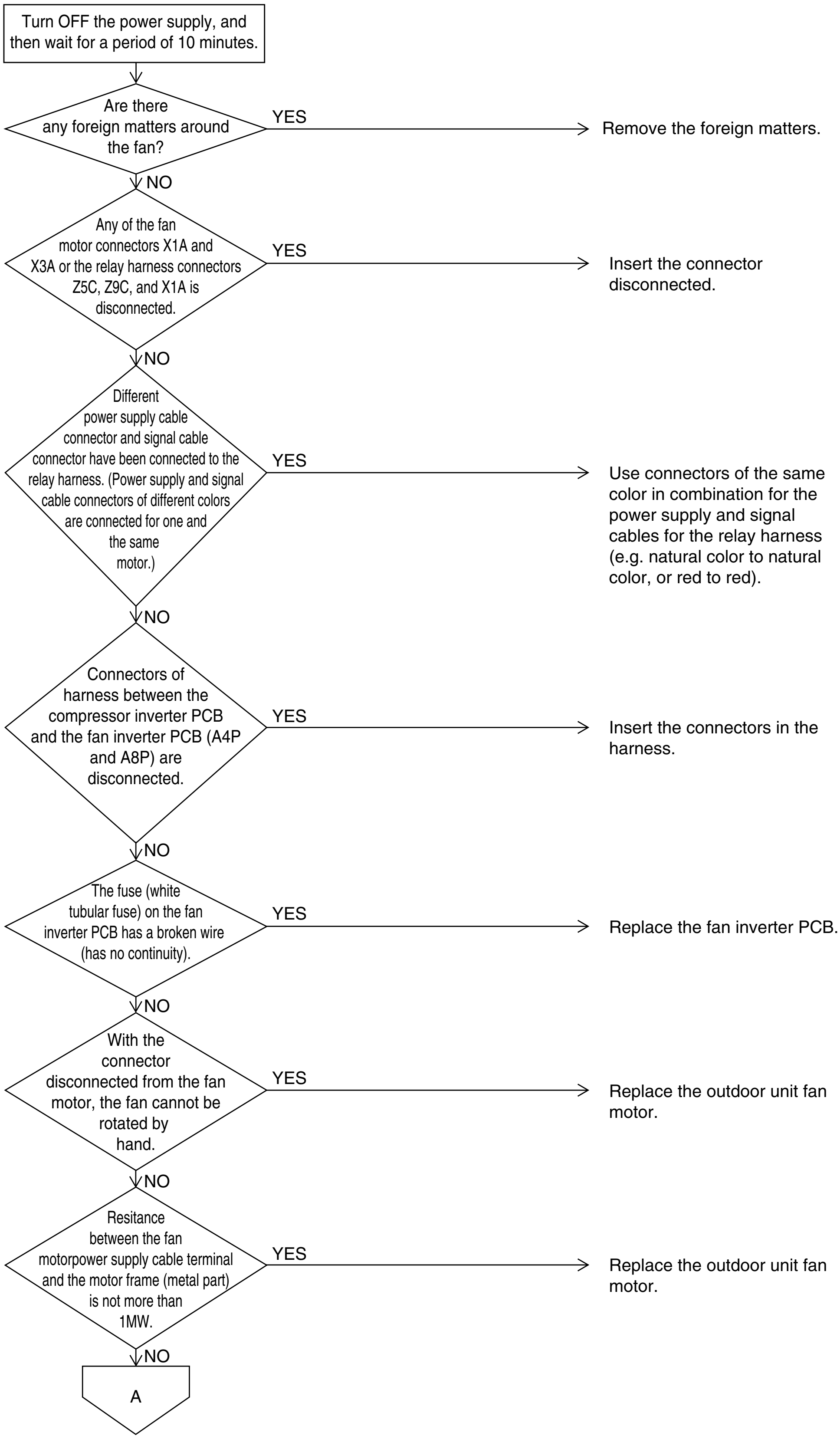
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

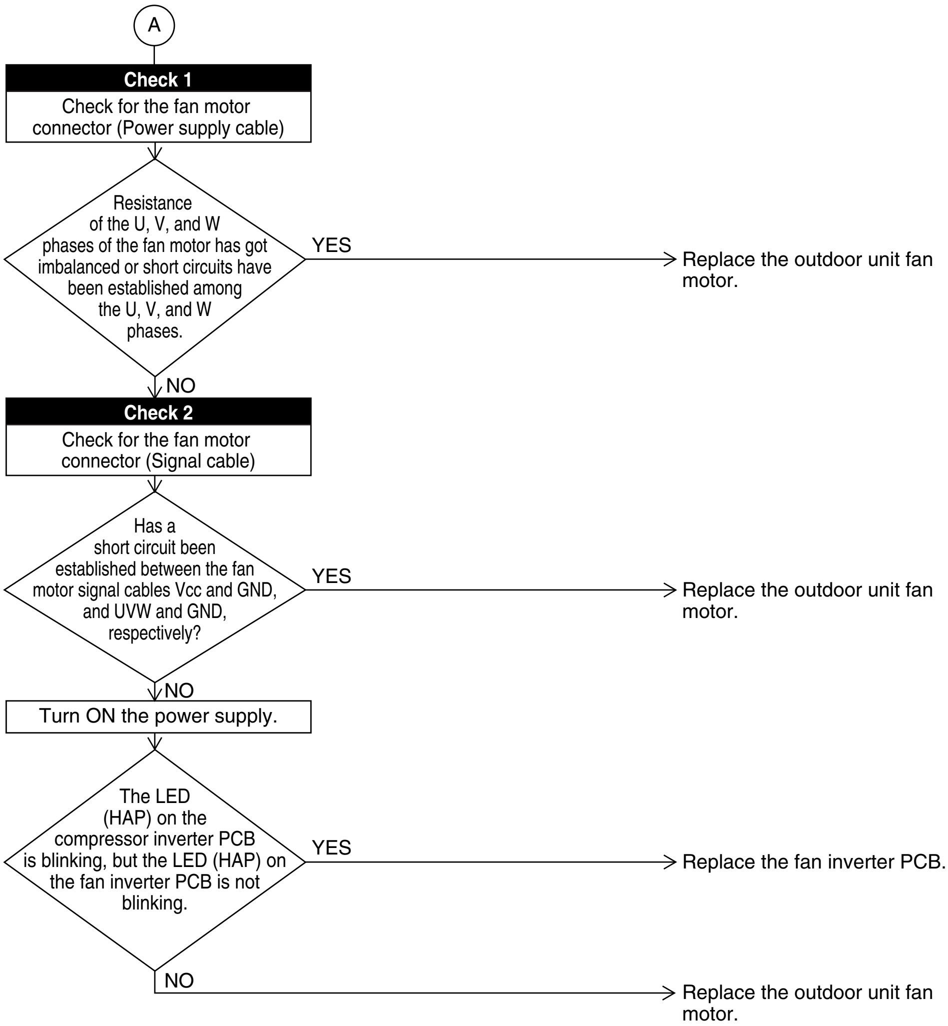
3.7 "E7" Outdoor Unit: Malfunction of Outdoor Unit Fan Motor

Error code	E7
Applicable models	ERX125~250A7W1B, ERX100~140A8V3B
Method of malfunction detection	Malfunction of fan motor system is detected according to the fan speed detected by hall IC when the fan motor runs.
Malfunction decision conditions	➤ When the fan runs with speed less than a specified one for 6 seconds or more when the fan motor running conditions are met ➤ When connector detecting fan speed is disconnected (only ERX125~250A7W1B) ➤ When malfunction is generated 4 times, the system shuts down.
Supposed causes	➤ Malfunction of fan motor ➤ The harness connector between fan motor and PC board is left in disconnected, or faulty connector ➤ Fan does not run due to foreign matters tangled ➤ Clearing condition: Operate for 5 minutes (normal)

Troubleshooting - ERX125~250A7W1B



Troubleshooting - ERX125~250A7W1B

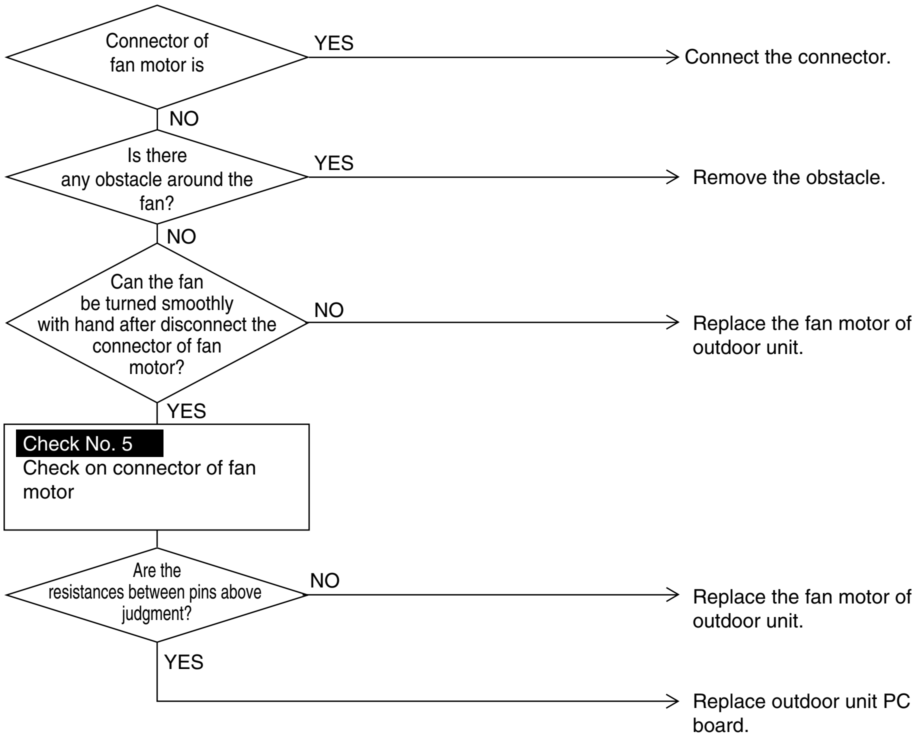


See also Check No. 1 on page 3-120 and Check No. 2 on page 3-121.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Troubleshooting - ERX100~140A8V3B



See also Check No. 5 on page 3-124.

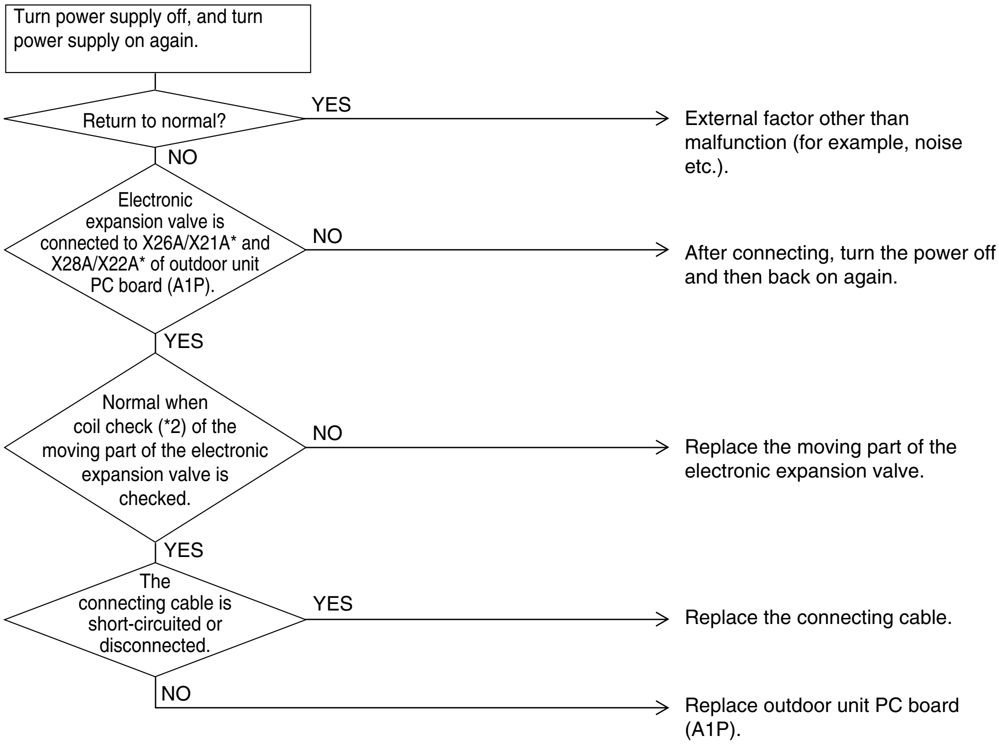
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.8 "E9" Outdoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y2E for ERX125~250A7W1B / Y1E, Y3E for ERX100~140A8V3B)

Error code	E9
Applicable models	ERX125~250A7W1B, ERX100~140A8V3B
Method of malfunction detection	➤ Check disconnection of connector ➤ Check continuity of expansion valve coil
Malfunction decision conditions	Error is generated under no common power supply when the power is on.
Supposed causes	➤ Defect of moving part of electronic expansion valve ➤ Defect of outdoor unit PC board (A1P) ➤ Defect of connecting cable

Troubleshooting



Note

*: X28A and X26A only for ERX125A7W1B, X21A and X22A for ERX100~140A8V3B.

*2: Make measurement of resistance between the connector pins, and then make sure the resistance falls in the range of 40 to 50Ω.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Graph

Measuring points
1 - 6
2 - 6
3 - 6
4 - 6

3.9 "F3" Outdoor Unit: Abnormal Discharge Pipe Temperature

Error code
F3

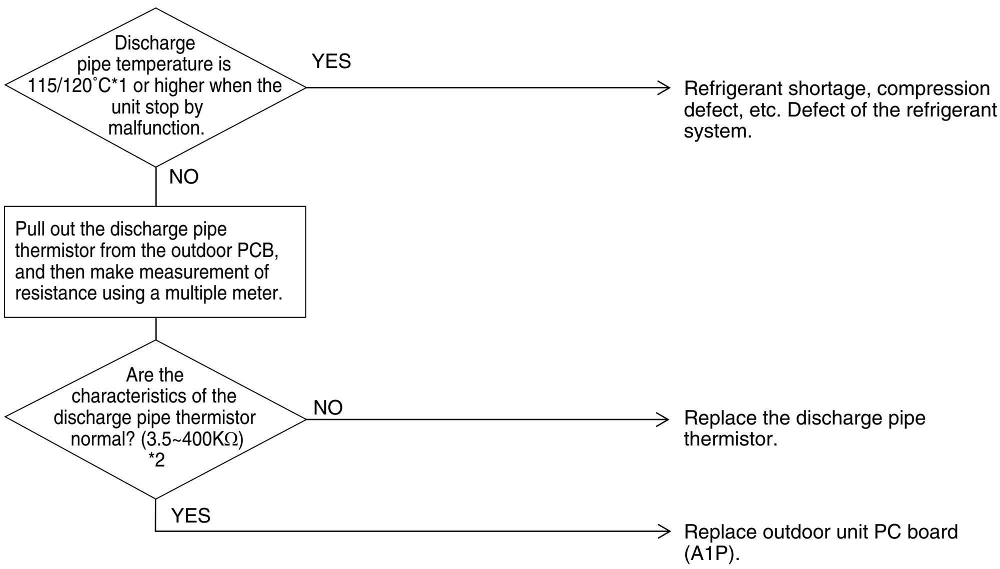
Applicable models
ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection
Abnormality is detected according to the temperature detected by the discharge pipe temperature sensor.

Malfunction decision conditions
- When the discharge pipe temperature rises to an abnormally high level.
- When the discharge pipe temperature rises suddenly.

Supposed causes
- Faulty discharge pipe temperature sensor
- Faulty connection of discharge pipe temperature sensor
- Faulty outdoor unit PC board

Troubleshooting



Notes
*1: 115°C for ERX125~250A7W1B, 120°C for ERX100~140A8V3B.

*2: Refer to “Thermistor Resistance / Temperature Characteristics” table on page 2-4.

Caution
Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.10 "F6" Outdoor Unit: Refrigerant Overcharged (ERX125~250A7W1B)

Error code

F6

Applicable models

ERX125~250A7W1B

Method of malfunction detection

Excessive charging of refrigerant is detected by using the outside air temperature, heat exchanging deicer temperature and liquid pipe temperature during a check run.

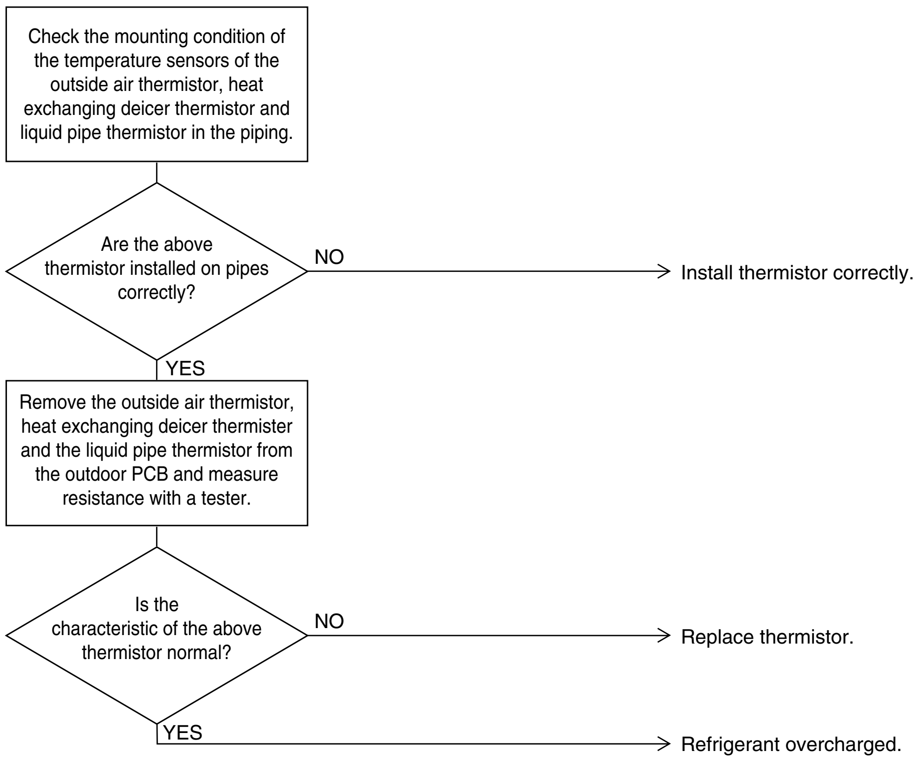
Malfunction decision conditions

When the amount of refrigerant, which is calculated by using the outside air temperature, heat exchanging deicer temperature and liquid pipe temperature during a check run, exceeds the standard.

Supposed causes

- Refrigerant overcharge
- Misalignment of the outside air thermistor
- Misalignment of the heat exchanging deicer thermistor
- Misalignment of the liquid pipe thermistor

Troubleshooting



Note

* Refer to "Thermistor Resistance / Temperature Characteristics" table on page 2-4.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.11 "F6" Outdoor Unit: Refrigerant Overcharged (ERX100~140A8V3B)

Error code

F6

Applicable models

ERX100~140A8V3B

Method of malfunction detection

Excessive charging of refrigerant is detected by using the heat exchanging deicer temperature during a check operation.

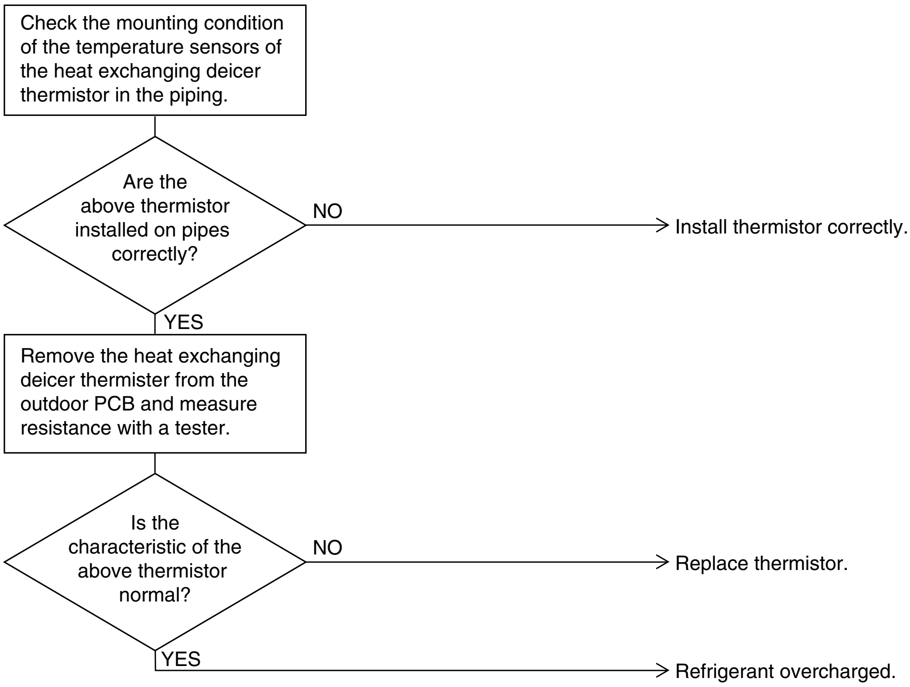
Malfunction decision conditions

When the amount of refrigerant, which is calculated by using the heat exchanging deicer temperature during a check run, exceeds the standard.

Supposed causes

- Refrigerant overcharge
- Misalignment of the thermistor for heat exchanger
- Defect of the thermistor for heat exchanger

Troubleshooting



Note

*Refer to "Thermistor Resistance / Temperature Characteristics" table on page 2-4.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.12 "H7" Outdoor Unit: Abnormal Outdoor Fan Motor Signal

Error code

H7

Applicable models

ERX125~250A7W1B

Method of malfunction detection

Detection of abnormal signal from fan motor.

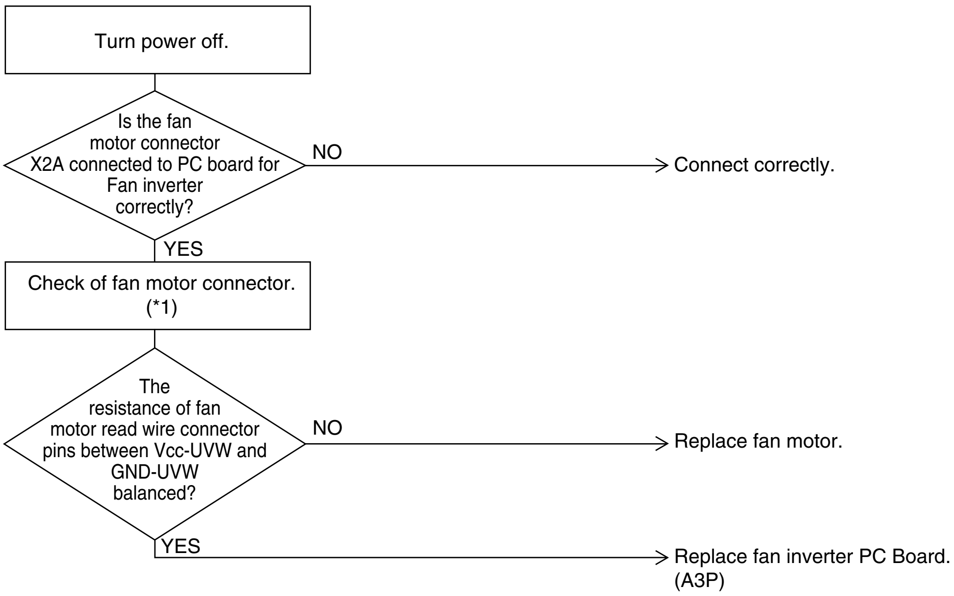
Malfunction decision conditions

In case of detection of abnormal signal at starting fan motor.

Supposed causes

- Abnormal fan motor signal (circuit malfunction)
- Broken, short or disconnection connector of fan motor connection cable
- Fan Inverter PC board malfunction

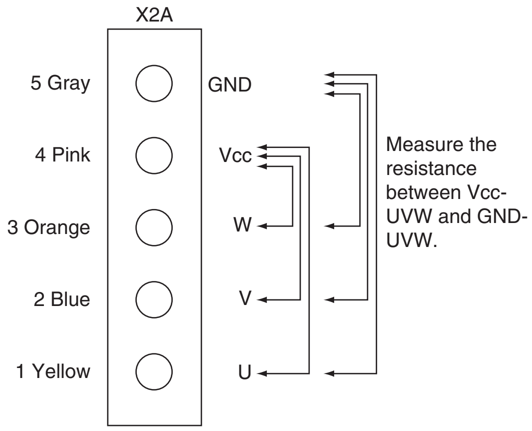
Troubleshooting



Note

*1: Disconnect connector (X2A) and measure the following resistance

Graph



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.13 "H9" Outdoor Unit: Malfunction of Thermistor (R1T) for Outdoor Air

Error code

H9

Applicable models

ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Malfunction is detected from the temperature detected by the outdoor air thermistor.

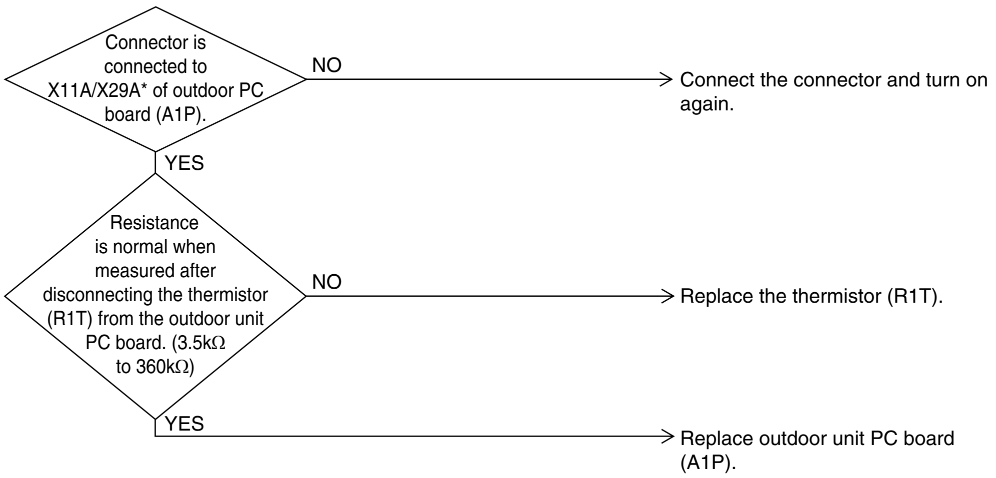
Malfunction decision conditions

When the outside air temperature thermistor has short circuit or open circuit.

Supposed causes

- ➤ Defect of thermistor (R1T) for outdoor air
- ➤ Defect of outdoor unit PC board (A1P)

Troubleshooting



Notes

*1: Connector X29A for ERX125~250A7W1B, connector X11A for ERX100~140A8V3B.

*2: Refer to “Thermistor Resistance / Temperature Characteristics” table on page 2-4.

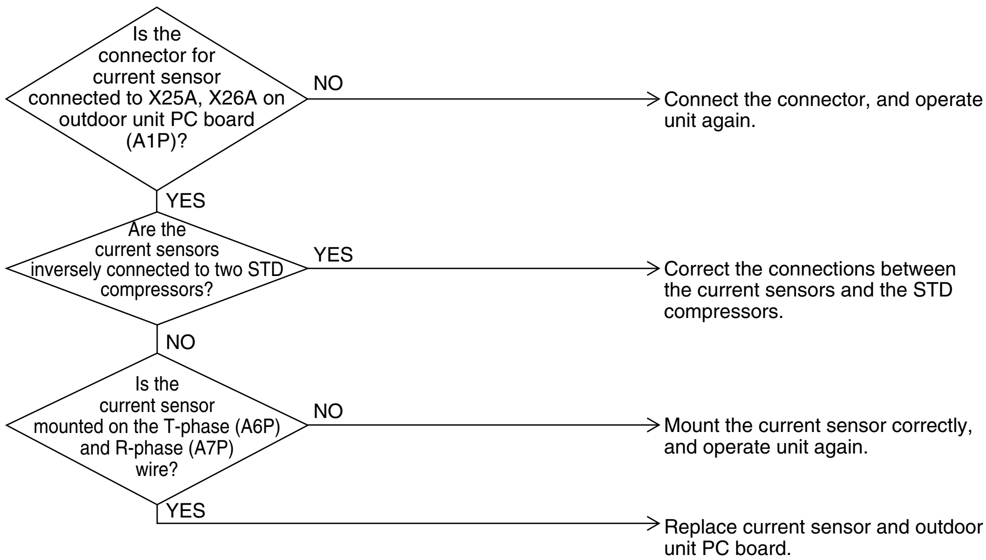
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.14 "J2" Outdoor Unit: Current Sensor Malfunction

Error code	J2
Applicable models	ERX125~250A7W1B
Method of malfunction detection	Malfunction is detected according to the current value detected by current sensor.
Malfunction decision conditions	When the current value detected by current sensor becomes 5A or lower, or 40A or more during standard compressor operation.
Supposed causes	➤ Faulty current sensor (A6P, A7P) ➤ Faulty outdoor unit PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Remark

For ERX100~140A8V3B the current sensor is integrated in the outdoor PCB (A1P).

3.15 "J3" Outdoor Unit: Malfunction of Discharge Pipe Thermistor (R3T, R31~32T for ERX125~250A7W1B / R2T for ERX100~140A8V3B)

Error code J3

Applicable models ERX125~250A7W1B, ERX100~140A8V3B

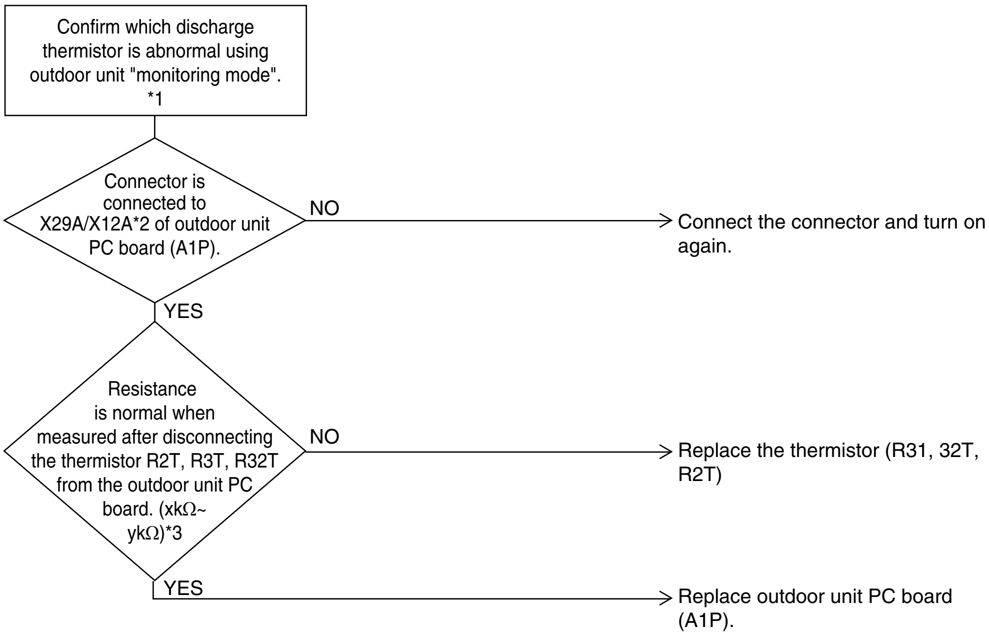
Method of malfunction detection Malfunction is detected from the temperature detected by discharge pipe temperature thermistor.

Malfunction decision conditions When a short circuit or an open circuit in the discharge pipe temperature thermistor is detected.

Supposed causes

- ➤ Defect of thermistor (R31T or R32T, R2T) for outdoor unit discharge pipe
- ➤ Defect of outdoor unit PC board (A1P)
- ➤ Defect of thermistor connection

Troubleshooting



- ➤ The alarm indicator is displayed when the fan is being used also.
- ➤ Refer to “Thermistor Resistance / Temperature Characteristics” table on page 2-4.

Note

*1: Refer to page 3-16 and page 3-21.

*2: Connector X29A for ERX125~250A7W1B, connector X12A for ERX100~140A8V3B.

*3: (2.5kΩ–1.3kΩ) for ERX125~250A7W1B, (5.0kΩ–640kΩ) for ERX100~140A8V3B.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Note

ERX125~200A7W1B class ··· R3T

ERX250A7W1B class ··· R31T, R32T

ERX100~140A8V3B class ··· R2T

3

3.16 "J5" Outdoor Unit: Malfunction of Thermistor or Suction Pipe (R2T for ERX125~250A7W1B / R3T, R5T for ERX100~140A8V3B)

Error code

J5

Applicable models

ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Malfunction is detected from the temperature detected by the suction pipe temperature thermistor (1,2: ERX100~140A8V3B).

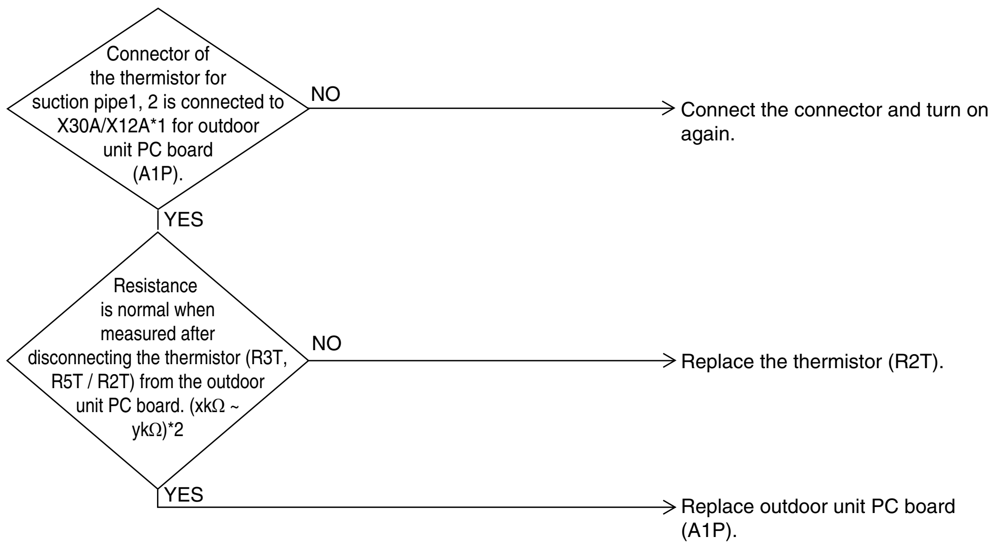
Malfunction decision conditions

When a short circuit or an open circuit in the suction pipe temperature thermistor is detected.

Supposed causes

- ➤ Defect of thermistor (R3T, R5T / R2T) for outdoor unit suction pipe
- ➤ Defect of outdoor unit PC board (A1P)
- ➤ Defect of thermistor connection

Troubleshooting



Refer to "Thermistor Resistance / Temperature Characteristics" table on page 2-4.

Note

*1: Connector X30A for ERX125~250A7W1B, connector X12A for ERX100~140A8V3B.

*2: (1.8kΩ–800kΩ) for ERX125~250A7W1B, (3.5kΩ–360kΩ) for ERX100~140A8V3B.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.17 "J6" Outdoor Unit: Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger

Error code J6

Applicable models ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection Malfunction is detected from the temperature detected by the heat exchanger thermistor.

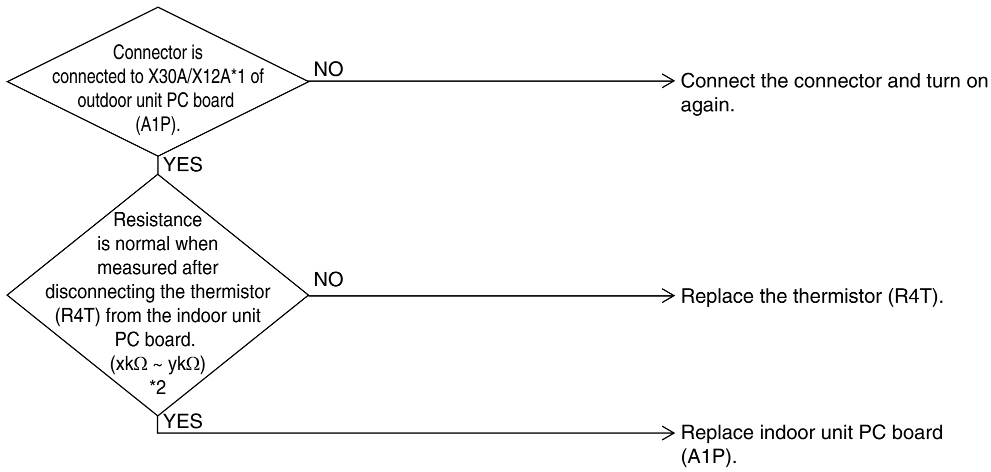
Malfunction decision conditions When a short circuit or an open circuit in the heat exchange thermistor is detected.

Supposed causes

- ➤ Defect of thermistor (R4T) for outdoor unit coil
- ➤ Defect of outdoor unit PC board (A1P)
- ➤ Defect of thermistor connection

3

Troubleshooting



Refer to "Thermistor Resistance / Temperature Characteristics" table on page 2-4.

Note

*1: Connector X30A for ERX125~250A7W1B, connector X12A for ERX100~140A8V3B.

*2: (1.8kΩ–800kΩ) for ERX125~250A7W1B, (3.5kΩ–360kΩ) for ERX100~140A8V3B.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.18 "J7" Outdoor Unit: Malfunction of Liquid Pipe Thermistor (R5T: ERX125A7W1B / R6T: ERX200~250A7W1B / R7T: ERX100~140A8V3B)

Error code

J7

Applicable models

ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Malfunction is detected according to the temperature detected by liquid pipe thermistor.

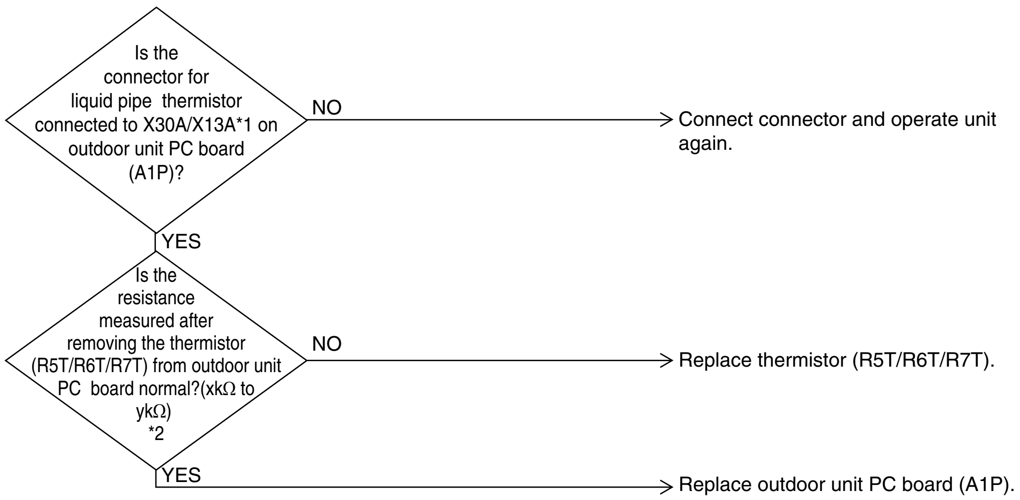
Malfunction decision conditions

When the liquid pipe thermistor is short circuited or open.

Supposed causes

- ➤ Faulty liquid pipe thermistor (R5T / R6T / R7T)
- ➤ Faulty outdoor unit PC board
- ➤ Defect of thermistor connection

Troubleshooting



Refer to "Thermistor Resistance / Temperature Characteristics" table on page 2-4.

Note

*1: Connector X30A for ERX125~250A7W1B, connector X13A for ERX100~140A8V3B.

*2: (1.8kΩ–800kΩ) for ERX125~250A7W1B, (3.5kΩ–360kΩ) for ERX100~140A8V3B.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.19 "J9" Outdoor Unit: Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R5T: ERX200~250A7W1B / R6T: ERX100~140A8V3B)

3

Error code

J9

Applicable models

ERX200~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Malfunction is detected according to the temperature detected by subcooling heat exchanger gas pipe thermistor.

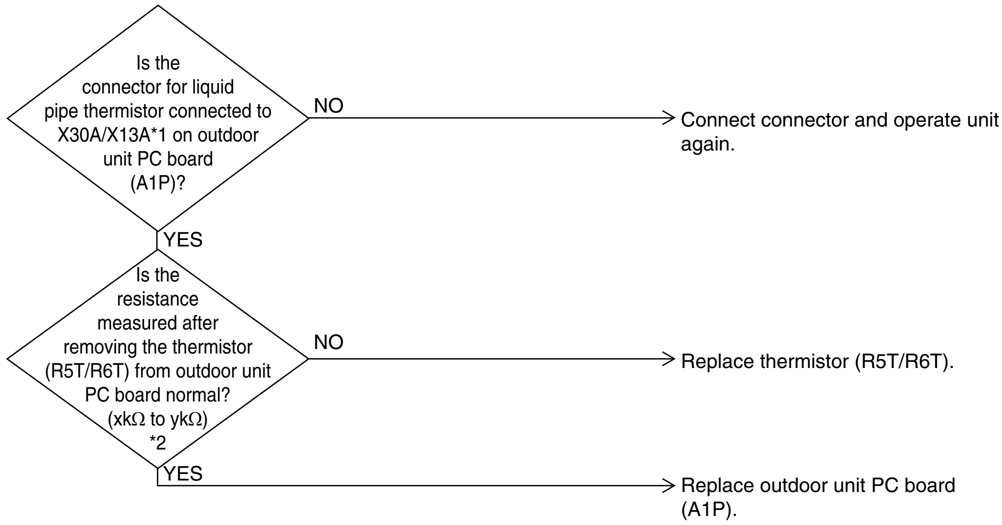
Malfunction decision conditions

When the subcooling heat exchanger gas pipe thermistor is short circuited or open.

Supposed causes

- ➤ Faulty subcooling heat exchanger gas pipe thermistor (R5T, R6T)
- ➤ Faulty outdoor unit PC board

Troubleshooting



Refer to “Thermistor Resistance / Temperature Characteristics” table on page 2-4.

Notes

*1: Connector X30A for ERX125~250A7W1B, connector X13A for ERX100~140A8V3B.

*2: (1.8kΩ–800kΩ) for ERX125~250A7W1B, (3.5kΩ–360kΩ) for ERX100~140A8V3B.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.20 "JA" Outdoor Unit: Malfunction of High Pressure Sensor

Error code JA

Applicable models ERX125~250A7W1B, ERX100~140A8V3B

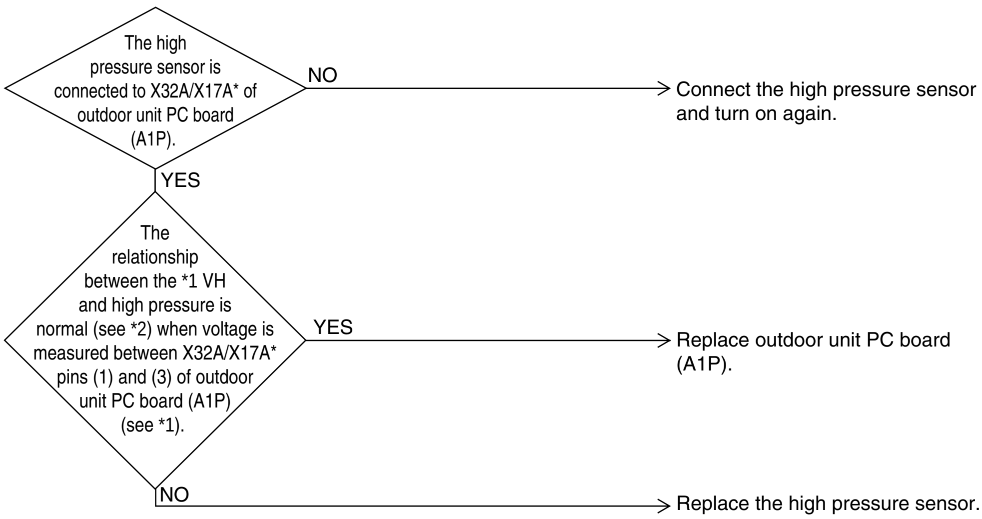
Method of malfunction detection Malfunction is detected from the pressure detected by the high pressure sensor.

Malfunction decision conditions When the high pressure sensor is short circuit or open circuit.

Supposed causes

- ➤ Defect of high pressure sensor system
- ➤ Connection of low pressure sensor with wrong connection.
- ➤ Defect of outdoor unit PC board.

Troubleshooting

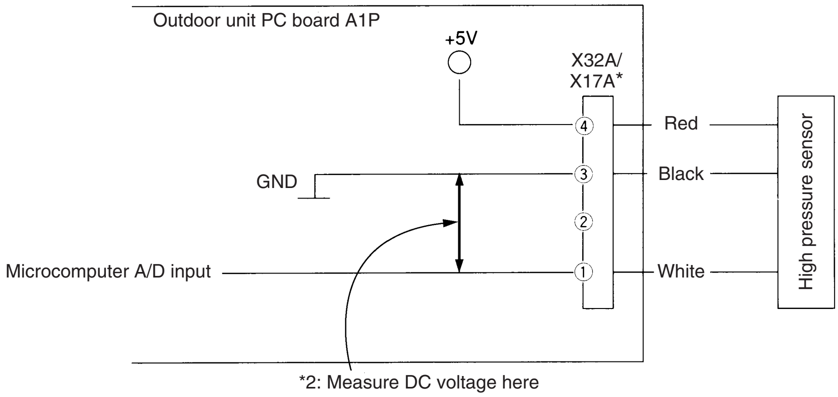


*1: Voltage measurement point

Note *: Connector X32A for ERX125~250A7W1B, connector X17A for ERX100~140A8V3B.

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Graph



∗2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on page 2-6.

Note

*: Connector X32A for ERX125~250A7W1B, connector X17A for ERX100~140A8V3B.

3

3.21 "JC" Outdoor Unit: Malfunction of Low Pressure Sensor

Error code

JC

Applicable models

ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Malfunction is detected from pressure detected by low pressure sensor.

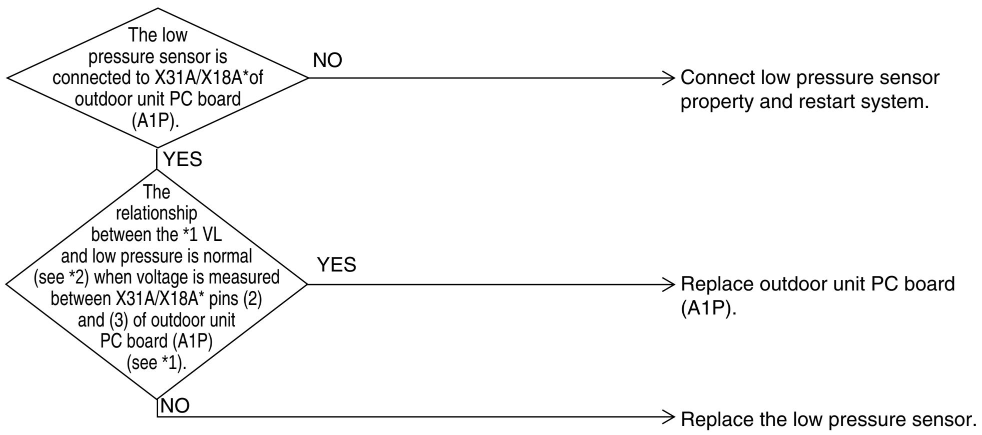
Malfunction decision conditions

When the low pressure sensor is short circuit or open circuit.

Supposed causes

- Defect of low pressure sensor system
- Connection of high pressure sensor with wrong connection.
- Defect of outdoor unit PC board.

Troubleshooting



*1: Voltage measurement point

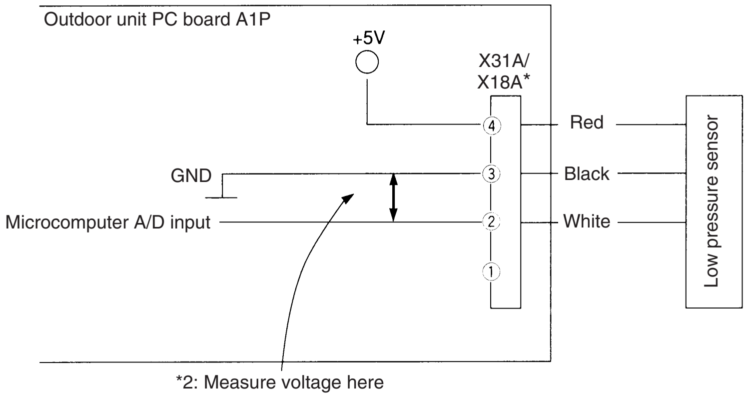
Note

*: Connector X31A for ERX125~250A7W1B, connector X18A for ERX100~140A8V3B.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Graph



*2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on page 2-6.

Note

*: Connector X31A for ERX125~250A7W1B, connector X18A for ERX100~140A8V3B.

3

3

3.22 "L1" Outdoor Unit: Malfunction of PC Board (ERX100~140A8V3B)

Error code L1

Applicable models ERX100~140A8V3B

Method of malfunction detection

- ➤ Detect malfunctions by current value during waveform output before compressor startup.
- ➤ Detect malfunctions by current sensor value during synchronized operation at the time of startup.
- ➤ Detect malfunctions using an SP-PAM series capacitor overvoltage sensor.

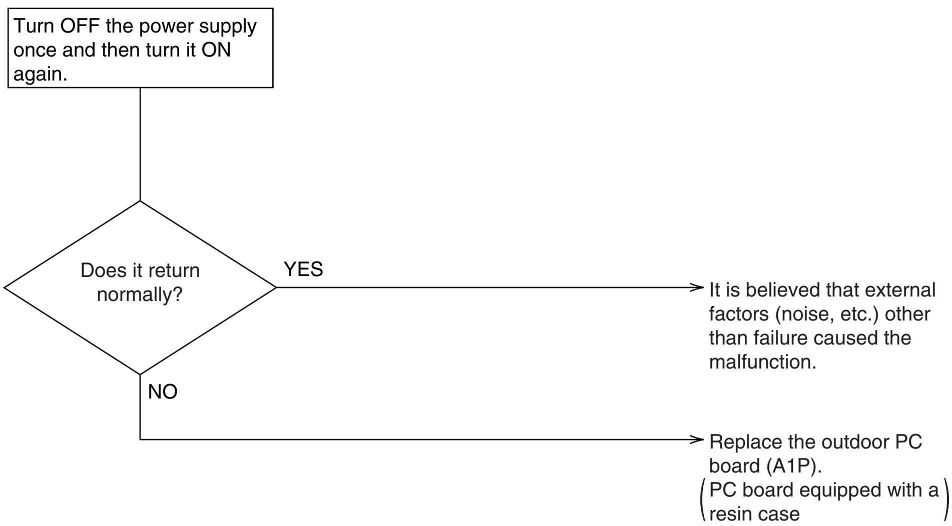
Malfunction decision conditions

- ➤ In case of overcurrent (OCP) during waveform output
- ➤ When the current sensor malfunctions during synchronized operation
- ➤ When overvoltage occurs in SP-PAM
- ➤ In case of IGBT malfunction

Supposed causes

- ➤ Faulty outdoor PC board (A1P)
  - ➤ IPM failure
  - ➤ Current sensor failure
  - ➤ SP-PAM failure
  - ➤ Failure of IGBT or drive circuit

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.23 "L4" Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise

Error code L4

Applicable models ERX125~250A7W1B, ERX100~140A8V3B

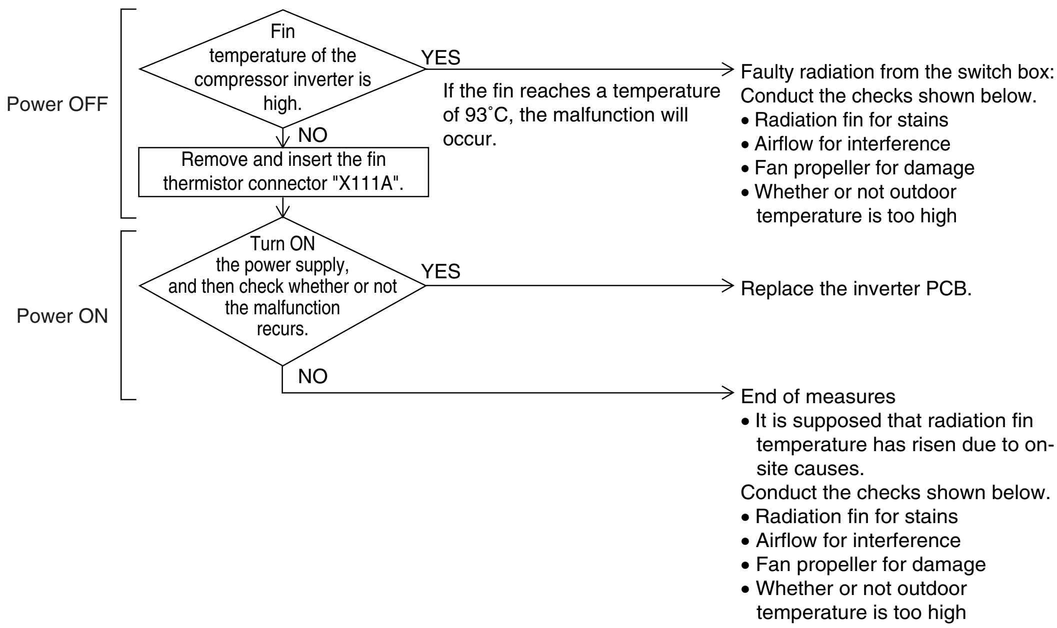
Method of malfunction detection Fin temperature is detected by the thermistor of the radiation fin.

Malfunction decision conditions When the temperature of the inverter radiation fin increases above 93°C (ERX125~250A7W1B) / 83°C (ERX100~140A8V3B).

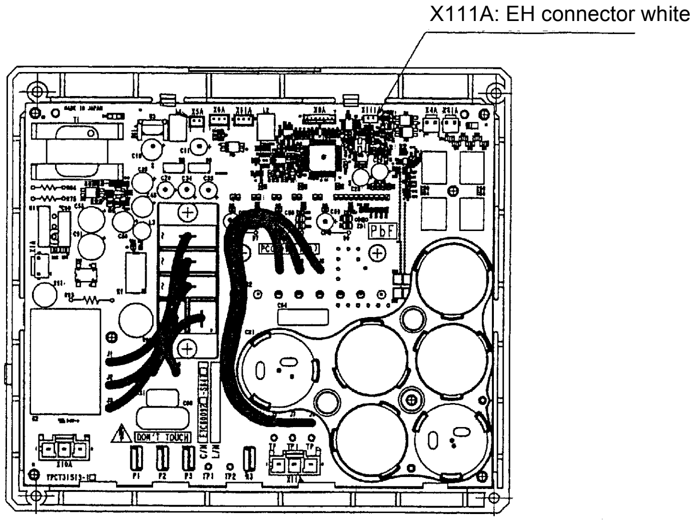
Supposed causes

- Actuation of fin thermal (Actuates above 93°C / 83°C)
- Defect of inverter PC board
- Defect of fin thermistor

Troubleshooting - ERX125~250A7W1B

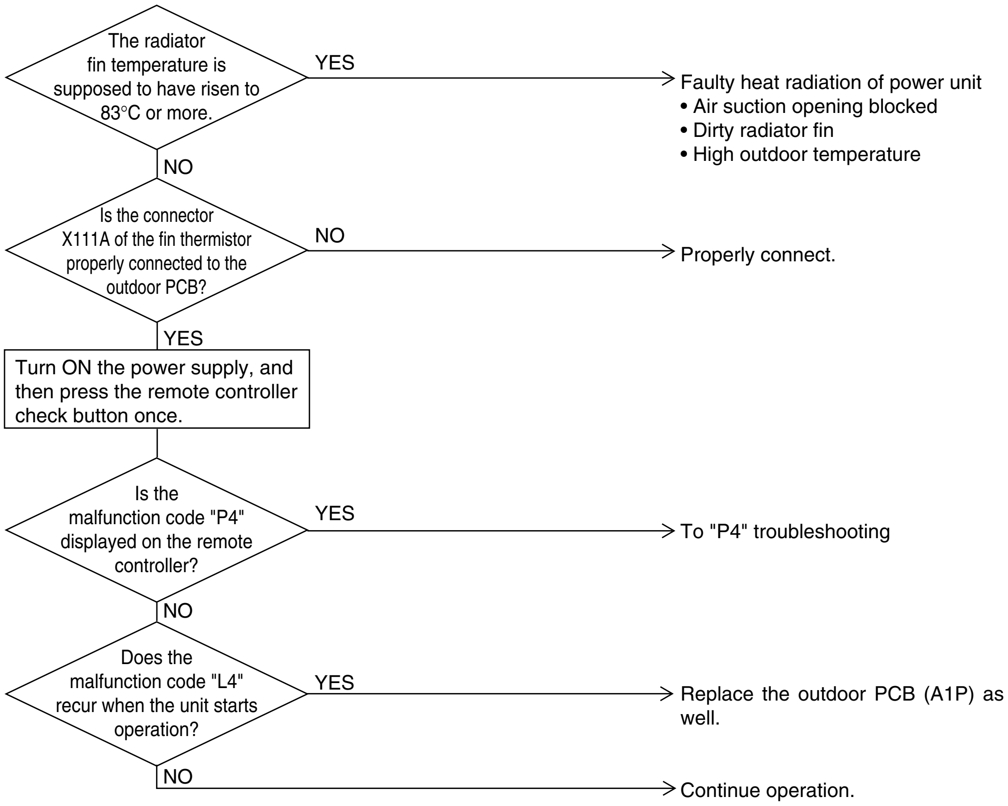


Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



* Refer to “Thermistor Resistance / Temperature Characteristics” table on page 2-4.

Troubleshooting - ERX100~140A8V3B



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.24 "L5" Outdoor Unit: Inverter Compressor Abnormal

Error code

L5

Applicable models

ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Malfunction is detected from current flowing in the power transistor.

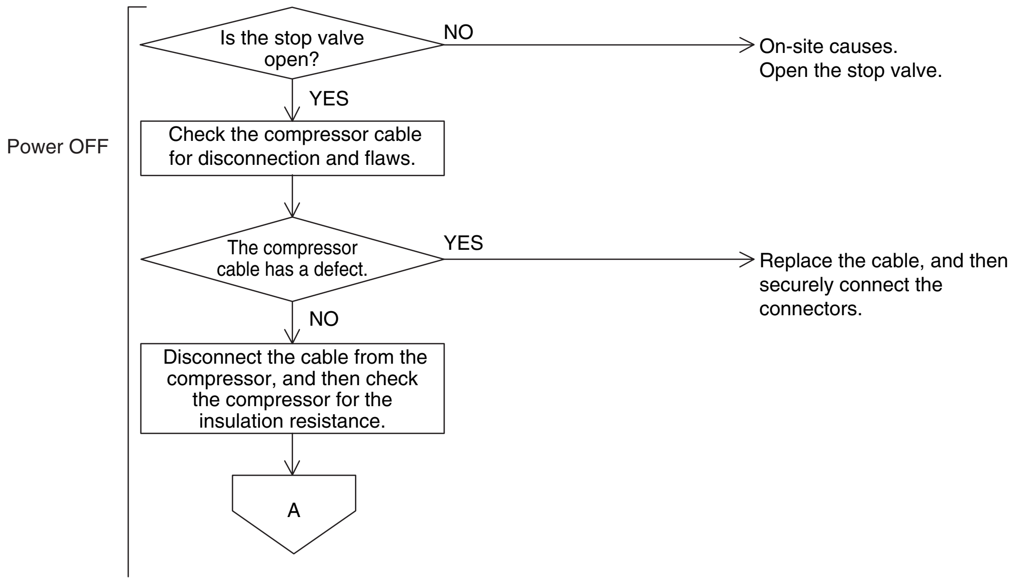
Malfunction decision conditions

When an excessive current flows in the power transistor.
(Instantaneous overcurrent also causes activation.)

Supposed causes

- Defect of compressor coil (disconnected, defective insulation)
- Compressor start-up malfunction (mechanical lock)
- Defect of inverter PC board

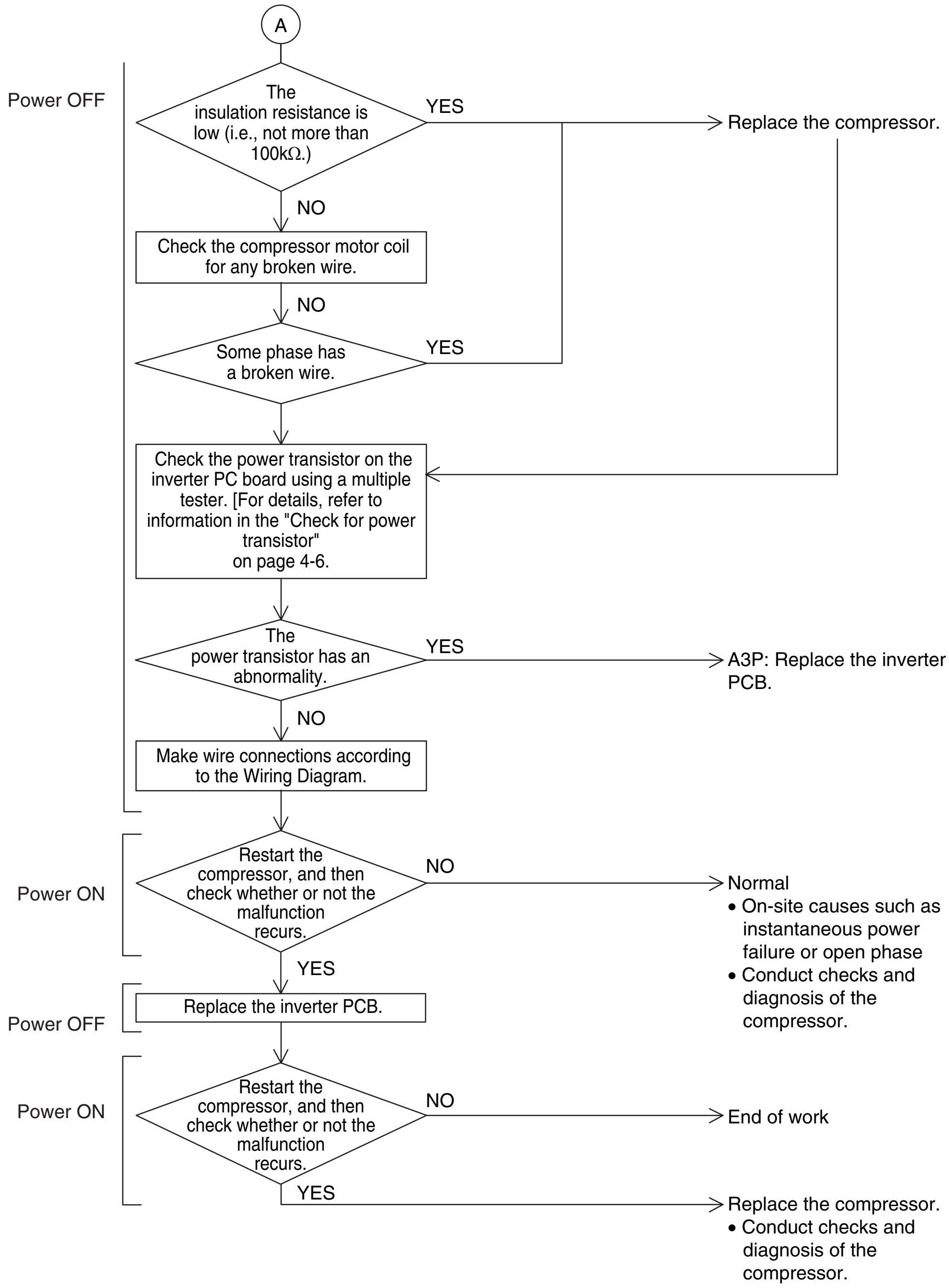
Troubleshooting - ERX125~250A7W1B



3

3

Troubleshooting - ERX125~250A7W1B

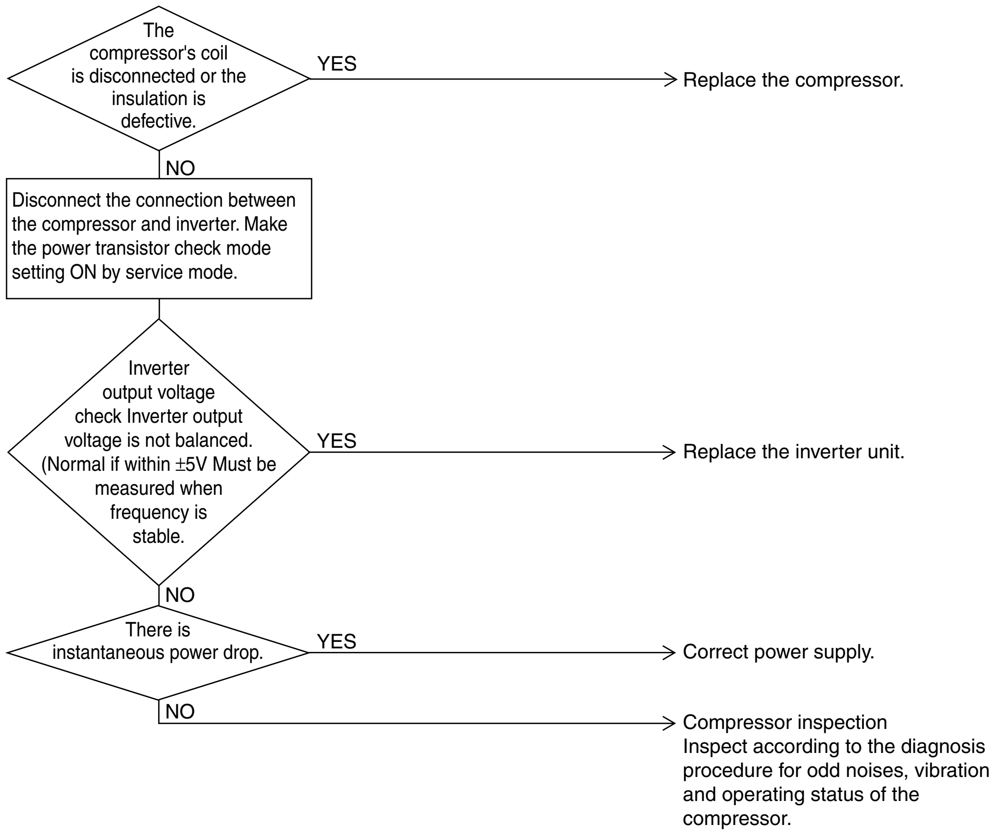


Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Troubleshooting - ERX100~140A8V3B

Compressor inspection



Higher voltage than actual is displayed when the inverter output voltage is checked by tester.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.25 "L8" Outdoor Unit: Inverter Current Abnormal

Error code L8

Applicable models ERX125~250A7W1B, ERX100~140A8V3B

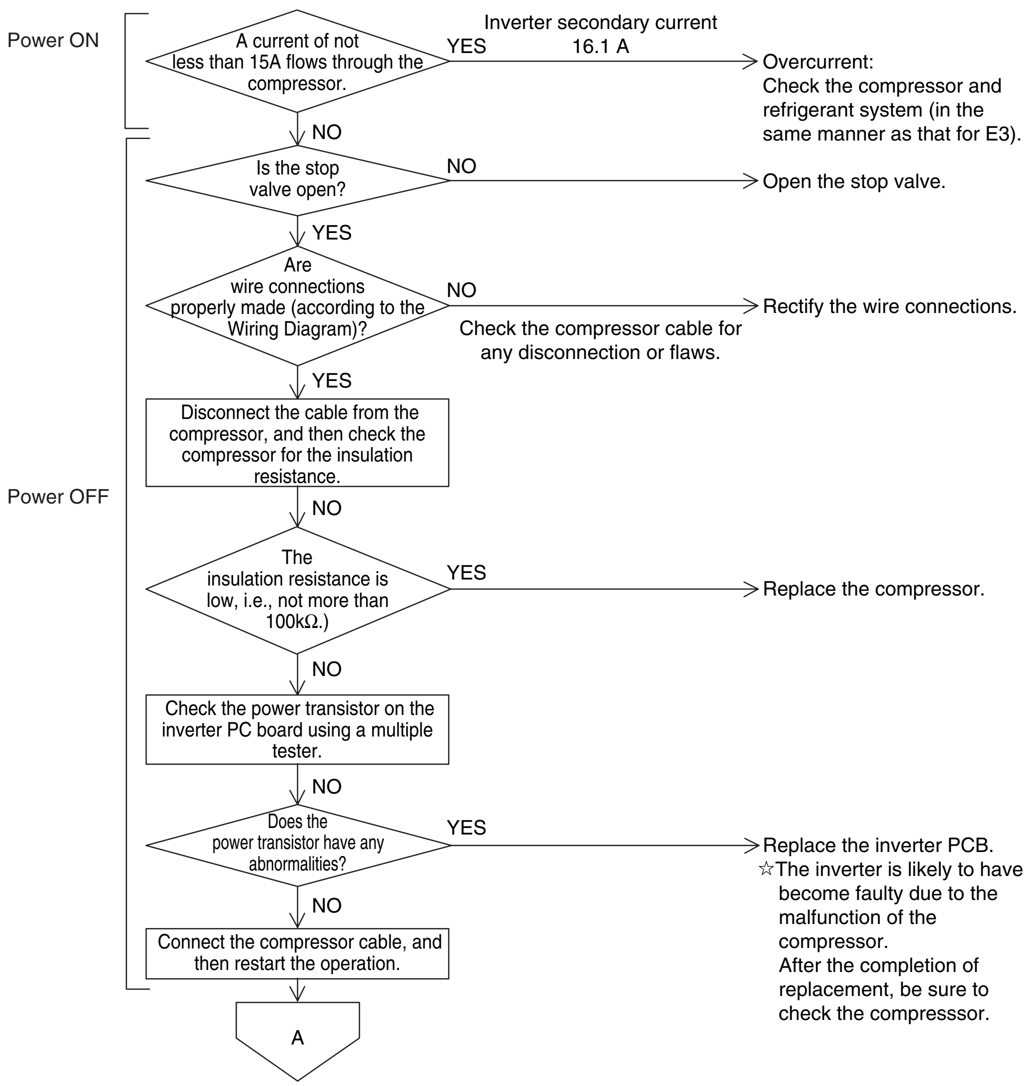
Method of malfunction detection Malfunction is detected by current flowing in the power transistor.

Malfunction decision conditions When overload in the compressor is detected.

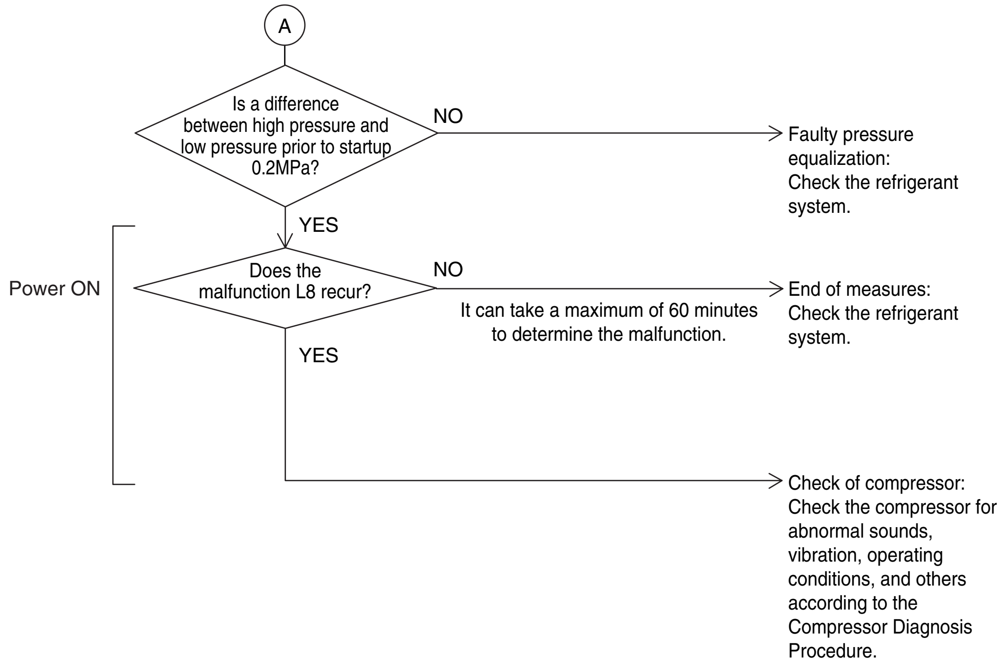
Supposed causes

- Compressor overload
- Compressor coil disconnected
- Defect of inverter PC board
- Faulty compressor

Troubleshooting - ERX125~250A7W1B



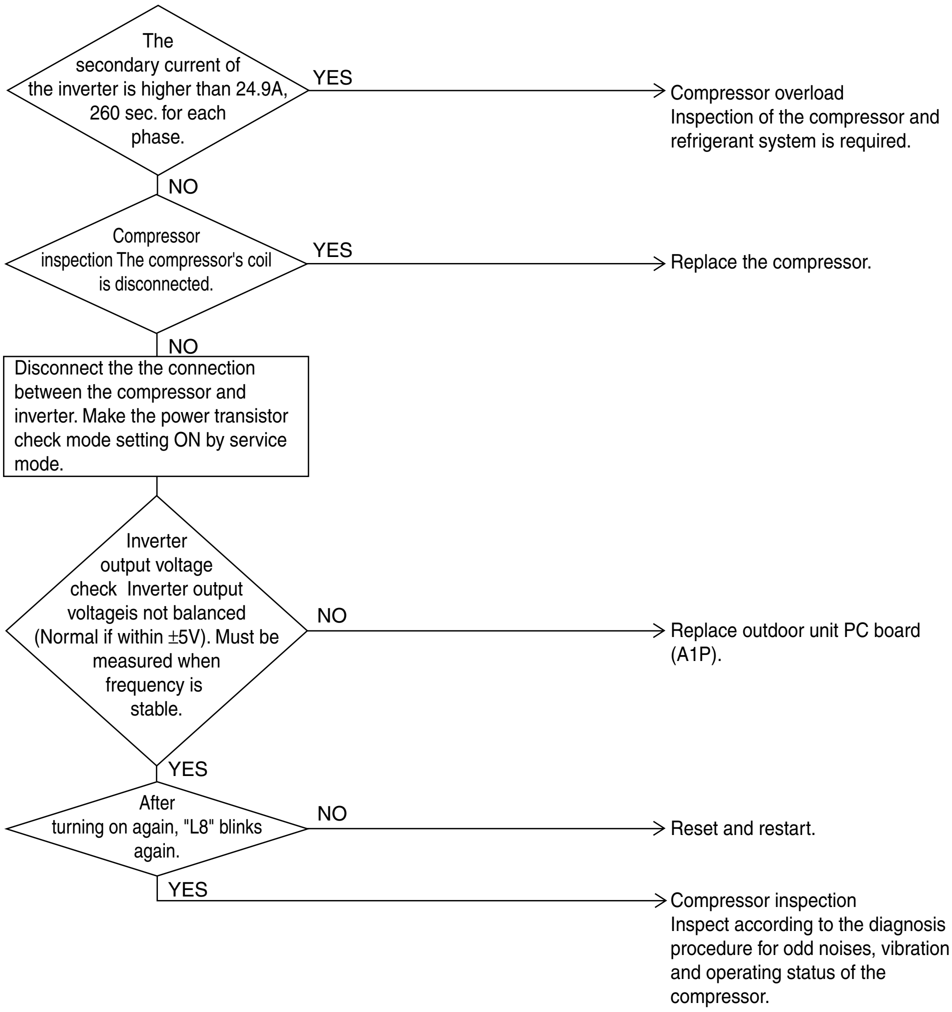
Troubleshooting - ERX125~250A7W1B



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Troubleshooting - ERX100~140A8V3B



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.26 "L9" Outdoor Unit: Inverter Start up Error (ERX125~250A7W1B)

Error code

L9

Applicable models

ERX125~250A7W1B

Method of malfunction detection

This malfunction code will be output if overcurrent occurs at the time of startup.

Malfunction decision conditions

When the startup control is failed.

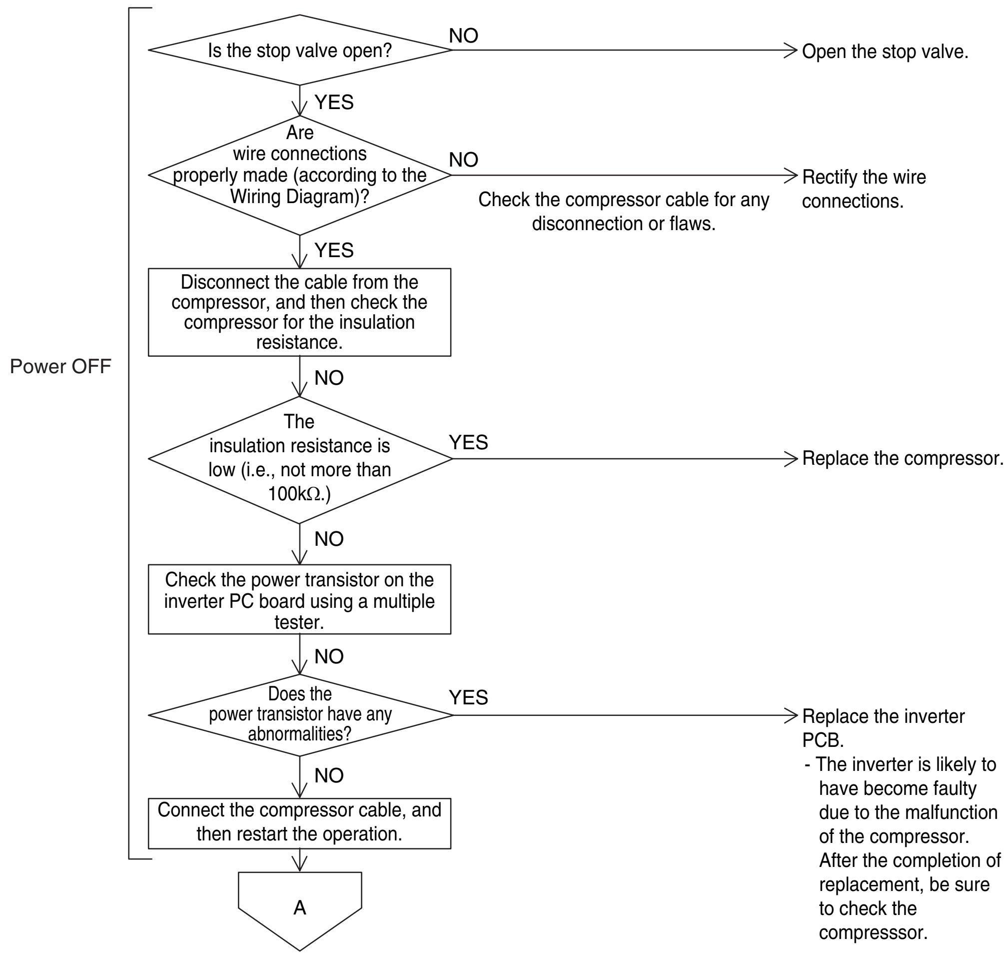
When an overcurrent is passed to the inverter due to the malfunction of a compressor or electrical system.

Supposed causes

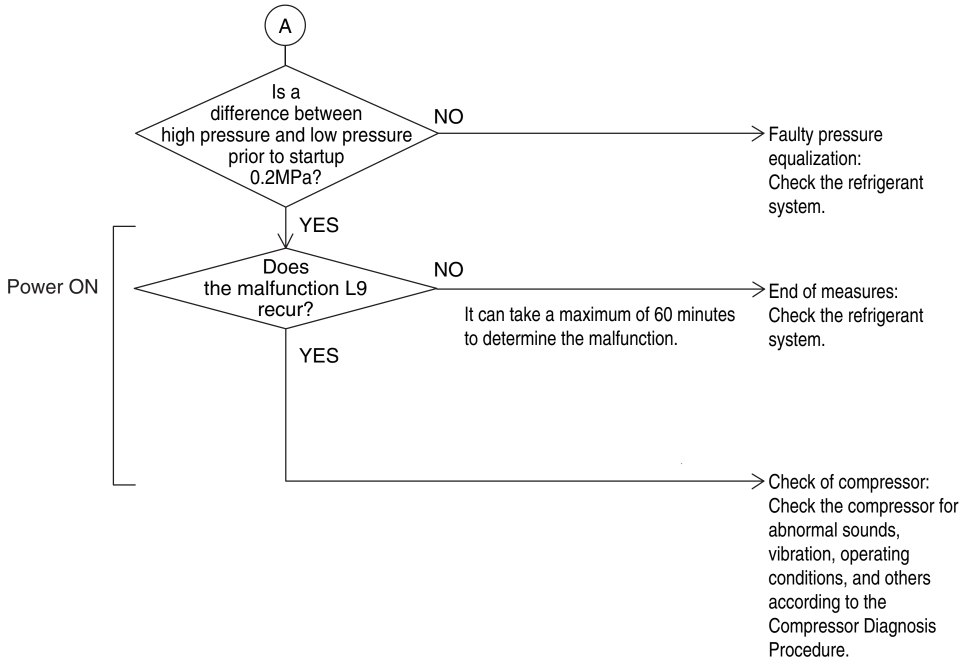
- Defect of compressor
- Pressure differential start
- Defect of inverter PC board
- Failure to open the stop valve
- Faulty compressor connection

3

Troubleshooting



Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.27 "L9" Outdoor Unit: Inverter Start up Error (ERX100~140A8V3B)

Error code

L9

Applicable models

ERX100~140A8V3B

Method of malfunction detection

Malfunction is detected from current flowing in the power transistor.

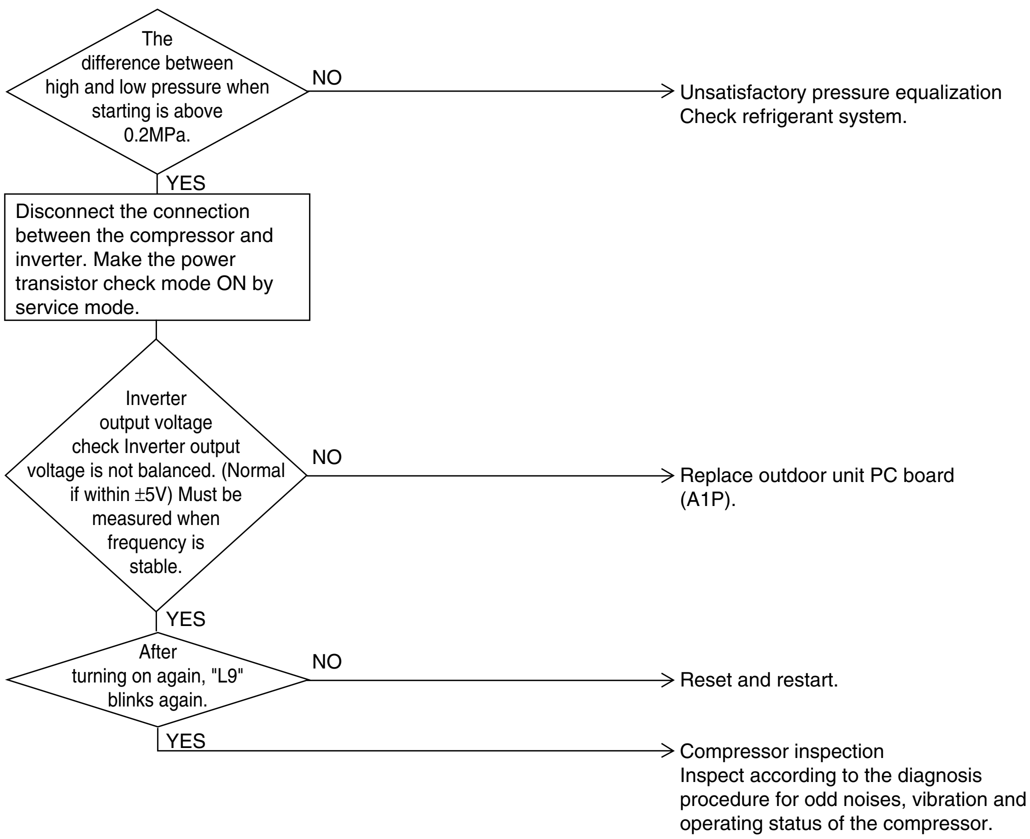
Malfunction decision conditions

When overload in the compressor is detected during startup

Supposed causes

- ➤ Defect of compressor
- ➤ Pressure differential start
- ➤ Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.28 "LC" Outdoor Unit: Malfunction of Transmission Between Inverter and Control PC Board (ERX125~250A7W1B)

Error code	LC
Applicable models	ERX125~250A7W1B
Method of malfunction detection	Check the communication state between inverter PC board and control PC board by microcomputer.
Malfunction decision conditions	When the correct communication is not conducted in certain period.
Supposed causes	➤ Malfunction of connection between the inverter PC board and outdoor control PC board ➤ Defect of outdoor control PC board (transmission section) ➤ Defect of inverter PC board ➤ Defect of noise filter ➤ Faulty fan inverter ➤ Incorrect type of fan inverter ➤ Faulty compressor ➤ Faulty fan motor

Troubleshooting

Power ON

Are the fan transmission wire connectors (X3A: Black, X4A: Yellow) wrongly connected?
- NO → Connect the connectors to the corresponding color (black or yellow).
- YES ↓

Check whether or not the power supply voltage between L2 and N falls in the range of 220 to 240VAC?
- NO → On-site cause. Correct the wiring.
- YES ↓

Power OFF

Is the type (PC No.) of the fan inverter correct?
- NO → Mount the correct type of fan inverter.

	FAN1	FAN2
RXYQ5P	PC0511-3	-
RXYQ8P	PC0511-1	-
RXYQ10P	PC0511-1	-
RXYQ12P	PC0511-3	PC0511-4
RXYQ16P	PC0511-3	PC0511-4
RXYQ18P	PC0511-1	PC0511-2

- YES ↓

Disconnect the cable from the compressor, and then check the compressor for the insulation resistance.
- NO ↓

The insulation resistance is low (i.e., not more than 100kΩ.)
- YES → Replace the compressor.
- NO ↓

Disconnect the cable from the fan, and then check the fan motor for the insulation resistance.
- NO ↓

The insulation resistance is low (i.e., not more than 1MΩ.)
- YES → Replace the fan motor. Replace the fan driver PC board.
- NO ↓

Check for connector connections: Remove and insert the connectors shown below.

[Fan 1]
- A1P X28A <-> X6A A3P
- A1P X20A <-> X4A A3P
- A3P X61A <-> X402A A2P
- A3P X1A <-> X403A A2P
- A3P X5A <-> X5A A4P
- A3P X41A <-> X3A A4P
- A4P X4A Short connector

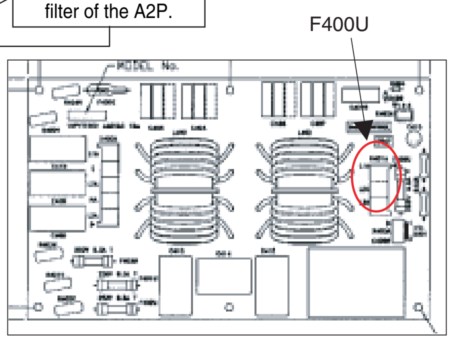
[Fan 2]
- A4P X51A <-> X5A A8P
- A4P X4A <-> X3A A8P
- A8P X4A Short connector

Note) X3A: black
X4A: yellow

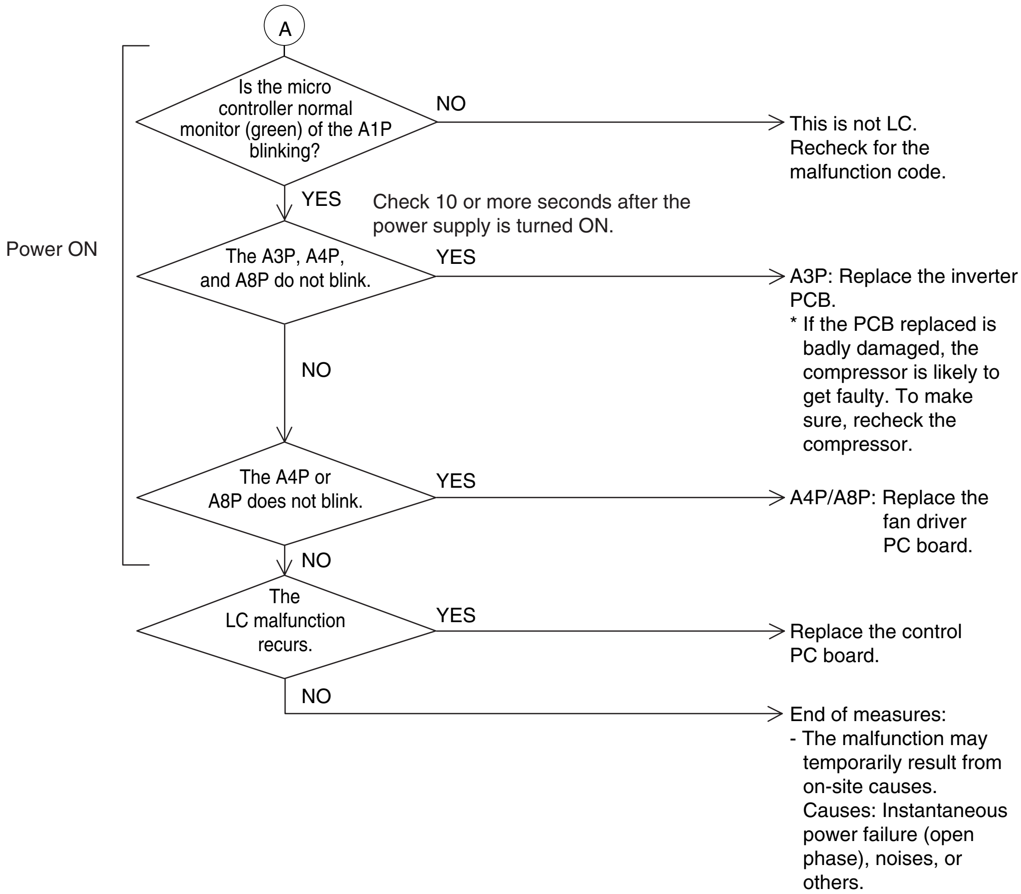
↓

F400U of the A2P has been molten.
- YES → Replace the noise filter of the A2P.
- NO ↓

A



Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.29 "LC" Outdoor Unit: Malfunction of Transmission Between Inverter and Control PC Board (ERX100~140A8V3B)

Error code

LC

Applicable models

ERX100~140A8V3B

Method of malfunction detection

Check the communication state between inverter PC board and control PC board by microcomputer.

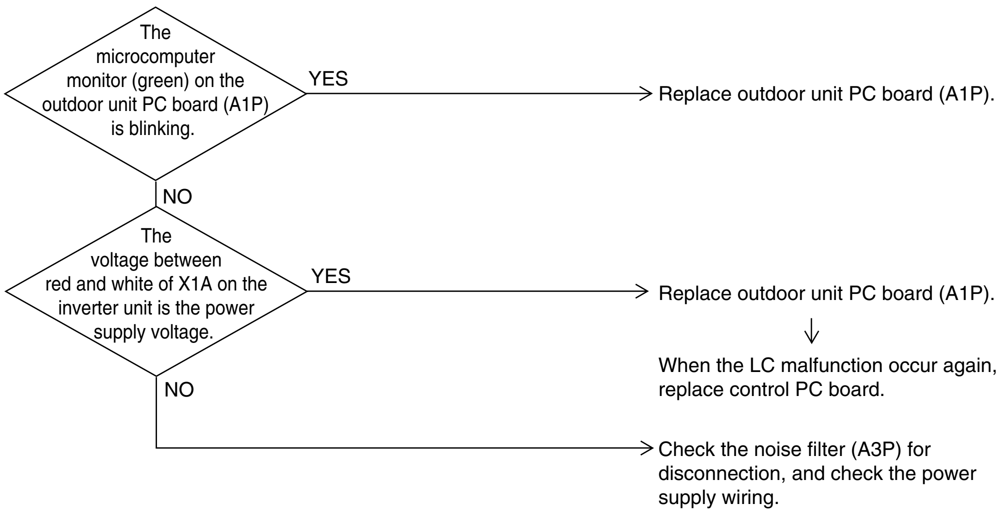
Malfunction decision conditions

When the correct communication is not conducted in certain period.

Supposed causes

- Malfunction of connection between the inverter microcomputer and outdoor control microcomputer
- Defect of outdoor unit PC board
- Defect of noise filter
- External factor (Noise etc.)

Troubleshooting



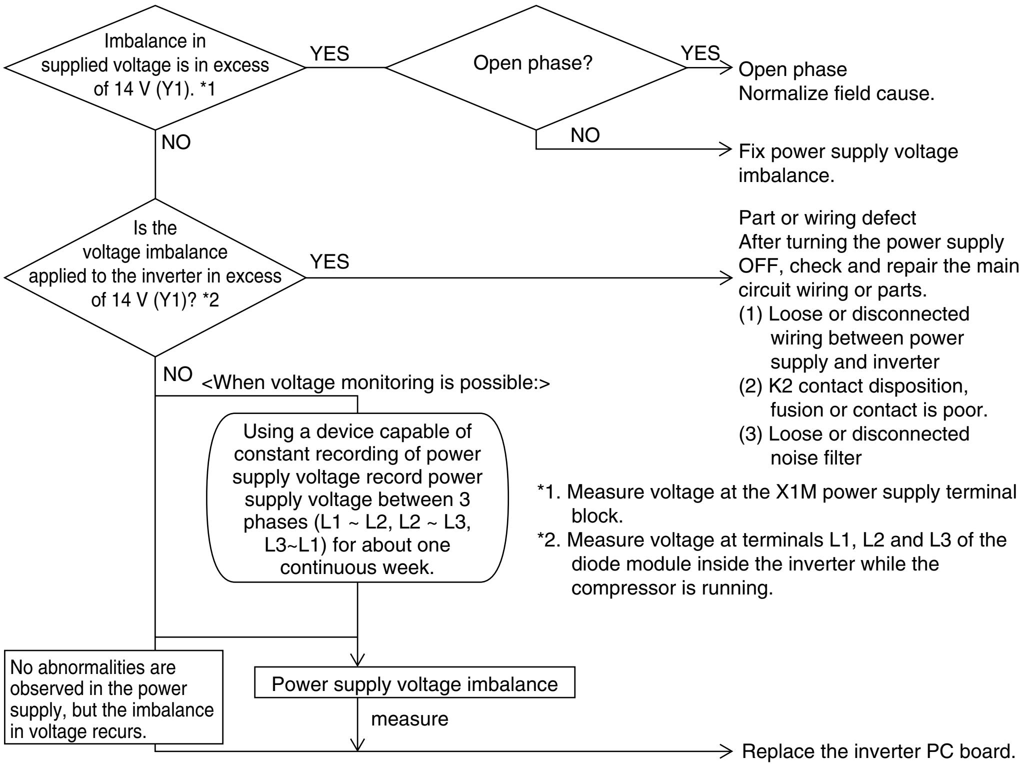
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.30 "P1" Outdoor Unit: Inverter Over-Ripple Protection (ERX125~250A7W1B)

Error code	P1
Applicable models	ERX125~250A7W1B3
Method of malfunction detection	Imbalance in supply voltage is detected in PC board. Imbalance in the power supply voltage causes increased ripple of voltage of the main circuit capacitor in the inverter. Consequently, the increased ripple is detected.
Malfunction decision conditions	When the resistance value of thermistor becomes a value equivalent to open or short circuited status. ➤ Malfunction is not decided while the unit operation is continued. "P1" will be displayed by pressing the inspection button. When the amplitude of the ripple exceeding a certain value is detected for consecutive 4 minutes.
Supposed causes	➤ Open phase ➤ Voltage imbalance between phases ➤ Defect of main circuit capacitor ➤ Defect of inverter PC board ➤ Defect of K2 relay in inverter PC board ➤ Improper main circuit wiring

Troubleshooting



Explanation for users *In accordance with "notification of inspection results" accompanying spare parts.

Give the user a copy of "notification of inspection results"and leave it up to him to improve the imbalance.

Be sure to explain to the user that there is a "power supply imbalance" of which DAIKIN is not responsible.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.31 "P1" Outdoor Unit: High Voltage of Capacitor in Main Inverter Circuit (ERX100~140A8V3B)

Error code P1

Applicable models ERX100~140A8V3B

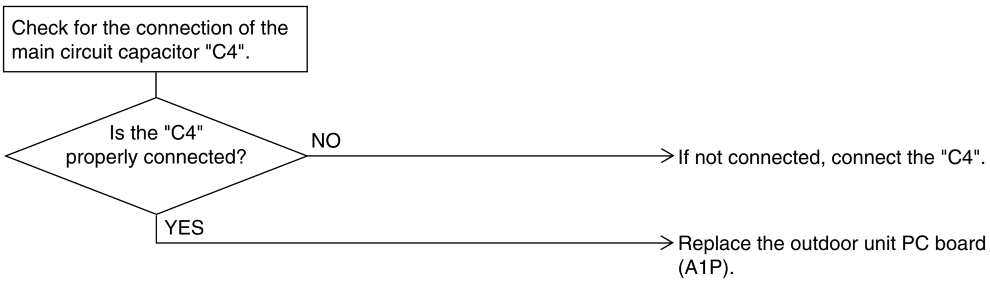
Method of malfunction detection Malfunction is detected according to the voltage waveform of main circuit capacitor built in the inverter.

Malfunction decision conditions When the aforementioned voltage waveform becomes identical with the waveform of the power supply open phase.

Supposed causes

- ➤ Defect of main circuit capacitor
- ➤ Improper main circuit wiring
- ➤ Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3.32 "P4" Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise Sensor

Error code

P4

Applicable models

ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Resistance of radiation fin thermistor is detected when the compressor is not operating.

Malfunction decision conditions

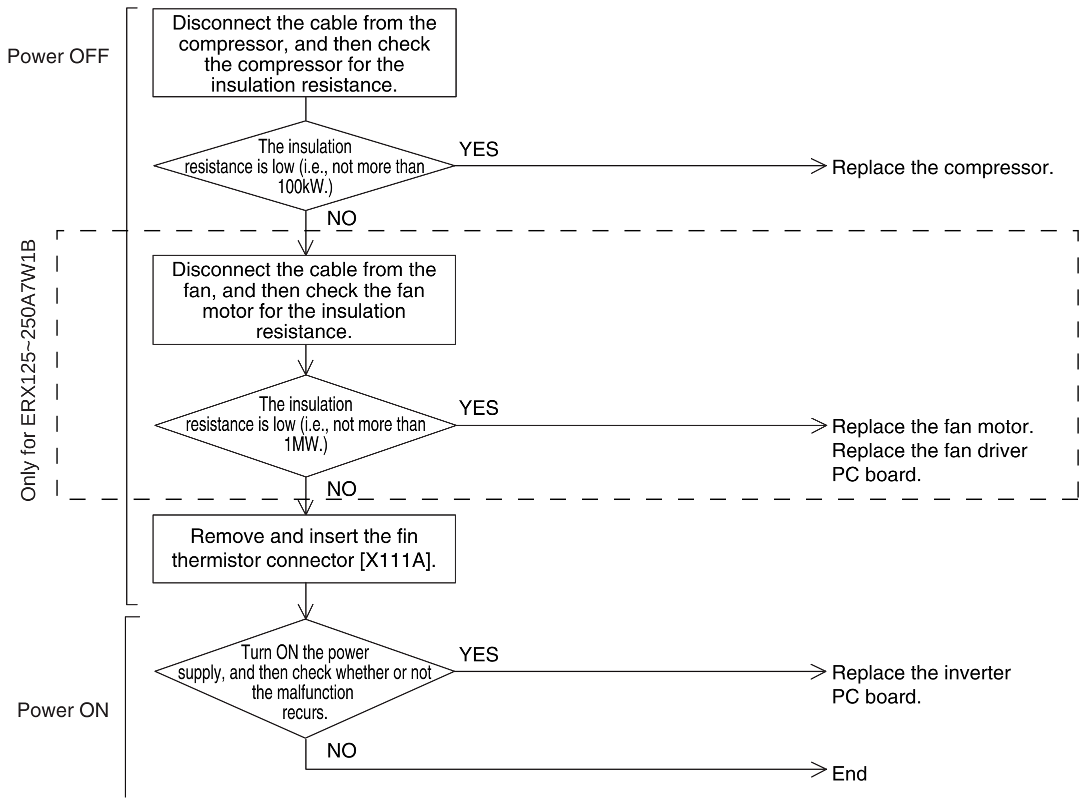
When the resistance value of thermistor becomes a value equivalent to open or short circuited status.

- Malfunction is not decided while the unit operation is continued.
  "P4" will be displayed by pressing the inspection button.

Supposed causes

- Defect of radiator fin temperature sensor
- Defect of inverter PC board

Troubleshooting



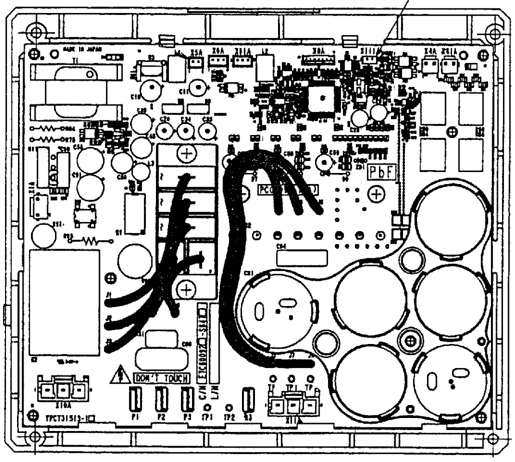
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3

Graph

X111A: EH connector white



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on page 2-4.

3.33 "PJ" Outdoor Unit: Faulty Field Setting after Replacing Main PC Board or Faulty Combination of PC Board (ERX125~250A7W1B)

Error code

PJ

Applicable models

ERX125~250A7W1B

Method of malfunction detection

The faulty (or no) field setting after replacing main PC board or faulty PC board combination is detected through communications with the inverter.

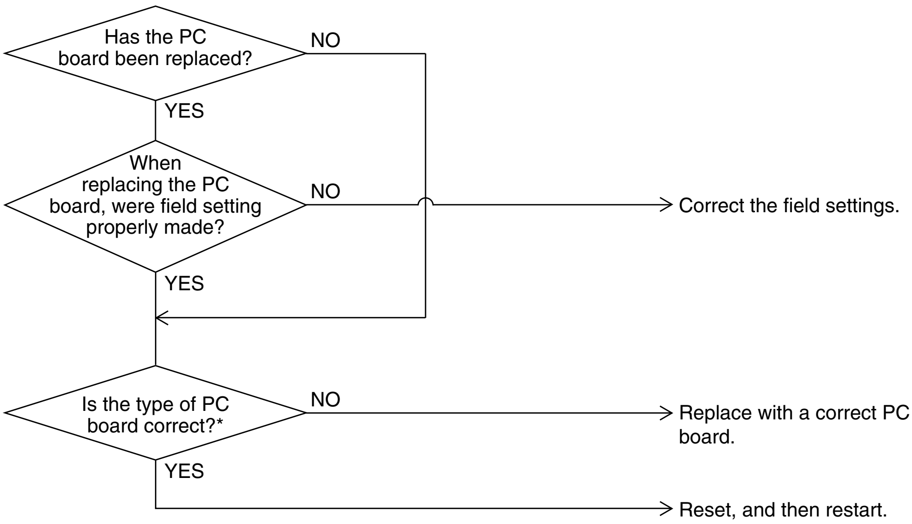
Malfunction decision conditions

Whether or not the field setting or the type of the PC board is correct through the communication date is judged.

Supposed causes

- ➤ Faulty (or no) field setting after replacing main PC board
- ➤ Mismatching of type of PC board

Troubleshooting



Note

Type of PC board mismatching includes:

- ➤ Main PC board
- ➤ Inverter PC board (for compressor)
- ➤ Fan driver PC board

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3

4 Error Codes: System Malfunctions

4.1 What Is in This Chapter?

Introduction

In the first stage of the troubleshooting sequence, it is important to correctly interpret the error code on the remote controller display. The error code helps you to find the cause of the problem.

3

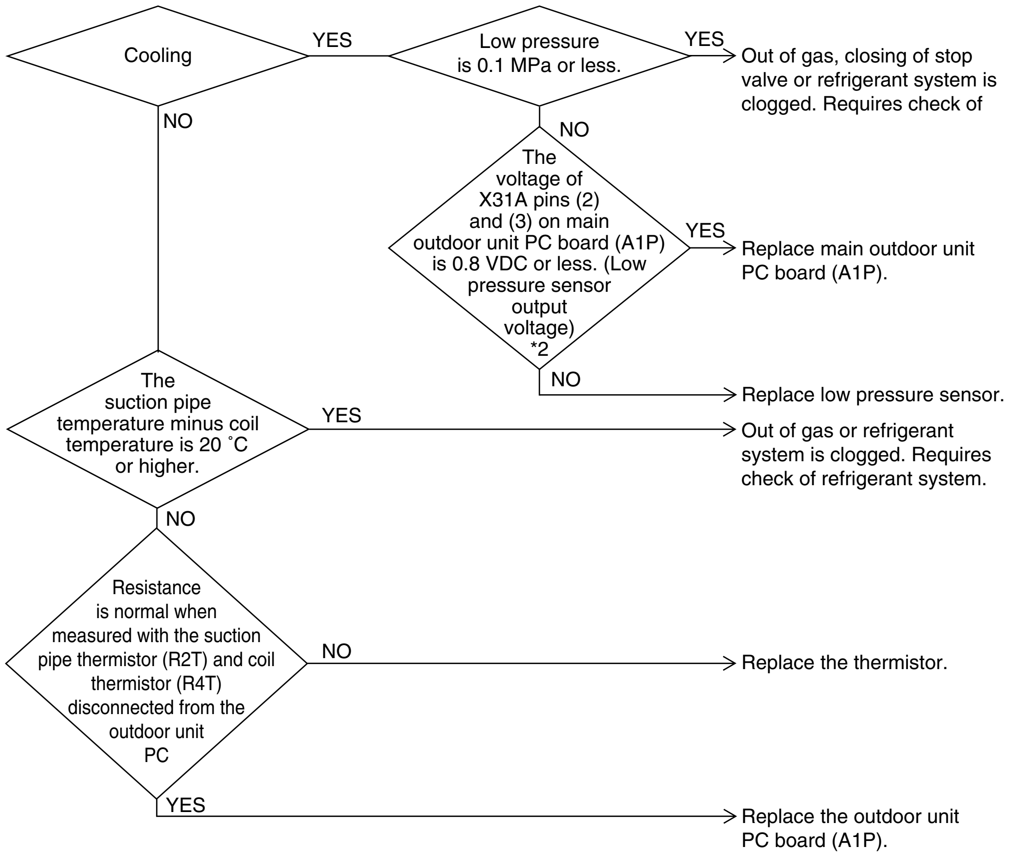
Overview

This chapter contains the following topics:

4.2 "U0" Outdoor Unit: Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure (ERX125~250A7W1B)

Error code	U0
Applicable models	ERX125~250A7W1B
Method of malfunction detection	Short of gas malfunction is detected by discharge pipe temperature thermistor.
Malfunction decision conditions	Microcomputer judge and detect if the system is short of refrigerant. ➤ Malfunction is not decided while the unit operation is continued.
Supposed causes	➤ Out of gas or refrigerant system clogging (incorrect piping) ➤ Defect of thermistor R2T or R4T ➤ Defect of pressure sensor ➤ Defect of outdoor unit PC board (A1P)

Troubleshooting



Notes

*1: Refer to “Thermistor Resistance / Temperature Characteristics” table on page 2-4
*2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on page 2-6.

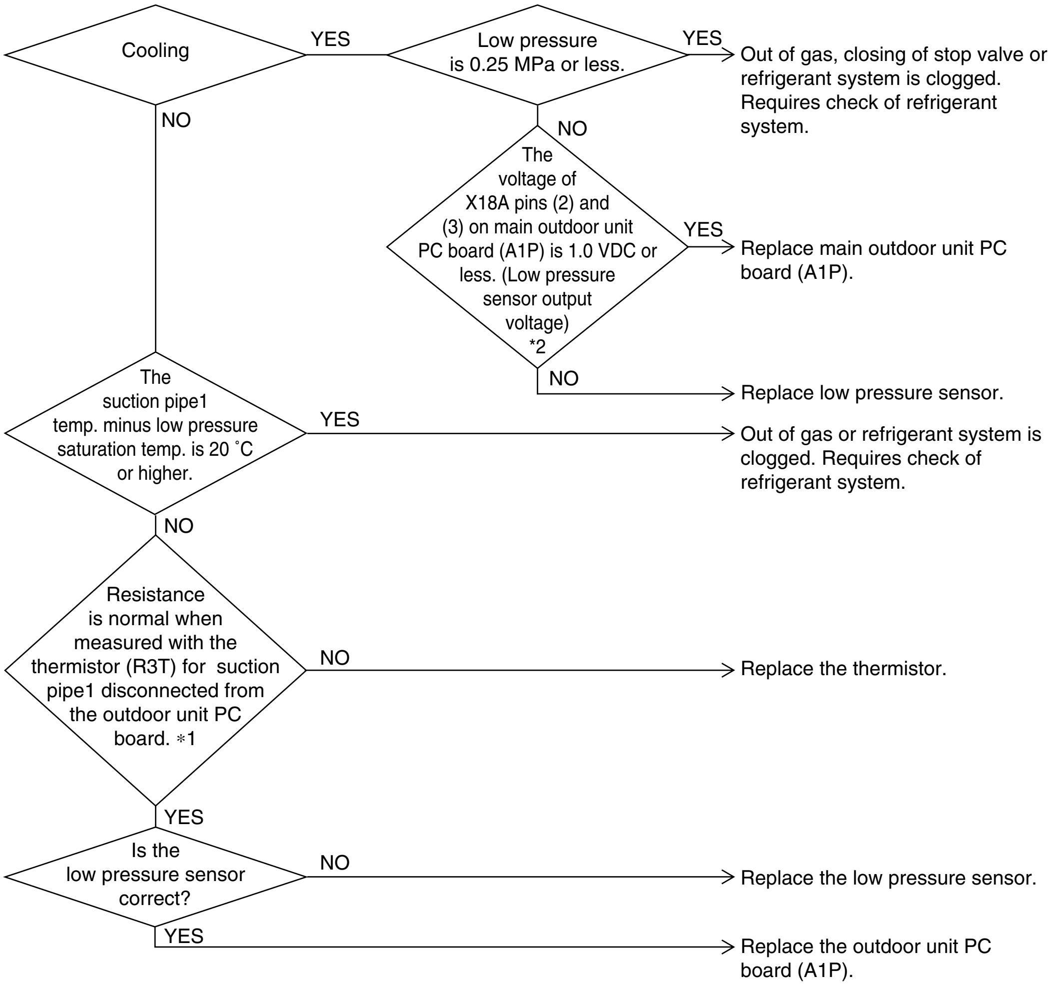
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.3 "U0" Outdoor Unit: Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure (ERX100~140A8V3B)

Error code	U0
Applicable models	ERX100~140A8V3B
Method of malfunction detection	Short of gas malfunction is detected by discharge pipe temperature thermistor and low pressure saturation temperature.
Malfunction decision conditions	Microcomputer judge and detect if the system is short of refrigerant. ➤ Malfunction is not decided while the unit operation is continued.
Supposed causes	➤ Out of gas or refrigerant system clogging (incorrect piping) ➤ Defect of thermistor R3T ➤ Defect of pressure sensor ➤ Defect of outdoor unit PC board (A1P)

Troubleshooting



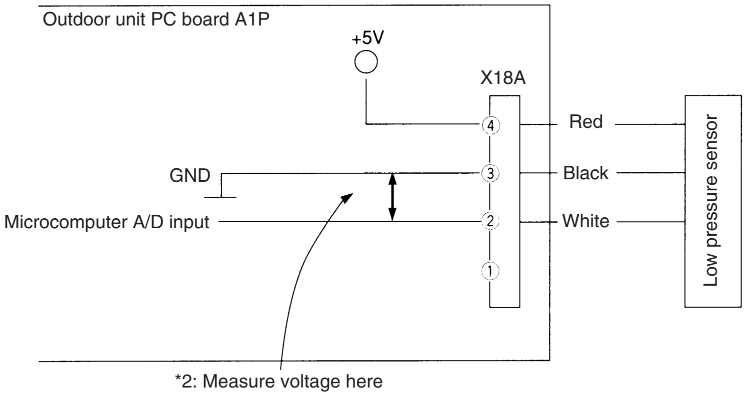
Note

*2: Voltage measurement point

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Graph



Notes

*1: Refer to “Thermistor Resistance / Temperature Characteristics” table on page 2-4.
*2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on page 2-6.

4.4 "U1" Reverse Phase, Open Phase (ERX125~250A7W1B)

Error code

U1

Applicable models

ERX125~250A7W1B

Method of malfunction detection

The phase of each phase are detected by reverse phase detection circuit and right phase or reverse phase are judged.

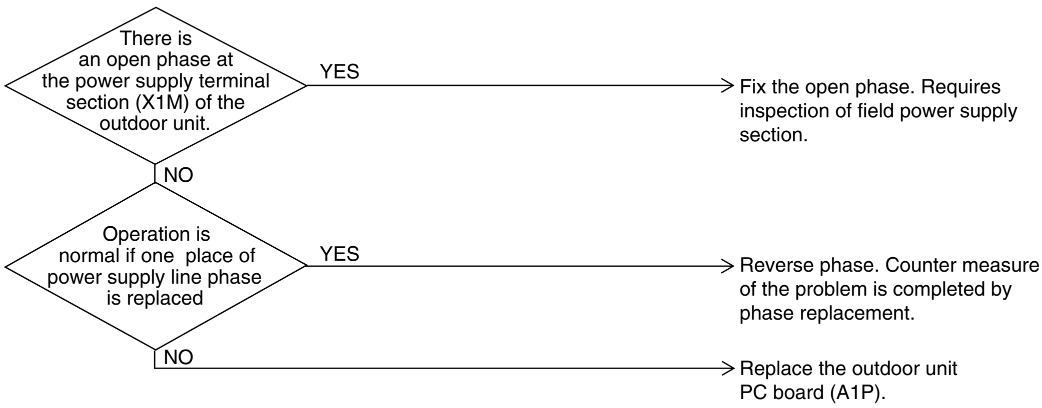
Malfunction decision conditions

When a significant phase difference is made between phases.

Supposed causes

- Power supply reverse phase
- Power supply open phase
- Defect of outdoor PC board (A1P)

Troubleshooting



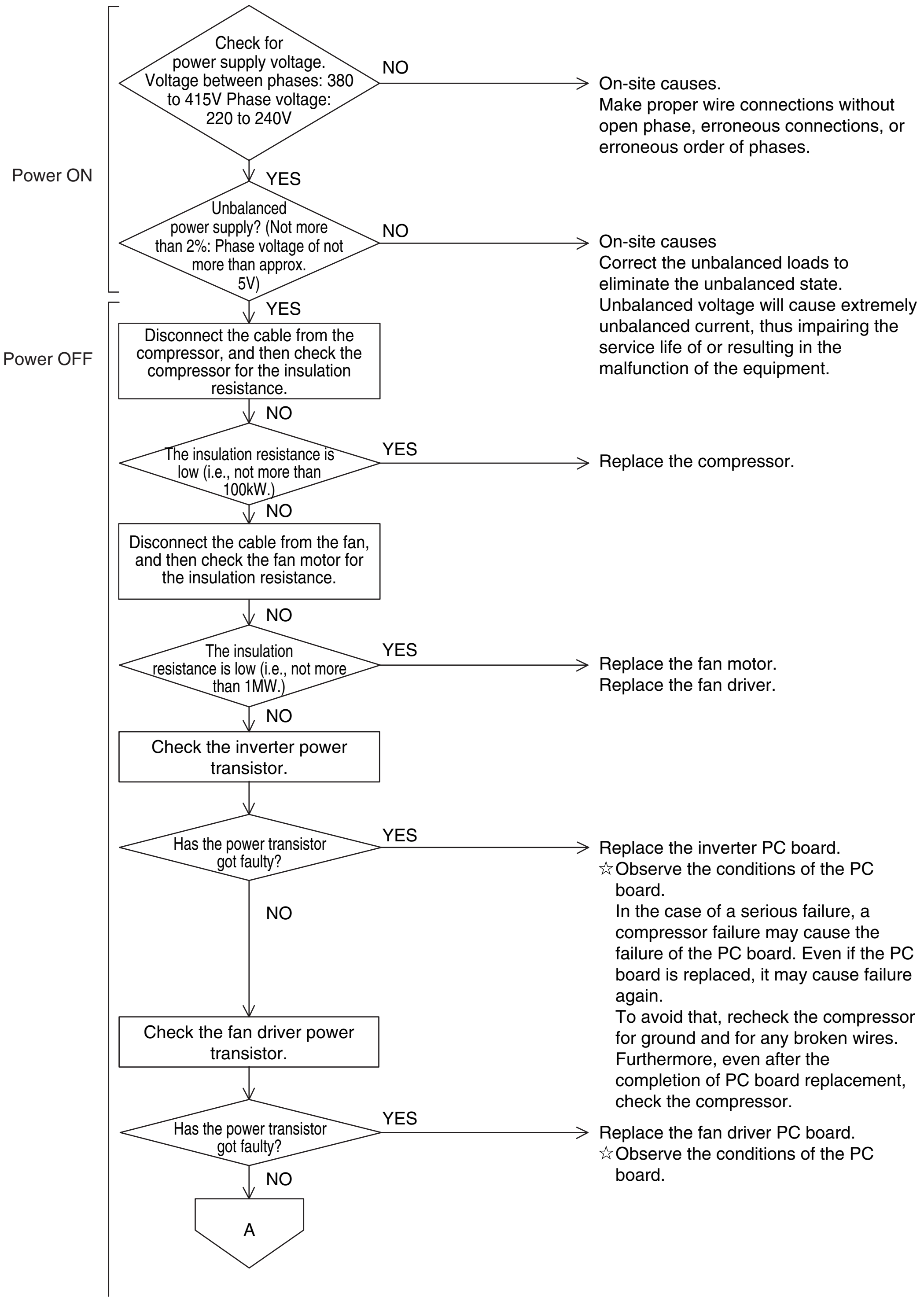
Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.5 "U2" Outdoor Unit: Power Supply Insufficient or Instantaneous Failure (ERX125~250A7W1B)

Error code	U2
Applicable models	ERX125~250A7W1B
Method of malfunction detection	Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.
Malfunction decision conditions	When the voltage aforementioned is not less than 780V or not more than 320V, or when the current-limiting voltage does not reach 200V or more or exceeds 740V.
Supposed causes	➤ Power supply insufficient ➤ Instantaneous power failure ➤ Open phase ➤ Defect of inverter PC board ➤ Defect of outdoor control PC board ➤ Main circuit wiring defect ➤ Faulty compressor ➤ Faulty fan motor ➤ Faulty connection of signal cable

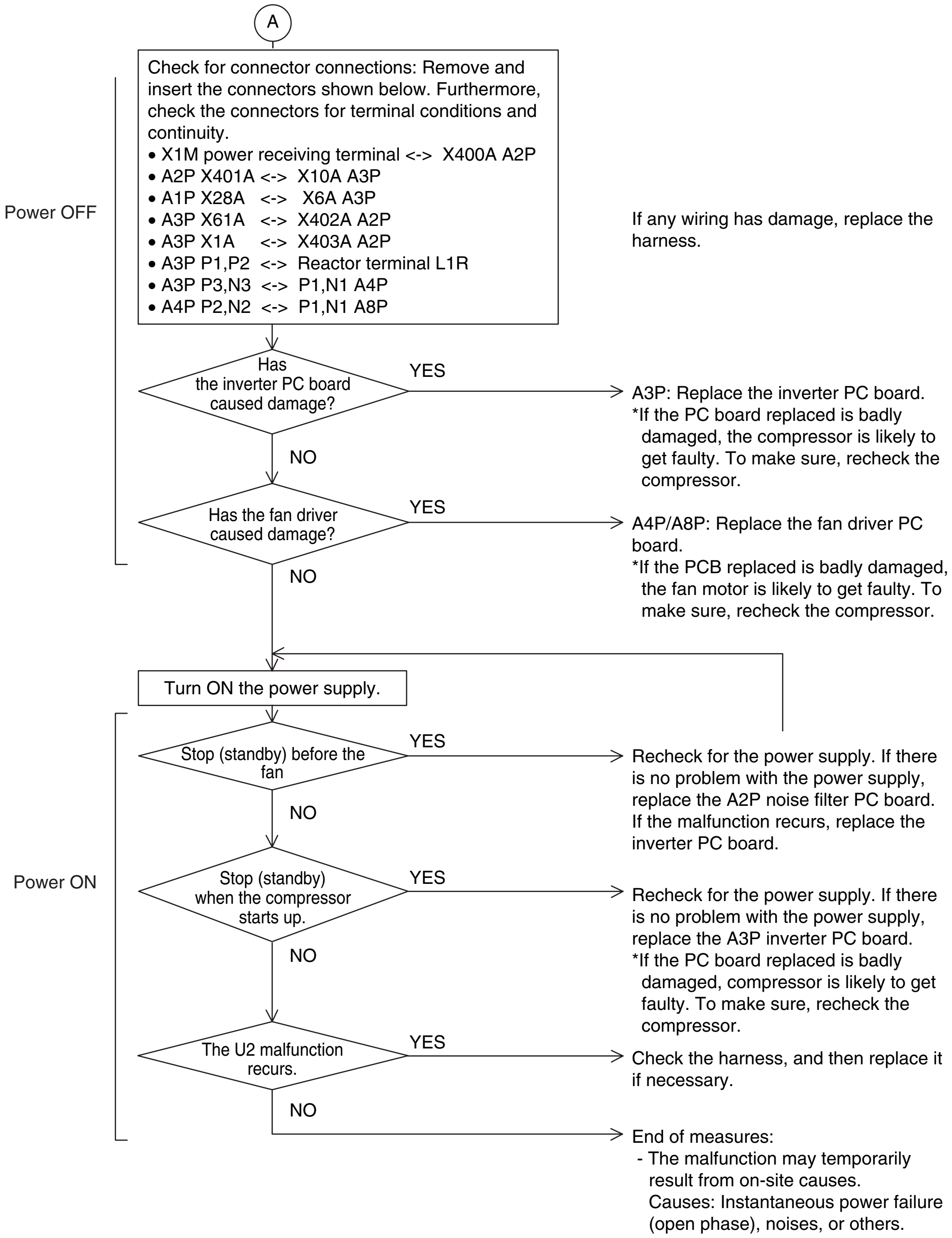
Troubleshooting



3

3

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.6 "U2" Power Supply Insufficient or Instantaneous Failure (ERX100~140A8V3B)

Error code

U2

Applicable models

ERX100~140A8V3B

Method of malfunction detection

Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.

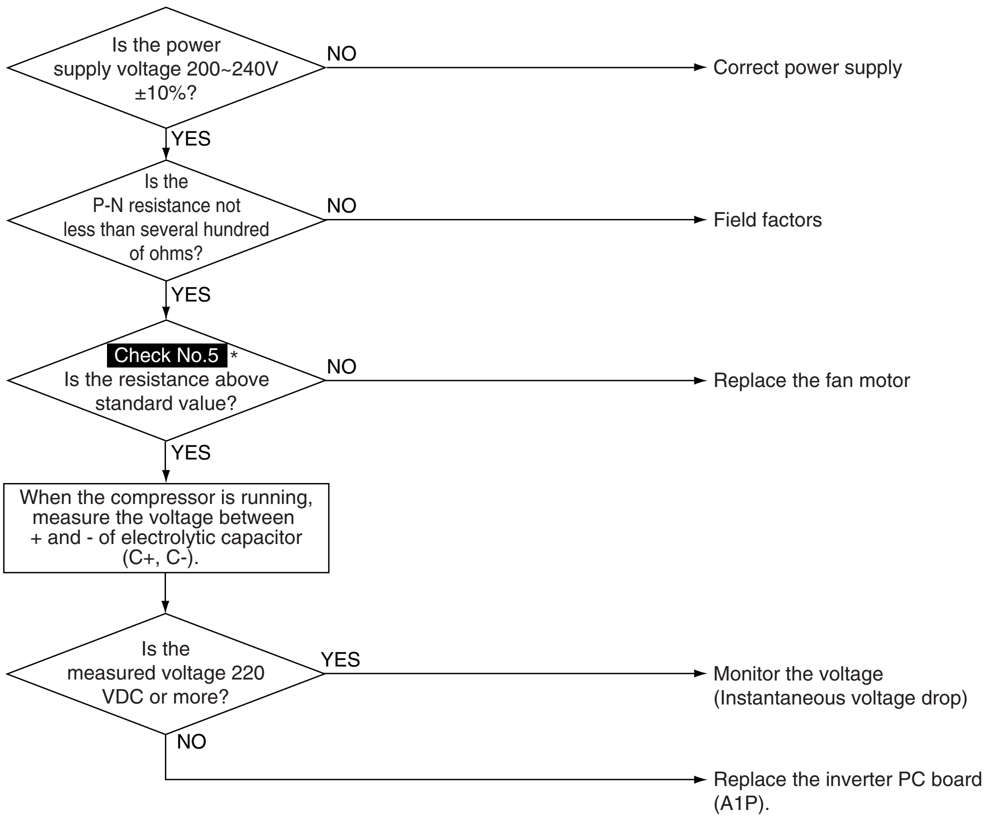
Malfunction decision conditions

When the abnormal voltage of main circuit capacitor built in the inverter and abnormal power supply voltage are detected.

Supposed causes

- Power supply insufficient
- Instantaneous power failure
- Defect of outdoor unit fan motor
- Defect of outdoor control PC board (A1P)

Troubleshooting



See also Check No.5 on page 3–124.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.7 “U3” Outdoor Unit: Check Operation not Executed

Error code

U3

Applicable models

ERX125~250A7W1B, ERX100~140A8V3B

Method of malfunction detection

Check operation is executed or not

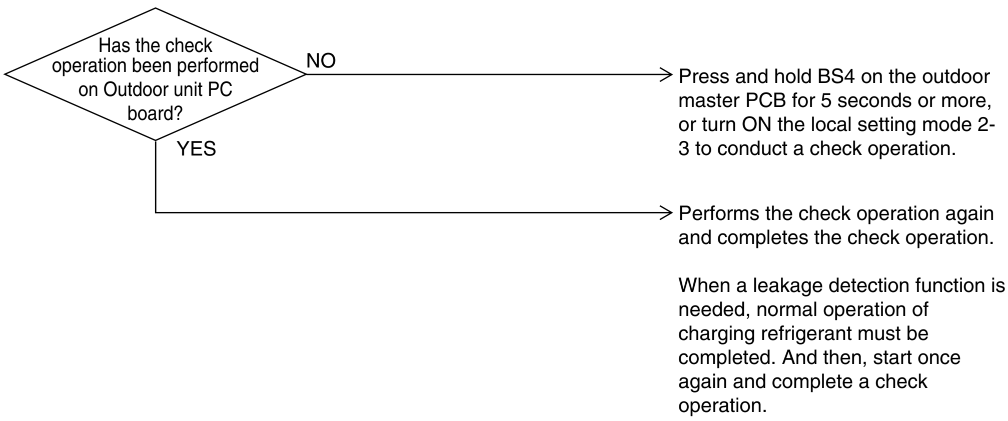
Malfunction decision conditions

Malfunction is decided when the unit starts operation without check operation.

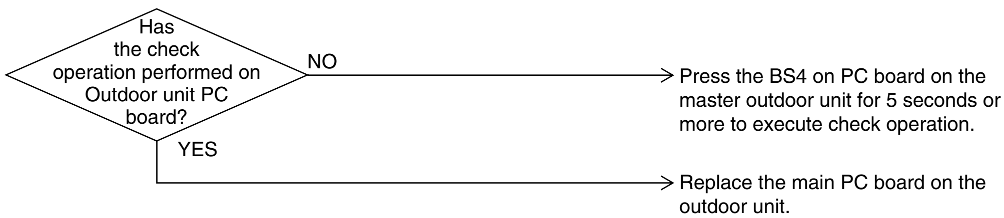
Supposed causes

- ➤ Check operation is not executed.

Troubleshooting ERX125~250A7W1B



Troubleshooting ERX100~140A8V3B



Caution

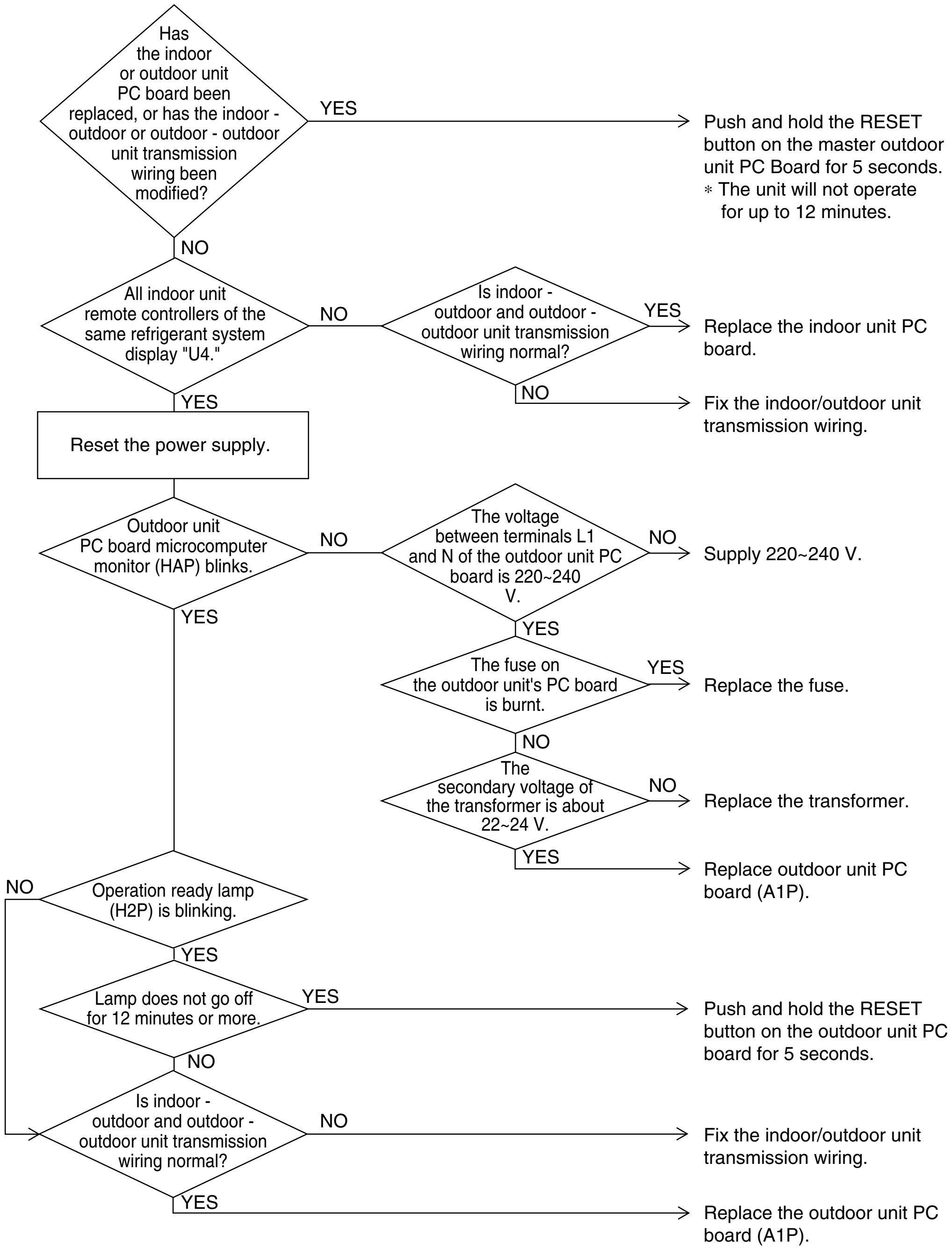
Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.8 "U4" Malfunction of Transmission between Indoor Units

Error code	U4
Applicable Models	ERX125~250A7W1B, ERX100~140A8V3B
Method of Malfunction Detection	Microcomputer checks if transmission between control box and outdoor units is normal.
Malfunction Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	➤ Indoor to outdoor, outdoor to outdoor transmission wiring F1, F2 disconnection, short circuit or wrong wiring ➤ Outdoor unit power supply is OFF ➤ System address does not match ➤ Defect of outdoor unit PC board ➤ Defect of indoor unit PC board

3

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.9 "U5" Indoor Unit: Malfunction of Transmission between Remote Controller and Indoor Unit

Error code

U5

Applicable Models

All models of indoor units

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer is signal transmission between indoor unit and remote controller (main and sub) is normal.

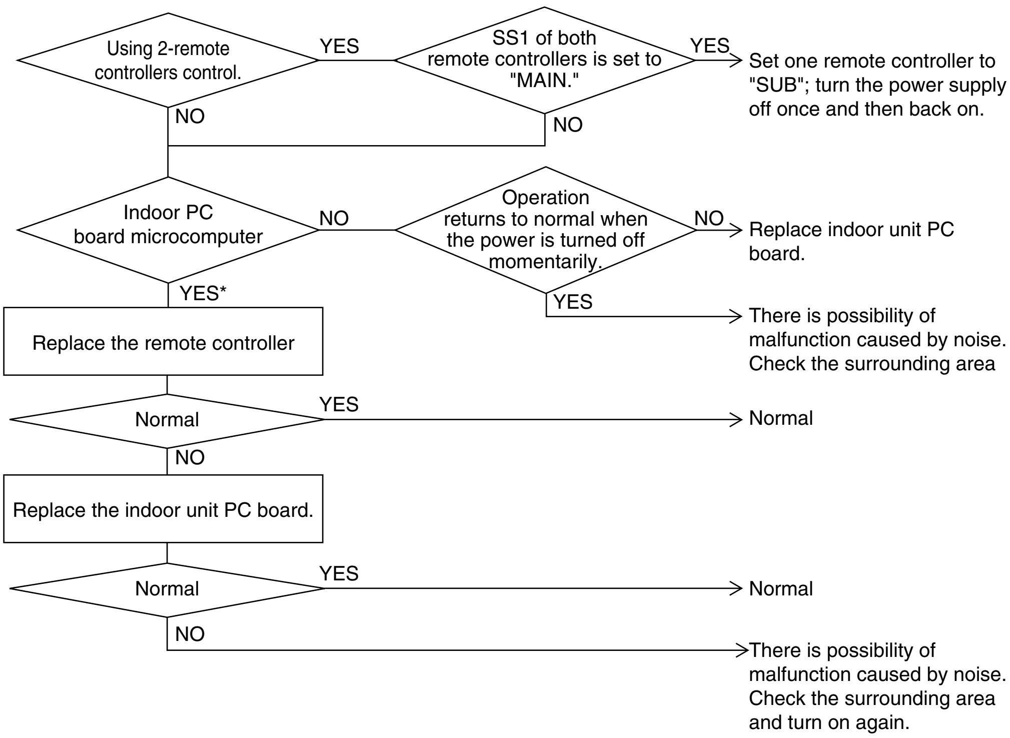
Malfunction Decision Conditions

Normal transmission does not continue for specified period.

Supposed Causes

- ➤ Malfunction of indoor unit remote controller transmission
- ➤ Connection of two main remote controllers (when using 2 remote controllers)
- ➤ Defect of indoor unit PC board
- ➤ Defect of remote controller PC board
- ➤ Malfunction of transmission caused by noise

Troubleshooting



* Multi-Core cable used for the indoor unit remote controller transmission wiring.
Switch to double core independent cable replacement.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.10 "U8" Indoor Unit: Malfunction of Transmission between Master and Sub Remote Controllers

Error code

U8

Applicable Models

All models of indoor units

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer if signal transmission between indoor unit and remote controller (main and sub) is normal.

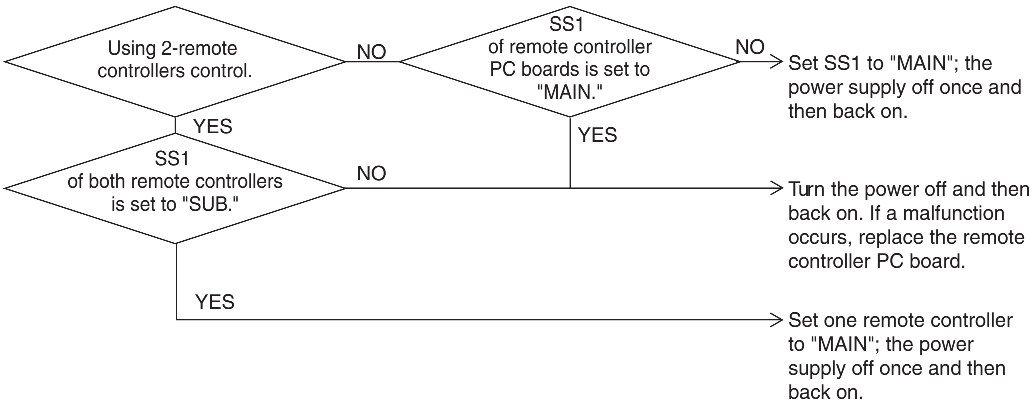
Malfunction Decision Conditions

Normal transmission does not continue for specified period.

Supposed Causes

- Malfunction of transmission between main and sub remote controller
- Connection between sub remote controllers
- Defect of remote controller PC board

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.11 "UA" Excessive Number of Control Boxes

Error code UA

Applicable Models All indoor unit models

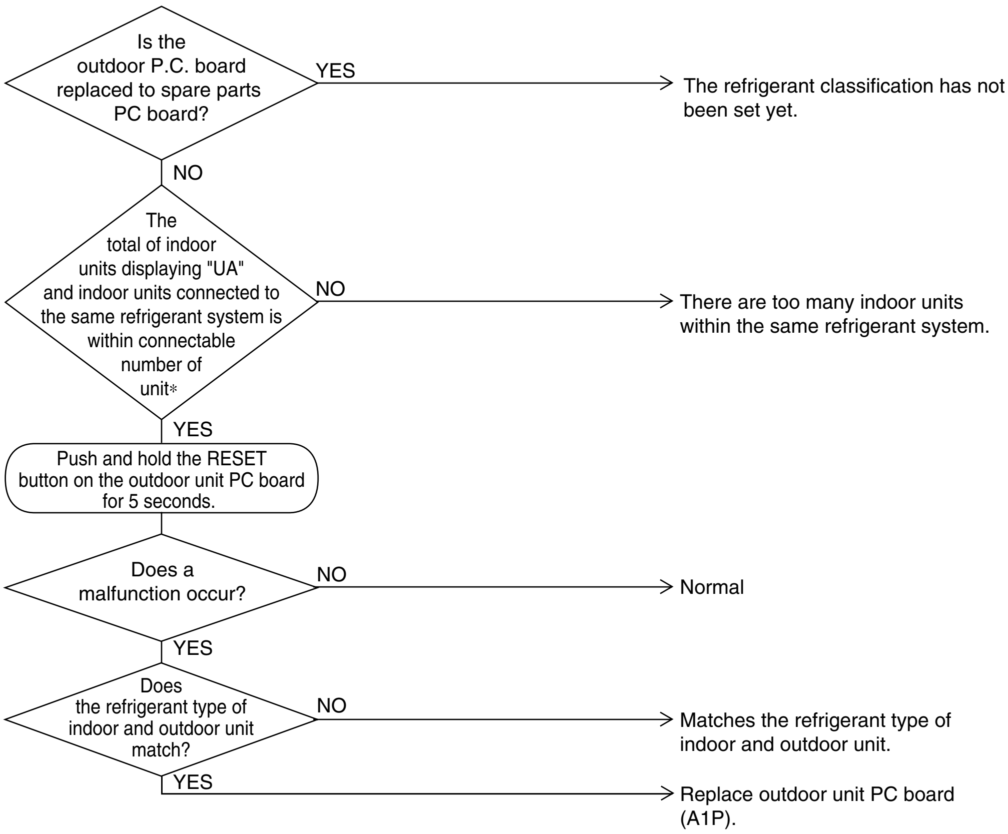
Method of Malfunction Detection

Malfunction Decision Conditions

Supposed Causes

- ➤ Excess of connected control boxes
- ➤ Defect of outdoor unit PC board (A1P)
- ➤ Mismatching of the refrigerant type of indoor and outdoor unit.
- ➤ Setting of outdoor PC board was not conducted after replacing to spare parts P.C. board.

Troubleshooting



* The number of indoor units that can be connected to a single outdoor unit system depends on the type of outdoor unit.

Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

4.12 "UH" Malfunction of System, Refrigerant System Address Undefined

Error code UH

Applicable Models All indoor unit models

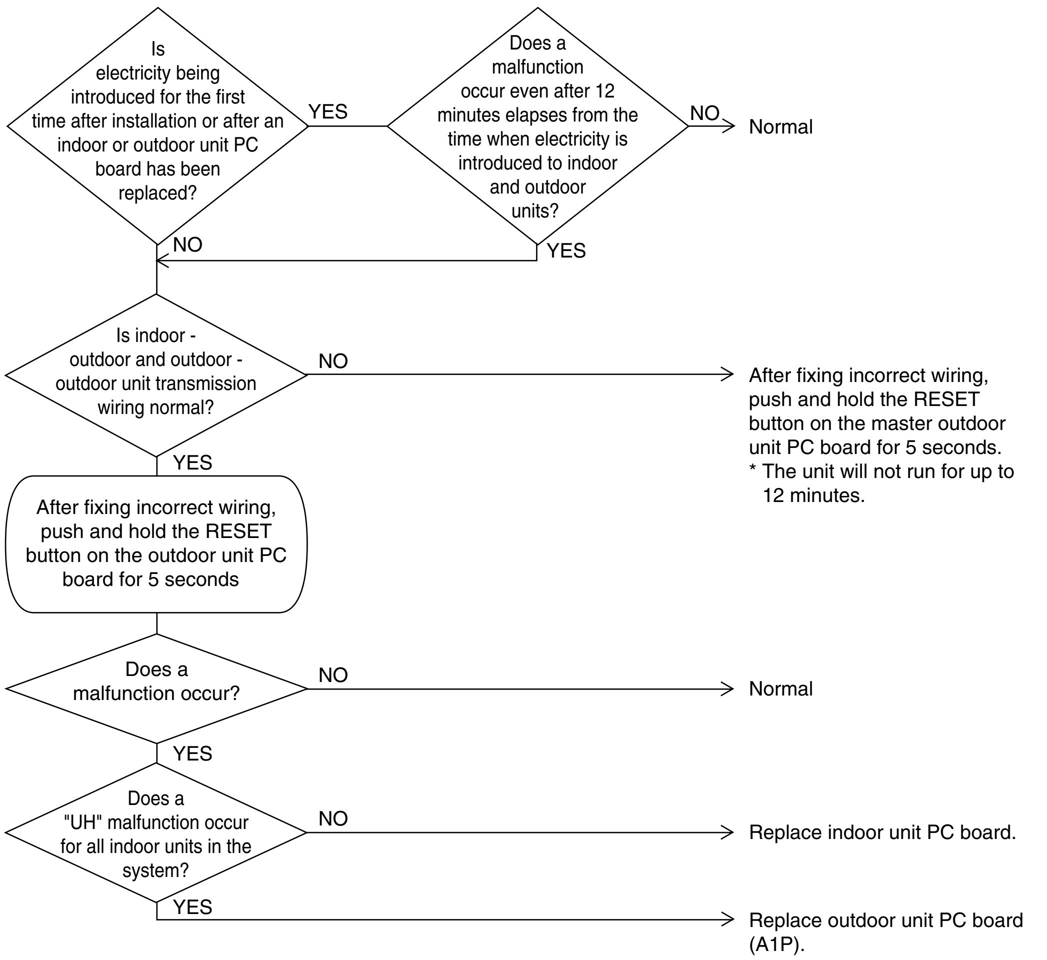
Method of Malfunction Detection

Malfunction Decision Conditions

Supposed Causes

- ➤ Improper connection of transmission wiring between outdoor unit and outdoor unit outside control adaptor
- ➤ Defect of indoor unit PC board
- ➤ Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

3

5 Additional Checks for Troubleshooting

5.1 What Is in This Chapter?

Introduction

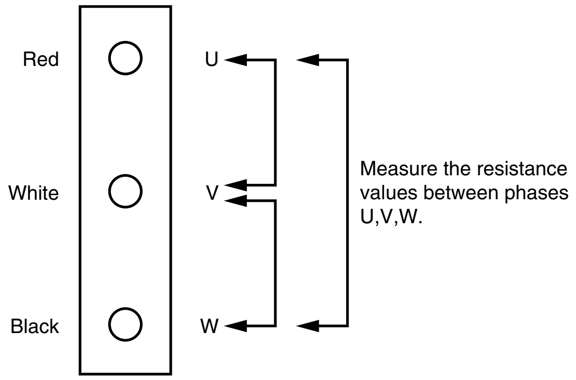
This chapter explains how you must check the units to carry out troubleshooting correctly.

Overview

This chapter contains the following topics:

5.2 Check No. 1 : Check on Connector of Fan Motor (Power Supply Cable)

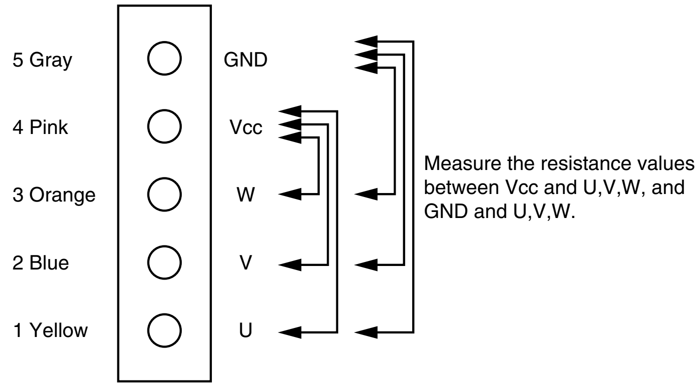
1 Turn off the power supply.
Measure the resistance between phases of U,V,W at the motor side connectors (three-core wire) to check that the values are balanced and there is no short circuiting, while connector or relay connector is disconnected.



5.3 Check No. 2

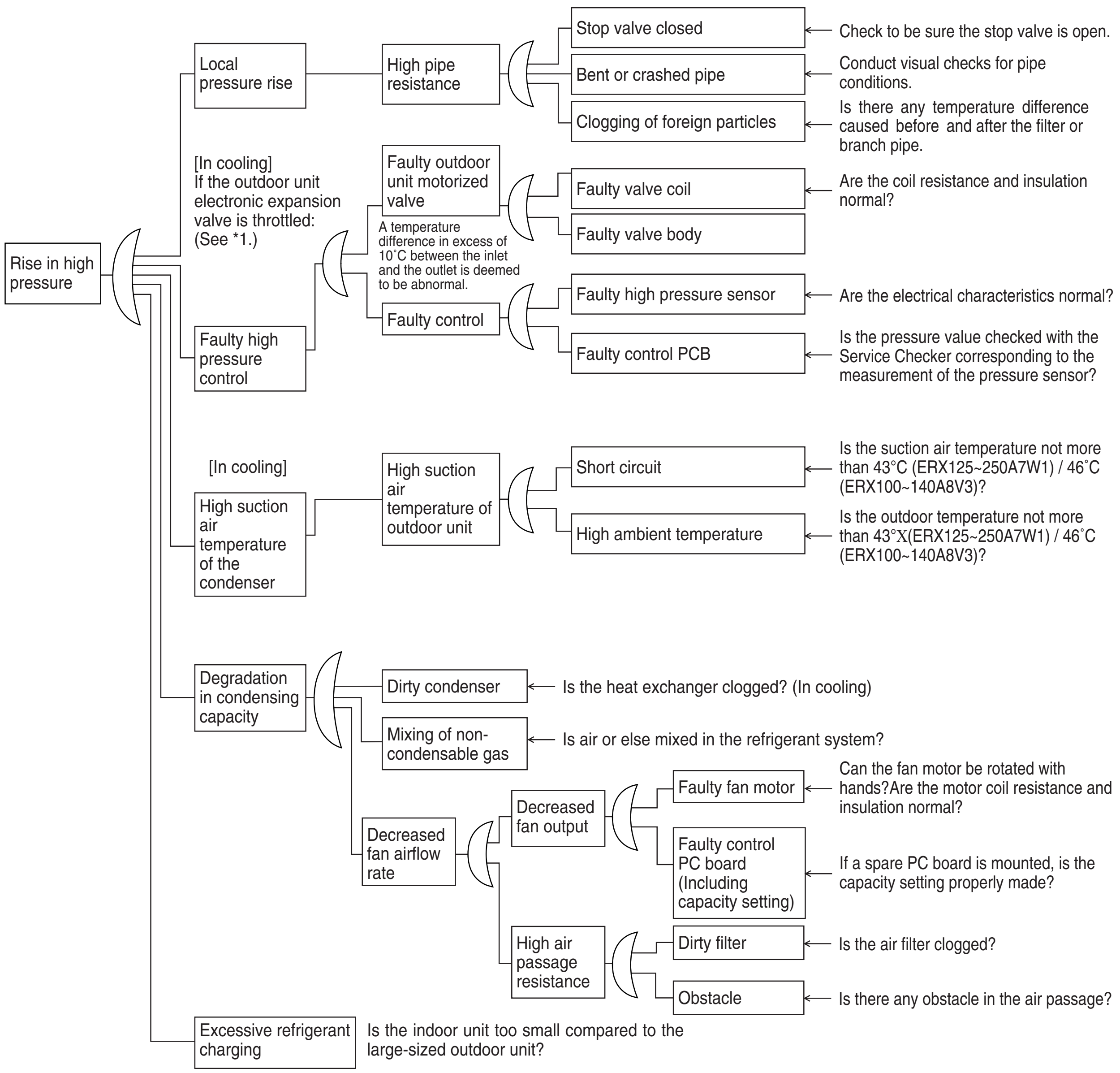
1 Turn off the power supply.

2 Measure the resistance between Vcc and each phase of U,V,W, and GND and each phase at the motor side connectors (five-core wire) to check that the values are balanced within the range of ± 20 %, while connector or relay connector is disconnected.
Furthermore, to use a multiple meter for measurement, connect the probe of negative pole to Vcc and that of positive pole to GND.



5.4 Check No. 3: Check for Causes of Rise in High Pressure

Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.

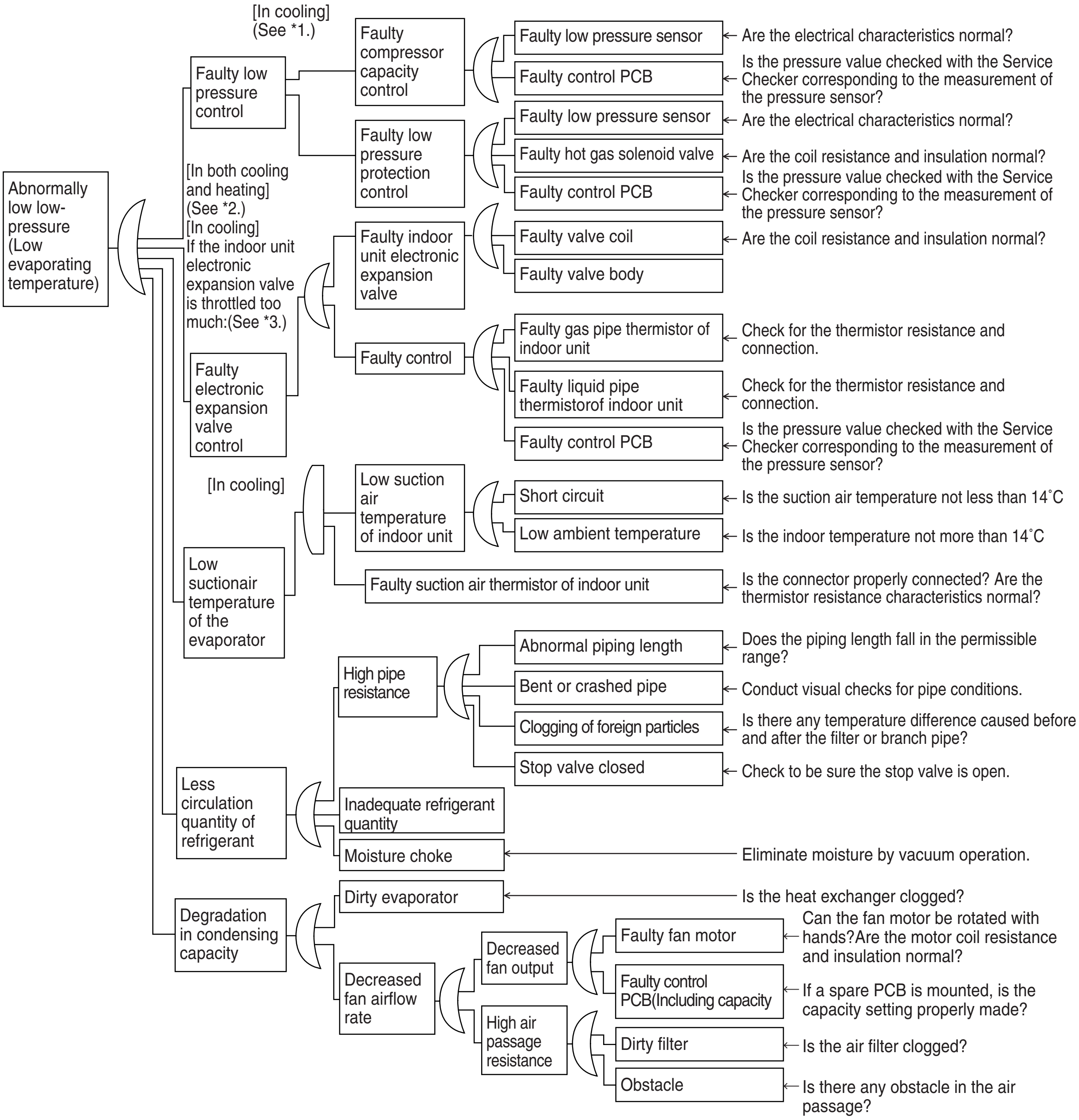


Note

*1: In cooling, it is normal if the outdoor unit electronic expansion valve (EV1) is fully open.

5.5 Check No. 4: Check for Causes of Drop in Low Pressure

Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.



Notes

*1: For details of the compressor capacity control while in cooling, refer to “Compressor PI Control” on page 2-17.

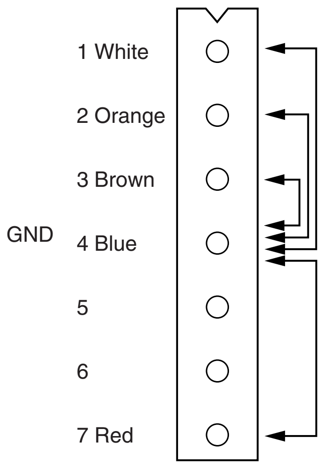
*2: The “low pressure protection control” includes low pressure protection control and hot gas bypass control. For details see page 2-32.

*3: In cooling, the indoor unit electronic expansion valve is used for “superheated degree control” on page 2-44.

5.6 Check No. 5: Check for Fan Motor Connector (Only ERX100~140A8V3B)

1 Turn the power supply off.

2 With the fan motor connector disconnected, measure the resistance between each pin, then make sure that the resistance is more than the value mentioned in the following table.



Measurement point	Judgment
1 - 4	1MΩ or more
2 - 4	100kΩ or more
3 - 4	100Ω or more
4 - 7	100kΩ or more

Part 4
Commissioning and Test Run

What is in this part?

This part contains the following chapters:

4

4

1 Field settings

1.1 What Is in This Chapter?

Introduction

This chapter contains the following information:

- How to change the field settings
- The field settings
- The factory settings.

Overview

This chapter contains the following topics:

1.2 Field Setting from Remote Controller

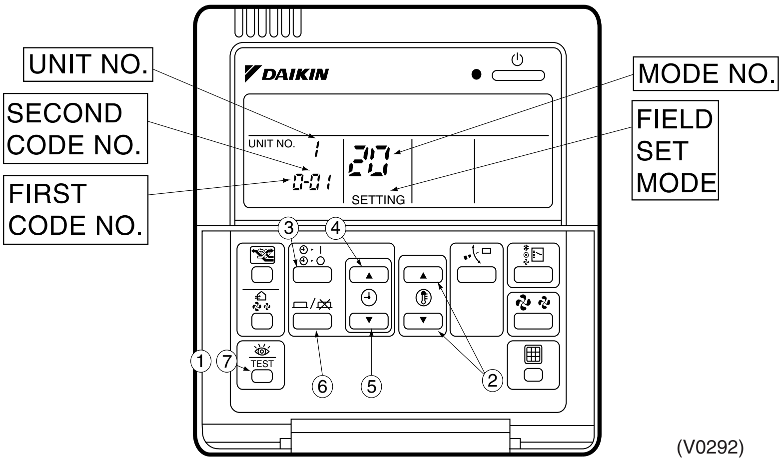
General

Individual function of indoor unit can be changed from the remote controller. At the time of installation or after service inspection / repair, make the local setting in accordance with the following description.

Wrong setting may cause malfunction.

(When optional accessory is mounted on the indoor unit, setting for the indoor unit may be required to change. Refer to information in the option handbook.)

Wired Remote Controller <BRC1C61, 62>



(V0292)

1. When in the normal mode, press the " " button for a minimum of four seconds, and the FIELD SET MODE is entered.
2. Select the desired MODE NO. with the " " button (2).
3. During group control, when setting by each indoor unit (mode No. 20, 22 and 23 have been selected), push the " " button (3) and select the INDOOR UNIT NO to be set. (This operation is unnecessary when setting by group.)
4. Push the " " upper button (4) and select FIRST CODE NO.
5. Push the " " lower button (5) and select the SECOND CODE NO.
6. Push the " " button (6) once and the present settings are SET.
7. Push the " " button (7) to return to the NORMAL MODE.

Example

If during group setting and the time to clean air filter is set to FILTER CONTAMINATION, HEAVY, SET MODE NO. to "10" FIRST CODE NO. to "0", and SECOND CODE NO. to "02".

1.3 Auto Restart after Power Failure Reset

General

For the air conditioners with no setting for the function (same as factory setting), the units will be left in the stop condition when the power supply is reset automatically after power failure reset or the main power supply is turned on again after once turned off. However, for the air conditioners with the setting, the units may start automatically after power failure reset or the main power supply turned on again (return to the same operation condition as that of before power failure).

For the above reasons, when the unit is set enabling to utilize “Auto restart function after power failure reset”, utmost care should be paid for the occurrence of the following situation.

Caution

1. The air conditioner starts operation suddenly after power failure reset or the main power supply turned on again. Consequently, the user might be surprised (with question for the reason why).
2. In the service work, for example, turning off the main power switch during the unit is in operation, and turning on the switch again after the work is completed start the unit operation (the fan rotates).

4

1.4 Field Setting from Outdoor Unit

Contents

1.4.1 List of Field Setting Items

This following section indicates the list of field setting items. For the lists of dip switch contents, Setting mode 1, and Setting mode 2, refer to information in tables shown on the following page onward.

For setting items of (*1), refer to detailed information provided on page page 4-4 onward.

Setting item			Content and objective of setting	Overview of setting procedure
Service setting	7	Emergency operation (*1)	If the compressor has a failure, used to prohibit the operation of compressor(s) concerned or outdoor unit(s) concerned and to conduct emergency operation of the system only with operable compressor(s) or outdoor unit(s).	Make this setting while in "Setting mode 2". ➤ For system with a single outdoor unit: Set with No. 19 or 42. ➤ For system with multiple outdoor units: Set with No. 38, 39, or 40.
	8	Additional refrig-erant charging (*1)	If a necessary amount of refrigerant cannot be charged due to the stop of outdoor unit, operate the outdoor unit and then refill refrigerant.	Set No. 20 of "Setting mode 2" to ON and then charge refrigerant.
	9	Refrigerant recovery mode (*1)	Used to recover refrigerant on site. With operations of indoor and outdoor units prohibited, fully open the expansion valve of the indoor and outdoor units.	Set No. 21 of "Setting mode 2" to ON.
	10	Vacuuming mode (*1)	Used to conduct vacuuming on site. Fully open the expansion valves of the indoor and outdoor units, and energize part of solenoid valves. Use a vacuum pump to conduct vacuuming.	Set No. 21 of "Setting mode 2" to ON.
	12	Power transistor check mode	Used for the troubleshooting of DC compressors. Inverter waveform output makes it possible to judge whether a malfunction results from the compressor or the PC board.	Set No. 28 of "Setting mode 2" to ON.

For setting items of (*1), refer to detailed information provided on page 4–6 onward.

4

1.4.2 Setting by DIP Switches (ERX125~250A7W1B)

Using dip switches on the PC board

Using dip switches on the PC board enables field setting shown below. However, make no changes of factory settings.

Dipswitch		Setting item	Description
No.	Setting		
DS1-1	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		
DS1-2 ~DS1-4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		
DS2-1 ~4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		

Setting at replacement by spare PC board

Caution:

<u>**DIP switch Setting after changing the main P.C.Board(A1P) to spare parts P.C.B.**</u>

After the replacement by the spare PC board, be sure to make settings shown below.

When you change the main P.C.Board(A1P) to spare parts P.C.B., please carry out the following setting.

Initial conditions of dip switches

<u>**DIP Switch Detail**</u>

DS No.	Item	Contents	
DS1-1	Cool/Heat change over setting	ON	–
		OFF (Factory setting of spare PC board)	–
DS1-2	Power supply specification	ON	–
		OFF (Factory setting of spare PC board)	400V class (380V)
DS1-3	Cooling only/Heat-pump setting	ON	Cooling only setting
		OFF (Factory setting of spare PC board)	Heat pump setting
DS1-4	Unit allocation setting	ON	Make the following settings according to allocation of unit. (All models are set to OFF at factory.)
DS2-1		OFF (Factory setting of spare PC board)	

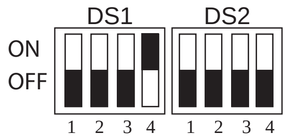
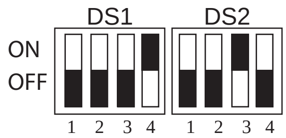
	Europe
DS1-4	ON
DS2-1	OFF

<table>
<tr><th>DS No.</th><th>Item</th><th>Contents</th></tr>
<tr><td>DS2-2</td><td rowspan="3">Model setting</td><td rowspan="3">Make the following settings according to models of outdoor unit. (All models are set to OFF at factory.)
<table>
<tr><th></th><th>ERX125A7W1</th><th>ERX200A7W1</th><th>ERX250A7W1</th></tr>
<tr><td>DS2-2</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>DS2-3</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>DS2-4</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
</table></td></tr>
<tr><td>DS2-3</td></tr>
<tr><td>DS2-4</td></tr>
</table>

Note

* If the DS1-1~1-4, DS2-2~2-4 setting has not been carried out, error code “UA” are displayed and unit can not be operated.

Detail of DS1-1~4, DS2-1~4 setting (for Overseas general)

<table>
<tr><th>Unit</th><th colspan="2">Setting method (■ represents the position of switches)</th></tr>
<tr><td>ERX125A7W1B</td><td>
</td><td>Set DS2-1 to OFF.</td></tr>
<tr><td>ERX200A7W1B</td><td>
</td><td>Set DS2-1 and DS2-3 to OFF.</td></tr>
<tr><td>ERX250A7W1B</td><td>
</td><td>Set DS2-1, DS2-2 and DS2-3 to OFF.</td></tr>
</table>

1.4.3 Setting by Dip Switches (ERX100~140A8V3B)

Using dip switches on the PC board

The following field settings are made by dip switches on PC board.

Dipswitch		Setting item	Description
No.	**Setting**		
DS1-1	ON	Cool / Heat change over set-	–
	OFF (Factory set)		
DS1-2	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		

DIP switch setting after changing the main PCB

Caution:

<u>DIP switch Setting after changing the main P.C.Board(A1P) to spare parts P.C.B.</u>

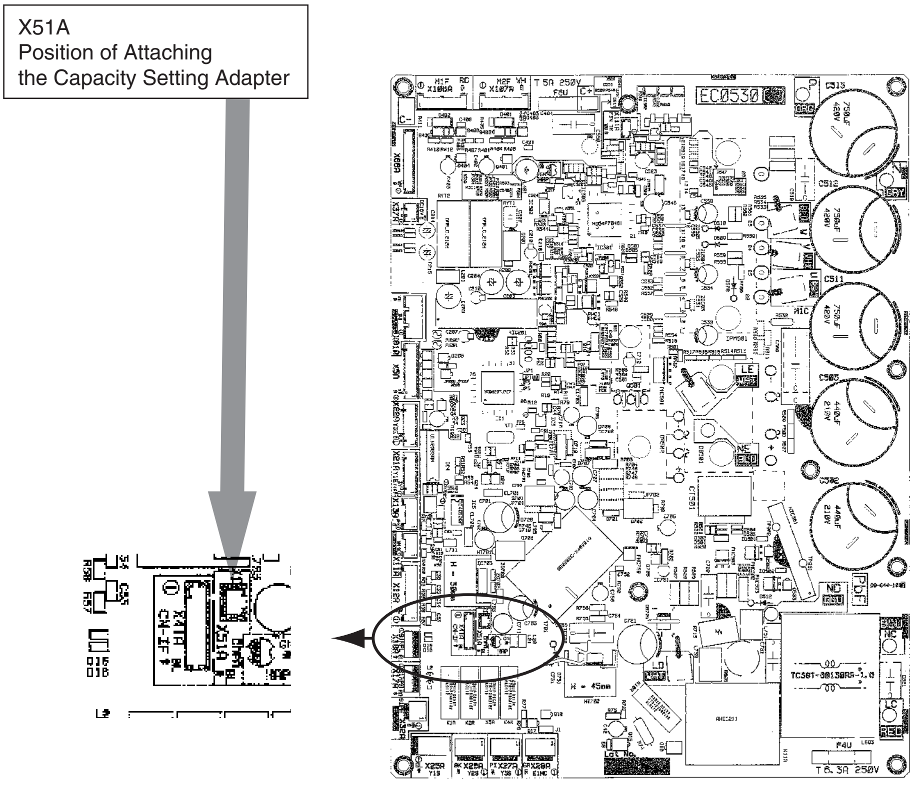
When you change the main P.C.Board(A1P) to spare parts P.C.B., please carry out the following setting.

Please Attach the Capacity Setting Adapter corresponding to Capacity Class (ex. 112, 140, 160) in connector X51A. (See Below)

Capacity Setting Adapter

	Capacity Class	Note
1	100 (112)	CAPACITY SETTING ADAPTER (for 100/J112)
2	125 (140)	CAPACITY SETTING ADAPTER (for 125/J140)
3	140 (160)	CAPACITY SETTING ADAPTER (for 140/J160)

Position of Attaching the Capacity Setting Adapter



1.5 Setting of Refrigerant Recovery Mode

General

When carrying out the refrigerant collection on site, fully open the respective expansion valve of indoor and outdoor units.
All indoor and outdoor unit's operation are prohibited.

Operation procedure

1. In **setting mode 2** with units in stop mode, set "Refrigerant Recovery / Vacuuming mode" to ON. The respective expansion valve of indoor and outdoor units are fully opened. (H2P turns to display "TEST OPERATION" (blinks), "TEST OPERATION" and "UNDER CENTRALIZED CONTROL" are displayed on the remote controller, and the indoor / outdoor unit operation is prohibited.
   After setting, do not cancel "Setting Mode 2" until completion of refrigerant recovery operation.
2. Collect the refrigerant using a refrigerant recovery unit. (See the instruction attached to the refrigerant recovery unit for more detail.)
3. Press Mode button "BS1" once and reset "Setting Mode 2".

1.6 Setting of Vacuuming Mode

General

In order to perform vacuuming operation at site, fully open the expansion valves of indoor and outdoor units and turn on some solenoid valves.

Operating procedure

1. With **Setting Mode 2** while the unit stops, set “Refrigerant recovery / Vacuuming mode” to ON. The expansion valves of indoor and outdoor units fully open and some of solenoid valves open.
(H2P blinks to indicate the test operation, and the remote controller displays "Test Operation" and "Under centralized control", thus prohibiting operation.)
After setting, do not cancel “Setting Mode 2” until completion of Vacuuming operation.
2. Use the vacuum pump to perform vacuuming operation.
3. Press Mode button “BS1” once and reset “Setting Mode 2”.

4

1.7 Check Operation Detail (ERX125~250A7W1B)

CHECK OPERATION FUNCTION

(Press the MODE button BS1 once and set to SETTING MODE 1 (H1P: OFF))

LED display (H1P~H7P) (○:ON ●:OFF ◑:BLINK)

			LED display (H1P~H7P)
	Unit stopping		● ● ○ ● ● ● ●
		Press the TEST button for 5 seconds.	
Step 1	Pressure equalizing		● ◑ ● ● ● ● ○
		10 sec to 10 minutes	
Step 2	Cooling start control		● ◑ ● ● ● ○ ●
		20 sec to 2 minutes	
Step 3	Stability waiting operation		● ◑ ● ● ● ○ ○
		10 minutes	
Step4~8	Judgement function	• Stop valve close check • Wrong wiring check • Correct Refrigerant charge check • Piping length check	● ◑ ● ● ○ ● ● ↓ ● ◑ ● ● ○ ● ○ ↓ ● ◑ ● ● ○ ○ ● ↓ ● ◑ ● ● ○ ○ ○ ↓ ● ◑ ● ○ ● ● ●
Step 9	Pump down residual operation		● ◑ ● ○ ● ● ○
		5 minutes	
Step 10	Standby for restarting		● ◑ ● ○ ● ○ ●
		5 minutes	
	Completion		

1.8 Check Operation Detail (ERX100~140A8V3B)

To prevent any trouble in the period of installation at site, the system is provided with a test operation mode enabling check for incorrect wiring, stop valve left in closed, coming out (or misplacing with suction pipe thermistor) of discharge pipe thermistor and judgment of piping length, refrigerant overcharging, and learning for the minimum opening degree of electronic expansion valve.

CHECK OPERATION FUNCTION

LED display (H1P~H7P) (○:ON ●:OFF ◐:BLINK)

			LED display (H1P~H7P)
	Unit stopping		● ● ○ ● ● ● ●
	↓	Press the TEST button for 5 seconds.	
Step 1	Pressure equalizing		● ◐ ● ● ● ● ○
	↓	10 sec to 10 minutes	
Step 2	Cooling start control		● ◐ ● ● ● ○ ●
	↓	20 sec to 2 minutes	
Step 3	Stability waiting operation		● ◐ ● ● ● ○ ○
	↓	10 minutes	
Step4~6	Judgment function	• Stop valve close check	● ◐ ● ● ○ ● ●
		• Wrong wiring check	● ◐ ● ● ○ ● ○
		• Piping length check	● ◐ ● ● ○ ○ ●
	↓	3 minutes	
Step 7	Refrigerant over charge judgment		● ◐ ● ● ○ ○ ○
	↓	15 minutes	
Step 8	Pump down residual operation		● ◐ ● ○ ● ● ○
	↓	5 seconds	
Step 9	Standby for restarting		● ◐ ● ○ ● ○ ●
	↓	2 minutes	
	Completion		

2 Test Operation

2.1 What Is in This Chapter?

Introduction

This chapter contains the following information:

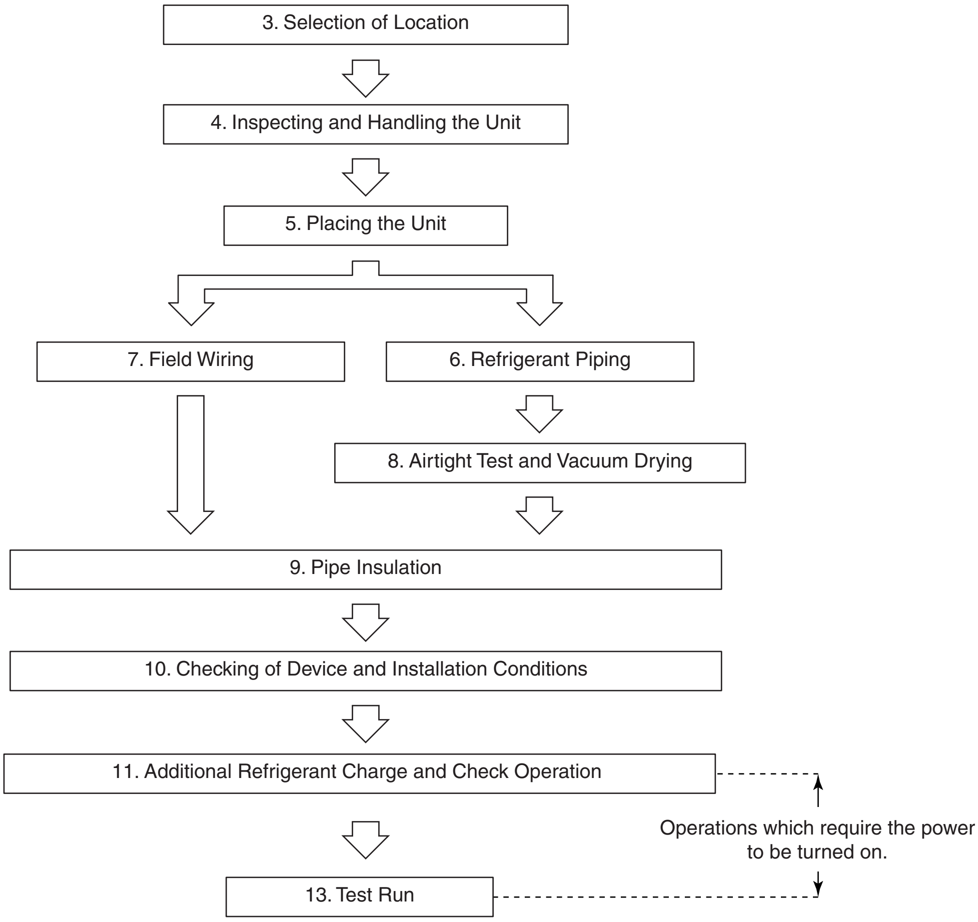
- ➤ Installation process
- ➤ Procedures and outline
- ➤ Operation

Overview

This chapter contains the following topics:

2.2 Installation Process (ERX125~250A7W1B)

Below Figure shows the installation process. Install in the order of the steps shown.



2.3 Procedure and Outline (ERX125~250A7W1B)

Contents

Follow the following procedure to conduct the initial test operation after installation.

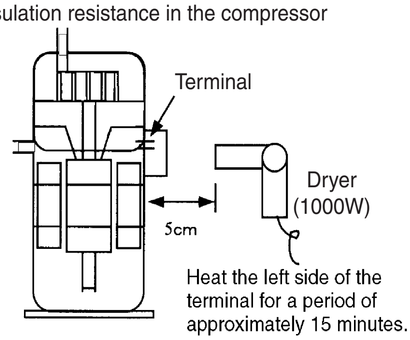
2.3.1 Check Work Prior to Turn Power Supply On (ERX125~250A7W1B)

Check the below items.
2Power wiring
2Control transmission wiring between units
2Earth wire

○ Is the wiring performed as specified?
○ Is the designated wire used?
○ Is the wiring screw of wiring not loose?
○ Is the grounding work completed?
○ Is the insulation of the main power supply circuit deteriorated?
Use a 500V megger tester to measure the insulation. (*1)
2 Do not use a megger tester for other circuits than 200V (or 240V) circuit.

*1:Measure to be taken against decreased insulation resistance in the compressor

If the compressor is left to stand for an extended period of time after the refrigerant charge with the stop valve open and the power supply OFF, the refrigerant may be mixed in the compressor, thus decreasing the insulation resistance.
Heat the compressor as shown on the right and then recheck the insulation.



Check on refrigerant piping / insulation materials

○ Is the pipe size proper?
○ Is the pipe insulation material installed securely?
Liquid and gas pipes need to be insulated. (Otherwise causes water leak.)

Check airtight test and vacuum drying.

○ Have the airtight test and the vacuum drying been conducted according to the procedure in the Installation Manual?

Check on amount of refrigerant charge

○ Is a proper quantity of refrigerant refilled?
The following two methods are available for refilling of the refrigerant.
(1) Use the automatic refrigerant refilling function.
(2) Calculate a refrigerant refilling quantity.

Check the stop valves for conditions.

○ Check to be sure the stop valves are under the following conditions.

Liquid-side stop valve	Gas-side stop valve
Open	Open

2.3.2 Turn Power On (ERX125~250A7W1B)

Turn outdoor unit and indoor unit power on.

○ Be sure to turn the power on 6 hours before starting operation to protect compressors. (to power on clankcase heater)

⇩

Check the LED display of the outdoor unit PC board.

○ Check to be sure the transmission is normal.
The transmission is normal if the LEDs display conditions as shown in table below.

⇩

LED display: ◐: Blink ☼: ON ●: OFF

LED display (Default status before delivery	Micro-computer operation monitor	MODE	TEST	COOL/HEAT select			Low Noise	Demand	Multi
				IND	MASTER	SLAVE			
	HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
One outdoor unit installed	◐	●	●	☼	●	●	●	●	●

(*) The master unit is the outdoor unit to which the transmission wiring for the indoor units is connected. The other outdoor units are slave units.

Make field settings with outdoor unit PC board.

○ Make field settings if needed.
(For the setting procedure, refer to information in "Field Setting from Outdoor Unit" from page 4-6 onward.)

⇩

Conduct check operations.

The check operations shown below will be automatically initiated.
- Check for erroneous wirings
- Check for failure to open stop valves
- Check for excessive refrigerant refilling
- Automatic judgment of piping length

⇩

Check for normal operation.

○ Before starting the normal operation after the completion of check operations, make sure indoor and outdoor units normally operate.

2.3.3 Air Tight Test and Vacuum Drying (ERX125~250A7W1B)

Note

- Always use nitrogen gas for the airtightness test.
- Absolutely do not open the shutoff valve until the main power ciruit insulation measurement has been completed. (measuring after the shutoff valve is opened will cause the insulation value to drop.)

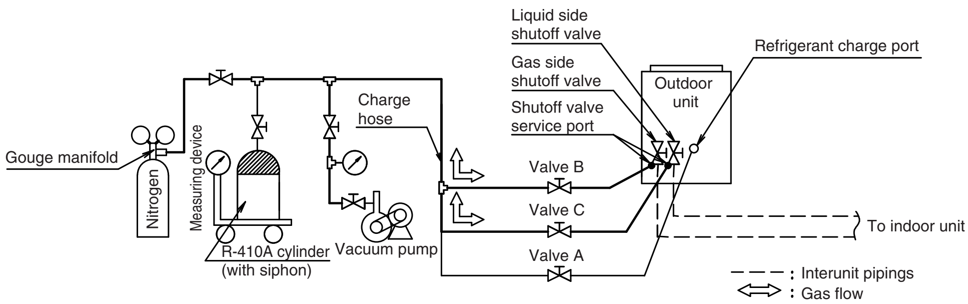
Preparations

<Needed tools>

Gauge manifold Charge hose valve	➤ To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R410A. ➤ Use charge hose that have pushing stick for connecting to service port of shutoff valves or refrigerant charge port.
Vacuum pump	➤ The vacuum pump for vacuum drying should be able to lower the pressure to –100.7kPa (5 Torr –755mm Hg). ➤ Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.

<The system for air tight test and vacuum drying>

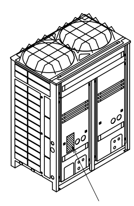
- Referring to the figure below, connect an nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.
- The shutoff valve and valve A~C in the figure below should be open or closed as shown in the table below.



of valve A, B and C and shutoff valves	Valve			shutoff valve	
	A	B	C	Liquid side	Gas side
Air tight test, Vacuum drying (Close valve A and shutoff valves certainly. Otherwise the refrigerant in the unit are released.)	Close	Open	Open	Close	Close

Note:

- The airtightness test and vacuum drying should be done using the liquid side and gas side shutoff valve service ports.
  See the [R-410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure at right).
- See **[Shutoff valve operation procedure]** for details on handling the shutoff valve. (Refer to page 4-22)
- The refrigerant charge port is connected to unit pipe.
  When shipped, the unit contains refrigerant, so use caution when attaching the charge hose.



Air tight test and vacuum drying method

After finished piping work, carry out air tight test and vacuum drying.

<Air tight test>

Pressurize the liquid and gas pipes to 4.0MPa (40bar) (do not pressurize more than 4.0MPa (40bar)). If the pressure does not drop within 24 hours, the system passes the test.

If there is a pressure drop, check for leaks, make repairs, and perform the airtight test again.

<Vacuum drying>

Evacuate the system from the liquid and gas pipes by using a vacuum pump for more than 2 hours and bring the system to –100.7kPa or less. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.

Note:

➤ **If moisture might enter the piping, follow belows.**
(I.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.)

1 After performing the vacuum drying for two hours, pressurize to 0.05 MPa (i.e., vacuum breakdown) with nitrogen gas, then depressurize down to –100.7 kPa for an hour using the vacuum pump (vacuum drying).

2 If the pressure does not reach –100.7 kPa even after depressurizing for at least two hours, repeat the vacuum breakdown - vacuum drying process.

After vacuum drying, maintain the vacuum for an hour and make sure the pressure does not rise by monitoring with a vacuum gauge.

2.3.4 Additional Refrigerant Charge and Check Operation (ERX125~250A7W1B)

General

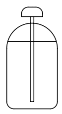
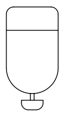
The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging.
For charging the additional refrigerant, follow the procedure in this chapter.

And then carry out the check operation.

2.3.4.1 Before working

About the refrigerant cylinder

Check whether the cylinder has a siphon pipe before charging and place the cylinder so that the refrigerant is charged in liquid form. (See the figure below.)

With siphon pipe	
	Stand the cylinder upright and charge. (The siphon pipe goes all the way inside, so the cylinder does not need be put upside-down charge in liquid form.)
Other tanks	
	Stand the cylinder upside-down and charge.

Caution

- ➤ Always use the proper refrigerant (R410A). If charged with the refrigerant containing an improper material, it may cause an explosion or accident.
- ➤ R410A is a mixed refrigerant, so charging it as a gas will cause the refrigerant composition to change, which may prevent normal operation.

Shutoff Valve Operation Procedure

When operating the shutoff valve, follow the procedure instructed below.

Note

- ➤ Do not open the shutoff valve until “2.3.1–Check Work Prior to Turn Power Supply On (ERX125~250A7W1B)” on page 4-18 are completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading insulation degradation.
- ➤ Be sure to use the correct tools.
- ➤ The shutoff valve is not a back-seat type. If forced it to open, it might break the valve body.
- ➤ When using a service port, use the charge hose.
- ➤ After tightening the cap, make sure no refrigerant gas is leaking.

1 [Tightening torque]

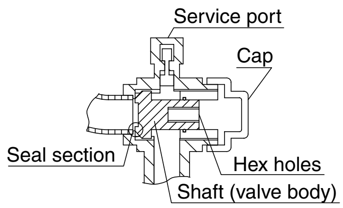
The sizes of the shutoff valves on each model and the tightening torque for each size are listed in the table below.

➤ **Size of Shutoff Valve**

	125 type	**200 type**	**250 type**
Liquid side shutoff valve	ϕ 9.5		
Gas side shutoff valve	ϕ 15.9	ϕ 19.1	ϕ 25.4 (The 250 type corresponds to the 22.2-diameter onsite piping using the accessory pipe.)

➤ **Tightening torque**

Shutoff valve size	**Tightening torque N·m (Turn clockwise to close)**			
	Shaft (valve body)		**Cap (valve lid)**	**Service port**
ϕ 9.5	5.4 - 6.6	Hexagonal wrench 4 mm	13.5 - 16.5	11.5 - 13.9
ϕ 12.7	8.1 - 9.9		18.0 - 22.0	
ϕ 15.9	13.5 - 16.5	Hexagonal wrench 6 mm	22.5 - 27.5	
ϕ 19.1	27.0 - 33.0	Hexagonal wrench 8 mm		
ϕ 25.4				



2 [To open]

➤ Remove the cap and turn the shaft counterclockwise with the hexagon wrench (JISB4648).

➤ Turn it until the shaft stops.

➤ Make sure to tighten the cap securely.
(For the tightening torque, refer to the item 'Tightening Torque'.)

3 [To close]

➤ Remove the cap and turn the shaft clockwise with the hexagon wrench (JISB4648).

➤ Securely tighten the valve until the shaft contacts the main body seal.

➤ Make sure to tighten the cap securely.
(For the tightening torque, refer to the item 'Tightening Torque'.)

2.3.4.1 Procedure of adding refrigerant charging and check operation

Electric shock warning

- Make sure to close the EL. COMPO. BOX lid before turning on the power when performing the refrigerant charging operation.
- Perform the setting on the PC-board (A1P) of the outdoor unit and check the LED display after the power is on via the inspection door which is in the EL. COMPO. BOX lid.
- Use an insulated rod to operate the push buttons via the EL. COMPO. BOX's inspection door. There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

Caution

- Make sure to use the protect tool (protective groves and goggles) when charging the refrigerant.
- Due to a danger of liquid hammer, the refrigerant must not be charged over the allowable maximum amount when charging the refrigerant.
- Do not perform the refrigerant charging operation under working for the indoor unit.
- When opening the front panel, make sure to take caution to the fan rotation during the working.
  After the outdoor unit stops operating, the fan may keep rotation for a while.

Note

- If operation is performed within 12 minutes after the indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.
- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operating. This is not a malfunction.

About refrigerant charging

- The refrigerant charge port is connected to the piping inside the unit.
  When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, make sure to close the lid of the refrigerant charging port.
  The tightening torque for the lid is 11.5 to 13.9 Nm.
- See page 4-22 for details on how to handle shutoff valves.
- When done or when pausing the refrigerant charging operation, close the valve of the refrigerant tank immediately. If the tank is left with the valve open, the amount of refrigerant which is properly charged may be off the point. More refrigerant may be charged by any remaining pressure after the machine is stopped.

About check operation

- Make sure to perform the check operation after installation. Otherwise, the malfunction code "U3" will be displayed and normal operation cannot be performed.
  And the failure of "Check of miswiring" may also cause abnormal operation. Performance may drop due to the failure of "Judgment of piping length".
- Check operation must be performed for each refrigerant piping system.
  Checking is impossible if plural systems are being done at once.
- The individual problems of indoor units can not be checked.
  About these problems check by test run after the check operation is completed. (See page 4-31)
- The check operation cannot be performed in recovery or other service modes.

Procedure

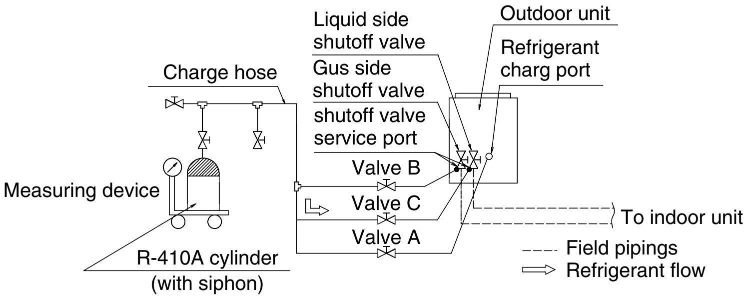
1. Make sure the following works are complete in accordance with the installation manual.

- Piping work
- Wiring work
- Air tight test
- Vacuum drying
- Installation work for indoor unit

2. Calculate the “additional charging amount”.

3. Open the valve C
(See figure below. The valve A, B and the liquid and gas side shutout valve must be left closed), and charge the refrigerant of the “additional charging amount” from the liquid side shutout valve service port.

- If the “additional charging amount” was charged fully, close the valve C and go to step 5.
- If the “additional charging amount” was not charged fully, go to step 4.

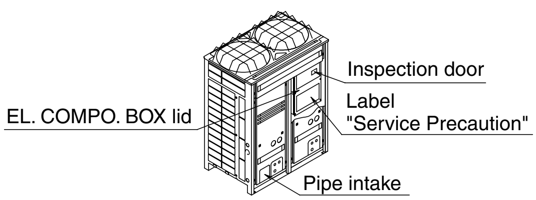


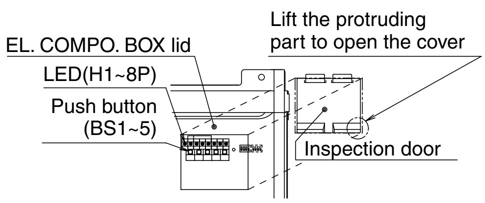
4. Perform the refrigerant charging operation
following [Refrigerant charging operation procedure] as shown on page 4-26, and charge the remaining refrigerant of the “additional charging amount”.

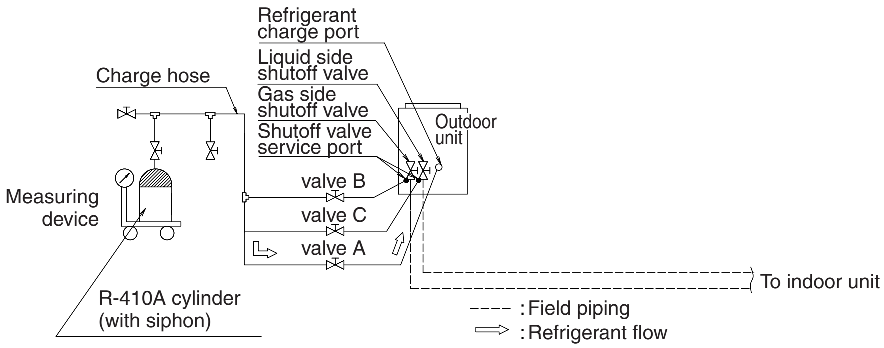
For performing the refrigerant charging operation the push button on the PC-board (A1P) of outdoor unit are used. In addition, the refrigerant are charged from the refrigerant charge port via the valve A. (See figure below)
For operating the push button and opening and closing the valve, follow the work procedure.

Note

The refrigerant will be charged about 22kg in one hour at outdoor temp. 30°C DB (6kg at 0°C DB).
If you need to speedup in case of multi system, connect the refrigerant cylinders to each outdoor unit as shown in the figure below.







[Refrigerant charging operation procedure]

STEP 1 Open the liquid and gas side shutoff valves (The valve A~C must be closed. The valve A~C means the valves in the figure above.)

- ➤ Display of normal system:

LED display: ☀: Blink ☼: ON ●: OFF

LED display (Default status of shipped)	SERV. MONITOR	MODE	TEST/HWL	C/H SELECTOR			L.N.O.P	DEMA-ND	MULTI
				IND	MASTER	SLAVE			
	HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
Single system	☀	●	●	☼	●	●	●	●	●

STEP 2 If necessary, set the field setting by using the dip switch on the outdoor unit PC board (A1P).

STEP 3 Follow this procedure:

- ➤ Close the EL. COMPO. BOX lid and all front panel except on the side of the EL. COMPO. BOX (*1) and turn the power to the outdoor unit and all connected indoor units. (*2)
- ➤ After H2P stop blinking (about 12 minutes after turning on the power), check LED displays as shown in the table [Display of normal system] and the system is normal state.

  If H2P is blinking, check the malfunction code in the remote controller, and correct the malfunction in accordance with [Remote controller display malfunction code] on page 4-28.

  (*1) Lead the refrigerant charge hose etc from the pipe intake. All front panels must be closed at the procedure (9).

  (*2)

  - ➤ If you perform the refrigerant charging operation within the refrigerant system that have the power off unit, the operation cannot finish properly.
  - ➤ To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.

STEP 4 Start the additional refrigerant charge operation.
(About the system settings for additional refrigerant charge operation, refer to the [Service Precaution] label attached on the EL. COMPO. BOX lid in the outdoor unit.)
Open valve A immediately after starting the compressor.

STEP 5 Close the valve A if the “additional charging amount” of refrigerant was charged, and push the RETURN button (BS3) once.

STEP 6 Record the charging amount on the accessory “REQUEST FOR THE INDICATION” label and attach it to the back side of the front panel.

5. After completing the additional refrigerant charging perform the check operation following below:

Note

- ➤ For check operation, the following work will be performed.
  - ➤ Check of shutoff valve opening
  - ➤ Check of miswiring
  - ➤ Judgment of piping length
  - ➤ Check of refrigerant overcharge
- ➤ It takes about 40 minutes to complete the check operation.

[Check Operation Procedure]

STEP 1 Make the onsite setting as needed using the dip switches on the outdoor unit PC-board (A1P) with the power off (See “1.2.5.1 Onsite Settings With the Power Off”)

STEP 2 Close the EL. COMPO. BOX lid and all front panels except as the side of the EL. COMPO. BOX and turn on the power to the outdoor unit and all connected indoor units.
(Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.)

STEP 3 Check the LED display on the outdoor unit PC-board (A1P) is as shown in the table below and transmission is normal.

LED display: ◐: Blink ☼: ON ●: OFF

LED display (Default status of shipped)	SERV. MONITOR	MODE	TEST/HWL	C/H SELECTOR			L.N.O.P	DEMA-ND	MULTI
				IND	MASTER	SLAVE			
	HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
Single system	◐	●	●	☼	●	●	●	●	●

STEP 4 Make the onsite settings as needed using the push button (BS1-BS5) on the outdoor unit PC-board (A1P) with the power on. (See “1.2.5.2 Onsite Settings With the Power On”)

STEP 5 Perform the check operation following the Check Operation Method of the [Service Precautions] label on the EL. COMPO. BOX lid. The system operation for about 40 minutes and automatically stops the check operation.
If the malfunction code is not displayed in the remote controller after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the malfunction code is displayed in the remote controller, correct the malfunction following [Remote controller displays malfunction code] and perform the check operation again.

[Remote controller displays malfunction code]

Malfunction code	Installation error	Remedial action
E3, E4 F3, F6 UF	The shutoff valve of the outdoor unit is left closed.	Open the shutoff valve.
U1	The phases of the power to the outdoor unit is reversed.	Exchange two of the three phases (L1, L2, L3) to make a proper connection.
U1 U4 LC	No power is supplied to an outdoor or indoor unit (including phase interruption).	Make sure the power source wire is properly connected to the outdoor unit and revise if necessary.
UF	There is conflict on the connection of transmission wiring in the system.	Check if the refrigerant piping line and the transmission wiring are consistent with each other.
E3 F6 UF	Refrigerant overcharge.	Recalculate the additional amount refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4 F3	Insufficient refrigerant.	➤ Check if the additional refrigerant charge has been finished correctly. ➤ Recalculate the additional amount refrigerant from the piping length and add the adequate amount.
U7, U4 UF, UH	If the outdoor unit terminal is connected when there is one outdoor unit installed.	Remove the line from the outdoor multi terminals (Q1 and Q2).

If any malfunction codes other than the above are displayed, check the service manual for how to respond.

Electric shock warning

Never perform with the power on. There is a serious risk of electric shock if any live part is touched.

2.4 Onsite Settings with the Power On (ERX125~250A7W1B)

General

Use the push button switches (BS1 through BS5) on the outdoor unit PC-board (A1P) to make the necessary onsite settings.

See the “Service Precautions” label on the EL. CONPO. BOX lid for details on the positions and operating method of the push button switches and on the onsite setting.

Make sure to record the setting on the accessory “REQUEST FOR THE INDICATION” label.

Warning

Electric Shock Warning

Use an insulated rod to operate the push buttons via the inspection door of EL. COMPO. BOX lid. There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

2.5 Test Run (ERX125~250A7W1B)

Contents

2.5.1 Before Test Run (ERX125~250A7W1B)

- Make sure the following works are completed in accordance with the installation manual.
  - Piping work
  - Wiring work
  - Air tight test
  - Vacuum drying
  - Additional refrigerant charge
- Check that all work for the indoor unit are finished and there are no danger to operate.

2.5.2 Test Run (ERX125~250A7W1B)

General

After check operation is completed, operate the unit normally and check the following.

1. Make sure the indoor and outdoor units are operating normally.
2. Check to see if cold air is coming out from the indoor unit.

Note

- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crank case heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the T1/T2 contact is closed.
- When the system operation is stopped, the outdoor units may continue operating for further 5 minutes at maximum.

2.5.3 Checks after Test Run (ERX125~250A7W1B)

Perform the following checks after the test run is complete.

- Record the contents of field setting.
  → Record them on the accessory “REQUEST FOR THE INDICATION” label.
  And attach the label on the back side of the front panel.
- Record the installation date.
  → Record the installation date on the accessory “REQUEST FOR THE INDICATION” label in accordance with the IEC60335-2-40.
  And attach the label on the back side of the front panel.

Note

After the test run, when handing the unit over to the customer, make sure the EL.COMPO.BOX lid, the inspection door, and the unit casing are all attached.

4

2.6 Operation when Power is Turned On (ERX125~250A7W1B)

Contents

2.6.1 When Turning On Power First Time (ERX125~250A7W1B)

4

General

The unit cannot be run for up to 12 minutes to automatically set the master power and address (indoor-outdoor address, etc.).

Status

Outdoor unit

Test lamp H2P .... Blinks

Can also be set during operation described above.

Indoor unit

If T1/T2 is closed during operation described above, the "UH" malfunction indicator blinks.

(Returns to normal when automatic setting is complete.)

2.6.2 When Turning On Power The Second Time and Subsequent (ERX125~250A7W1B)

Tap the RESET button on the outdoor unit PC board. Operation becomes possible for about 2 minutes. If you do not push the RESET button, the unit cannot be run for up to 10 minutes to automatically set master power.

Status

Outdoor unit

Test lamp H2P .... Blinks

Can also be set during operation described above.

Indoor unit

If T1/T2 is closed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

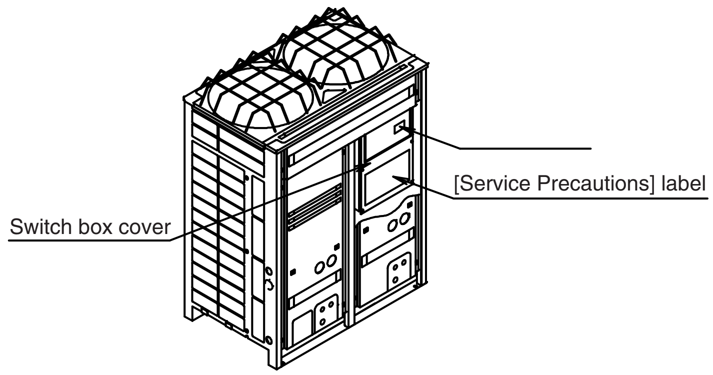
2.6.3 When an Indoor Unit or Outdoor unit PC Board has been Changed (ERX125~250A7W1B)

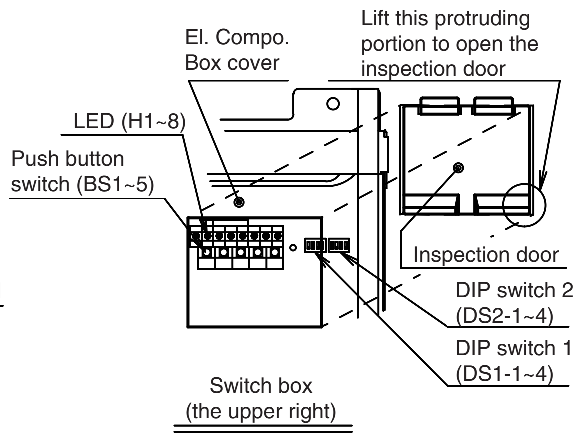
General

Be sure to push and hold the RESET button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outdoor address, etc.)

Status

Outdoor unit	Test lamp H2P .... ON Can also be set during operation described above.
Indoor unit	If T1/T2 is closed during operation described above, the "UH" or "U4" malfunction indicator blinks. (Returns to normal when automatic setting is complete.)





Caution

When the 400 volt power supply is applied to “N” phase by mistake, replace Inverter PCB (A2P) and control transformer (T1R/T2R) in switch box together.

2.7 Procedure and Outline (ERX100~140A8V3B)

Contents

Follow the following procedure to conduct the initial test operation after installation.

2.7.1 Check Work Prior to Turn Power Supply On (ERX100~140A8V3B)

Check the below items.
- Power wiring
- Control transmission wiring between units
- Earth wire

○ Is the power supply single-phase 220-230V / 50Hz, 220V / 60Hz?
○ Have you finished a ductwork to drain?
○ Have you detach transport fitting?
○ Is the wiring performed as specified?
○ Are the designated wires used?
○ Is the grounding work completed?
Use a 500V megger tester to measure the insulation.
- Do not use a megger tester for other circuits than 220-230V circuit.

○ Are the setscrews of wiring not loose?
○ Is the electrical component box covered with an insulation cover completely?

⇩

Check on refrigerant piping

○ Is pipe size proper? (The design pressure of this product is 4.0MPa.)
○ Are pipe insulation materials installed securely?
Liquid and gas pipes need to be insulated. (Otherwise causes water leak.)
○ Are respective stop valves on liquid and gas line securely open?

⇩

Check on amount of refrigerant charge

○ Is refrigerant charged up to the specified amount?
If insufficient, charge the refrigerant from the service port of stop valve on the liquid side with outdoor unit in stop mode after turning power on.
○ Has the amount of refrigerant charge been recorded on "Record Chart of Additional Refrigerant Charge Amount"?

(V3180)

2.7.2 Turn Power On (ERX100~140A8V3B)

Turn outdoor unit power on.

○ Be sure to turn the power on 6 hours before starting operation to protect compressors.
○ Close outside panels of the outdoor unit.

⇩

Turn indoor unit power on.

⇩

Carry out field setting on outdoor PC board

(V3056)

2.7.3 Check Operation (ERX100~140A8V3B)

Overview

➤ During check operation, mount front panel to avoid the misjudging.

➤ Check operation is mandatory for normal unit operation.
(When the check operation is not executed, alarm code "U3" will be displayed.)

Press and hold the TEST OPERATION button (BS4) on outdoor unit PC board for 5 seconds.

○ The test operation is started automatically.
The following judgements are conducted within 15 minutes(about 30 minutes at the maximum).
- “Check for wrong wiring”
- “Check stop valve for not open”
- “Pipe length automatic judgement”

The following indications are conducted while in test operation.
- LED lamp on outdoor unit PC board — H2P flickers (test operation)
- Remote controller
  - Indicates “UNDER CENTRALIZED CONTROL” on upper right.
  - Indicates “TEST OPERATION” on lower left.

↓

Check on operation

(V3057)

On completion of test operation, LED on outdoor unit PC board displays the following.

➤ H3P ON: Normal completion

➤ H2P and H3P ON: Abnormal completion → Check the indoor unit remote controller for abnormal display and correct it.

Malfunction code In case of an alarm code displayed on remote controller:

Malfunction code	Nonconformity during installation	Remedial action
E3	The shutoff valve of an outdoor unit is left closed.	Open the gas-side shutoff valve and the liquid-side shutoff valve.
	Refrigerant overcharge.	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4	The shutoff valve of an outdoor unit is left closed.	Open the gas-side shutoff valve and the liquid-side shutoff valve.
	Insufficient refrigerant.	Check if the additional refrigerant charge has been finished correctly.
		Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.
F3	Refrigerant overcharge.	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
	The shutoff valve of an outdoor unit is left closed.	Open the gas-side shutoff valve and the liquid-side shutoff valve.
	Insufficient refrigerant.	Check if the additional refrigerant charge has been finished correctly.
		Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.
F6	Refrigerant overcharge	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
U2	Insufficient supply voltage	Check to see if the supply voltage is supplied properly.
U3	If a check operation has not been performed.	Perform a check operation.
U4	No power is supplied to an outdoor unit.	Turn the power on for the outdoor unit.
UA	If no dedicated indoor unit is being used.	Check the indoor unit. If it is not a dedicated unit, replace the indoor unit.
UF	The shutoff valve of an outdoor unit is left closed.	Open the gas-side shutoff valve and the liquid-side shutoff valve.
	If the right indoor unit piping and wiring are not properly connected to the outdoor unit.	Make sure that the right indoor unit piping and wiring are properly connected to the outdoor unit.
UH	If the interunit wiring has not be connected or it has shorted.	Make sure the interunit wiring is correctly attached to terminals (X2M) F1/F2 (TO IN/D UNIT) on the outdoor unit circuit board.

2.7.4 Confirmation on Normal Operation (ERX100~140A8V3B)

- Conduct normal unit operation after the check operation has been completed.
  (When outdoor air temperature is 24°CDB or higher, the unit can not be operated with heating mode. See the installation manual attached.)
- Confirm that the indoor/outdoor units can be operated normally.
- (When an abnormal noise due to liquid compression by the compressor can be heard, stop the unit immediately, and turn on the crankcase heater to heat up it sufficiently, then start operation again.)
- Operate indoor unit one by one to check that the corresponding outdoor unit operates.
- Confirm that the indoor unit discharges cold air (or warm air).
- Operate the air direction control button and flow rate control button to check the function of the devices.

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2.8 Operation when Power is Turned On (ERX100~140A8V3B)

Contents

Follow the following procedure to conduct the initial test operation after installation.

2.8.1 When Turning On Power First Time (ERX100~140A8V3B)

4

General

The unit cannot be run for up to 12 minutes to automatically set the master power and address (indoor-outdoor address, etc.).

Status

Outdoor unit

Test lamp H2P .... Blinks
Can also be set during operation described above.

Indoor unit

If T1/T2 is closed during operation described above, the “UH” malfunction indicator blinks.

(Returns to normal when automatic setting is complete.)

2.8.2 When Turning On Power the Second Time and Subsequent (ERX100~140A8V3B)

General

Tap the RESET(BS5) button on the outdoor unit PC board. Operation becomes possible for about 2 minutes. If you do not push the RESET button, the unit cannot be run for up to 10 minutes to automatically set master power.

Status

Outdoor unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If T1/T2 is closed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

2.8.3 When an Indoor Unit or Outdoor Unit PC Board has been Changed (ERX100~140A8V3B)

General

Be sure to push and hold the RESET button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outdoor address, etc.)

Status

Outdoor unit	Test lamp H2P .... ON Can also be set during operation described above.
Indoor unit	If T1/T2 is closed during operation described above, the “UH” or “U4” malfunction indicator blinks. (Returns to normal when automatic setting is complete.)

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