

DAIKIN

ESIE05-05 DRAFTv.1
Issued 15/11/2005



DRAFT

Service Manual

RZQ200~250B7W1

Large Sky-Air Inverter R-410A B series

www.daikineurope.com

Important

This Draft version of the ESIE05-05 Service Manual is intended as aid in troubleshooting and servicing the RZQ200~250B7W1 sky air inverter models, until the final version of the Service Manual ESIE05-05 becomes available.

Although the content within this draft manual has been checked before issuing, it might be possible that some parameters are to be changed in a next revision.

Please check the extranet for regular updates of the draft until the final version of the service manual becomes available.

Should any urgent questions or unclear matter remain, contact the Daikin Service Dept.

Chapter 2 : Functional concept

What is in this chapter ?

Overview

This chapter 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.

Topic	See Page
General Functionality	
Indoor Unit Functional Concept	
Outdoor Unit Function Concept	

Part 2 : General functionality

What is in this chapter ?

Introduction

This chapter will explain all functions not related to the compressor frequency control, outdoor unit fan control and expansion valve control. These functions have been programmed to ensure the unit's reliability and lifetime, enable the operation in case of malfunction, or increase the customer's comfort.

Overview

Topic	See Page
Forced Operation Mode (Emergency Operation)	
Simulated Operation Function	
Restart Standby	
Automatic Restart	
Using Conditions for Remote Controller Thermostat	
Forced Thermostat OFF	
Test Run Control	
4-Way Valve Control	
Pump Down Residual Operation	
Pump Down Operation	
Defrost Operation	
Freeze Prevention Function	
PMV Control	
Preheating Operation Control	
Crankcase Heater Control	
Thermostat Control	

Forced Operating Mode (Emergency Operation)

Purpose

If...	Then...
<ul style="list-style-type: none"> ▪ R/C is defective ▪ Indoor PCB is defective ▪ Outdoor PCB is defective 	Forced operating mode can be used to go to cooling or heating. In forced operating mode, the compressor is forced to operate until the defective indoor or outdoor PCB is back online.

Starting conditions

You can operate the system manually by changing the emergency switch on the indoor and outdoor PCB from “normal” to “emergency”.
When the system is operating in “emergency” it can not control the room temperature.

Both the indoor and outdoor unit must be set to “emergency” while the power is off.

Ending conditions

You can end the emergency operation by changing the “emergency” switch back to “normal” while the power is OFF.

Emergency operation

Below table explains what will happen when the switch is set to “emergency”:

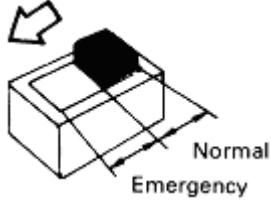
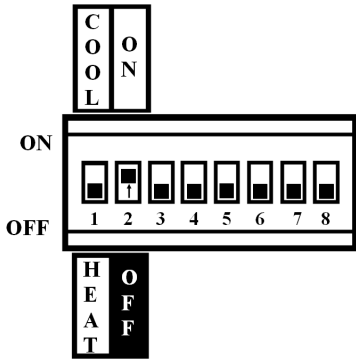
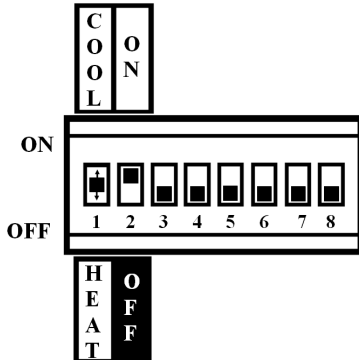
Changing the switch to “emergency” for the...	Switches ON the...
Indoor unit	<ul style="list-style-type: none"> ▪ Indoor fan ▪ Drain pump
Outdoor unit	<ul style="list-style-type: none"> ▪ Compressor(s) ▪ Outdoor fan

Continued on next page

Forced Operating Mode (Emergency Operation), Continued

How to set Emergency Operation ?

To switch to forced operating mode, proceed as follows :

Step	Action
1	Turn OFF the power supply.
2	Switch ON the emergency switch (SS1) on the indoor PCB. 
3	Switch ON the emergency switch (2) on the outdoor PCB (DS1) 
4	Set the emergency switch on the outdoor PCB to the forced mode you prefer : “Cooling” or “Heating” (1) 
5	Turn ON the power supply.

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Forced Operating Mode (Emergency Operation), Continued

Active components

Component	Forced cooling	Forced heating	Forced defrosting
Compressor	ON	ON	ON
4-way valve	OFF	ON	OFF
Outdoor fan	H fan speed	H fan speed	OFF
Indoor fan	H fan speed	H fan speed	OFF
Drain pump	ON	OFF	ON

Remarks

- During emergency operation, do not attempt to operate the equipment from the remote controller. The remote controller shows “88” while the emergency operation is active on the indoor unit
- If a safety device is activated during emergency, all actuators are turned OFF
- In cooling, the unit runs for 20min and then stops for 10min in order to avoid freeze-up of the indoor coil.
- In heating, defrost is activated for 3 minutes once every hour.
- Emergency operation can not be carried out when the PCB board itself is defective.
- Be sure to set the emergency switch on both the outdoor and indoor unit.
- The unit will not regulate the temperature during emergency operation.
- Change the position of the emergency switch only when the power is turned off.

Simulated Operation Function

Outline When a malfunction on one of the below thermistors occurs, operation will continue while displaying the applicable alarm on the remote-controller.
Fin thermistor malfunction is only displayed when pressing the “Inspection” button on the remote-controller.

- Sensors**
- Outside temperature thermistor
 - Outdoor heat exchanger thermistor
 - Fin thermistor
 - Indoor unit air suction thermistor
 - Indoor heat exchanger thermistor
-

Remark Simulated operation will not be conducted in case LPS, HPS, Subcool Thermistor or Suction pipe thermistor are defective.

Restart Standby

Outline

To prevent the compressor from frequently turning ON and OFF and allow pressure equalization, forced thermostat OFF will be conducted for 3 minutes after compressor stopping (compressor guard timer).

Automatic Restart

Purpose

The purpose of the auto-restart function is to automatically resume the same operating mode as when the unit was operating when the power supply is restored after a power failure.

Do not use the "Automatic Restart" function to daily start/stop the unit.

Precautions when turning OFF power

- When you have to turn OFF the power supply in order to carry out maintenance, make sure to turn the remote control's ON/OFF switch OFF firstly.
 - Do not start/stop the unit by disconnecting the power supply.
Stop the unit by stop commando from the remote controller or optional controller before disconnecting the power supply.
Be sure that the compressor and the outdoor fans are stopped before disconnecting the power supply so the "Refrigerant Recovery function" has been finished correctly.
 - When restarting the unit after the power was disconnected for a longer period leave the unit OFF with the power supply connected for half an hour minimum (See "Crankcase heater control")
-

Using Conditions for Remote Control Thermostat

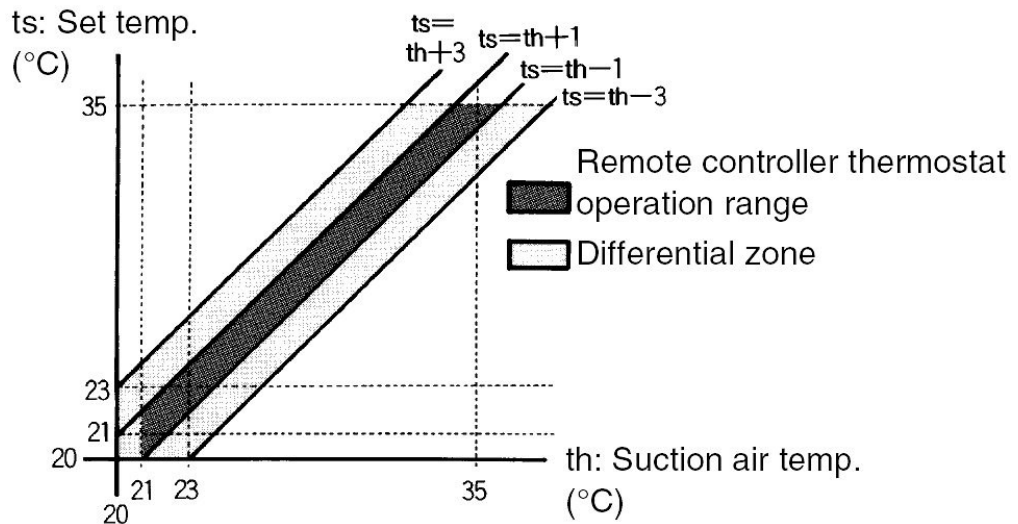
Applicable The remote control thermostat is only available in wired remote controls

Method Unlike with VRV units, the remote control sensor is standard disabled for sky-air units.
The use of the remote control sensor can be enabled by changing field setting 10(20)-2-02 to 10(20)-2-01.

Conditions The table below contains the condition in which the remote control thermostat is not used :

Condition	The remote control thermostat is not used when...
1	The remote control thermostat malfunctions
2	Group control is used
3	The set temperature / air suction temperature combination is out of range. See below graph :

Cooling The diagram below shows the operation range of the set temperature / air suction temperature combination in cooling operation :

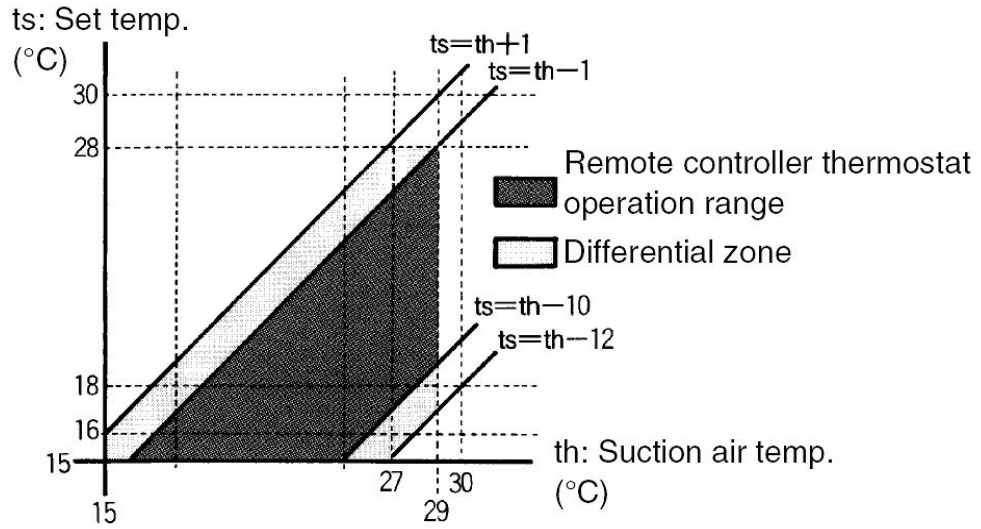


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Using Conditions for Remote Control Thermostat, Continued

Heating

The diagram below shows the operation range of the set temperature / air suction temperature combination in heating operation :



Forced Thermostat Off

Outline

The unit will perform the forced thermostat off function in following conditions :

Condition 1 (cooling)

Thermostat off
due to freeze-up
prevention

Prevent the indoor unit heat exchanger from freezing in cooling operation when one of the below conditions is applicable (indoor decision) :

- Indoor unit heat exchanger temperature < -5°C for 1 minute continuously.
 - Indoor unit heat exchanger temperature < -1°C for 40 minutes accumulated.
-

Condition 2 (heating)

Thermostat off
due to high
outdoor
temperature

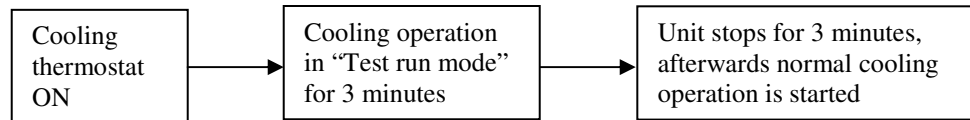
When the outside temperature is > 30°CDB in heating mode, the unit will conduct a forced thermostat off operation to protect the system.

Heating operation will be restarted when the outdoor ambient temperature becomes ≤ 27°C.

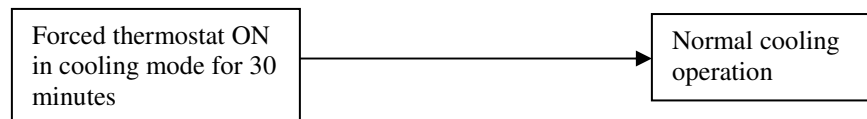
Test Run Control

Purpose When operating the RZQ units for the first time after installation, the unit will – depending on the selected operation mode - perform a test run operation first.

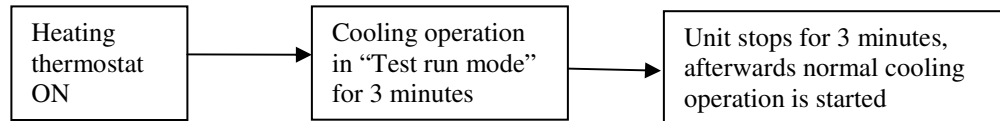
Situation 1 Cooling – first operation after installation in “Cooling mode”



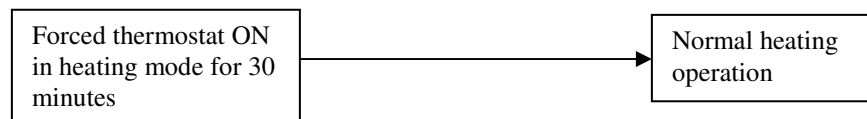
Situation 2 Cooling – operation after first operation in “test run” (from remote controller or BS4 on outdoor unit PCB)



Situation 3 Heating – first operation after installation in “Heating mode”



Situation 4 Heating – operation after first operation in “test run” (from remote controller or BS4 on outdoor unit PCB)



- Remarks**
- When running in test run mode, the unit will sense on site installation parameters (e.g.: failure to open stop valves,..) and indicate the applicable malfunction code if required.
 - If the remote controller shows E3, E4 or L8 as an error code, there is possibility that either the stop valve is closed or the air flow outlet is obstructed.
 - Check the inter unit branch wiring connection (1-2-3 wiring) when the error code U4 or UF is displayed on the remote controller.
 - The “Test Run Control” function is only performed after first power on at installation or after first power on after a pump down by using the pump down switch is completed.

4-way Valve Control

Purpose

The purpose of the 4-way valve control is to control how the superheated refrigerant passes through the 4-way valve. The 4-way valve control carries out the changeover switching of the 4-way valve. This changeover switching is only carried out during operation, because a certain pressure difference is required to move the internal cylinder.

When...	Then the 4-way valve connects the outlet of the compressor with...
Cooling	Outdoor heat exchanger
Heating	Indoor heat exchanger

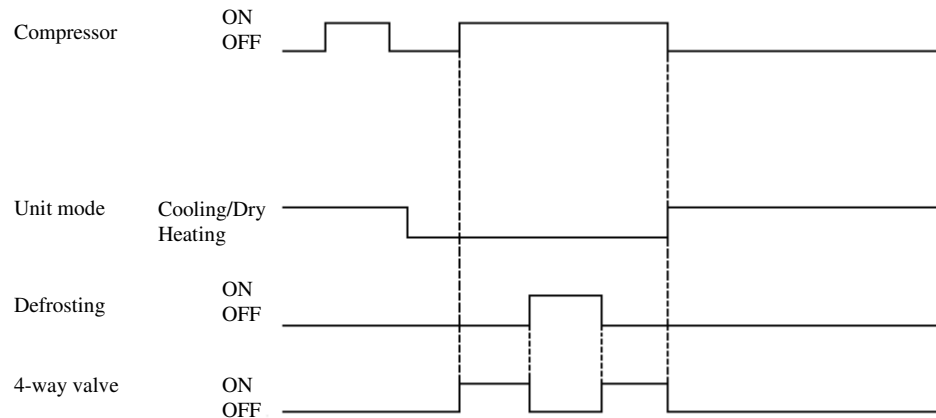
Method

The table below describes the 4-way valve control operation

In...	The 4-way valve is...
Heating, except for defrosting	ON
<ul style="list-style-type: none"> ▪ Cooling ▪ Dry keep ▪ Defrosting 	OFF

Time chart

The time chart below illustrates the 4-way valve control



Pump Down Residual Operation

Purpose

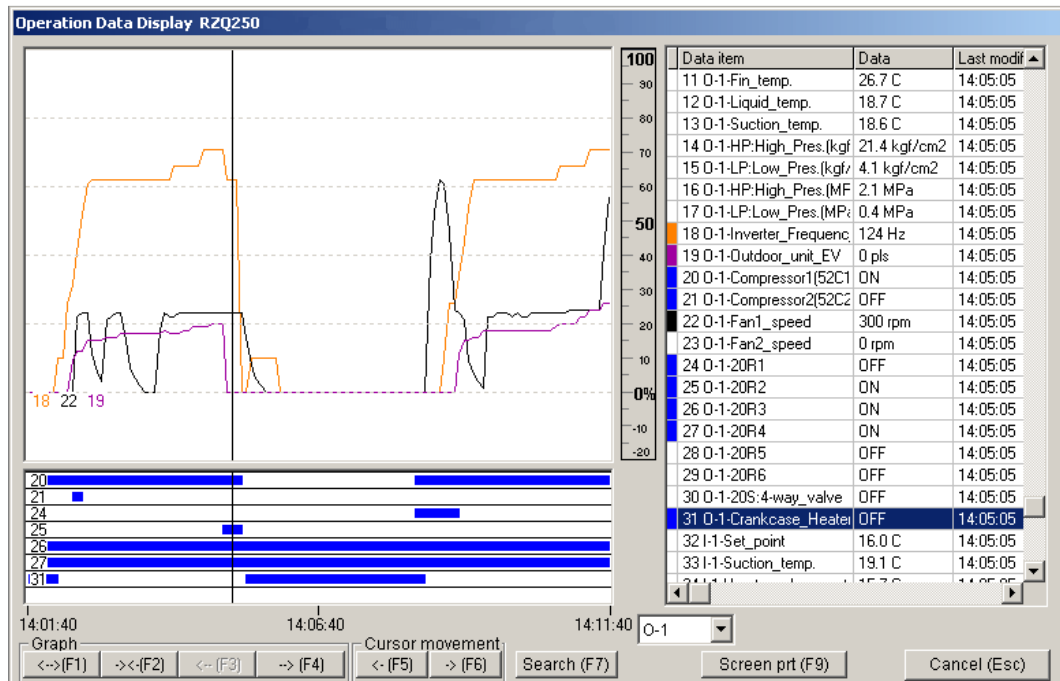
The unit will conduct a pump down residual operation after each compressor stop command.

Purpose of this function is to collect the refrigerant in the liquid receiver and outdoor heat exchanger in order to prevent liquid refrigerant from remaining in the indoor heat exchanger.

Parameters

RZQ200~250B	
Compressor M1C (Inverter)	124 Hz
Compressor M2C (Standard)	OFF
Expansion valve	→ 0 pulses

Graph



Ending condition

- 30 seconds have elapsed since start of residual operation
- OR**
- LP < 2.7 bar (in cooling)
- LP < 1.4 bar (in heating)

Pump Down Operation

Outline

Whenever the units need to be moved or removed, perform a pump-down operation before disconnecting the field piping.

By performing a pump-down operation, all of the refrigerant will be collected in the outdoor unit.

Procedure

Procedure		Precautions
1	Close the liquid stop valve and open the gas stop valve	
2	Start "Fan only operation" from the remote controller	Confirm that the liquid stop valve is closed and that the gas stop valve is open.
3	Push the pump-down button BS5 on the outdoor PCB for more than 5 seconds.	H2P will flash. Compressor and outdoor fan will start automatically.
4	Continuous operation for 20 minutes maximum.	
5	When the operation stops, immediately close the gas stop valve.	
6	After the "Pump Down Operation" has been finished the wired remote controller screen may be blank or show "U4" error indication. It will not be able to start the unit from the remote controller without switching OFF the power supply first.	Make sure the stop valves are opened before restarting the unit.

Cautions

- Pressing the pump down switch (BS1) on the outdoor PCB may cause the outdoor and indoor fan to start operating automatically.
- Be sure to open the stop valves after the pipe work has been finished. Be sure not to operate the unit with closed stop valves, or the compressor may brake down.

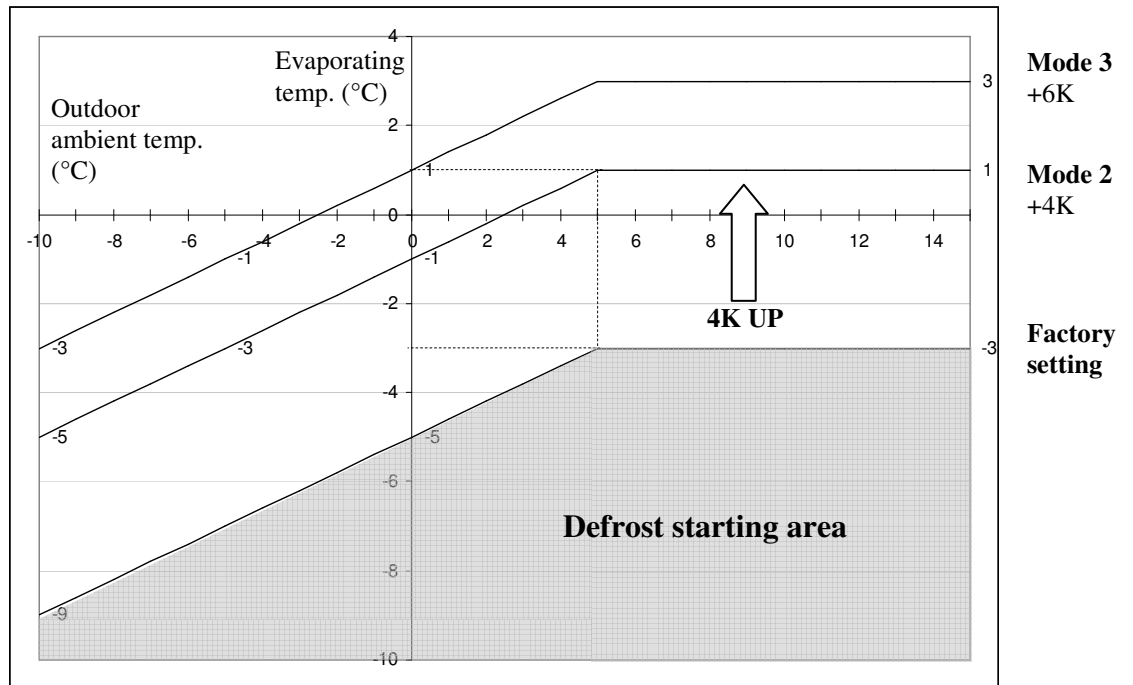
Defrost Operation

Outline When the unit is operating in heating mode, a defrost operation will be conducted in order to avoid ice formation on the outdoor unit heat exchanger.

Defrost starting conditions Defrost will start when the following conditions have been realized :

- Integrated compressor running time is ≥ 25 minutes since the completion of the previous defrost operation.
- OR
- $T_{coil} \leq -3^{\circ}\text{C}$
 - $T_{coil} \leq 0.4 \times T_a - 5^{\circ}\text{C}$
- &
- OR
- Maximum operation “timer A” condition is met
- &
- Integrated heating capacity reduced (Intelligent control)
 - Continuous compressor operation time ≥ 5 minutes
- &
- $HP > 26$ bar continuous for ≥ 5 minutes
 - Compressor frequency = maximum

Definition of defrost starting area



Continued on next page

Defrost Operation, Continued

Definition of
“timer A”

Setting by Remote Controller

Field Setting	Timer A	
	Outdoor ambient > -5°C	Outdoor ambient ≤ -5°C
16(26)-3-01 (Factory setting)	3 hours	6 hours
16(26)-3-02 (Slow setting)	40 minutes	40 minutes
16(26)-3-03 (Fast setting)	6 hours	8 hours

Definition of
“timer A”

Setting by using “Mode 2” on the outdoor unit

	Timer A	
	Outdoor ambient > -5°C	Outdoor ambient ≤ -5°C
Mode 1	3 hours	6 hours
Mode 2	6 hours	8 hours
Mode 3	12 hours	12 hours
Mode 4	24 hours	24 hours
Mode 5	40 minutes	40 minutes
Mode 6	25 minutes	25 minutes

Setting
Procedure
Mode 2

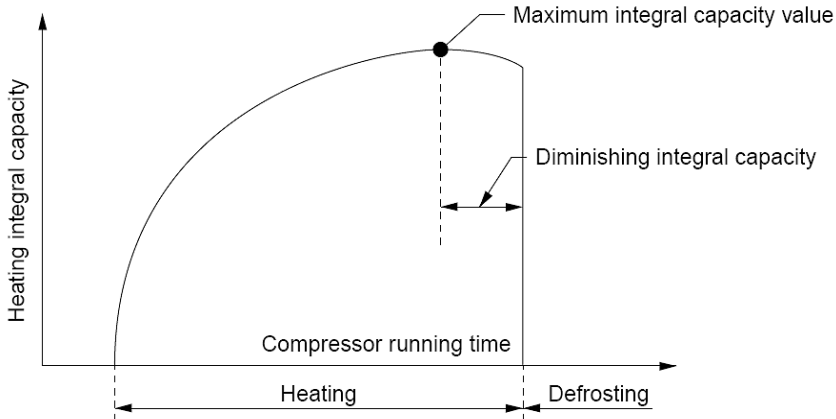
Procedure	LED Indication						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter “mode 2”	○	●	●	●	●	●	●
Go to binary code 10, by pressing BS2 (Set)	○	●	●	○	●	○	●
Press BS3 (Return) once to enter item	○	●	●	●	●	●	☼
Select preferred defrost setting by pressing BS2	Mode 1	○	●	●	●	●	☼
	Mode 2	○	●	●	●	●	☼
	Mode 3	○	●	●	●	☼	●
	Mode 4	○	●	●	☼	●	●
	Mode 5	○	●	☼	●	●	●
	Mode 6	○	☼	●	●	●	●
Confirm selected defrost setting by pressing BS3 once	Mode 1	○	●	●	●	●	○
	Mode 2	○	●	●	●	○	●
	Mode 3	○	●	●	●	○	●
	Mode 4	○	●	●	○	●	●
	Mode 5	○	●	○	●	●	●
	Mode 6	○	○	●	●	●	●

○	= LED ON
●	= LED OFF
☼	= LED blinking

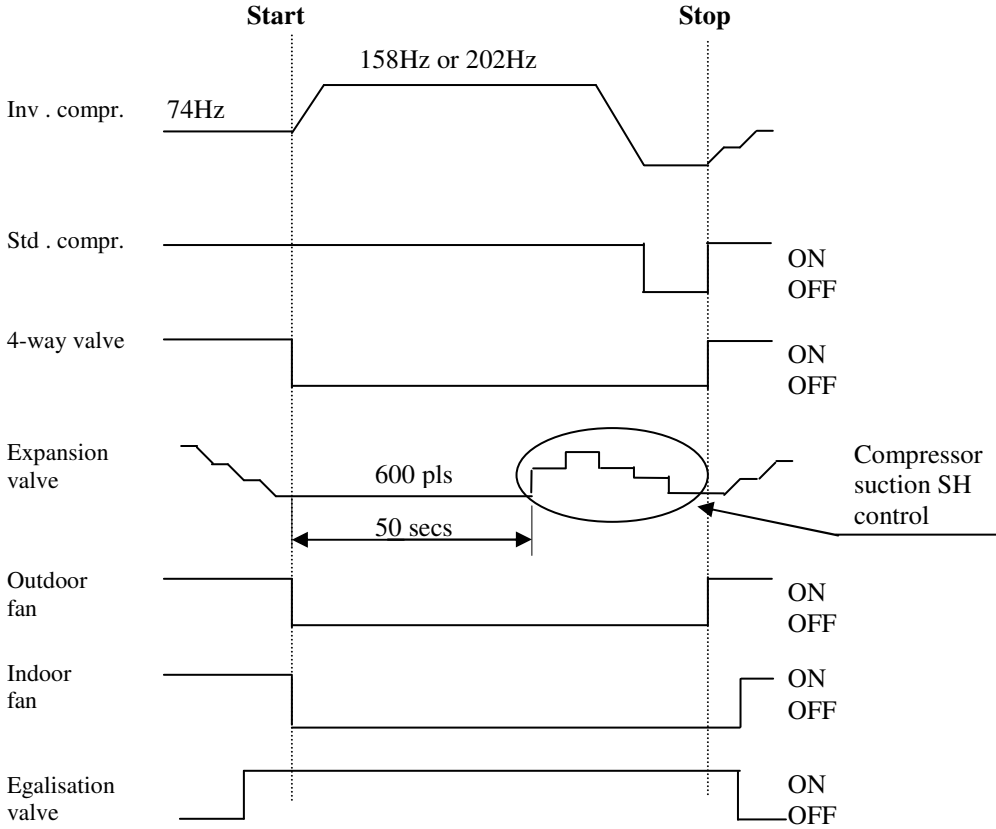
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Defrost Operation, Continued

Calculation of integrated heating capacity



Defrost control



Defrost Operation, Continued

Defrost ending condition

The defrost cycle will be ended when one of the following conditions have been reached minimum 1 minute after defrost start :

- Outdoor unit heat exchanger temperature $\geq 10^{\circ}\text{C}$
 - Discharge pipe temperature $\geq 105^{\circ}\text{C}$
 - High pressure ≥ 30.4 bar
 - 10 minutes have elapsed since start of defrost operation
-

Freeze Prevention Function

Purpose In order to avoid formation of ice on the indoor unit heat exchanger in cooling and dry mode, the system automatically starts up a freeze prevention cycle when a number of specific conditions are fulfilled.

Freeze Prevention start conditions Freeze prevention start decided by the indoor unit (factory setting) :

OR { • Indoor coil temperature $\leq -1^{\circ}\text{C}$ for 40 minutes accumulated
 & { ◦ Indoor coil temperature $< A^{\circ}\text{C}$ for 1 minute continuous
 ◦ Compressor is running for minimum 8 minutes since operation start or end of previous freeze up cycle.

Freeze Prevention stop conditions Freeze prevention stop decided by the indoor unit (factory setting) :

- Indoor coil temperature $> 7^{\circ}\text{C}$ for 10 minutes continuous

Parameters

	FAQ	FHQ	All except FAQ & FHQ
A	-1°C	-3°C	-5°C

PMV Control

Outline When the automatic mode is selected on the remote-controller, the unit will automatically activate the (simplified) PMV control.

What is PMV ? The room temperature control minimizes excessive heating and cooling based on the predicted mean values (PMV index) specified in the ISO7730 International Standards. This control reduces annual power consumption without affecting the room comfort. Since the PMV index is an average comfort level calculated from responses of many samples (persons) in the same room conditions, this index may not apply to some people. Those who do not feel comfortable with the mean value are represented by a PPD index (percentage of predicted dissatisfaction). Refer to ISO 7730 for more details.

Function The ISO7730 International Standard specifies an equation using 10 parameters for determining the PMV index. These parameters include mean radiation heat temperature, thermal resistance of clothes, air temperature,..

Basically, the RZQ unit is re-calculating the set point by means of a simplified calculation method using the indoor and outdoor temperature.

In practice, the set point will be moved with 1 or 2 degrees – depending on the actual indoor and outdoor temperatures, and actual set point - whenever the conditions change. This will result in a combination of power saving and increased comfort level.

The PMV value is calculated every 5 seconds.

PMV control can be disabled by changing the field settings :

From : 11(21)-4-01 to : 11(21)-4-02

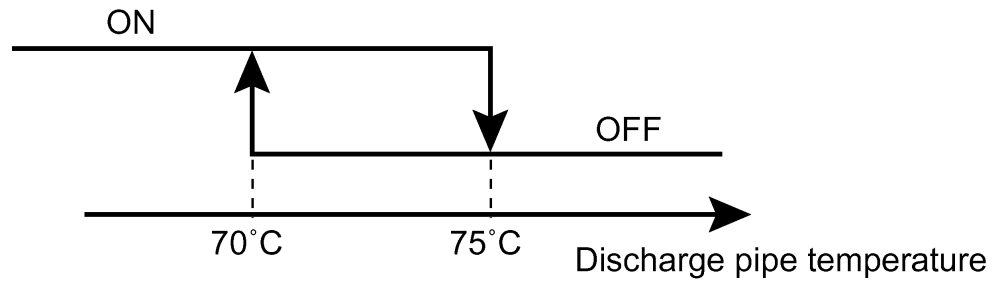
PMV control is not active when cooling or heating mode is selected on the remote control (only in automatic mode).

Crankcase Heater Control

Outline

After the compressor has been turned off, the crankcase heater control will be activated in order to avoid refrigerant from dissolving in the compressor oil.

Trigger conditions



Thermostat Control

Purpose

Based on the information received from the air return sensor, the thermostat control will decide the required operation status of the system.

**Thermostat
ON**

- $\Delta T = 0^{\circ}\text{C}$
-

**Thermostat
OFF (OR)**

- $\Delta T \leq -1.0^{\circ}\text{C}$ for 30 seconds continuously.
 - Cooling : $\Delta T \leq -2.5^{\circ}\text{C}$.
 - Heating : $\Delta T \leq -3.0^{\circ}\text{C}$.
-

Outdoor Unit Functional Concept

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

Topic	See Page
Frequency Regulating Functions	
Expansion Valve Control	
Outdoor Unit Fan Speed Control	

Frequency Regulating Functions

What is in this chapter ?

Introduction

One of the main functions of the μ -controller will be the control of the compressor frequency. The next chapter will explain how the compressor frequency is determined.

Content

Topic	See page
Starting Frequency Control (cooling & heating)	
General Frequency Control (cooling & heating)	
Low Pressure Protection Control (cooling & heating)	
High Pressure Protection Control (cooling & heating)	
Discharge Pipe Temperature Control (cooling & heating)	
Suction Pipe Superheat Protection Control (only for heating)	
Inverter Current Protection Control (cooling & heating)	
Inverter Fin Temperature Control (cooling & heating)	
Pressure Difference Control (cooling & heating)	
Oil Recovery Operation (cooling & heating)	

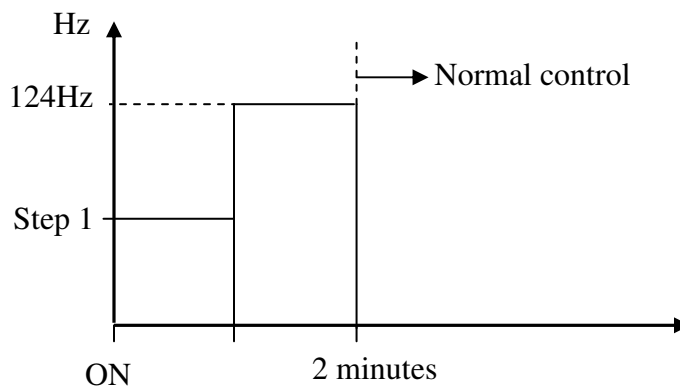
Starting Frequency Control

Outline The inverter compressor will start up with a limited fixed frequency value for a specified period of time in order to prevent liquid back to the compressor, and to limit the starting current.

General The normal starting control time is 2 minutes. The maximum starting frequency control time is limited to 10 minutes.

During compressor start-up, a pressure difference will be build up in order to have sufficient pressure difference for the 4-way valve to change over.

Graph



Ending condition The starting control will be terminated after 2 minutes when the low pressure value has reached < 6 bar (within the 2 minutes) or when the maximum starting time of 10 minutes has been reached in case the low pressure value stays > 6 bar.

General Frequency Control

Outline After the “Starting frequency control” function has been terminated, the ideal compressor frequency will be determined by the “General frequency control”.

General The compressor operation frequency is controlled in order to keep a constant evaporation temperature in cooling and a constant condensing temperature in heating.

Note When other control functions are activated (e.g. discharge pipe control), they can change the compressor frequency using other inputs than the ones normally being used by the “General frequency control” function.

Cooling In cooling, the target operation frequency will be determined by the indoor Δt and the evaporating temperature.

Δt cool = Remote controller set temperature - Indoor return air temperature.

Depending on the cooling load, the target evaporating temperature (T_e) will be a value *between* $2^{\circ}\text{C} \leq T_e \leq 20^{\circ}\text{C}$.(tbc)

Heating In heating, the target operation frequency will be determined by the indoor Δt and the condensing temperature.

Δt heat = Indoor return air temperature – Remote controller set temperature.

Depending on the heating load, the target condensing temperature (T_c) will be a value *between* $42^{\circ}\text{C} \leq T_c \leq 51^{\circ}\text{C}$.(tbc)

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General Frequency Control, Continued

Frequency steps

The operating frequency for the sky-air RZQ200~250 inverter units will be a value chosen from a list with fixed frequency settings that is programmed in the unit's memory :

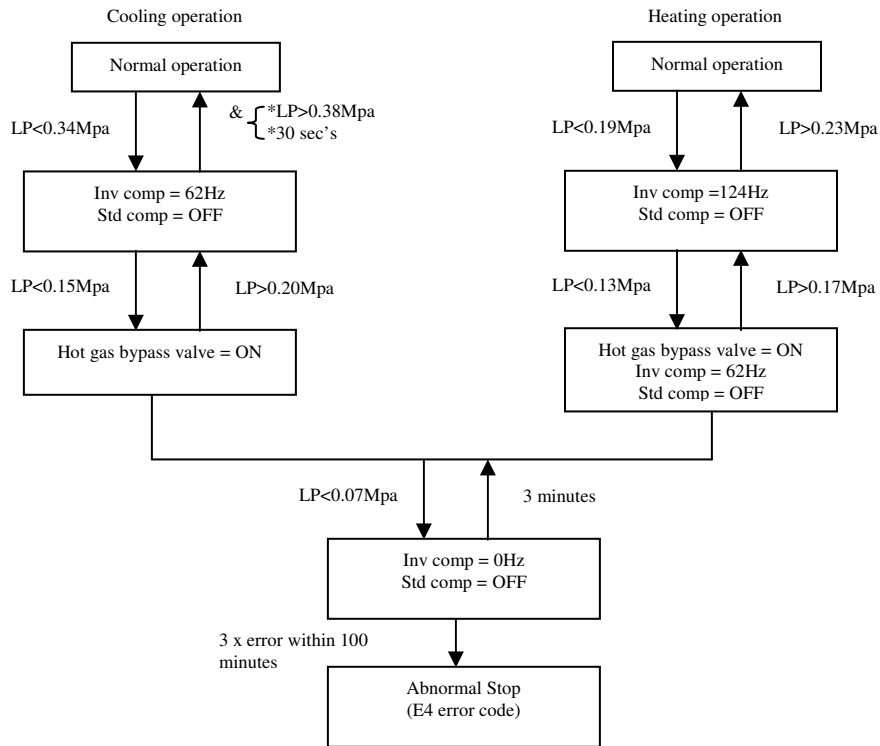
Step No.	Compressor operation	
	Inverter compressor	Standard compressor
1	52Hz	OFF
2	57Hz	
3	62Hz	
4	68Hz	
5	74Hz	
6	81Hz	
7	88Hz	
8	96Hz	
9	104Hz	
10	110Hz	
11	116Hz	
12	124Hz	
13	133Hz	
14	143Hz	
15	158Hz	
16	165Hz	
17	177Hz	
18	189Hz	
19	202Hz	
20	210Hz	
21	68Hz	ON
22	74Hz	
23	96Hz	
24	116Hz	
25	133Hz	
26	158Hz	
27	177Hz	
28	202Hz	
29	210Hz	

Low Pressure Protection Control

Outline

In order to prevent abnormal low pressures in the system, the below control function will be activated. Low pressure is measured by the low pressure sensor.

Flow chart

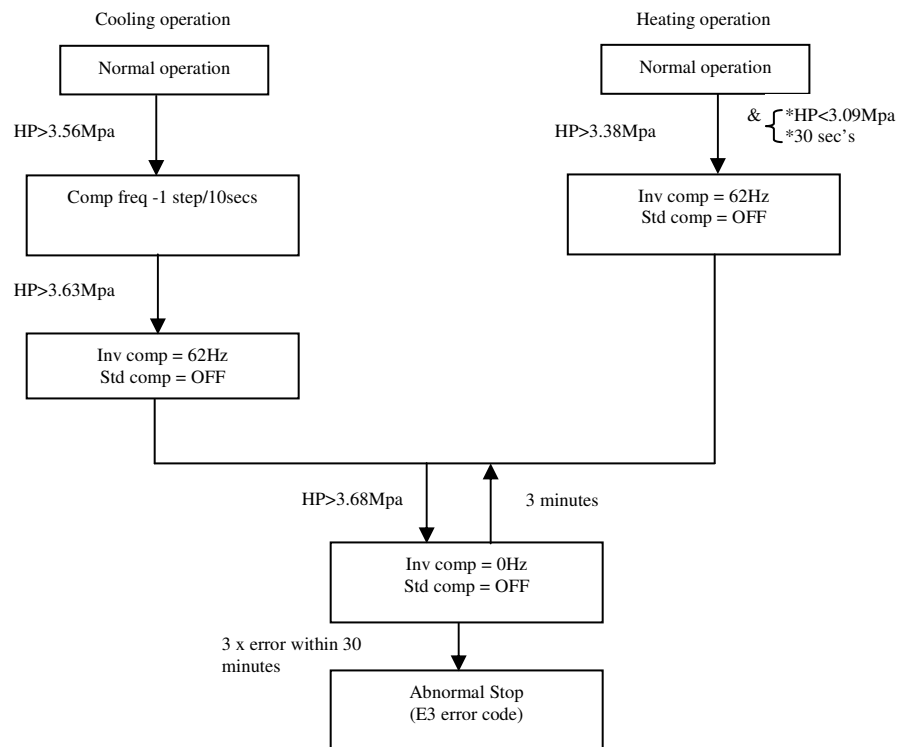


High Pressure Protection Control

Outline In order to prevent abnormal high pressures in the system and hence avoiding activation of the high pressure safety device the below control function will be activated.

Details The high pressure value is measured by the High Pressure Sensor.

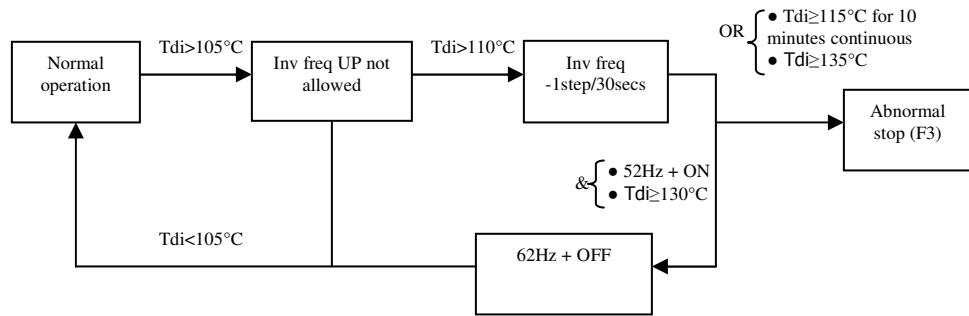
Flow chart



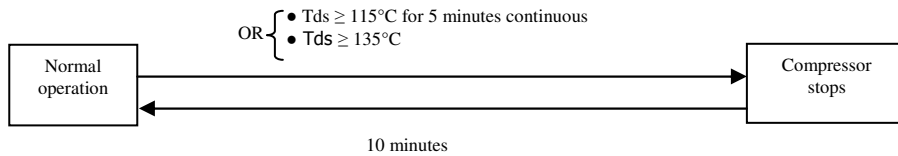
Discharge Pipe Temperature Control

Outline The Inverter and Standard Compressor will be controlled in order to avoid abnormal high compressor temperatures (see also expansion valve control).

Flow chart 1 Inverter Compressor



Flow chart 2 Standard Compressor



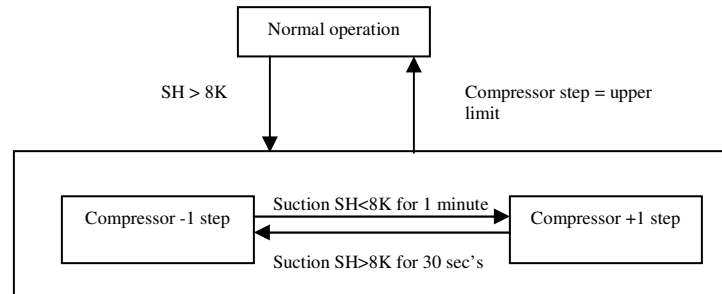
Parameters
 Tdi = Inverter compressor discharge pipe temperature
 Tds = Standard compressor discharge pipe temperature

Suction Pipe Superheat Protection Control (Heating Mode)

Outline

In case the suction superheat value in heating mode is too high, the oil return to the compressor will be insufficient. In order to avoid that the compressor oil will be accumulated in the outdoor unit heat exchanger, the upper limit frequency will be decreased.

Flow chart

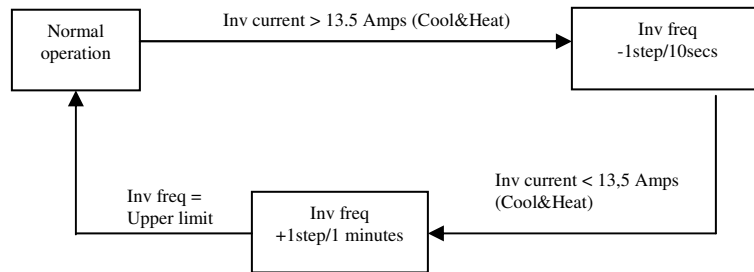


Inverter Current Protection Control

Outline

The compressor operating frequency will be restricted in order to prevent an over-current to the compressor.

Flow chart



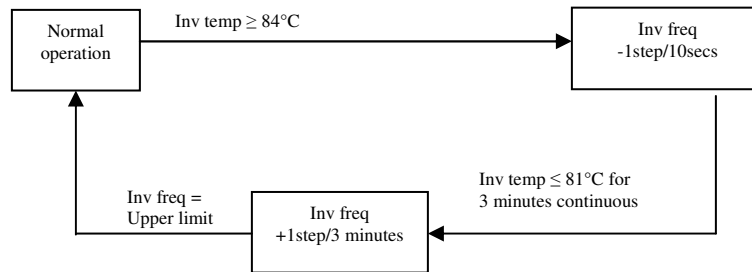
Inverter Cooling Fin Temperature Control

Outline

This control will restrict the compressor upper limit frequency in order to protect the electronic components in the switch box from overheating (L4-error activation).

By lowering the compressor frequency, the current drawn by the compressor will be reduced and as a result the temperature inside the switch box will drop.

Flow chart



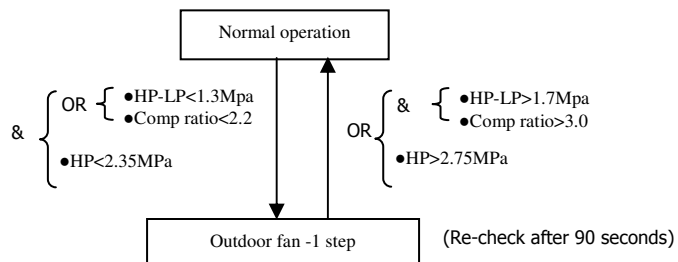
Pressure Difference Control

Outline

To ensure the compression ratio (pressure difference between high and low pressure) at low outdoor temperature conditions in cooling mode and high outdoor temperature conditions in heating mode, the outdoor fan and target compressor frequency may be varied.

Cooling

In cooling low ambient conditions, the outdoor fan speed will be adapted to secure the differential pressure between high and low pressure and ensure a sufficient HP value.



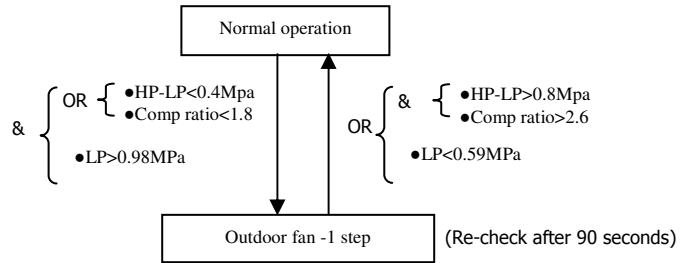
Continued on next page

Pressure Difference Control, Continued

Heating

High outdoor ambient (overload conditions) :

In heating overload conditions, the outdoor fan speed will be adapted to secure the differential pressure between high and low pressure and avoid an excessive LP value.



Oil Recovery Operation

Outline

When the compressor operates for a certain period of time at low frequency, the oil level in the compressor may become low due to incomplete oil recovery. To prevent damage to the compressor and in worst case avoid compressor lock, an oil recovery operation will be conducted.

Contents

- During the oil recovery operation, the operation frequency of the compressor will be increased for a time period of 10 minutes.
 - Oil recovery operation will overrule low noise operation and I-demand.
-

Expansion Valve Regulating Functions

What is in this chapter ?

Introduction

This chapter will explain the functions that are used to control the expansion valve opening.

Content

Topic	See page
Expansion Valve Control at Startup (cooling & heating)	
General Expansion Valve Control (cooling & heating)	

Expansion Valve Control at Startup

Outline Before going to the general expansion valve control, the expansion valve opening will be limited in order to avoid the risk of liquid back and allow quick build up of pressure difference.

Details During startup, the opening degree is determined by both the compressor frequency & the suction superheat.

During startup, it is not possible to use only the value of the suction superheat because the operation is not stable yet.
As a consequence also the SH value will not be stable.

Ending condition The starting control will be terminated when the low pressure value $< 6\text{bar}$ or when the maximum starting time of 10 minutes has been reached in case the low pressure value stays $> 6\text{bar}$.

General Expansion Valve Control

Outline

After the start up control function has been terminated the general expansion valve control function will regulate the expansion valve opening in function of the target suction SH value (= superheat at evaporator outlet).

The actual discharge SH value will be used to set the target suction SH value during operation.

The measured suction SH value will be used to control the opening of the expansion to the target suction SH value.

Details

When the unit is in cooling or heating operation the opening of the expansion valve will be controlled in order to keep the amount of superheat at the evaporator outlet constant. This way the evaporator can be used at maximum efficiency under all conditions.

The initial target heat exchanger outlet superheat value = 5°C.

The target heat exchanger outlet superheat value can be increased in case the discharge superheat value decreases.

The target heat exchanger outlet superheat value can be decreased in case the discharge superheat value increases.

Control

During “General expansion valve control” 2 parameters will be used to control the actual expansion valve opening degree :

1. Target superheat amount :

When the target heat exchanger outlet superheat > actual heat exchanger outlet superheat → the expansion valve will close.

When the target heat exchanger outlet superheat < actual heat exchanger outlet superheat → the expansion valve will open.

The superheat amount is checked every 10 seconds.

2. Frequency change :

At the time of compressor frequency change, the expansion valve opening will be changed with a fixed value. This value will be in function of the amount of compressor frequency change.

Part 3 : Troubleshooting

Contents

Overview

Topic	See Page
3.1 Overview of error codes	

3.1 Overview of error codes

Codes

Code	Contents	Refer to
A1	Failure of indoor PCB assy	ESIE05-03
A3	Malfunction of drain water level system	ESIE05-03
A6	Indoor unit fan motor lock/overcurrent	ESIE05-03
A7	Indoor unit swing flap motor lock	ESIE05-03
AF	Abnormal drain water level (level switch activation at compressor OFF)	ESIE05-03
AJ	Failure of capacity setting	ESIE05-03
C4	Malfunction of heat exchanger temperature sensor system	ESIE05-03
C5	Malfunction of gas piping temperature sensor system	ESIE05-03
C9	Malfunction of air suction temperature sensor system	ESIE05-03
CJ	Malfunction of remote control temperature sensor system	ESIE05-03
E0	Actuation of outdoor safety device	SiE33-105, page 169
E1	Outdoor unit PC board malfunction	ESIE05-03
E3	High pressure malfunction (outdoor unit)	ESIE05-03
E4	Abnormality of low pressure (outdoor)	ESIE05-03
E5	Compressor motor lock malfunction	ESIE05-03
E7	Outdoor fan motor lock or outdoor fan instantaneous overcurrent malfunction	ESIE05-03
E9	Malfunction of electronic expansion valve	ESIE05-03
F3	Discharge pipe temperature malfunction	ESIE05-03
H3	Failure of high pressure switch	ESIE05-03
H7	Abnormal outdoor fan motor signal	SiE39-302, page 182
H9	Malfunction of outdoor air temperature sensor system	ESIE05-03
J2	Current sensor malfunction	SiE39-302, page 184
J3	Malfunction of discharge pipe temperature sensor system	ESIE05-03
J5	Malfunction of suction pipe temperature sensor system	ESIE05-03
J6	Malfunction of outdoor heat exchanger temperature sensor system	ESIE05-03
JA	Malfunction of discharge pipe pressure sensor	SiE39-302, page 189
JC	Malfunction of suction pressure sensor	ESIE05-03
L4	Radiation fin temperature rise	ESIE05-03
L5	Instantaneous overcurrent	ESIE05-03
L8	Electronic thermal	ESIE05-03
L9	Stall prevention	ESIE05-03
LC	Malfunction of transmission system (between control PCB and inverter PCB)	ESIE05-03
P1	Open phase or voltage unbalance	ESIE05-03
P4	Abnormal inverter fin temperature	ESIE05-03
U0	Refrigerant shortage	ESIE05-03
U1	Reverse phase protection activation	SiE39-302, page 200
U2	Abnormal power supply voltage	ESIE05-03
U4/UF	Failure of transmission system (between indoor and outdoor unit)	ESIE05-03
U5	Failure of transmission system (between indoor and remote controller)	ESIE05-03
U8	Failure of transmission system (between "main" and "sub" remote controller)	ESIE05-03
U9	Malfunction of transmission between indoor and outdoor units in the same system	SiE39-302, page 210
UA	Failure of field setting	ESIE05-03
UC	Address error of central remote controller	ESIE05-03

Part 4 : Commissioning and Test Run

Contents

Overview

Topic	See Page
4.1 Outdoor Field Settings RZQ200~250B7 : Setting methods	
4.2 Outdoor Field Settings RZQ200~250B7 : Setting Contents	

4.1 Outdoor Field Settings RZQ200~250B7 : Setting Method

What is in this chapter ?

Overview

Topic	See Page
4.1.1 Overview of the outdoor Field settings from indoor remote controller	
4.1.2 Overview of the outdoor Field settings from outdoor PCB : DS1_1 ~ DS1_8	
4.1.3 Overview field settings from outdoor PCB : Mode 2	

4.1.1 Outdoor Field Settings from Indoor Remote Controller

Overview

Mode No.	First code No.	Description of the setting	Details
16(26)	0	Night time low noise setting	Chapter 4, Page xx
	1	Low noise level + start/stop setting	Chapter 4, Page xx
	3	Defrost settings	Chapter 3, Page xx

Possible settings

Mode No.	First code No.	Second code No.						
		01	02	03	04	05	06	07
16(26)	0	Factory	Night time low noise	Night time low noise + capacity preceding	---	---	---	---
	1	Level 1 : 22pm~6am	Level 1 : 22pm~8am	Level 2 : 22pm~6am	Level 2 : 22pm~8am	Level 2 : 20pm~8am	Level 3 : 22pm~8am	Level 3 : 20pm~8am
	3	Normal (factory)	Slow setting	Fast setting	---	---	---	---

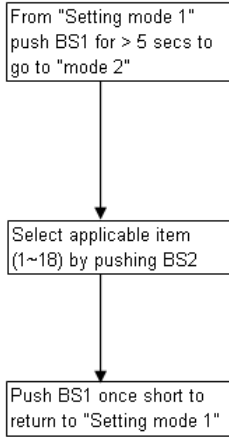
4.1.2 Field Settings from Outdoor PCB : DS1-1 ~ DS1-8

Overview

Setting	Description	Details									
DS1-1	Cool / Heat setting for Emergency Operation	ON = Cooling, OFF = Heating Details : see functional description : “Forced Operating Mode”									
DS1-2	ON/OFF setting for Emergency Operation	Details : see functional description : “Forced Operating Mode”									
DS1-3	External low noise activation	Details : see page XX									
DS1-4	High Static Pressure Setting	<table border="1"> <thead> <tr> <th></th> <th>DS1-4 = OFF (Factory setting)</th> <th>DS1-4 = ON</th> </tr> </thead> <tbody> <tr> <td>ESP</td> <td>400 Pa</td> <td>800 Pa</td> </tr> <tr> <td>Max fan speed</td> <td>825 rpm</td> <td>915rpm</td> </tr> </tbody> </table>		DS1-4 = OFF (Factory setting)	DS1-4 = ON	ESP	400 Pa	800 Pa	Max fan speed	825 rpm	915rpm
	DS1-4 = OFF (Factory setting)	DS1-4 = ON									
ESP	400 Pa	800 Pa									
Max fan speed	825 rpm	915rpm									
DS1-5	Automatic low noise operation at night time	Details : see page XX									
DS1-6	Power consumption limitation setting	Details : see page XX									
DS1-7	For development testing purpose only !	Do not change factory setting (= OFF)									
DS1-8	Capacity class setting	In case of spare part PCB only ! RZQ200 = OFF RZQ250 = ON									

4.1.3 Field settings from outdoor PCB : Mode 2

**Overview
factory settings**

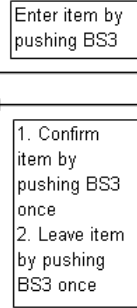


Binary Code

	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7
0	ON	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	ON
2	ON	OFF	OFF	OFF	OFF	ON	OFF
3	ON	OFF	OFF	OFF	OFF	ON	ON
4	ON	OFF	OFF	OFF	ON	OFF	OFF
5	ON	OFF	OFF	OFF	ON	OFF	ON
6	ON	OFF	OFF	OFF	ON	ON	OFF
7	ON	OFF	OFF	OFF	ON	ON	ON
8	ON	OFF	OFF	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	ON
10	ON	OFF	OFF	ON	OFF	ON	OFF
11	ON	OFF	OFF	ON	OFF	ON	ON
12	ON	OFF	OFF	ON	ON	OFF	OFF
13	ON	OFF	OFF	ON	ON	OFF	ON
14	ON	OFF	OFF	ON	ON	ON	OFF
15	ON	OFF	OFF	ON	ON	ON	ON
16	ON	OFF	ON	OFF	OFF	OFF	OFF
17	ON	OFF	ON	OFF	OFF	OFF	ON
18	ON	OFF	ON	OFF	OFF	ON	OFF

Factory Setting

LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	Flash	OFF
ON	OFF	OFF	OFF	OFF	Flash	OFF
ON	OFF	OFF	OFF	Flash	OFF	OFF
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	Flash	OFF
ON	OFF	OFF	OFF	OFF	Flash	OFF
ON	OFF	OFF	OFF	Flash	OFF	Flash
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	Flash	OFF
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	OFF	Flash
ON	OFF	OFF	OFF	OFF	Flash	OFF
ON	OFF	OFF	OFF	OFF	Flash	OFF



Contents

Setting	Contents	Refer to
0	Additional refrigerant charging operation	
1	Refrigerant recovery operation / vacuuming operation	
2	Low noise operation level setting (external)	
3	Automatic low noise operation at night time	
4	Night time start setting	
5	Night time stop setting	
6	Capacity priority during low noise & I-demand operation	
7	I-demand operation	
8	N.A. Do not change factory setting !	---
9	N.A. Do not change factory setting !	---
10	Defrost setting	
11	N.A. Do not change factory setting !	---
12	N.A. Do not change factory setting !	---
13	N.A. Do not change factory setting !	
14	N.A. Do not change factory setting !	
15	N.A. Do not change factory setting !	---
16	N.A. Do not change factory setting !	---
17	Power transistor check mode (check inverter signal)	
18	N.A. Do not change factory setting !	---

4.2 Outdoor Field Settings RZQ200~250B7 : Setting Contents

What is in this chapter ?

Overview

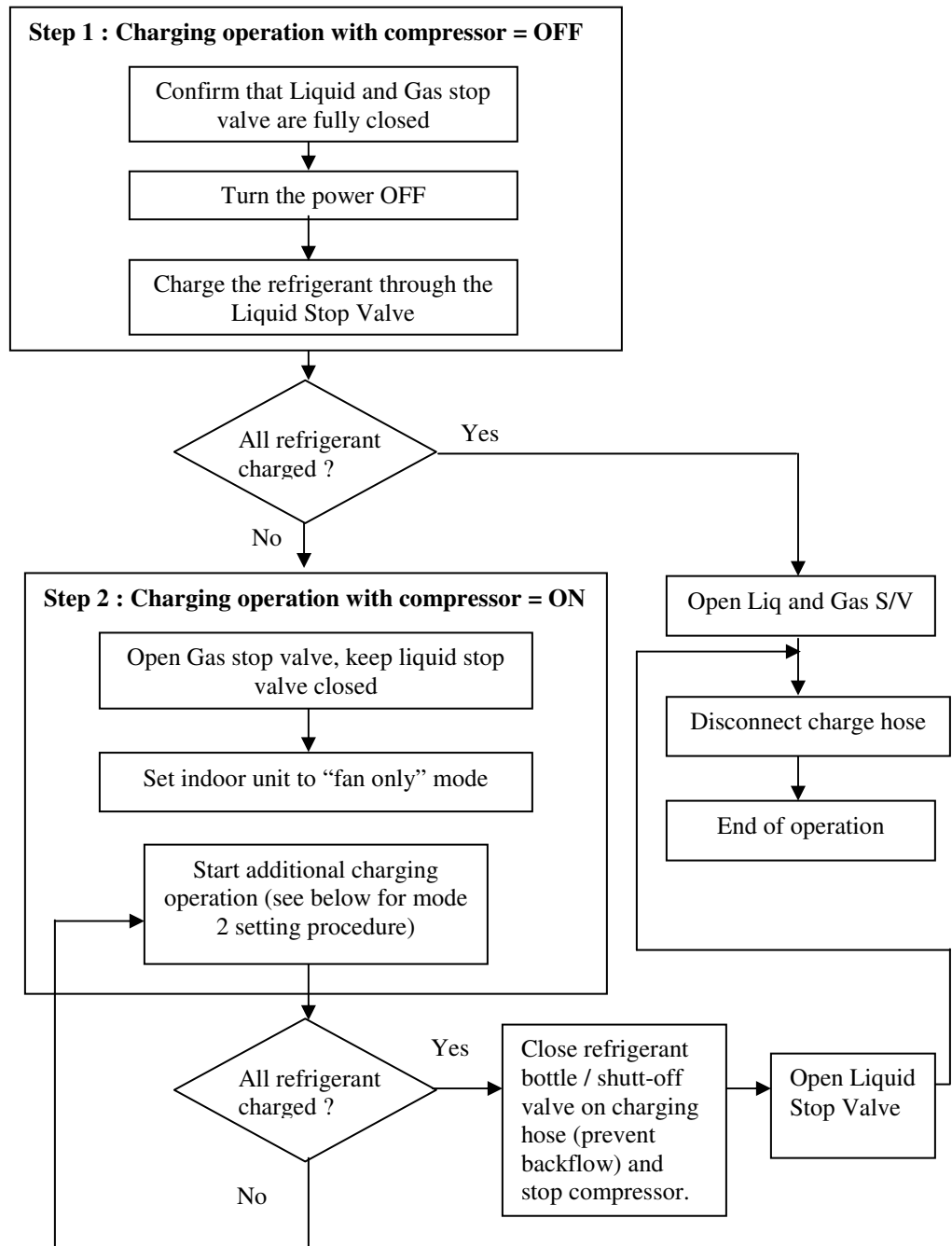
Topic	See Page
4.2.1 Additional Refrigerant Charging Operation	24
4.2.2 Refrigerant Recovery Operation / Vacuuming Operation	26
4.2.3 Low Noise Operation Setting (External Activation)	27
4.2.4 Automatic low noise Operation at Night Time	29
4.2.5 Capacity Priority during Low Noise & I-demand	31
4.2.6 I-demand	32
4.2.7 Defrost Mode Settings	34
4.2.8 Transistor Check Mode	36

4.2.1 Additional Refrigerant Charging Operation

Purpose

When additional refrigerant needs to be charged (e.g. field piping > 30meter), or when a complete refrigerant re-charge needs to be performed (e.g. after a leak has occurred), it will be required to use this function in order to fully charge the system.

Charging Method flow chart



4.2.1 Additional Refrigerant Charging Operation, continued

Setting Procedure

Procedure	LED Indication						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter "mode 2"	○	●	●	●	●	●	●
Leave binary code 0, do not press BS2 (Set)	○	●	●	●	●	●	●
Press BS3 (Return) once to enter item	○	●	●	●	●	●	☼
Change setting from OFF to ON by pressing BS2 once	○	●	●	●	●	☼	●
Confirm setting by pressing BS3	○	●	●	●	●	○	●
Leave item by pressing BS3	☼	☼	●	●	●	●	●
Actual low pressure value is indicated by LED display	LP ≥ 7.4 bar	○	☼	○	○	○	○
	5.9 ≤ LP < 7.4 bar	○	☼	●	○	○	○
	4.4 ≤ LP < 5.9 bar	○	☼	●	●	○	○
	2.9 ≤ LP < 4.4 bar	○	☼	●	●	●	○
	LP < 2.9 bar	○	☼	●	●	●	●
Charging function is automatically ended after 30 minutes	○	●	●	●	●	☼	☼
Return to Setting Mode 1 by pressing BS1 once	○	●	●	●	●	○	●

○	= LED ON
●	= LED OFF
☼	= LED blinking

Notes

- Press BS3 (Return) to stop the charging procedure when the refrigerant is charged up to the specified amount.
- When the charging is not completed within 30 minutes, start the procedure again.
- When the unit stops immediately after the procedure has started, the unit is excessively charged. No more refrigerant can be added.
- Immediately fully open the liquid stop valve after the charging procedure is ended.

4.2.2 Refrigerant Recovery Operation / Vacuuming Operation

Purpose When the total refrigerant charge needs to be reclaimed from the system or a vacuuming operation is required on the system, it will be necessary to force the expansion valve in the outdoor unit to full open position.

- Method**
1. Power = ON
 2. Set indoor unit to “fan only” mode
 3. Connect the reclaim unit
 4. Start the “Refrigerant Recovery Operation”, using below mode 2 setting procedure.

Setting Procedure

Procedure	LED Indication						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter “mode 2”	○	●	●	●	●	●	●
Go to binary code 1, by pressing BS2 (Set)	○	●	●	●	●	●	○
Press BS3 (Return) once to enter item	○	●	●	●	●	●	☼
Change setting from OFF to ON by pressing BS2 once	○	●	●	●	●	☼	●
Confirm setting by pressing BS3	○	●	●	●	●	○	●

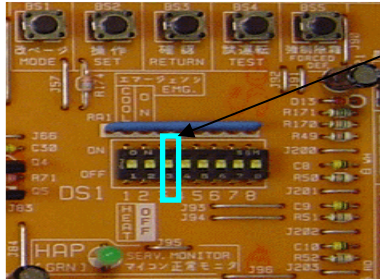
○	= LED ON
●	= LED OFF
☼	= LED blinking

- Notes**
- Press BS3 (Return) to stop the recovery procedure or turn the power OFF.
 - Recovery mode setting needs to be reset manually from mode 2.

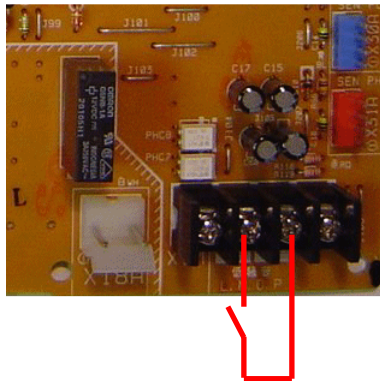
4.2.3 Low Noise Operation Setting (External Activation)

Purpose Outdoor unit low noise operation can be activated and de-activated automatically or by using an external contact (e.g. contact from time clock). This part will explain how to set low noise operation using external activation.

Low Noise Activation Method 1. Set Dip Switch DS1-3 on the outdoor PCB from factory setting “OFF” to “ON” (= upward position) while the power is OFF



2. Low noise operation will be activated when contacts between T1 & T2 on X1M are closed



Low Noise Level Setting

3 different low noise levels can be set by using mode 2 settings :

Procedure		LED Indication						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter “mode 2”		○	●	●	●	●	●	●
Go to binary code 2, by pressing BS2 (Set)		○	●	●	●	●	○	●
Press BS3 (Return) once to enter item		○	●	●	●	●	☼	●
Select preferred low noise level by pressing BS2	Low Noise Level 1	○	●	●	●	●	●	☼
	Low Noise Level 2 (factory)	○	●	●	●	●	☼	●
	Low Noise Level 3	○	●	●	●	☼	●	●
Confirm selected low noise level by pressing BS3 once	Low Noise Level 1	○	●	●	●	●	●	○
	Low Noise Level 2 (factory)	○	●	●	●	●	○	●
	Low Noise Level 3	○	●	●	●	○	●	●

○	= LED ON
●	= LED OFF
☼	= LED blinking

4.2.3 Low Noise Operation Setting (External Activation), continued

**Noise
Reduction**

	RZQ200		RZQ250	
	Cooling	Heating	Cooling	Heating
Low Noise level 1	53 dBA	55 dBA	53 dBA	55 dBA
Low Noise level 2	50 dBA	52 dBA	50 dBA	52 dBA
Low Noise level 3	47 dBA	40 dBA	47 dBA	40 dBA

Exceptions

The silent operation will be overruled in the following conditions :

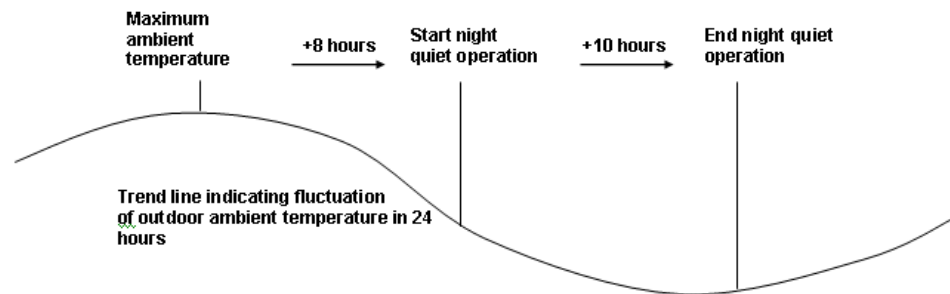
- Pump down residual operation
 - Startup control
 - Defrost operation
 - Oil recovery
-

4.2.4 Automatic Low Noise Operation at Night Time

Purpose Outdoor unit low noise operation can be activated and de-activated automatically or by using an external contact (e.g. contact from time clock). This part will explain how to set automatic low noise operation.

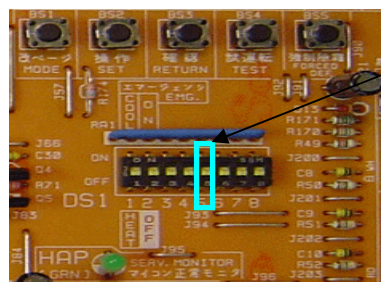
Judgement When setting DS1-5 to ON, silent operation will be carried out by presuming the current time in accordance with the outside temperature. Every 5 minutes, the outdoor unit will check the actual outdoor temperature. The unit will keep in it's memory an average of the highest temperature of the last 10 days. Automatic mode will start when the outdoor temperature is = average max of last 10 days -5°C and will be conducted for 10 hours. The maximum outdoor temperature is supposed to occur at 14:00h. The night time low noise operation is supposed to be activated between 22:00h and 08:00h in factory setting, but can be changed by field setting. As the time judgement is made in accordance with the outdoor temperature, the above mentioned timing is an estimation only.

Graph



Low Noise Activation Method

1. Set Dip Switch DS1-5 on the outdoor PCB from factory setting "OFF" to "ON" (= upward position) while the power is OFF



4.2.4 Automatic Low Noise Operation at Night Time, continued

Setting Method 3 different low noise levels, low noise operation starting times and low noise operation ending times can be set by using mode 2 settings :

Procedure		LED Indication						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter "mode 2"		○	●	●	●	●	●	●
Go to binary code 3, by pressing BS2 (Set)		○	●	●	●	●	○	○
Press BS3 (Return) once to enter item		○	●	●	●	●	☼	●
Select preferred low noise level by pressing BS2	Low Noise Level 1	○	●	●	●	●	●	☼
	Low Noise Level 2 (factory)	○	●	●	●	●	☼	●
	Low Noise Level 3	○	●	●	●	☼	●	●
Confirm selected low noise level by pressing BS3 once	Low Noise Level 1	○	●	●	●	●	●	○
	Low Noise Level 2 (factory)	○	●	●	●	●	○	●
	Low Noise Level 3	○	●	●	●	○	●	●
Go to binary code 4, by pressing BS2 (Set)		○	●	●	●	○	●	●
Press BS3 (Return) once to enter item		○	●	●	●	●	☼	●
Select preferred low noise starting time by pressing BS2	Low Noise Start at 20h	○	●	●	●	●	●	☼
	Low Noise Start at 22h (factory)	○	●	●	●	●	☼	●
	Low Noise Start at 24h	○	●	●	●	☼	●	●
Confirm selected low noise starting time by pressing BS3 once	Low Noise Start at 20h	○	●	●	●	●	●	○
	Low Noise Start at 22h (factory)	○	●	●	●	●	○	●
	Low Noise Start at 24h	○	●	●	●	○	●	●
Go to binary code 5, by pressing BS2 (Set)		○	●	●	●	○	●	○
Press BS3 (Return) once to enter item		○	●	●	●	☼	●	●
Select preferred low noise ending time by pressing BS2	Low Noise End at 6h	○	●	●	●	●	●	☼
	Low Noise End at 7h	○	●	●	●	●	☼	●
	Low Noise End at 8h (factory)	○	●	●	●	☼	●	●
Confirm selected low noise ending time by pressing BS3 once	Low Noise End at 6h	○	●	●	●	●	●	○
	Low Noise End at 7h	○	●	●	●	●	○	●
	Low Noise End at 8h (factory)	○	●	●	●	○	●	●

○	= LED ON
●	= LED OFF
☼	= LED blinking

Noise Reduction

	RZQ200		RZQ250	
	Cooling	Heating	Cooling	Heating
Low Noise level 1	53 dBA	55 dBA	53 dBA	55 dBA
Low Noise level 2	50 dBA	52 dBA	50 dBA	52 dBA
Low Noise level 3	47 dBA	40 dBA	47 dBA	40 dBA

Exceptions

The silent operation will be overruled in the following conditions :

- Pump down residual operation
- Startup control
- Defrost operation
- Oil recovery

4.2.5 Capacity Priority during Low Noise & I-demand

Purpose

When “Capacity Priority” has been set and Low Noise Operation or Power Consumption Limitation (I-demand) is activated, the limitation operation will be stopped when the heating or cooling capacity becomes insufficient. In such a case, the operation will return to normal operation. The unit will return to low-noise operation or I-demand when the heating or cooling load decreases again.

Setting Method

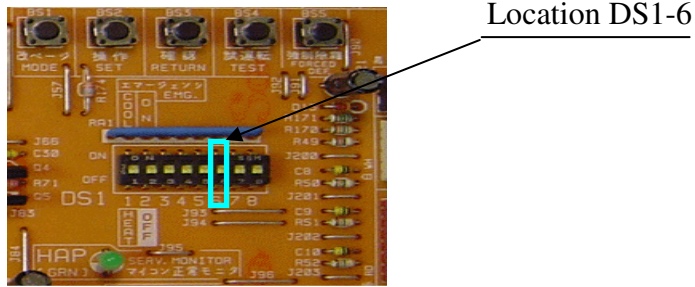
Procedure	LED Indication						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter “mode 2”	○	●	●	●	●	●	●
Go to binary code 6, by pressing BS2 (Set)	○	●	●	●	○	○	●
Press BS3 (Return) once to enter item	○	●	●	●	●	●	☼
Change setting from OFF to ON by pressing BS2 once	○	●	●	●	●	☼	●
Confirm setting by pressing BS3	○	●	●	●	●	○	●

○	= LED ON
●	= LED OFF
☼	= LED blinking

4.2.6 I-demand (Power Consumption limitation)

Purpose Set a limitation towards the power consumption from the system.
(e.g. budget control, limit power consumption during peak moments,..)

A. Setting Method using Mode 2 (=continuous) Set Dip Switch DS1-6 on the outdoor PCB from factory setting “OFF” to “ON” (= upward position) while the power is OFF



Limitation will be set continuously to 60%, 70% or 80% when dip switch DS1-6 is set to ON, depending on following mode 2 setting :

Procedure		LED Indication						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter “mode 2”		○	●	●	●	●	●	●
Go to binary code 7, by pressing BS2 (Set)		○	●	●	●	○	○	○
Press BS3 (Return) once to enter item		○	●	●	●	●	☼	●
Select preferred low noise level by pressing BS2	P.I limitation 60%	○	●	●	●	●	●	☼
	P.I limitation 70% (factory)	○	●	●	●	●	☼	●
	P.I limitation 80%	○	●	●	●	☼	●	●
Confirm selected low noise level by pressing BS3 once	P.I limitation 60%	○	●	●	●	●	●	○
	P.I limitation 70% (factory)	○	●	●	●	●	○	●
	P.I limitation 80%	○	●	●	●	○	●	●

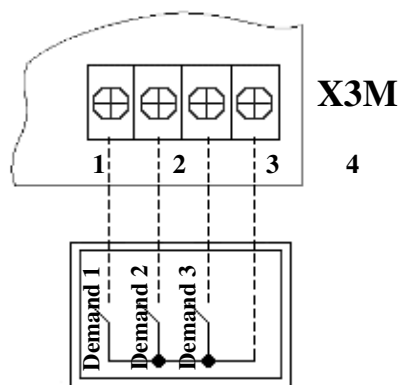
○	= LED ON
●	= LED OFF
☼	= LED blinking

4.2.6 I-demand (Power Consumption limitation), continued

B. Activation method using external contact

Next to the activation method using Mode 2 setting, a power consumption limitation of 60% or 40% can also be set by using terminal X3M in the outdoor unit switch box.

	Closed contact between terminals	Limitation Setting
Demand 1	1-4	70%
Demand 2	2-4	40%
Demand 3	3-4	Forced OFF



Exceptions

The Power Consumption Limitation Operation will be overruled in the following conditions :

- Pump down residual operation
- Startup control
- Defrost operation
- Oil recovery

4.2.7 Defrost setting

Purpose Defrost parameters can be altered. See Chapter 3 for details on defrost operation.

Setting Method

Procedure		LED Indication						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter "mode 2"		○	●	●	●	●	●	●
Go to binary code 10, by pressing BS2 (Set)		○	●	●	○	●	○	●
Press BS3 (Return) once to enter item		○	●	●	●	●	●	☼
Select preferred defrost setting by pressing BS2	Mode 1	○	●	●	●	●	●	☼
	Mode 2	○	●	●	●	●	☼	●
	Mode 3	○	●	●	●	☼	●	●
	Mode 4	○	●	●	☼	●	●	●
	Mode 5	○	●	☼	●	●	●	●
	Mode 6	○	☼	●	●	●	●	●
Confirm selected defrost setting by pressing BS3 once	Mode 1	○	●	●	●	●	●	○
	Mode 2	○	●	●	●	●	○	●
	Mode 3	○	●	●	●	○	●	●
	Mode 4	○	●	●	○	●	●	●
	Mode 5	○	●	○	●	●	●	●
	Mode 6	○	○	●	●	●	●	●

○	= LED ON
●	= LED OFF
☼	= LED blinking

4.2.8 Transistor Check Mode

Purpose

The “Transistor Check Mode” will be used in case there is failure in the inverter system. This function will be helpful to determine if the failure is related to a breakdown in the inverter circuit (electronical) or inverter compressor.

Checking Method

1. Disconnect the U-V-W wires on the compressor terminal
2. Activate the “Transistor Check Mode “(see below for setting procedure)
3. Measure the output on the U-V-W wires. When the output voltage is approx 50V (10Hz) and the voltage balance between phases U-V-W towards the compressor is within $\pm 5\%$, the inverter PCB is normal.
4. If available, connect a transmission monitor.

Setting Method

Procedure	LED Indication						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P
Press BS1 (Mode) for 5 seconds to enter “mode 2”	○	●	●	●	●	●	●
Go to binary code 17, by pressing BS2 (Set)	○	●	○	●	●	●	○
Press BS3 (Return) once to enter item	○	●	●	●	●	●	☼
Change setting from OFF to ON by pressing BS2 once	○	●	●	●	●	☼	●
Confirm setting by pressing BS3	○	●	●	●	●	○	●

○	= LED ON
●	= LED OFF
☼	= LED blinking

Notes

- Transistor check will be started about 4 minutes after the check mode has been activated.