



DAIKIN

Marine type
Container Refrigeration Unit

Pocket Manual

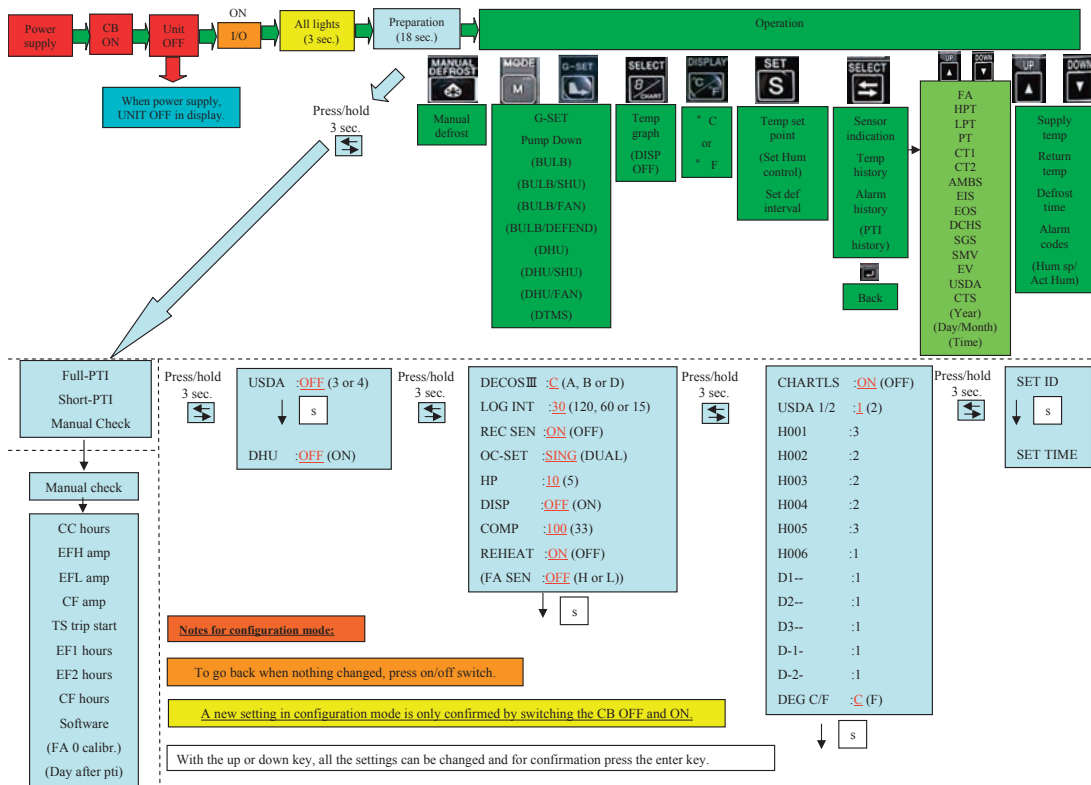
Contents

1. Controller Operation Procedure	
(1) Basic Operation	3 ~ 8
(2) Initial Setting	9 ~ 11
2. Piping Diagram	
(1) Air Cooled Condenser with Re-Heat Coil	14 ~ 15
(2) Air & Water Cooled Condenser with Re- Heat Coil	16 ~ 17
(3) Operation Current & Pressure ...	18 ~ 19
3. Trouble Shooting	
(1) Alarm Code	21 ~ 23
(2) Checking Procedure.....	26 ~ 46
F101,F803,E101,E103,E105,E107, E109,E205,E401-E409(Each Sensor Alarm),E413,E415	
4. Set Point of Functional Parts & Resistance	
(1) Protection Device Set point	47
(2) Temperature Sensor	48 ~ 50
(3) Discharge Gas Temperature Sensor (DCHS)	51 ~ 53
(4) Coil Resistance	54
(5) Pressure Sensor	55
5. How to use Service Port	56 ~ 60

Contents

6. Refrigerant Charging	61 ~ 63
7. Auto-PTI	
(1) Operation procedure (Short PTI & Full PTI)	64 ~ 66
(2) J Code Alarm (Alarm Code for PTI Failure)	67
(3) Manual Check procedure	69
8. Repair Method of Major Parts	
(1) Compressor	70 ~ 74
(2) Electric Expansion Valve (EEV)	75 ~ 82
9. Emergency Operation	83
(1) Decos III c&d	84 ~ 88
(2) Decos III d-1	89 ~ 93
(3) Decos III e.....	94 ~ 100
10. Appendix	
Bolt tightening torque	101
Fuse protection table	102
Defrost operation	103
PT / CT board replacement	105
Solenoid valve ON/OFF operation	106
Sensor replacement procedure for connector type	107

1. Controller Operation Procedure



How to change setpoint.



Press the S key once, until “SET-SPC” is displayed.

With the up or down key, the set point can be changed and for confirmation press the enter key.

How to change defrost time.



Press the S key until “SET-DEF” is displayed.

With the up or down key, the defrost time can be changed and for confirmation press the enter key.

Note: 99 is an automatic defrost.

How to switch ON de-humidification.



Press the Mode key, until “DHU” is displayed.

With the up or down key, the de-humidification can be switched **ON** or **OFF** and for confirmation press the enter key.

How to change Humidity setpoint.



When De-Humidification is ON, press the Mode key until SET-SHU is displayed.

With the up or down key, the humidity set point can be changed, for confirmation press the enter key.

LXE10E-1 & LXE10E-A Initial setting table into spare controller DECOS III d

MODEL NAME Note 1	Optional fun.		Basic function mode										Optional Condition mode													Input Data	
	USdA	dHu	DECOS- II	LOG INT	REC SEN	OC-SET	HP	diSP	COMP	REHEAT	FASEN	C/F	CHARTLS	USdA1/2	H001	H002	H003	H004	H005	H006	D1--	D2--	D3--	D-1-	D-2-	SET ID	SET TIME
LXE10E-1 LXE10E-1A to LXE10E-1E	AU	OFF	d	60	ON	Sing	10	OFF	100	ON	L	F	ON	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A5C to LXE10E-A5E	OFF	OFF	d	30	ON	Sing	10	OFF	100	OFF	OFF	C	OFF	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A9B	OFF	OFF	d	30	ON	Sing	10	OFF	100	OFF	OFF	C	OFF	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A12C to LXE10E-A12F	OFF	OFF	d	30	ON	Sing	10	ON	100	OFF	OFF	C	OFF	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A15C to LXE10E-A15J	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	OFF	C	ON	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A15BR LXE10E-A15GR	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	OFF	C	ON	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A18B to LXE10E-A18D	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	OFF	C	OFF	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A19A	OFF	OFF	d	30	ON	Sing	10	OFF	100	OFF	OFF	C	OFF	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A21B LXE10E-A21D	OFF	OFF	d	30	ON	Sing	10	OFF	100	OFF	OFF	C	ON	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A23 LXE10E-A23A to LXE10E-A23C	OFF	OFF	d	60	ON	Sing	10	OFF	100	OFF	OFF	C	ON	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT +8
LXE10E-A26B to LXE10E-A26D	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	OFF	C	OFF	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A27B	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	OFF	C	ON	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A29A	OFF	OFF	d	30	ON	Sing	10	OFF	100	OFF	OFF	C	ON	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A31A LXE10E-A31B	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	OFF	C	ON	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A32A LXE10E-A32B	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	H	C	OFF	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A33 LXE10E-A33A	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	OFF	C	ON	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A35 LXE10E-A35A LXE10E-A35B	OFF	OFF	d	30	ON	Sing	10	OFF	100	OFF	OFF	C	OFF	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A36 LXE10E-A36A	OFF	OFF	d	60	ON	Sing	10	OFF	100	ON	OFF	C	ON	2	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A37	OFF	OFF	d	30	ON	Sing	10	ON	100	OFF	OFF	C	ON	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT
LXE10E-A40	OFF	OFF	d	30	ON	Sing	10	OFF	100	OFF	OFF	C	OFF	1	3	2	2	2	3	3	1	1	1	1	1	*	GMT

Note 1. Confirm MODEL NAME stamped in the name plate mounted on the reefer unit.

LXE10E-A Initial setting table into spare controller DECOS III c

MODEL NAME/Note	Optional function		Basic function mode									Optional Condition setting mode														Input Data		
LXE10E	USdA	dHu	DECOS-III	LOG INT	REC SEN	OC-SET	HP	diSP	COMP	REHEAT	CHARTLS	USdA1/2	H001	H002	H003	H004	H005	H006	D1--	D2--	D3--	D-1-	D-2-	C/F	SET I	d	SET TIME	
	USdA sensor	Dehumidification control	Controller setting	Logging interval	Data recorder sensor	Input power	Hose power	Panel lighting OFF	Comp. Unload setting	Reheat coil setting	D/H code indication	USdA sensor type	H code						D code					Temp. indication	Container I.D.	Controller set time		
— A4	OFF	OFF	C	30	ON	Single	10	OFF	100	OFF	ON	1	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A5																												
— A5A	OFF	OFF	C	30	ON	Single	10	OFF	100	OFF	OFF	1	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A5B																												
— A6																												
— A6R																												
— A12	OFF	OFF	C	30	ON	Single	10	ON	100	OFF	OFF	1	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A12A																												
— A12B																												
— A28																												
— A7																												
— A11	OFF	OFF	C	60	ON	Single	10	OFF	100	OFF	OFF	2	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A20																												
— A26										ON																		
— A26A																												
— A8																												
— A9																												
— A9R	OFF	OFF	C	30	ON	Single	10	ON	100	OFF	OFF	1	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A19																												
— A5BR																												
— A14																												
— A15	OFF	OFF	C	60	ON	Single	10	OFF	100	ON	ON	2	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A15A																												
— A15B																												
— A5																												
— A16	OFF	OFF	C	30	ON	Single	10	OFF	100	OFF	ON	1	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A21																												
— A29																												
— A17	OFF	OFF	C	30	ON	Single	10	OFF	100	OFF	OFF	1	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A17A																												
— A18																												
— A18A	OFF	OFF	C	60	ON	Single	10	OFF	100	ON	OFF	1	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A30																												
— A21	OFF	OFF	C	30	ON	Single	10	OFF	100	OFF	ON	1	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A21A																												
— A24R	OFF	OFF	C	30	ON	Single	10	OFF	100	OFF	OFF	1	3	2	2	1	3	3	1	1	1	1	1	C	*	Jpn		
— A15AR	OFF	OFF	C	60	ON	Single	10	OFF	100	ON	ON	2	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A15B																												
— A27	OFF	OFF	C	60	ON	Single	10	OFF	100	ON	ON	2	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		
— A27A																												
— A31	OFF	OFF	C	60	ON	Single	10	OFF	100	ON	ON	2	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT		

Note 1. Confirm MODEL NAME stamped in the name plate mounted on the reefer unit.

DECOS III d-1 INITIAL SETTING TABLE

MODEL NAME Note 1	Optional function setting mode		Basic function mode										Optional Condition setting mode												Input Data		
	USdA	dHu	DECOS- II	LOG INT	REC SEN	OC-SET	HP	dISP	COMP	REHEAT	FA SEN	CHARTLS	USdA1/2	H001	H002	H003	H004	H005	H006	D1--	D2--	D3--	D-1-	D-2-	C/F	SET Id	SET TIME
LXE10E	USdA sensor connection	Dehumidification control	Controller setting	Logging interval	Data recorder sensor	Input power	Hose power	Panel Lighting OFF	Compressor Unload setting	Reheat coil setting	FA setting	D/H code alarm indication	USdA sensor type	H code						D code					Temp. indication	Container I.D.	Controller set time
LXE10E-A14 LXE10E-A15 LXE10E-A15A LXE10E-A15B	OFF	OFF	d-1	60	ON	Single	10	OFF	100	ON	OFF	ON	2	3	2	2	1	3	3	1	1	1	1	1	C	*	GMT
LXE10E-1 LXE10E-1A LXE10E-1B LXE10E-1C LXE10E-1D LXE10E-1E	AU	OFF	d-1	60	ON	Single	10	OFF	100	ON	L	ON	2	3	2	2	2	3	3	1	1	1	1	1	F	*	GMT
Spare controller	blank	blank	blank	blank	blank	blank	blank	blank	blank	blank	blank	1	3	2	2	2	3	3	1	1	1	1	1	C	ON	blank	01/1/1

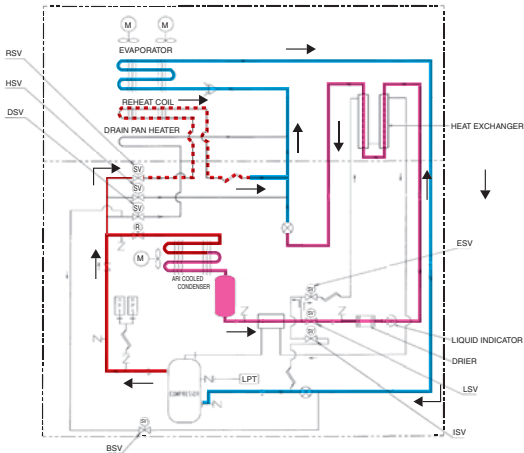
- Notes
1. Confirm MODEL NAME mentioned in the name plate mounted on the reefer unit.
 2. It is possible to input Container I.D. and Controller Time with both the panel operation and the personal computer installed DCCS's software.
 3. If you don't input container I.D., it is impossible to download the logger data with the personal computer.
 4. If you don't input the controller set time, it starts from 2001.1.1, 0:00.

DECOS III e INITIAL SETTING TABLE

MODEL NAME Note 1	Optional function setting mode		Basic function mode										Optional Condition setting mode												Input Data		
	USdA	dHu	DECOS- II	LOG INT	REC SEN	OC-SET	HP	dISP	COMP	REHEAT	FA SEN	CHARTLS	USdA1/2	H001	H002	H003	H004	H005	H006	D1--	D2--	D3--	D-1-	D-2-	C/F	SET Id	SET TIME
LXE10E	USdA sensor connection	Dehumidification control	Controller setting	Logging interval	Data recorder sensor	Input power	Hose power	Panel Lighting OFF	Compressor Unload setting	Reheat coil setting	FA setting	D/H code alarm indication	USdA sensor type	H code						D code					Temp. indication	Container I.D.	Controller set time
LXE10E136	OFF	OFF	e	*	ON	Single	10	OFF	100	ON	OFF	*	1	3	2	2	2	3	3	1	1	1	1	1	C	*	*
LXE10E132	OFF	OFF	e	*	ON	Single	10	OFF	100	ON	H	*	1	3	2	2	2	3	3	1	1	1	1	1	C	*	*
LXE10E126	OFF	OFF	e	60	ON	Single	10	OFF	100	ON	OFF	*	1	3	2	2	2	3	3	1	1	1	1	1	C	*	GMT
LXE10E133	OFF	OFF	e	60	ON	Single	10	OFF	100	ON	OFF	ON	1	3	2	2	2	3	3	1	1	1	1	1	C	*	GMT
LXE10E145	OFF	OFF	e	60	ON	Single	10	OFF	100	ON	OFF	ON	1	3	2	2	2	3	3	1	1	1	1	1	C	*	GMT
LXE10E109	OFF	OFF	e	30	ON	Single	10	ON	100	OFF	OFF	OFF	1	3	2	2	2	3	3	1	1	1	1	1	C	*	GMT
LXE10E102	OFF	OFF	e	60	ON	Single	10	OFF	100	ON	OFF	OFF	1	3	2	2	2	3	3	1	1	1	1	1	C	*	GMT

2. Piping Diagram

Piping Diagram (Air Cool with Re heater coil)



BSV :Dis. Gas Bypass Solenoid Valve

ESV :Economizer Sol.Valve

HSV :Hot Gas Solenoid Valve

HPT :High Pressure Transducer

SMV :Suction Modulation Valve

DSV :Defrost Solenoid Valve

EV :Electronic Expansion Valve

LPT :Low Pressure Transducer

RSV :Reheat coil Solenoid Valve (Option)

--- Common control for Chilled and Defrost operation ---

DPR :Discharge Pressure Regulator (Open when HPT>690kPa)

ISV :Injection Solenoid Valve (Injection control)

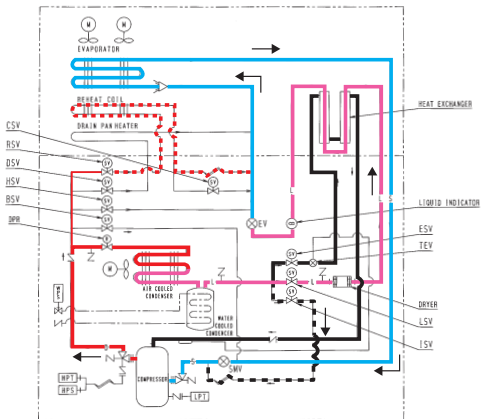
HPS :High Pressure Switch (OFF>2400kPa, ON<1900kPa)

Operation of magnetic contactor and solenoid valve

Component name			Pull-down	Capacity control	Heat-up	Overcool protection
Magnetic contactor	Compressor	CC	ON	ON	ON	OFF
	Evaporator fan. High speed	EFH	ON	ON	ON	ON
	Evaporator fan. Low speed	EFL	OFF	OFF	OFF	OFF
	Condenser fan	CF	ON / OFF ※ 1	ON	ON / OFF ※ 4	OFF
Solenoid valve	Liquid solenoid valve	LSV	ON	ON	OFF	OFF
	Economizer solenoid valve	ESV	ON	OFF	OFF	OFF
	Injection solenoid valve	ISV	ON / OFF ※ 2	ON / OFF ※ 5	ON / OFF ※ 3	OFF
	Hot-gas solenoid valve	HSV	OFF	ON / OFF ※ 5	ON	OFF
	Defrost solenoid valve	DSV	OFF	ON / OFF ※ 5	ON	OFF
	Discharge gas by-pass solenoid valve	BSV	OFF	ON / OFF ※ 5	OFF	OFF
	Reheat solenoid valve	RSV	ON / OFF ※ 6	OFF	OFF	OFF
Suction modulating valve		SMV	100%	3 to 100%	100%	100%
Old model	Electronic expansion valve	EEV	200~2000pls	200~2000pls	0pls	1000pls
New model	Electronic expansion valve	EEV	21~420pls (5~100%)	48~420pls (11~100%)	0pls (0%)	189pls (45%)

Note) ※ 1: High pressure control ※ 4: Release control
 ※ 2: Injection control ※ 5: Capacity control and hot gas by-pass
 ※ 3: Charge control ※ 6: RSV : OFF RS ≤ 20°C, RSV : ON RS ≥ 25°C

Piping Diagram (Air/Water Cooled with Re heater coil)



FROZEN (Return air < 5°C)

EV :Electronic Expansion Valve
LSV :Liquid Solenoid Valve
DSV :Defrost Solenoid Valve
ESV :Economizer Solenoid Valve
DPR :Discharge pressure regulator
SMV :Suction Modulation Valve
WPS :Water pressure switch

HSV :Hot Gas Solenoid Valve
ISV :Injection Solenoid Valve
BSV :Discharge gas Bypass Solenoid Valve
LPT :Low Pressure Transducer
HPT :High Pressure Transducer
HPS :High Pressure Switch.
CSV :Capillary solenoid valve. ※
 Note) ※ Only for LXE10E-1, not available for LXE10E-1A or later.

Operation of magnetic contactor and solenoid valve

Component name			Pull-down	Capacity control	Heat-up	Overcool protection
Magnetic contactor	Compressor	CC	ON	ON	ON	OFF
	Evaporator fan. High speed	EFH	ON	ON	ON	ON
	Evaporator fan. Low speed	EFL	OFF	OFF	OFF	OFF
	Condenser fan	CF	ON / OFF ※ 1	ON	ON / OFF ※ 4	OFF
Solenoid valve	Liquid solenoid valve	LSV	ON	ON	OFF	OFF
	Economizer solenoid valve	ESV	ON	OFF	OFF	OFF
	Injection solenoid valve	ISV	ON / OFF ※ 2	ON / OFF ※ 5	ON / OFF ※ 3	OFF
	Hot-gas solenoid valve	HSV	OFF	ON / OFF ※ 5	ON	OFF
	Defrost solenoid valve	DSV	OFF	ON / OFF ※ 5	ON	OFF
	Discharge gas by-pass solenoid valve	BSV	OFF	ON / OFF ※ 5	OFF	OFF
	Reheat solenoid valve	RSV	ON / OFF ※ 6	OFF	OFF	OFF
Suction modulating valve		SMV	100%	3 to 100%	100%	100%
Old model	Electronic expansion valve	EEV	200~2000pls	200~2000pls	0pls	1000pls
New model	Electronic expansion valve	EEV	21~420pls (5~100%)	48~420pls (11~100%)	0pls (0%)	189pls (45%)

Note) ※ 1: High pressure control ※ 4: Release control

※ 2: Injection control ※ 5: Capacity control and hot gas by-pass

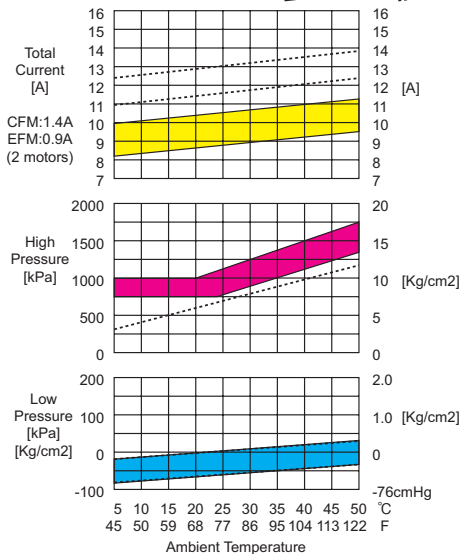
※ 3: Charge control ※ 6: RSV : OFF RS ≤ 20°C, RSV : ON RS ≥ 25°C

Condenser fan control in water-cooled operation

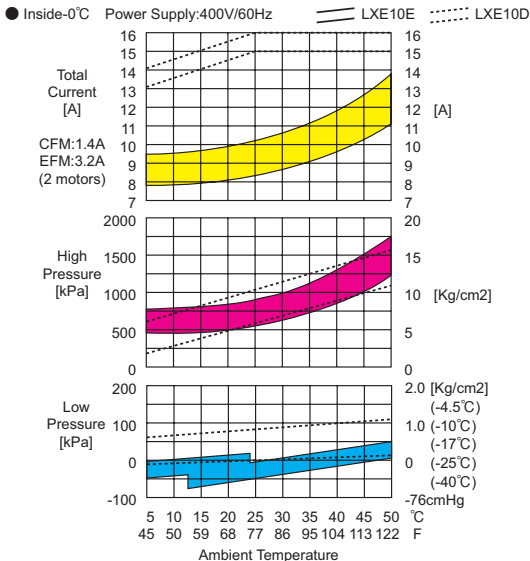
This refrigeration unit is functional either in air-cooled operation or in water-cooled operation. The selection of air-cooled operation and water-cooled operation is automatically made through the water pressure switch. In other words, when cooling water flows in the water cooled condenser to apply water pressure to the inlet of the condenser, a contact in the water pressure switch will open to stop the condenser fan motor, thus switching the unit to water-cooled operation. By contrast, if feeding water stops in water-cooled operation, a contact in the water pressure switch will be closed to run the condenser fan motor, thus switching the unit to air-cooled operation.

Operation Pressure and Running Frozen Operation LXE10E100 or later, LXE10EA, LXE10E-1

● Inside-18°C Power Supply:400V/60Hz — LXE10E LXE10D



Operation Pressure and Running Current , Chilled Operation LXE10E100 or later, LXE10EA, LXE10E-1



3. Trouble Shooting

Alarm codes on electronic controller

If any alarm occurs, search its cause and repair it referring to the following table.

Be sure to check the connectors in the electronic controller as the poor contact of them may cause the controller alarm codes.

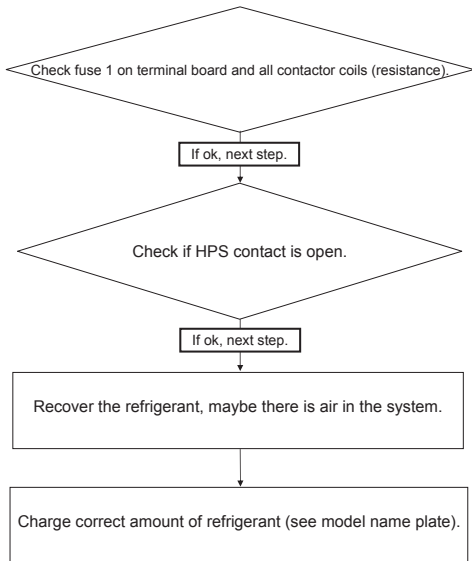
Alarm code	Content	Possible cause/checkpoint
F101	The high-pressure switch (HPS) contact is open	<ul style="list-style-type: none"> HPS circuit check • Broken lead wire • Faulty contact • Blown fuse Fu1
	The HPS activates within 20 seconds after the compressor starts	<ul style="list-style-type: none"> Condenser fan motor operation check • Discharge stop valve • Discharge filter • Discharge check valve • Discharge pressure regulating valve
	The fuse Fu1 is blown	Fuse Fu1 circuit check
F109	Faulty controller	Faulty controller
		<ul style="list-style-type: none"> Refrigerant circuit check • Suction stop valve • SMV (Suction modulating valve) • EV (Electronic expansion valve) • LSV (Liquid solenoid valve) • High pressure transducer LPT inlet filter • Clogged EV, LSV inlet filter
	The LPT is decreased to -85 KPa or less within 2 seconds after the compressor starts	<ul style="list-style-type: none"> Low pressure transducer LPT circuit check • Fu5, LPT fault, broken lead wire disconnection, short circuit
F111	Shortage of refrigerant	Shortage of refrigerant
		Faulty controller
		<ul style="list-style-type: none"> Disconnection of high pressure switch
F301	The high pressure switch does not activate at set value	<ul style="list-style-type: none"> Disconnection of high pressure transducer
	Temperature setting request	<ul style="list-style-type: none"> Set temperature has not been set up yet (Set up the temperature when the controller is replaced)
		Faulty controller (SRAM fault)
F401 F403	Faulty SS and RS	<ul style="list-style-type: none"> Faulty SS and RS • Broken or short-circuited lead wire • Faulty wiring (incomplete connection of connector) • Faulty sensor
	Supply air temperature sensor SS fault Return air temperature sensor RS fault	Faulty sensor (faulty CPU PCB)
		Faulty sensor (faulty CPU PCB)
F603	Faulty SMV body	Faulty SMV body
	Broken coil	Broken coil
	Faulty driving circuit	<ul style="list-style-type: none"> Faulty driving circuit • Disconnection of connector • Faulty wiring • Faulty PCB for suction modulating valve (EC6)
	Wrong controller model setting	<ul style="list-style-type: none"> Decos III c or d for LXE10E Decos III b for LXE10D
		<ul style="list-style-type: none"> Abnormal power supply voltage • 530 V or more
		<ul style="list-style-type: none"> Faulty voltage detection • Faulty PT of PC/CT board (other than disconnection and short-circuit) • Faulty contact of connector • S phase is open phase
F701	Abnormal power supply voltage	<ul style="list-style-type: none"> Abnormal power supply voltage • S phase is open phase
F705		<ul style="list-style-type: none"> Faulty contact of power supply facility
	S phase is open phase	<ul style="list-style-type: none"> Faulty power supply equipment • Faulty contact of power plug • Faulty contact of power cable
		<ul style="list-style-type: none"> Faulty PT/CT board (EC5)

Alarm code	Content	Possible cause/checkpoint
F803	<p>If any of the following conditions are applicable</p> <ol style="list-style-type: none"> 1) E107 is generated twice due to EV opening error. 2) Errors are identified in the 2 evaporator fans (Refer to E205.) 3) The contacts of magnetic switch for the compressor is welded. 4) 2 of the HPT sensor, LPT sensor and DCHS sensor are abnormal. 	Find the cause of the alarm for each of the issued alarm codes
E101	High-pressure switch (HPS) activates during operation	<p>Refer to The inside temperature does not decrease and The high pressure is excessively high in 6. Troubleshooting</p> <ul style="list-style-type: none"> • Single phase operation due to faulty contact • Magnetic contactor for compressor • Compressor cable • Compressor terminal
E103 (Electric type OC)	Operating current of the compressor is great	<ul style="list-style-type: none"> • Malfunctioned equipment • Clogged capillary at ESV • Actuation of thermal protector CTP for compressor • Faulty PT/CT board (EC5) • Faulty controller (CPU, I/O board) <p>Wrong initial setup of PT/CT board (jumper wire) (Single or Dual power supply, 10HP or 5HP)</p>
E105 (Micro-computer type OC)	Operating current of the compressor is high	<ul style="list-style-type: none"> • Single phase operation due to incomplete contact • Magnetic contactor for compressor • Compressor cable • Compressor terminal
E107	The discharge gas temperature is excessively high	<p>Malfunctioned equipment</p> <ul style="list-style-type: none"> • Compressor lock • Faulty CT of PT/CT board • Abnormal controller (CPU board) <p>Wrong initial setup of controller (Single or Dual power supply, 10HP or 5HP)</p> <ul style="list-style-type: none"> • Clogged refrigerant system • Dryer • Filter
E109	Shortage of refrigerant is detected	<p>Shortage of refrigerant</p> <p>Malfunctioned equipment</p> <ul style="list-style-type: none"> • Faulty operation of ESV • Clogged capillary at ESV outlet <p>Clogged refrigerant system</p> <ul style="list-style-type: none"> • Dryer • Filter
E201	Low pressure is decreased during operation	<p>Shortage of refrigerant</p> <p>Refer to the Unit operates but soon stops and Low pressure is excessively low in 6. Troubleshooting</p> <p>Malfunctioned equipment</p> <ul style="list-style-type: none"> • Faulty low pressure transducer LPT • Faulty controller (CPU board) • Blown fuse F43 <p>The solenoid valve cannot be closed (dusts caught in)</p> <ul style="list-style-type: none"> • LSV (liquid solenoid valve) • HSV (hot gas solenoid valve) • ESV (defrost solenoid valve) • BSV (discharge gas bypass solenoid valve)
E203	Pumpdown is not completed within 120 seconds	<p>Faulty operation of compressor</p> <p>Malfunctioned equipment</p> <ul style="list-style-type: none"> • Controller • Low pressure transducer LPT <p>Refer to the Control is unstable and Temperature continues to decrease in 6. Troubleshooting</p>
E205	Overcooling prevention (control sensor<=SP-3.0) continues for three minutes or longer in the chilled or partial frozen mode	<p>Faulty operation of evaporator fan motor</p> <ul style="list-style-type: none"> • Motor lock • Burned-out motor coil • Operation of thermal protector CTP for compressor • Disconnection on the secondary side of electromagnetic contactor for evaporator fan
E205	The inside fan motor stops	<p>Faulty evaporator fan propeller</p> <ul style="list-style-type: none"> • Propeller ice lock • Foreign matters caught in propeller

Alarm code	Content	Possible cause/checkpoint
E207	Defrost cannot be completed within 90 minutes	<ul style="list-style-type: none"> Malfunctioned equipment Faulty sensor (EOS, RS, HPT, LPT, DCHS) Faulty controller Faulty operation of HSV, DSV, ISV Faulty operation of discharge pressure regulating valve Abnormal refrigerant system Storage of refrigerant Heavy frosting
E303 E305 E307 E311 E315	Humidity setting request Defrost timer setting request Calendar setting request Trip start setting request PT/CT board malfunction	<ul style="list-style-type: none"> System malfunctioned Faulty controller Faulty operation Wrong initial setting of controller Faulty PT/CT board
E401 E402 E403 E404 E405 E406 E407 E409 E411 E413 E415 E416 E425 E427 E429 E431 E433	Supply air temperature sensor (SS) fault Rack recorder supply air temperature sensor (DSS) fault Rack recorder return air temperature sensor (DRS) fault Discharge pipe temperature sensor (DCHS) fault Suction gas temperature sensor (SGS) fault Evaporator inlet pipe temperature sensor (EIS) fault Evaporator outlet pipe temperature sensor (EOS) fault Ambient temperature sensor (AMBS) fault Low pressure transducer (LPT) fault High pressure transducer (HPT) fault Voltage sensor (V2) fault Pulp temperature sensor (USD A1) fault Pulp temperature sensor (USD A2) fault Pulp temperature sensor (USD A3) fault Humidity sensor (Hus) fault Cargo temperature sensor (STS) fault	<ul style="list-style-type: none"> System malfunction Faulty sensor Faulty controller Broken or short-circuited lead wire Wrong wiring Disconnection of connector
E417 E421 E423	Voltage sensor (PT1) fault Current sensor (CT1) fault Current sensor (CT2) fault	<ul style="list-style-type: none"> Malfunctioned equipment Faulty sensor Faulty controller Broken or short-circuited lead wire Wrong wiring Disconnection of connector
E603	Disconnection of suction modulating valve (SMV) or faulty driving circuit or wrong setting of controller	<ul style="list-style-type: none"> Malfunctioned equipment Faulty controller Faulty SMV coil Faulty PCB SMV Broken wire of harness (disconnection of connector)
E607	Faulty contact point of manual defrost key (sheet key)	<ul style="list-style-type: none"> Faulty operation Wrong initial setup of controller
E707	Momentary power failure	Faulty short-circuit of switch
E801	Exhausted battery for the CPU board	Faulty short-circuit of CPU
E805	Ventilator opening detector error	The power is not supplied for 40 to 300 mm sec.
E807	Initial setting FA SEN of the controller is wrong. Opened lower ventilator	Don't set H or L for the unit not equipped ventilator opening detector. The lower ventilator is opened during frozen operation

Code	Descriptions	Alarm LED	
		Operation	Auto PTI
FXXX	When fatal damage, which may lead to difficulty of temperature in-range is occurred and unit will stop.	●	●
EXXX	This condition is not serious to maintain temperature in-range. Mostly auto back up operation is activating.	○	●
HXXX	Information code > shows when temp is out of range (instead of partlow chart).	○	○
DXXX	Information code > shows when temp is out of range (instead of partlow chart).	○	○
JXXX	If Auto PTI judges unit abnormal, J-code is shown.	○	●
PXXX	This code shows that unit is in "Pull down" condition. "XXX" shows pull down time.	○	○

● LED ON ○ LED OFF

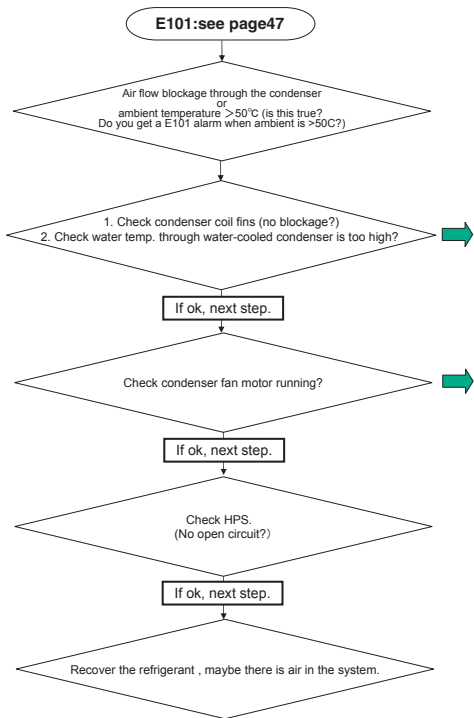


The alarms cause of F803 indication	Number of times	Soft Version
E101, E103, E105, E107, E109, E707	10 Times	2301~ 230b
	20 Times	230c~ 2313
	9 Times	2314~ 2401~
E107 : shortage of refrigerant amount	Twice	2504~

Clarify the cause of F803 alarm immediately by press the down key and solve the problem in accordance to the E-alarm.

The unit which indicate F803 can be restarted the operation by switching the ON/OFF button on the control panel.

But if you repeat the restart before the cause of the problem is cleared up, it may cause damage of compressor or other fatal malfunction of the unit.



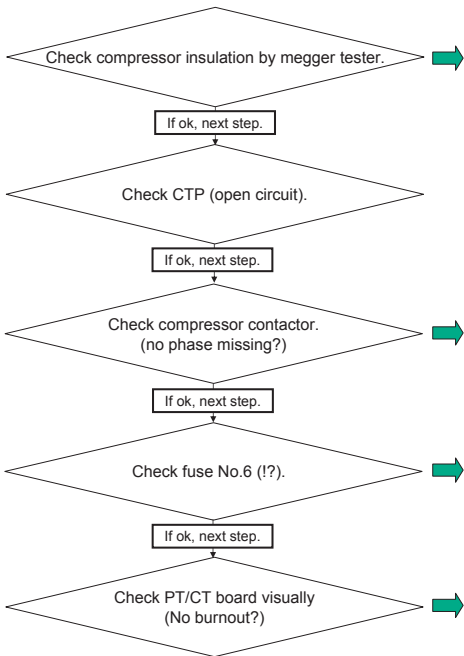
Check the condenser coil blockage with a flash light.



Check condenser fan motor insulation resistance (see page 39).
Check condenser fan motor contactor (24V 440V).



Check controller output > 24 Volts?



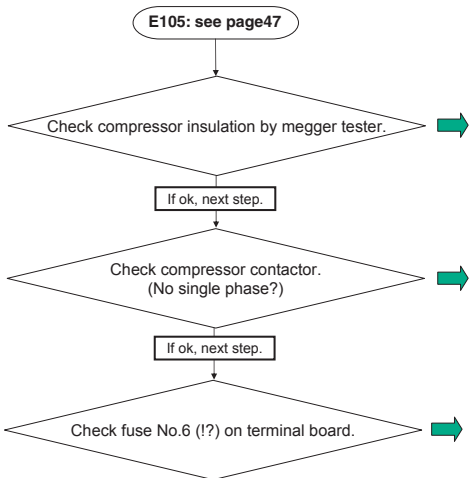
Check compressor insulation (L1,L2, L3).



Check compressor input & output voltage (L1/L2,L1/L3,L2/L3).



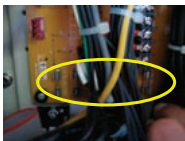
Check entire PT/CT board if burned or water penetration?

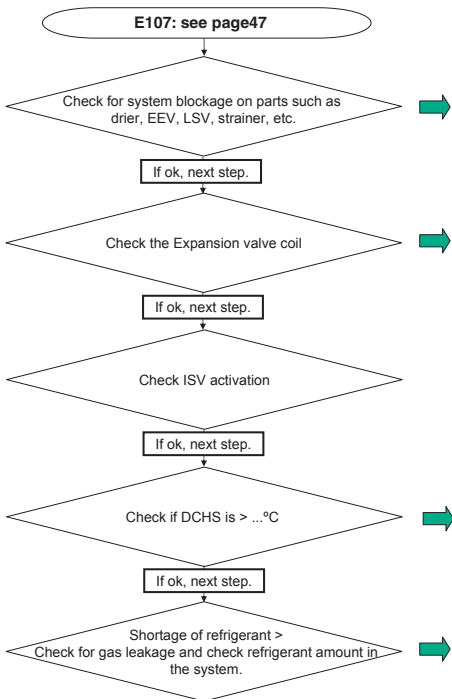


Check compressor insulation (L1,L2,L3).



Check compressor input & out put voltage (L1/L2,L1/L3,L2/L3).





Check if there is no blockage in LSV, filter dryer, strainer, etc.



Check the EEV valve, see add EEV replacement procedure see page 76~83.

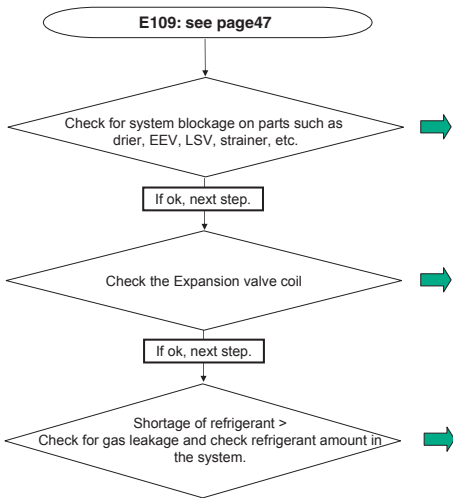


Check DCHS resistance, see page37 (Left:DECOS3D, Right:DECOS3E).



Check if there is no refrigerant leakage on entire system.





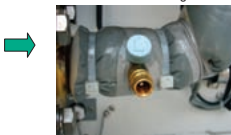
Check if there is no blockage in LSV, filter dryer, strainer, etc.

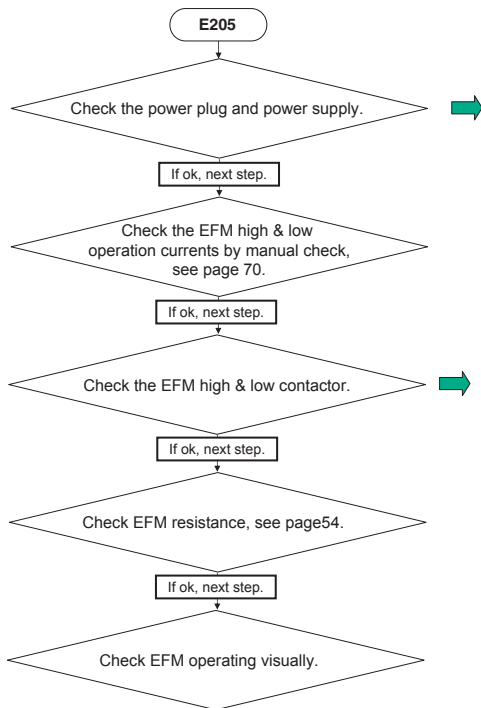


Check the EEV valve, see add EEV replacement procedure page 76~83.



Check if there is no refrigerant leakage on entire system.





Check if power plug is ok, no burning pins?



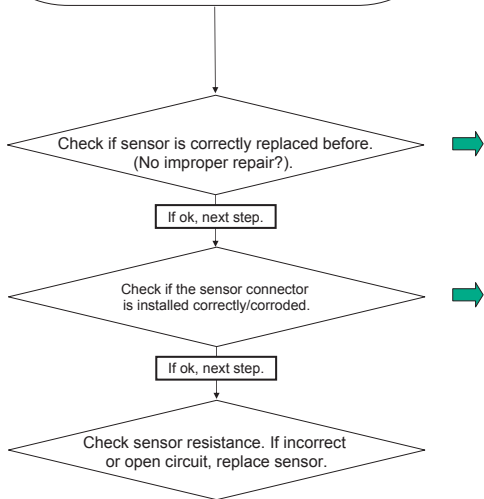
Check EFM input & out put voltage (L1-L2,L1-L3,L2-L3).



Check currents from EFM high and low speed.

E401,E402,E403,E404,E407,E409.

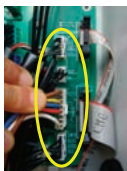
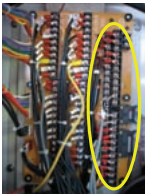
For sensor resistance: see page 48~53.



Check if the sensor is repaired improper/water penetration into to wiring?



Check sensor connector on terminal board (Left:DECOS3C/D – Mid: DECOS3D Right:DECOS3E).



E405 & E406
For sensor resistance: see page48~53.

Check if sensor is correctly replaced before.
(No improper repair?).

If ok, next step.

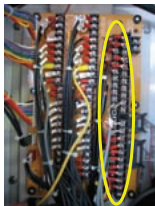
Check if the sensor connector
is installed correctly/corroded.



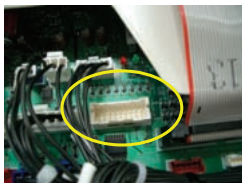
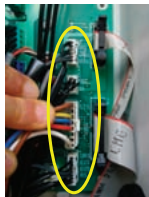
If ok, next step.

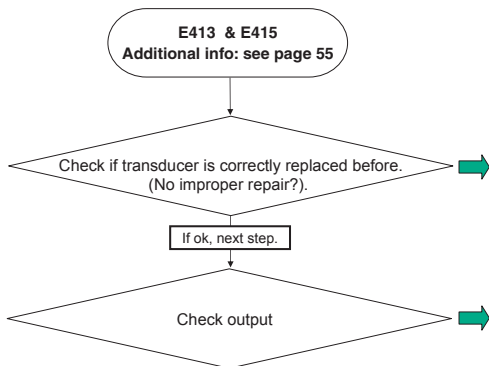
Check sensor resistance. If incorrect
or open circuit, replace sensor.

Check sensor connectors on terminal board.



Left: DECOS3C/D
Right: DECOS3D
Below: DECOS3E

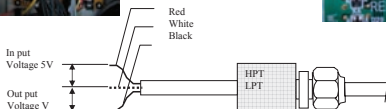
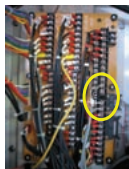




Check if for improper repair or if water penetrated into wiring?



HPT, LPT connector locations (Left: DECOS3C/D - Mid: DECOS3D - Right: DECOS3E)



When black and red are 0V = Replace the Terminal board.
When black and white are 0V or 5V = Replace the transducer.

● Back-up for temperature sensors (EIS, EOS, SGS) at frozen mode (superheat control)

No.	Evaporator inlet sensor EIS	Evaporator outlet sensor EOS	Compressor suction gas sensor SGS	Back-up operation
1	Normal	Normal	Normal	superheat control
2	Normal	Normal	Abnormal	superheat control
3	Normal	Abnormal	Normal	Liquid refrigerant back prevention to compressor by EIS and SGS
4	Normal	Abnormal	Abnormal	Expansion valve fixed opening rate control
5	Abnormal	Normal	Normal	Liquid refrigerant back prevention to compressor by EOS and SGS
6	Abnormal	Normal	Abnormal	Expansion valve fixed opening rate control
7	Abnormal	Abnormal	Normal	Expansion valve fixed opening rate control
8	Abnormal	Abnormal	Abnormal	Expansion valve fixed opening rate control

4. Set Point of Functional Parts & Resistance

Set point of functional parts and protection devices

	Device name		Actuation	Set point	Detection method	Symbol
Pressure switch	High-pressure switch		OFF ON	2400kPa (24.47kg/cm ²) 1900kPa (19.37kg/cm ²)	High-pressure switch	HPS
	Electronic controller	Defrosting timer	Short Pull down Long In range	ON	4 hours ※ 1 3, 6, 9, 12, 24 and 99 hours ※ 2	Auto Manual
Defrosting termination set point		OFF Reset	20°C or 30°C 15°C (59°F)	Evaporator outlet temperature sensor Return air temperature sensor	EOS RS, DRS	
High-pressure control for Condenser fan		OFF ON	800kPa (8.2kg/cm ²) 1000kPa (10.2kg/cm ²) ※ 3	High-pressure transducer	HPT	
Discharge gas temperature protection set point		Pull down LPT>50kpa	OFF Reset	135°C (275°F) After 3 minutes elapsed	Discharge gas temperature sensor	DCHS
		LPT ≤ 50kpa	OFF Reset	123°C (262°F) After 3 minutes elapsed		
Overcurrent protection set point (Cutout)		OFF Reset	26.0A After 3 minutes elapsed	PT/CT board	CT2	
Current	Circuit breaker		OFF	30A		CB
Motor	Evaporator fan motor thermal protector Built-in		OFF	EFM150°C ± 5°C		
	Condenser fan motor thermal protector Built-in		OFF	CFM135°C ± 5°C		MTP
	Compressor motor thermal protector Built-in		OFF	140°C (284°F)		CTP
-	Fusible plug		-	95 ~ 100°C		

- (※ 1) When Return air (RS) is lower than -20°C, defrost starts every 6 hours.
 (※ 2) When "99" hours is selected, refer to on demand defrost in clause 2.5.3.
 (※ 3) When dehumidification is ON in dehumidification mode, the setting figure may change between 900~2100kPa automatically (Refer to "High Pressure Control" Page 2-27)

Characteristic table for temperature sensor

SS/RS/DSS/DRS/RSS/RRS/EIS/EOS/SGS/AMBS

Temperature(°C)	Temperature(°F)	Resistance(KΩ)
+ 50	+ 122	0.985
+ 49	+ 120	1.018
+ 48	+ 118	1.054
+ 47	+ 116	1.090
+ 46	+ 114	1.128
+ 45	+ 113	1.167
+ 44	+ 111	1.208
+ 43	+ 109	1.251
+ 42	+ 107	1.296
+ 41	+ 105	1.342
+ 40	+ 104	1.390
+ 39	+ 102	1.441
+ 38	+ 100	1.493
+ 37	+ 98	1.548
+ 36	+ 97	1.605
+ 35	+ 95	1.665
+ 34	+ 93	1.727
+ 33	+ 91	1.791
+ 32	+ 89	1.859
+ 31	+ 87	1.929
+ 30	+ 86	2.003
+ 29	+ 84	2.080
+ 28	+ 82	2.160
+ 27	+ 80	2.244
+ 26	+ 78	2.331
+ 25	+ 77	2.423
+ 24	+ 75	2.519
+ 23	+ 73	2.619
+ 22	+ 71	2.724
+ 21	+ 69	2.833

Temperature(°C)	Temperature(°F)	Resistance(KΩ)
+ 20	+ 68	2.948
+ 19	+ 66	3.068
+ 18	+ 64	3.193
+ 17	+ 62	3.325
+ 16	+ 60	3.463
+ 15	+ 59	3.607
+ 14	+ 57	3.758
+ 13	+ 55	3.917
+ 12	+ 53	4.083
+ 11	+ 51	4.258
+ 10	+ 50	4.441
+ 9	+ 48	4.633
+ 8	+ 46	4.834
+ 7	+ 44	5.046
+ 6	+ 42	5.268
+ 5	+ 41	5.501
+ 4	+ 39	5.747
+ 3	+ 37	6.004
+ 2	+ 35	6.275
+ 1	+ 33	6.560
+ 0	+ 32	6.860
- 1	+ 30	7.176
- 2	+ 28	7.508
- 3	+ 26	7.857
- 4	+ 24	8.226
- 5	+ 23	8.614
- 6	+ 21	9.023
- 7	+ 19	9.454
- 8	+ 17	9.909
- 9	+ 15	10.39

Temperature(°C)	Temperature(°F)	Resistance(KΩ)
- 10	+ 14	10.89
- 11	+ 12	11.43
- 12	+ 10	11.99
- 13	+ 8	12.59
- 14	+ 6	13.22
- 15	+ 5	13.88
- 16	+ 3	14.59
- 17	+ 1	15.33
- 18	- 0	16.12
- 19	- 2	16.95
- 20	- 4	17.83
- 21	- 5	18.76
- 22	- 7	19.75
- 23	- 9	20.80
- 24	- 11	21.91
- 25	- 13	23.08
- 26	- 14	24.33
- 27	- 16	25.66
- 28	- 18	27.06
- 29	- 20	28.56
- 30	- 22	30.15
- 31	- 23	31.83
- 32	- 25	33.63
- 33	- 27	35.53
- 34	- 29	37.56
- 35	- 31	39.72
- 36	- 32	42.02
- 37	- 34	44.46
- 38	- 36	47.07
- 39	- 38	49.85
- 40	- 40	52.81

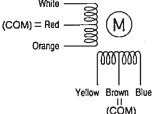
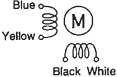
**Characteristic table
for DCHS temperature sensor**

Temperature(°C)	Temperature(°F)	Resistance(K Ω)
10	50	478.765
11	51	455.208
12	53	432.939
13	55	411.880
14	57	391.960
15	59	373.110
16	60	355.269
17	62	338.376
18	64	322.377
19	66	307.220
20	68	292.857
21	69	279.241
22	71	266.330
23	73	254.085
24	75	242.467
25	77	231.442
26	78	220.975
27	80	211.037
28	82	201.598
29	84	192.629
30	86	184.107
31	87	176.005
32	89	168.302
33	91	160.976
34	93	154.006
35	95	147.374
36	96	141.061

Temperature(°C)	Temperature(°F)	Resistance(K Ω)
37	98	135.051
38	100	129.328
39	102	123.876
40	104	118.681
41	105	113.731
42	107	109.012
43	109	104.512
44	111	100.221
45	113	96.127
46	114	92.221
47	116	88.493
48	118	84.935
49	120	81.537
50	122	78.291
51	123	75.191
52	125	72.229
53	127	69.398
54	129	66.692
55	131	64.105
56	132	61.630
57	134	59.264
58	136	56.999
59	138	54.832
60	140	52.758
61	141	50.772
62	143	48.871
63	145	47.049

Temperature(°C)	Temperature(°F)	Resistance(KΩ)
64	147	45.305
65	149	43.633
66	150	42.031
67	152	40.496
68	154	39.024
69	156	37.612
70	158	36.258
71	159	34.959
72	161	33.713
73	163	32.517
74	165	31.369
75	167	30.267
76	168	29.208
77	170	28.192
78	172	27.216
79	174	26.278
80	176	25.376
81	177	24.510
82	179	23.677
83	181	22.877
84	183	22.107
85	185	21.366
86	186	20.654
87	188	19.969
88	190	19.309
89	192	18.675
90	194	18.064

Coil Resistance

Symbol	Name	Resistance
CM	Compressor motor coil	1.780 Ω (@75°C)
CFM	Condenser fan motor coil	21.5 Ω (20°C)
EFMH	Evaporator fan motor coil High speed	U-V 114 $\Omega \pm 10\%$ (20°C)
EFML	Evaporator fan motor coil Low speed	U-V 17.2 $\Omega \pm 10\%$ (20°C)
LSV	Liquid solenoid valve coil	15.2 $\Omega \pm 10\%$ (20°C)
HSV	Hot gas solenoid valve coil	
DSV	Defrosting solenoid valve coil	
ISV	Injection solenoid valve coil	
ESV	Economizer solenoid valve coil	
BSV	Hot gas by-pass solenoid valve coil	
RSV	Reheater solenoid valve coil	
CSV	Capillary solenoid valve coil (LXE10E-1 only)	
EV	Electronic expansion valve coil 	LXE10E-A, 10E-1, 10D White – Red : 150 $\pm 10\%$ Orange – Red : 150 $\Omega \pm 10\%$ Yellow – Brown : 150 $\Omega \pm 10\%$ Blue – Brown : 150 $\Omega \pm 10\%$
		LXE10E100 or later White – Red : 46 $\Omega \pm 3 \Omega$ Orange – Red : 46 $\Omega \pm 3 \Omega$ Yellow – Brown : 46 $\Omega \pm 3 \Omega$ Blue – Brown : 46 $\Omega \pm 3 \Omega$
SMV	Suction modulation valve coil 	Blue – Yellow : 113 Ω (20°C) Black – White : 113 Ω (20°C)

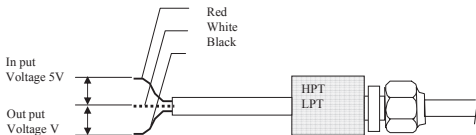
Pressure transducer Conversion

For High pressure transducer

Pressure(kPa · G)	Out put Voltage(V)	Pressure(kPa · G)	Out put Voltage(V)
0	0.50	1100	1.62
100	0.60	1200	1.72
200	0.70	1300	1.83
300	0.81	1400	1.93
400	0.91	1500	2.03
500	1.01	1600	2.13
600	1.11	1700	2.23
700	1.21	1800	2.34
800	1.32	1900	2.44
900	1.42	2000	2.54
1000	1.52	2100	2.64

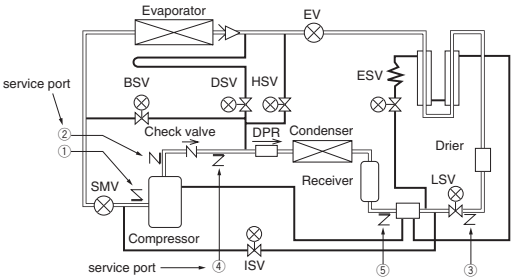
For Low pressure transducer

Pressure(kPa · G)	Out put Voltage(V)	Pressure(kPa · G)	Out put Voltage(V)
— 500	— 1.03	300	1.42
— 400	— 0.72	400	1.72
— 300	— 0.42	500	2.03
— 200	— 0.11	600	2.34
— 100	0.19	700	2.64
0	0.50	800	2.95
100	0.81	900	3.25
200	1.11	1000	3.56

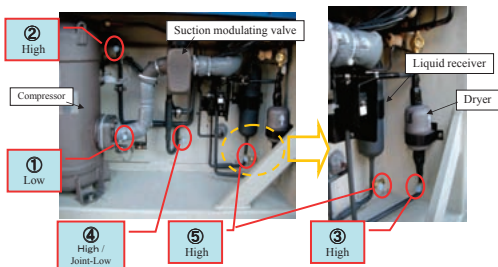


5. How to use Service Port

How to use 5 service ports

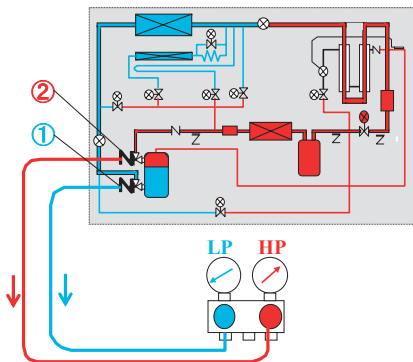


How to use 5 service ports.

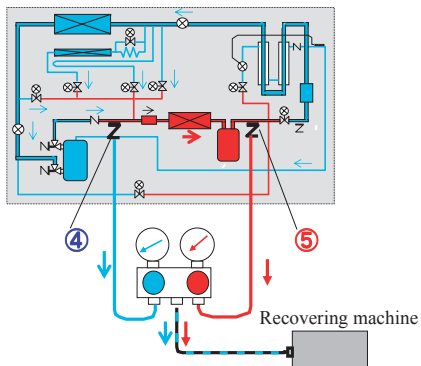


Service work		Service port	Remarks
Pressure check	High pressure	②	Take care that the high pressure at the port ④ & ⑤ will be keeping a while after the unit stops.
	Low pressure.	①	
Refrigerant charge	1.Refrigerant recovery	④ & ⑤	Recover refrigerant from ④ & ⑤ after operating automatic pump-down first.
	2.Vacuum & Dehydration	④ & ⑤	After recovering, vacuum from port ④ & ⑤.
	3.Liquid charging	⑤→③	After vacuuming, charge liquid refrigerant from ⑤ first and then from ③ .
			If not reached to the specified amount, go to next below.
		③	1.Operate automatic pump-down first and stop it using ON/OFF switch when the compressor stops during the auto pump-down operation.2.Charge liquid refrigerant at port ③ .

OPERATION PRESSURE CHECK



REFRIGERANT RECOVERING



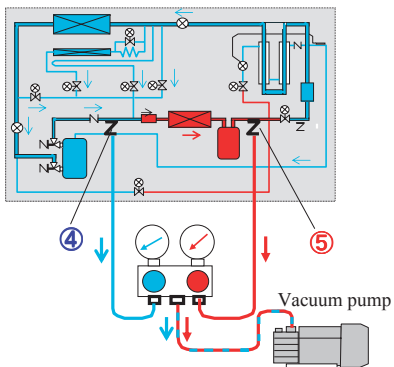
Refrigerant recovering



Leak testing with N2



Vacuum & Dehydration



6. Refrigerant Charging

Specified charge amount of R134a

LXE10E100 or later, LXE10E-A and LXE10E-1.

Refrigeration amount of Daikin machine vary according to model number.

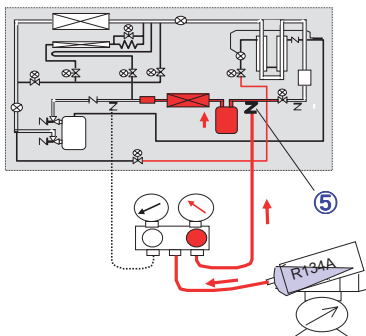
Please confirm specified charge amount of R134a described on model name plate.

Variation of amount : 4.6kg, 4.8kg, 5.2kg and 5.4kg

DAIKIN INDUSTRIES, LTD.	
LXE10E <input type="text" value="-XXXX"/>	MFG.NO. -----
REFRIGERANT [R134a] <input type="text" value="4.8"/>	kg

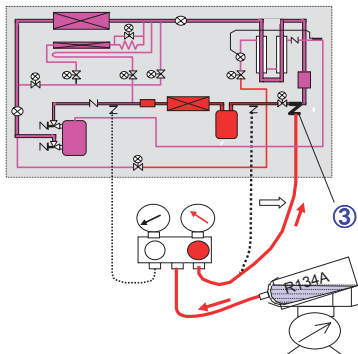
REFRIGERANT CHARGING, STEP 1

Don't start the unit at step 1 and 2 and don't charge liquid on service port 1.

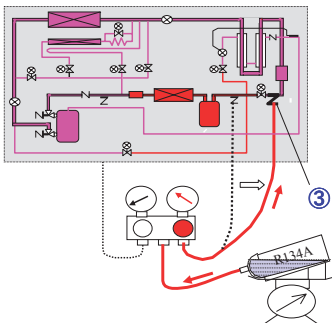


REFRIGERANT CHARGING, STEP 2

Don't start the unit at step 1 and 2 and don't charge liquid on service port 1.



REFRIGERANT CHARGING, STEP 3

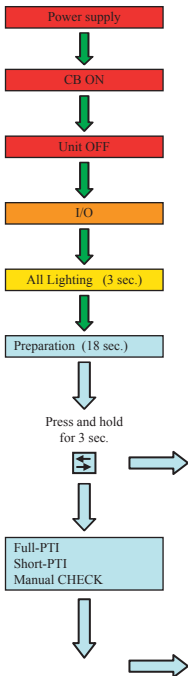



1. Start the unit and operate automatic pump down.
2. Stop the automatic pump down when compressor stops during the operation.

7. Auto-PTI


AUTO PTI OPERATION Procedure

Don't start a automatic PTI when the unit is loaded with cargo.



To start FULL PTI, press the  key while "F.PTI" is display on the LCD



To start SHORT PTI, press the  key while "S.PTI" is display on the LCD

● Automatic PTI enable conditions

	Water cooled operation	Air cooled operation	Ambient temperature condition
S. PTI	×	○	-10°C < Ambient temperature ≤ 43°C When the ambient temperature is above 43°C or below -10°C, the correct judgment may not be possible.
F. PTI	×	○	-10°C ≤ Ambient temperature ≤ 43°C When the ambient temperature is above 43°C or below -10°C, the following alarm will be indicated. J501: Out of ambient temperature specified condition.
M. CHECK	○	○	

Short PTI (S.PTI)

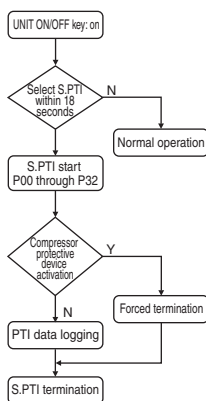
● Step display and content

Step	Content
P00	Basic data record (container No., date, time, compressor integrated run-hour, ambient temperature)
P02	Alarm check on all sensors
P04	Power conditions (voltage and frequency) check
P05	Compressor start running check
P06	Actuating pressure check at OFF and ON of High pressure switch (HPS)
P08	Pump-down check
P10	Solenoid valve leakage check · Liquid solenoid valve (LSV) · Injection solenoid valve (ISV) · Hot gas solenoid valve (HSV) · Defrost solenoid valve (DSV) · Discharge gas by-pass (BSV) · Economizer solenoid valve (ESV)
P12	Supply and return air sensor (SS and RS) accuracy check
P14	Pressure sensor (HPT and LPT) accuracy check
P16	Evaporator fan high and low-speed operation check
P18	Start up
P20	Economizer solenoid valve (ESV) opening or closing check ※ 1 ※ 2
P22	Discharge gas by-pass solenoid valve (BSV) opening or closing check ※ 2
P24	Defrost solenoid valve (DSV) opening or closing check
P26	Standard pull-down operation
P28	Suction modulating valve (SMV) operation check
P29	Electronic expansion valve (EV) operation check
P30	Injection solenoid valve (ISV) opening or closing check ※ 2
P32	Hot-gas solenoid valve (HSV) and Reheat coil solenoid valve (RSV -optional) opening or closing check

※ 1 If the ambient temp is -10°C or lower, the function check of the solenoid valve cannot be preformed correctly, short circuit the terminals 121 and 102 on the terminal board, and check the operation of the solenoid valve.

※ 2 If the difference between ambient temperature and return air temperature is 15°C or higher, these steps will be skipped.

● S.PTI Flow chart operation



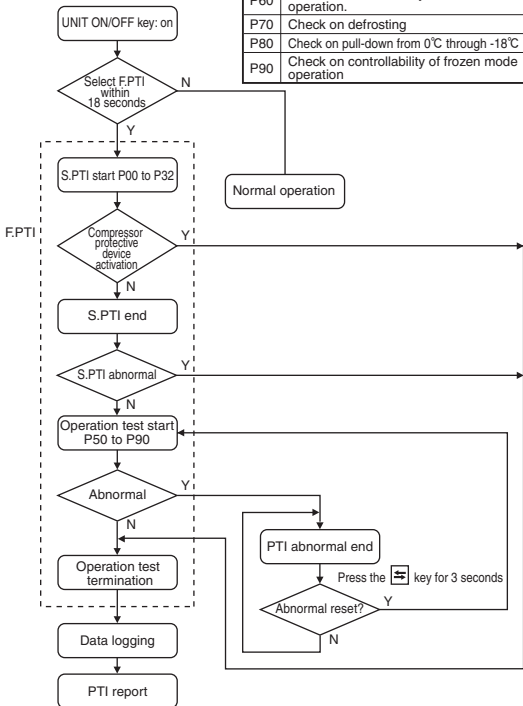
Full PTI (F.PTI)

F.PTI consists of S.PTI and operation tests.

- Step display and contents (step P00 to P32 are as same as S.PTI)

Step	Content
P50	Check on pull-down to 0°C
P60	Check on controllability of chilled mode operation.
P70	Check on defrosting
P80	Check on pull-down from 0°C through -18°C
P90	Check on controllability of frozen mode operation

- F.PTI flow chart



PTI Alarm Judgement

Operation condition : $-10^{\circ}\text{C} < \text{AMBS} \leq 43^{\circ}\text{C}$ (If RS < AMBS-15°C , J201(P20)/J221(P22) /J301(P30) might be appeared.)

RS \geq AMBS-15°C

		STEP	Alarm	Judgement				
				DECOS III c	DECOS III d & d-1	DECOS III e		
F-PTI	S-PTI	P00	—	—	—	—		
		P02	—	—	—	—		
		P04	—	—	—	—	—	
		P05	J051	Whether machine can start operation without HPS activation or over current				
		P06	J064	No HPS activation by HPT>2900Kpa or No HPS activation after 10 mins CFM stopped.				
			J061	HPS activation pressure is outside the scope of 2000Kpa ≤ HPT ≤ 2900Kpa				
			J065	Contact point dose not reset even pass over 3 mints HPS activated (HPT < 1500Kpa)				
			J062	Contact point dose not reset even pass over 3 mints HPS activated (HPT < 1500Kpa)				
		P08	J081	LPT < -55Kpa within 2 Min.				
		P10	J101	LPT < 200Kpa within 3 Min.	LPT < 350Kpa within 3 Min.			
		P12	J121	ABS(DRS-RS) < 1.5°C & ABS(DSS-SS) < 1.5°C				
		P14	J141	ABS(HPT-LPT) ≤ 350Kpa				
		P16	J161	EFM running current at HIGH > 1.8A & EFM running current at LOW > 0.6A		EFM running current at HIGH > at LOW		
		P18	—	—	—	—	—	
		P20	J201	(HPT at ESV open)-(HPT at ESV close) ≥ 30Kpa within 30sec. (HPT at ESV open)-(HPT at ESV close) ≥ 10Kpa 30sec later.				
		P22	J221	(LPT at BSV open)-(LPT at BSV close) ≥ 20Kpa within 30sec. (LPT at BSV open)-(LPT at BSV close) ≥ 10Kpa 30sec later.				
		P24	J241	(HPT at DSV close)-(HPT at DSV open) ≥ 50Kpa within 30sec. (HPT at DSV close)-(HPT at DSV open) ≥ 40Kpa 30sec later.				
		P26	—	—	—	—	—	
		P28	J281	(LPT at SMV full open) -(LPT at SMV 3% open) > 20Kpa	(LPT at SMV full open) -(LPT at SMV 9% open) > 20Kpa or LPT < -20Kpa			
		P29	J291	LPT < -55Kpa within 2 Min.	(LPT at EEV 40% open) -(LPT at EEV 10% open) > 50Kpa			
		P30	J301	(SGS at ISV close)-(SGS at ISV open) ≥ 2.0°C				
		P32	J321	(HPT at HSV close)-(HPT at HSV open) ≥ 50Kpa within 30sec. (HPT at HSV close)-(HPT at HSV open) ≥ 40Kpa 30sec later.				
			With Reheat	J322	(HPT at CSV close)-(HPT at CSV open) ≥ 50Kpa within 30sec. (HPT at CSV close)-(HPT at CSV open) ≥ 40Kpa 30sec later.			
			P50	J501	-10 ≤ AMBS ≤ 43.0°C			
			J502	OK when operation completes in 120 Min.				
		P60	—	OK when operation completes in 60 or 10 Min.(depends on software version.)				
		P70	J701	Out of starting condition				
			J702	Defrosting time ≤ 100 Min.				
		P80	J801	OK when operation completes in 180 Min.				
		P90	—	—				

Manual check Procedure.

I/O



All Lighting (3 sec.)



Preparation (18 sec.)



Press and hold
for 3 sec.



Full-PTI
Short-PTI
Manual CHECK



Press enter to confirm.



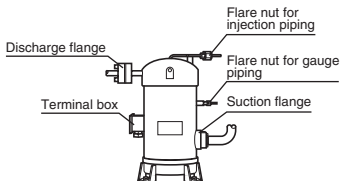
CC run hours
EFH ampere
EFL ampere
CF ampere
TS trip start
EF1 run hours
EF2 run hours
CF run hours
Software version
(FA 0 calibr.)
(Day after pti)

8. Repair Method of Major Parts

Compressor replacement.

Scroll compressor

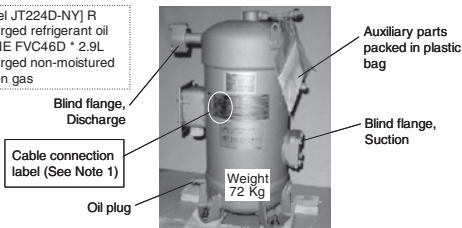
The compressor is of a hermetic scroll type with the built-in motor so that there are less places where refrigerant may leak. No refrigerant oil is required when the unit is new because it has been charged before delivery.



(1) Preparation of spare parts compressor

[Model JT224D-NY] R

- * Precharged refrigerant oil DEPHNE FVC46D * 2.9L
- * Precharged non-moistured nitrogen gas

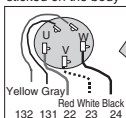


[Auxiliary parts]

Instruction card	Gasket, Suction	Gasket, Discharge	Packing tape for suction flange	Insulation tape for suction flange	Cable connection label for LXE10E-1
2 pcs	1 pcs	1 pcs	1 pcs	1 pcs	1 pcs
					(See Note 1)

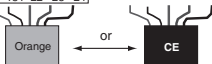
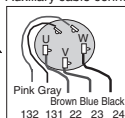
Note 1. Stick the auxiliary cable connection label onto the label stuck on the compressor body. This is only for LXE10E-1.

Cable connection label
sticked on the body



Stick on

Auxiliary cable connection label



(For LXE10E-1)

Note 2. Don't drop the precharged refrigerant oil out after removing the blind flanges.



CAUTION

The preparation of refrigerant oil is not required.
The compressor has been charged with the oil.

(2) Removal of compressor

Recover refrigerant

1. Recover the refrigerant from service port ④ on discharge line and ⑤ at receiver/water cooled condenser outlet.
(Refer to the clause 4.1.4 Refrigerant Recovery and charge)
2. Close the discharge and suction side stop valves on the compressor.

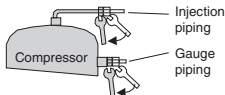
Disconnect cables and mounting bolts

3. Switch off the power.
4. Open the terminal box cover and disconnect the cables.
5. Remove the mounting bolts.

Disconnect pipings

6. Remove the flare nuts for the injection piping on the compressor head and gauge piping on the body.

Attention !
Use double wrenches
when the flare nuts
are removed.



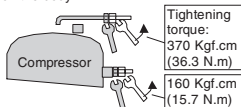
7. Remove the insulation tape fixed on suction flange and discharge flange.
8. Remove the bolts for suction and discharge flange.

(3) Installation of compressor

Connect pipings and fix mounting bolts

1. Before connecting pipings, insert and screw in the mounting bolts slightly.
2. Tighten the flare nuts for the injection piping and gauge piping on the body.

Attention !
Use double wrenches when the flare nuts are tightened.



3. Fix the suction and discharge flanges using with the auxiliary gaskets and the bolts.
4. Tighten the mounting bolts.

Tightening torque
257 Kgf.cm (25.2 N.m)

Connect cables

5. Connect the cables to the terminals.

435 Kgf.cm (42.7 N.m)

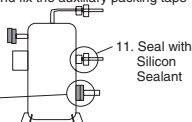
Attention ! Pay the attention to the cable connection.
Incorrect wiring may run the compressor in wrong direction and may cause burn out.

Charge refrigerant

6. Open the discharge and suction side stop valves.
7. Vacuum and dehydrate from service port ④ and ⑤.
8. Then charge the refrigerant from service port ⑤ and ③.
(Refer to the clause 4.1.4 Refrigerant Recovery and charge)
9. Check gas leakage especially at suction/discharge flanges and flare nuts for injection piping/gauge piping.
10. Fix the auxiliary insulation tape and fix the auxiliary packing tape using clamp band to the suction flanges.

11. Seal with silicon sealant around the flare nut for gauge piping.

10. Fix the auxiliary insulation tape



CAUTION

The preparation of refrigerant oil is not required.
The compressor has been charge with the oil.

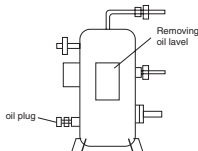


CAUTION

The unit does not have suction stop valve. Be sure to adhere packing tape at suction piping section to prevent moisture from entering.

(4) Removal of excess refrigerant oil after compressor replacement

The oil plug and "Removing oil label" are fitted on the spare parts compressor.



- When the compressor is replaced to spare parts compressor, remove the excess refrigerant oil in the following procedure.


1. First check again whether the discharge/suction side stop valves are opened and the cable connection at terminal is correct.




Preparation 2. Connect manifold to the discharge and suction ports.

3. Operate the unit for about 5 minutes. Stop the unit.

Return the oil to the compressor 4. Operate the S-PTI (Short PTI) and stop at step of "P10".

(1) Set the ON/OFF switch to ON.

(2) Push and hold the  key for 3 seconds to enter PTI selection mode.

(3) Selecting the "S-PTI" mode using the   key and pushing the  key activates the short PTI.

(4) When "P10" is displayed on the LED, stop the unit.

<Function of step P06 & P08 before P10>

Operate the steps of "P06" and "P08" which are displayed on the LCD.

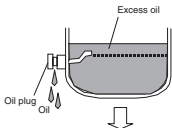
P06/HPS check:

When the high pressure rises, the circulation rate of refrigerant increases and the oil is expected to return to the compressor.

P08/Pump down check:

The refrigerant contained in the compressor oil is evaporated and separated from the oil.

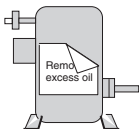
5. Bypass gas from high pressure side to low pressure side of gauge manifold, adjust the low pressure to 0kPa or more.
6. Loosen the oil drain plug and remove the excess oil.



7. Close the oil plug when no more oil comes out.



8. Take off "Removing oil label" stuck on compressor body.



REMOVING EXCESS COMPRESSOR OIL IS NOT COMPLETED.

REMOVE EXCESS COMPRESSOR OIL. THEN TAKE OFF THIS LABEL

EEV replacement.

Procedure for Replacing Electronic expansion Valve coil

[The purpose of the work]

The procedure is to avoid water penetration into EV coil and connector parts.

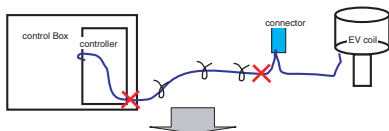
- Install a new EV coil which does not have the connector
- Put Lock-tight on the upper part of valve to seal between coil and body

■ Please follow the instruction below.

EV = Expansion Valve

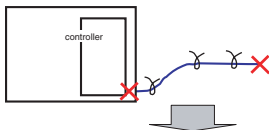
[Outline]

The Lead wire shall be cut at control box outlet and at the EV coil connector



Remove EV coil and the wiring in controlbox.

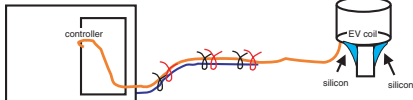
(The clamped lead wire shall be remained as it is)



Lock-tight shall be applied on the valve top















Install the new EV coil






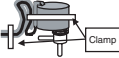


※ The number of clamps and the positions are different by a model.
In that case, please match it with an original.

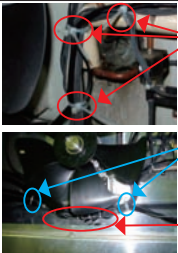
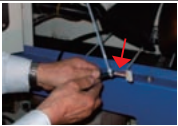

Procedure for Replacing Electronic expansion Valve coil

No.	photos	process	points	tools
1		Unplug the power. Remove the condenser fan cover and Solenoid valve cover at right side of the condenser fan like the left picture.		10mm Socket wrench
2		Cut the three(3) clamps on wiring cable of the EV coil.		Nipper
3		After removing the water proof tube of the connector, the cable shall be cut.		Nipper
4		Remove sealant underneath the EV coil, then, unscrew and remove the EV coil		
5		Disconnect the EV cable connector [CN18] on controller.		
6		Cut out the part of the EV cable in the control box.		Nipper







Procedure for Replacing Electronic expansion Valve coil				
No.	photos	process	points	tools
7		<p>1) Blow out the moisture inside the EV body, by blowing pressured air or Nitrogen on top of the EV body.</p> <p>2) Carefully dehydrate the EV body with a dryer.</p>	<p>1) By blowing Air or Nitrogen on top of the EV body, moisture will be removed from the mechanical side of the body</p> <p>2) Do not use a flame to dry the EV body, because the soldering part of valve body may melt which causes a refrigerant leak.</p>	<ul style="list-style-type: none"> Pressured Air (Pressured Nitrogen) Hair dryer (around 1000W) Waste cloth
8		The state that removed EV (Confirm that EV is not stained)		
9		Prepare for LOCTITE262, plain washer(M12)		
10		Apply LOCTITE_262 to a plain washer	Don't apply too much LOCTITE.	<ul style="list-style-type: none"> Loctite262 Plain washer (M12)
11		Insert the plain washer which applied LOCTITE_262 in this side of the body and turn	Check the behind condition	
12		< Reference > The state that put a flat washer by procedure 10		




Procedure for Replacing Electronic expansion Valve coil

No.	photos	process	points	tools
13		Remove a plain washer	Don't apply too much LOCTITE. Check the behind condition	
14		Fix a new EV coil	Torque 150kgf/cm	<ul style="list-style-type: none"> • 17,19mm Spanner • Torque wrench
15		<p>A new EV coil shall be installed and the cable shall be clamped at two(2) positions.</p> 	<ol style="list-style-type: none"> 1) Install the coil on valve body 2) Then, turn the lock nut clockwise to fasten the coil. Do not turn coil itself. 	<ul style="list-style-type: none"> • 17,19mm Spanners • Small Clamp x 2 (T-50R) • Torque wrench
16		<p>Lock nuts shall be sealed by silicone.</p> 	<ol style="list-style-type: none"> 1) Clean up lock nut before seal. 2) Silicone shall be applied carefully and make sure it is completely sealed. The pipe insulation shall be moved a little to do this work perfectly. 3) Do not use soapy water. 4) Check all around the sealing 	Silicon

Procedure for Replacing Electronic expansion Valve coil				
No.	photos	process	points	tools
17		<p>Small Clamp x3</p> <p>The new EV cable shall be clamped at the same position as original EV cable.</p> <p>Plastic Band Please put a cable through the inside of the plastic band</p> <p>Large Clamp x6</p>	<p>Please use the three (3) small type of clamps in the right of fan.</p> <p>Please use the six (6) LARGE type of clamps above the condenser coil.</p> <p>※ The number of clamps and the positions are different by a model. In that case, please match it with an original</p>	<p>Large Clamp (T-50L) x 6</p> <p>Small Clamp (T-50R) x 3</p>
18		<p>At the end of the new EV coil cable, a Large clamp shall be fastened close to the connector, like the picture on the left.</p>	<p>This clamp guides the new EV cable thru the flexible tube into the control box, like shown at step number 15.</p>	<p>Large Clamp (T-50L) × 1</p>
19		<p>Cut the clamp(1) on the "upper" flexible tube.</p>	<p>There are two flexible tubes to the controller box. The new EV cable shall be pulled through "Upper" flexible tube because there is more space then in the lower flexible tube.</p>	<p>Cutting tool</p>

Procedure for Replacing Electronic expansion Valve coil

No.	photos	process	points	tools
20	   	<p>Drag the new EV cable through the Upper flexible tube by the use of the Large clamp</p>		
21		<p>Measure the resistance between the each connector terminal. (red — white, red — orange, brown — yellow, brown — blue) Resistance of each terminal should be about 150 Ω .</p>	<p>Check the electrical wiring to the EV coil</p>	<p>Electrical measuring devise</p>
22		<p>Connect the EV connector to the controller [CN18] .</p>		

Procedure for Replacing Electronic expansion Valve coil				
No.	photos	process	points	tools
23		Clamp EV cables at one(1) location.		Large Clamp (T-50L) × 1
24		The flexible tube shall be clamped.		Large Clamp (T-50L) × 1
25		Re- install the fan cover and Solenoid valve cover at right side of the condenser fan		

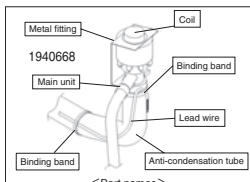
New model EEV replacement.

Electronic expansion valve

● Model Coil : HCM-MD12DM-1

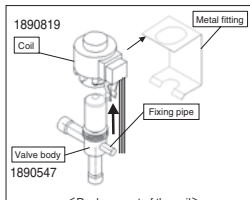
Body : HCM-BD35DM-1

This unit adopts an electronic expansion valve. The electronic expansion valve controls the optimum refrigerant flow rate automatically, using the temperature sensor at the evaporator inlet and outlet pipes. In case of emergency including controller malfunctions, refer to the chapter of troubleshooting, section 6.5, Emergency operation.



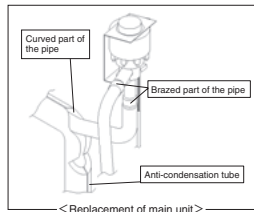
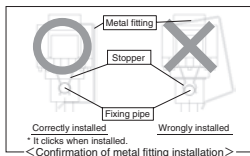
(1) Replacing the coil

- 1 Remove the binding band fixing the coil lead wire.
- 2 Disconnect the connector of the coil.
- 3 Remove the metal fitting and the coil.
- 4 Replace the old coil with a new one.
- 5 Attach the coil and the metal fitting.
- 6 Mount the connector of the coil.
- 7 Fix the coil lead wire with a binding band.



(2) Replacing the body

- 1 Remove the binding band fixing the coil lead wire.
- 2 Detach the anti-condensation tube until the curved part of the pipe.
- 3 Remove the metal fitting and the coil.
- 4 Remove the brazed part of the pipe.
- 5 Insert the new valve body in the pipe.
→ Braze the new valve body while cooling it with a wet cloth.
Cooling temperature: 120°C (248°F) or less
- 6 Mount the coil and the metal fitting.
- 7 Mount the anti-condensation tube.
- 8 Fix the coil lead wire with a binding band.



Attention (When installing the coil and the metal fitting)

- Securely attach the coil stopper to the valve body fixing pipe.
→ If wrongly attached, the expansion valve may function abnormally, damaging the compressor.
- Take care not to allow the metal fitting damage or pinch the lead wire.
→ Malfunction of the expansion valve may arise.

9. Emergency Operation

Controller type	EEV	SMV	Procedure No
DECOSⅢ C,D	Old EEV	Old SMV	A
DECOSⅢ D-1	New EEV	Old SMV	B
DECOSⅢ E	New EEV	New SMV	C

OLD EEV



NEW EEV



Emergency Operation A

Emergency operation

Emergency operation of controller

In case of the controller malfunction, emergency operation can be executed by using emergency operation kit.

(1) Components to be prepared (emergency operation kit)

- ☐ Short circuit connector --- Stored on the back of CPU/IO board case in the control box.
- ☐ Electronic expansion valve emergency cap --- Stored in the spare parts kit.
- ☐ Suction modulating valve emergency magnet --- Stored in the spare parts kit.

(2) On-site work

The on-site work is requested as follows for Emergency Operation

① Wiring change for short circuit operation

'1) Wiring change for cutting off the power to CPU board

'2) Wiring change for making the forced running of Compressor, Condenser Fan and Evaporator Fans.

* Connect the short circuit connector stored on the back of controller.

* For the details, refer to the clause 6.4.2 "Short Circuit Operation"

② Electronic Expansion Valve opening adjustment for 1/4 opening.

* Use Emergency Cap for the for 1/4 opening.

* For the details, refer to the clause 6.4.3 "Opening Adjustment"

③ Suction Modulation Valve opening adjustment for full opening.

* Use Emergency Magnet for full the opening.

* For the details, refer to the clause 6.4.4 "Emergency operation of suction modulating valve"

(3) Operating condition at emergency

Temperature can not be controlled. Turn the circuit breaker on or off to maintain the target temperature.

Mode	Available function of protection devices	Operating condition of unit
Cooling operation	RPP : Reverse phase protection device HPS : High pressure switch CTP : Compressor thermal protector	<ul style="list-style-type: none"><input type="radio"/> Compressor runs continuously.<input type="radio"/> Evaporator fan runs at low speed continuously.<input type="radio"/> Condenser fan runs continuously.<input type="radio"/> Electronic expansion valve operates with fixed opening by the emergency cap.<input type="radio"/> Suction modulating valve operates with full opening by emergency magnet.
Heat operation	_____	<ul style="list-style-type: none"><input type="radio"/> Compressor stops.<input type="radio"/> Evaporator fan runs at high speed continuously.<input type="radio"/> Condenser fan stops.

Short circuit operation of controller

● LXE10E-1 or later (Connector Type Terminal Board)

For cutting off the power to CPU board

For making the forced running of EFM.
(Heating operation)

For checking reverse phase power

For correction of reverse phase power

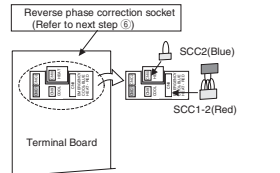
For cooling operation

① Turn the circuit breaker OFF.

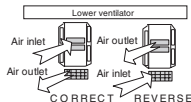
② Disconnect the power supply connector CN82(White) on SMV adapter board.

③ Remove Short Circuit Connector SCC1-1(Blue), SCC1-2(Red) and SCC2(Blue) stored on back of controller.

④ Connect the Short Circuit Connector SCC1-2(Red) to CN8 and SCC2(Blue) to CN10 on terminal board.



⑤ Turn the circuit breaker ON.
If the power is in reverse phase, EFM runs reversely with high speed. Then fresh air is sucked to Outlet Hole and discharged from Inlet Hole at the lower ventilator.

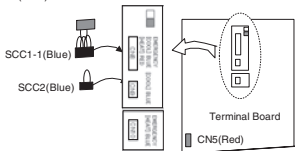


⑥ If it is in reverse phase, turn the circuit breaker OFF and replace the reverse phase correction socket to opposite side. ("Lower socket CN-C1 to Upper CN-C2" or "Upper CN-C2 to Lower CN-C1")

Operate continuously for heating operation.

For cooling operation, go to next step ⑦.

⑦ Connect Short Circuit Connector SCC1-1(Blue) to CN8 and SCC2(Blue) to CN9 on terminal board.

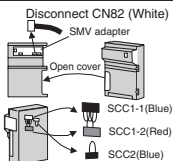


● LXE10E-1 ~ 1D (Screwed Cramp Type Terminal Board)

For cutting off the power to CPU board

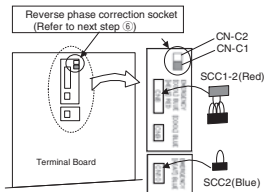
- ① Turn the circuit breaker OFF.

- ② Disconnect the power supply connector CN82(White) on SMV adapter board.

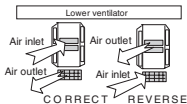


- ③ Remove Short Circuit Connector SCC1-1(Blue), SCC1-2(Red) and SCC2(Blue) stored on back of controller.

- ④ Connect the Short Circuit Connector SCC1-2(Red) to CN8 and SCC2(Blue) to CN10 on terminal board.



- ⑤ Turn the circuit breaker ON.
If the power is in reverse phase, EFM runs reversely with high speed. Then fresh air is sucked to Outlet Hole and discharged from Inlet Hole at the lower ventilator.



- ⑥ If it is in reverse phase, turn the circuit breaker OFF and replace the reverse phase correction socket to opposite side.
("Lower socket CN-C1 to Upper CN-C2" or "Upper CN-C2 to Lower CN-C1")

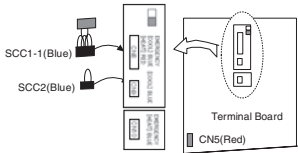
Operate continuously for heating operation.
For cooling operation, go to next step ⑦.

For checking reverse phase power

For correction of reverse phase power

For cooling operation

- ⑦ Connect Short Circuit Connector SCC1-1(Blue) to CN8 and SCC2(Blue) to CN9 on terminal board.



Opening adjustment of electronic expansion valve

In case of the controller malfunction or faulty electronic expansion valve coil, electronic expansion valve can be operated with fixed valve opening by using emergency cap.



CAUTION

If the electronic expansion valve is energized while the coil is removed from valve body, the coil driver with which the valve needle is pushed protrude excessively. In this state, when the valve is restored from emergency operation, the needle may be caught with the driver resulting the valve fully closed. Therefore, be sure not to energize the coil before emergency operation.

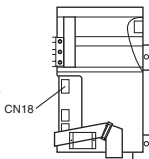
[Disenergizing of coil]

- When controller malfunction

Disconnect the red power supply connector (red : CN5) on the terminal board when removing of controller short circuit connector (SCC1-1 or SCC1-2) to disenergize the electronic expansion valve. (described in the section 6.4.2)

- When only electronic expansion valve is conducted emergency operation.

Disconnect CN18 on the controller CPU board to disenergize the electronic expansion valve.



- ① Remove the coil.

- ② Set the emergency cap on the electronic expansion valve body.

- ③ Fully close the electronic expansion valve by turning the minus recessed screw of emergency cap clockwise with miniature driver.

(Tightening torque: approx. 1 kgf · cm The torque is required to tighten the valve softly until the driver stops turning)

- ④ Then slightly open the electronic expansion valve by turning the minus recessed screw of emergency cap counter clockwise for 60°

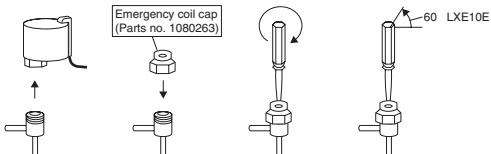
- ⑤ Apply a loose-free adhesive on the screw.

- ① Remove the coil.

- ② Set the emergency coil cap. (Parts no. 1080263)

- ③ Fully close.

- ④ Slightly open.



Recommendation

*EV opening adjustment during pull-down operation

To shorten the operation hours, it is recommended that the opening be adjusted up to max. 50%.

However if the frost is observed around the comp. body or the super heat is insufficient due to wet operation, close slightly the opening.



Emergency operation of suction modulation valve:

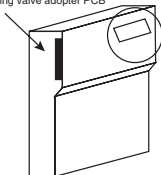
In case of emergency, there are two ways to open the suction modulating valve manually.

It is important to follow these steps in this sequence. Use step 1 first. If this is not working, then use step 2.

Step 1. Fully open the valve by using the dip switch on the adaptor PCB.

In case of controller malfunction while the suction modulating valve and adaptor PCB are normal, turn the No. 1 dip switch ON to open the valve automatically. At the same time the dip switch is switched, a clicking sound can be heard that the valve fully opens. If nothing will be heard, continue to step 2.

Modulating valve adaptor PCB



Position of dip switches

Normal operation		Emergency operation	
ON		ON	
OFF		OFF	
	1 2 3		1 2 3

Controller CPU/IO unit

Step 2. Fully open the valve by using an emergency magnet.

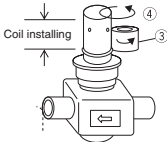
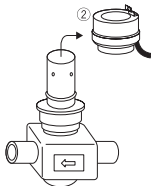
If the method of step 1 was not working, use this step to open the valve.

In case of the suction modulating valve or adaptor PCB malfunction, the valve can be opened by using an emergency magnet.

- ① Prepare Emergency Magnet
- ② Remove the coil of the modulating valve.
- ③ Contact the emergency magnet to the coil mounting section of the valve with the "UPSIDE" up. (the emergency magnet is attracted to the coil installing section by magnetic force of the inside driving magnet)
- ④ Rotate the emergency magnet counter clockwise to open the valve fully. (when the valve is fully opened, the inside driving magnet will be inactive and the emergency magnet can be removed)

①

Emergency Magnet
(Parts no. 1270530)



Emergency Operation B

Emergency operation

Emergency operation of controller

In case of the controller malfunction, emergency operation can be executed by using emergency operation kit.

(1) Components to be prepared (emergency operation kit)

- ☐ Short circuit connector --- Stored on the back of CPU/IO board case in the control box.
- ☐ Electronic expansion valve emergency cap --- Stored in the spare parts kit.
- ☐ Suction modulating valve emergency magnet --- Stored in the spare parts kit.

(2) On-site work

The on-site work is requested as follows for Emergency Operation

① Wiring change for short circuit operation

'1) Wiring change for cutting off the power to CPU board

'2) Wiring change for making the forced running of Compressor, Condenser Fan and Evaporator Fans.

* Connect the short circuit connector stored on the back of controller.

* For the details, refer to the clause 6.4.2 "Short Circuit Operation"

② Electronic Expansion Valve opening adjustment for 1/4 opening.

* Use Emergency Cap for the for 1/4 opening.

* For the details, refer to the clause 6.4.3 "Opening Adjustment"

③ Suction Modulation Valve opening adjustment for full opening.

* Use Emergency Magnet for full the opening.

* For the details, refer to the clause 6.4.4 "Emergency operation of suction modulating valve"

(3) Operating condition at emergency

Temperature can not be controlled. Turn the circuit breaker on or off to maintain the target temperature.

Mode	Available function of protection devices	Operating condition of unit
Cooling operation	RPP : Reverse phase protection device HPS : High pressure switch CTP : Compressor thermal protector	<ul style="list-style-type: none"><input type="radio"/> Compressor runs continuously.<input type="radio"/> Evaporator fan runs at low speed continuously.<input type="radio"/> Condenser fan runs continuously.<input type="radio"/> Electronic expansion valve operates with fixed opening by the emergency cap.<input type="radio"/> Suction modulating valve operates with full opening by emergency magnet.
Heat operation	_____	<ul style="list-style-type: none"><input type="radio"/> Compressor stops.<input type="radio"/> Evaporator fan runs at high speed continuously.<input type="radio"/> Condenser fan stops.

Short circuit operation of controller

● LXE10E-1 or later (Connector Type Terminal Board)

For cutting off the power to CPU board

For making the forced running of EFM.
(Heating operation)

For checking reverse phase power

For correction of reverse phase power

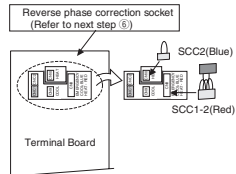
For cooling operation

① Turn the circuit breaker OFF.

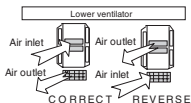
② Disconnect the power supply connector CN82(White) on SMV adapter board.

③ Remove Short Circuit Connector SCC1-1(Blue), SCC1-2(Red) and SCC2(Blue) stored on back of controller.

④ Connect the Short Circuit Connector SCC1-2(Red) to CN8 and SCC2(Blue) to CN10 on terminal board.



⑤ Turn the circuit breaker ON.
If the power is in reverse phase, EFM runs reversely with high speed. Then fresh air is sucked to Outlet Hole and discharged from Inlet Hole at the lower ventilator.

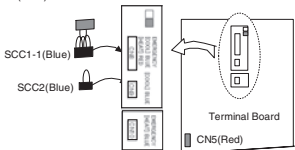


⑥ If it is in reverse phase, turn the circuit breaker OFF and replace the reverse phase correction socket to opposite side. ("Lower socket CN-C1 to Upper CN-C2" or "Upper CN-C2 to Lower CN-C1")

Operate continuously for heating operation.

For cooling operation, go to next step ⑦.

⑦ Connect Short Circuit Connector SCC1-1(Blue) to CN8 and SCC2(Blue) to CN9 on terminal board.



● LXE10E-1 ~ 1D (Screwed Cramp Type Terminal Board)

For cutting off the power to CPU board

For making the forced running of EFM.
(Heating operation)

For checking reverse phase power

For correction of reverse phase power

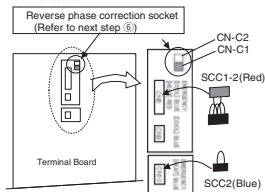
For cooling operation

① Turn the circuit breaker OFF.

② Disconnect the power supply connector CN82(White) on SMV adapter board.

③ Remove Short Circuit Connector SCC1-1(Blue), SCC1-2(Red) and SCC2(Blue) stored on back of controller.

④ Connect the Short Circuit Connector SCC1-2(Red) to CN8 and SCC2(Blue) to CN10 on terminal board.

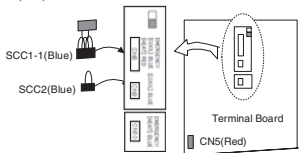


⑤ Turn the circuit breaker ON.
If the power is in reverse phase, EFM runs reversely with high speed. Then fresh air is sucked to Outlet Hole and discharged from Inlet Hole at the lower ventilator.

⑥ If it is in reverse phase, turn the circuit breaker OFF and replace the reverse phase correction socket to opposite side.
("Lower socket CN-C1 to Upper CN-C2" or "Upper CN-C2 to Lower CN-C1")

Operate continuously for heating operation.
For cooling operation, go to next step ⑦.

⑦ Connect Short Circuit Connector SCC1-1(Blue) to CN8 and SCC2(Blue) to CN9 on terminal board.

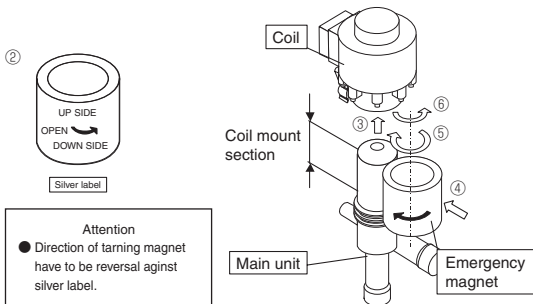


Emergency operation of electronic expansion valve

If the controller does not work or the electronic expansion valve coil has failed, the emergency magnet can be used to fully open the electronic expansion valve.

- ① Disconnect the CN11 connector from the power supply I/O board of the controller to forcibly turn OFF the power supply to the electronic expansion valve.
- ② Prepare the emergency magnet.
- ③ Remove the electronic expansion valve coil.
- ④ Bring the emergency magnet into contact with the coil mount section of the electronic expansion valve body with indication "UP SIDE" located upward. (The emergency magnet is magnetically attracted to the coil mount section by the driving magnet located inside.)
- ⑤ Turn the emergency magnet in the OPEN direction (clockwise) in the same place.
→ Ensure that the valve is fully open. (There is a small click sound.)
- ⑥ Turn 90° to 180° counterclockwise the emergency magnet in the same place.

To shorten the operation time, it is recommended that the opening be adjusted. However, slightly close the opening if there is a frost around the compressor due to the operation in wet conditions or the degree of superheat is small.



Emergency operation of suction modulation valve:

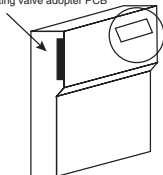
In case of emergency, there are two ways to open the suction modulating valve manually.

It is important to follow these steps in this sequence. Use step 1 first. If this is not working, then use step 2.

Step 1. Fully open the valve by using the dip switch on the adaptor PCB.

In case of controller malfunction while the suction modulating valve and adaptor PCB are normal, turn the No. 1 dip switch ON to open the valve automatically. At the same time the dip switch is switched, a clicking sound can be heard that the valve fully opens. If nothing will be heard, continue to step 2.

Modulating valve adaptor PCB



Position of dip switches

Normal operation	Emergency operation
ON	ON
OFF	OFF
1 2 3	1 2 3

Controller CPU/IO unit

Step 2. Fully open the valve by using an emergency magnet.

If the method of step 1 was not working, use this step to open the valve.

In case of the suction modulating valve or adaptor PCB malfunction, the valve can be opened by using an emergency magnet.

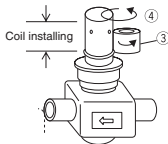
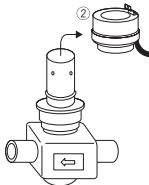
- ① Prepare Emergency Magnet
- ② Remove the coil of the modulating valve.
- ③ Contact the emergency magnet to the coil mounting section of the valve with the "UPSIDE" up. (the emergency magnet is attracted to the coil installing section by magnetic force of the inside driving magnet)
- ④ Rotate the emergency magnet counter clockwise to open the valve fully. (when the valve is fully opened, the inside driving magnet will be inactive and the emergency magnet can be removed)

①

Emergency Magnet
(Parts no. 1270530)



②



Emergency Operation C

Emergency operation of controller

In case of the controller malfunction, emergency operation can be executed by using emergency operation kit.

(1) Components to be prepared (emergency operation kit)

- ☐ Short-circuit connector ... Installed in front of the controller inside the control box
- ☐ Emergency magnet ... (Part No. 1896110)

(2) On-site work

The following works are required for emergency operation.

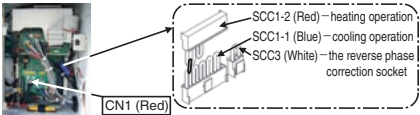
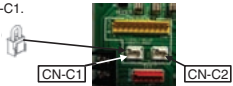
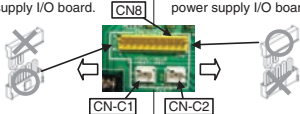
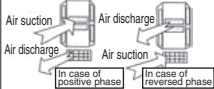
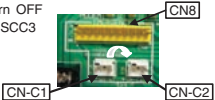
- ① Wiring change for short circuit operation
 - 1) Wiring change for cutting off the power to CPU board
 - 2) Wiring change for making the forced running of Compressor, Condenser Fan and Evaporator Fans.
 - * Install the short-circuit connector in front of the controller.
 - * For the details, refer to the clause 6.5.2 "Short Circuit Operation"
- ② Opening adjustment of electronic expansion valve
 - * The emergency magnet is used to adjust the opening.
 - * For the details, refer to the clause 6.5.3 "Opening Adjustment"
- ③ Suction Modulation Valve opening adjustment for full opening.
 - * Use Emergency Magnet for full the opening.
 - * For details, refer to "Adjustment in fully open condition" in section 6.5.4.

(3) Operating condition at emergency

Temperature can not be controlled. Turn the circuit breaker on or off to maintain the target temperature.

Mode	Available function of protection devices	Operating condition of unit
Cooling operation	RPP : Reverse phase protection device HPS : High pressure switch CTP : Compressor thermal protector	<input type="radio"/> Compressor runs continuously. <input type="radio"/> Evaporator fan runs at low speed continuously. <input type="radio"/> Condenser fan runs continuously. <input type="radio"/> Electronic expansion valve operates with fixed opening. <input type="radio"/> Suction modulating valve operates with full opening.
Heat operation	_____	<input type="radio"/> Compressor stops. <input type="radio"/> Evaporator fan runs at high speed continuously. <input type="radio"/> Condenser fan stops.

Short circuit operation of controller

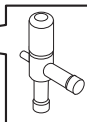
	Cooling operation	Heating operation
Power OFF	① Turn OFF the circuit breaker.	
Forcible operation of compressor and condenser fan	② Disconnect power supply connector CN1 (Red) located in front of the controller, and disconnect short-circuit connectors SCC1-1 (Blue), SCC1-2 (Red) and SCC3 (White). <div data-bbox="329 254 968 425">  </div>	
	③ Connect SCC3 (White) to CN-C1. <div data-bbox="609 445 961 574">  </div>	
	④ Connect short-circuit connector SCC1-1 (Blue) to CN8 of the power supply I/O board. <div data-bbox="416 645 872 816">  </div>	④ Connect short-circuit connector SCC1-2 (Red) to CN8 of the power supply I/O board.
Confirmation of power supply reversed phase	⑤ Turn ON the circuit breaker. If the power supply is in reversed phase, the compressor does not operate. And the condenser fan is rotated inversely. <div data-bbox="650 968 975 1102">  </div>	
	⑥ In case of reversed phase, turn OFF the circuit breaker and connect SCC3 (White) from CN-C1 to CN-C2. <div data-bbox="629 1110 955 1259">  </div>	

Emergency operation of electronic expansion valve

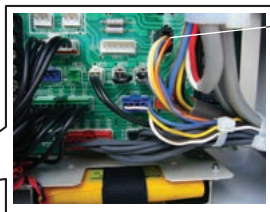
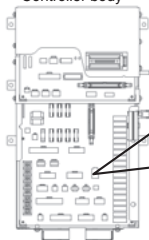
If the controller does not work or the electronic expansion valve coil has failed, the emergency magnet can be used to fully open the electronic expansion valve.

- ① Disconnect the CN11 connector from the power supply I/O board of the controller to forcibly turn OFF the power supply to the electronic expansion valve.
- ② Prepare the emergency magnet.
- ③ Remove the electronic expansion valve coil.
- ④ Bring the emergency magnet into contact with the coil mount section of the electronic expansion valve body with indication "UP SIDE" located upward. (The emergency magnet is magnetically attracted to the coil mount section by the driving magnet located inside.)
- ⑤ Turn the emergency magnet in the OPEN direction (clockwise) in the same place.
→ Ensure that the valve is fully open. (There is a small click sound.)
- ⑥ Turn 90° to 180° counterclockwise the emergency magnet in the same place.

To shorten the operation time, it is recommended that the opening be adjusted. However, slightly close the opening if there is a frost around the compressor due to the operation in wet conditions or the degree of superheat is small.



Controller body



①
CN11

② Emergency magnet
(Part No.1896110)



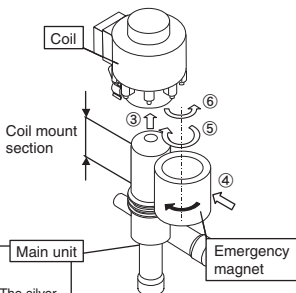
○ Yellow label



× Silver label

Attention

- The silver label is not used. (The silver labels are used for LXE10E-A, 10E-1 and 10D.)



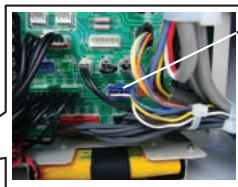
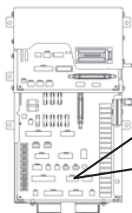
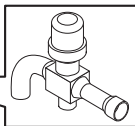
Emergency operation of suction modulation valve

If the controller does not work or the suction modulation valve coil has failed, the emergency magnet can be used to fully open the suction modulation valve.

- ① Disconnect the CN9 connector from the power supply I/O board of the controller to forcibly turn OFF the power supply to the suction modulation valve.
- ② Remove the binding band of the suction modulation valve cap, and then remove the cap.
- ③ Remove the binding band from the upper section of the suction modulation valve coil.
- ④ Remove the binding band of the suction modulation valve cover to expose the lower section of the suction modulation valve coil.
- ⑤ Remove the binding band from the lower section of the suction modulation valve coil.



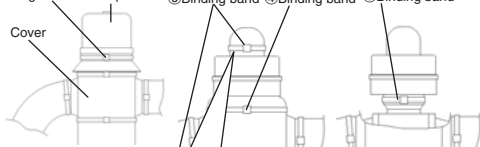
Controller body



①
CN9

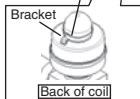
② Binding band Cap ③ Binding band ④ Binding band ⑤ Binding band

Cover

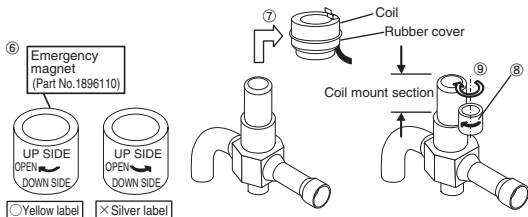


Bracket

Back of coil



- ⑥ Prepare the emergency magnet.
- ⑦ Remove the suction proportional coil. (Removed together with the coil's lower rubber cover)
- ⑧ Bring the emergency magnet into contact with the coil mount section of the suction modulation valve with indication "UP SIDE" located upward. (The emergency magnet is magnetically attracted to the coil mount section by the driving magnet located inside.)
- ⑨ Turn the emergency magnet in the OPEN direction (clockwise) in the same place.
→ Ensure that the valve is fully open. (There is a small click sound.)



Attention

- The silver label is not used. (The silver labels are used for LXE10E-A, 10E-1 and 10D.)

10. Appendix

Standard tightening torques for bolts

	Bolt size	Main part	Tightening torque		
			N · m	kgf · cm	lbf · ft
Stainless steel	M4	Small parts	1.6	16	1.2
	M5	Solenoid valve	1.2	12.2	0.9
	M6	Access panel	5.2	53	3.8
	M8	Evaporator fan motor Condenser fan motor Control box Service door	12.3	125	9.1
	M10	Evaporator fan motor mounting base Compressor suction flange Compressor discharge flange	25.2	257	18.6
	M12	Compressor	42.7	435	31.5

Note: Tolerance of tightening torque is within $\pm 10\%$.

Standard tightening torque for flare nut

Pipe size		Main part	Tighten torque		
mm	in.		N · m	kgf · cm	lbf · ft
ϕ 6.4	2/8	Compressor pressure port	15.7	160	11.3
ϕ 9.5	3/8	—	36.3	370	26.8
ϕ 12.7	4/8	Dryer	54.9	500	40.5

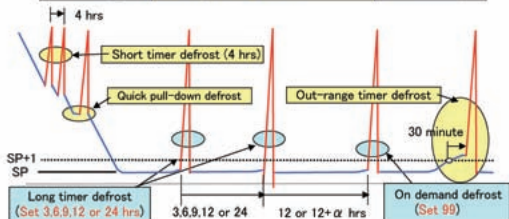
Note: Tolerance of tightening torque is within $\pm 10\%$.

Fuse protection table

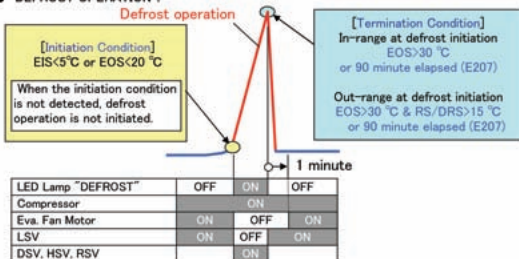
	Protection of:
Fuse 1 (250V, 10A)	<ul style="list-style-type: none"> • High pressure switch (HPS) • Compressor contactor (CC) • Evaporator fan contactor high speed (EFH) • Evaporator fan contactor low speed (EFL) • Condensor fan contactor (CFC) • Compressor terminal protector (CTP) • Phase correction contactor (PCC1, PCC2)
Fuse 2 (250V, 10A)	<ul style="list-style-type: none"> • Gas bypass solenoid valve (BSV) • Defrost solenoid valve (DSV)
Fuse 3 (250V, 10A)	<ul style="list-style-type: none"> • Hot gas solenoid valve (HSV) • Liquid solenoid valve (LSV) • Injection solenoid valve (ISV) • Economizer solenoid valve (ESV)
Fuse 4 (250V, 10A)	<ul style="list-style-type: none"> • Electronic expansion valve (EV) • PT and CT board
Fuse 5 (250V, 10A)	<ul style="list-style-type: none"> • Recorder • LED indication • LCD display
Fuse 6 (250V, 10A)	<ul style="list-style-type: none"> • Remote monitoring receptacle (RM)
Fuse 7 (250V, 5A)	<ul style="list-style-type: none"> • Suction modulating valve (SMV)

● WHEN IS THE DEFROST OPERATION IS PERFORMED ?

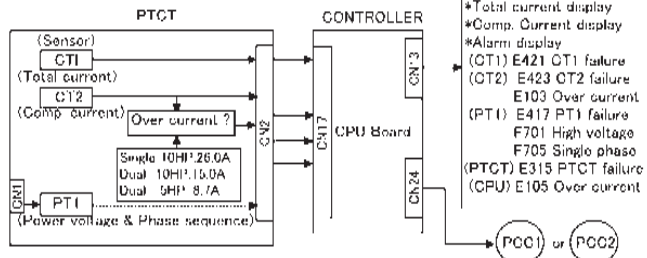
Pull-down	Short timer 4 Hr	Automatically
	Quick pull-down defrost	
In-Range	Long timer ~"3,6,9,12,24" Hr	Manually setting
	On demand defrost ~"99"	
Out-Range	Out range timer 30 min.	Automatically



● DEFROST OPERATION ?

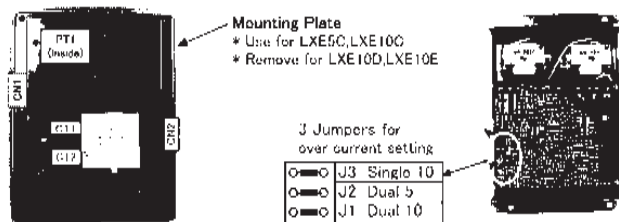


[1] FUNCTION OF PTCT BOARD



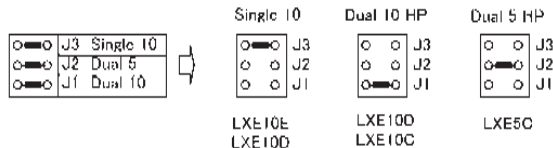
[2] REPLACEMENT OF PTCT BOARD

Spare parts. PTCT BOARD



Caution !!

Cut the jumpers depending on the Single (400V only) or Dual (400V・200V) power and 10 or 5 HP of the compressor shown on below before installing the PTCT BOARD from spare parts.



Solenoid Valves ON/OFF operation

Solenoid valve	Frozen operation (10 to 50°C)	Chilled / Partial frozen operation (10 to 25°C)	Defrost / heating operation	Pump-down	Alarm Stop	Note
ESV (Economiser Sol. Valve)	ON when RS > 5°C	ON when RS > 5°C during pull-down operation OFF during capacity control	OFF	ON	OFF	By using the ESV the cooling capacity will be much bigger
BSV (By-pass Sol. Valve)	ON at start-up when AMS < 10°C or OFF at AMS > 4°C for quickly heat up the oil temperature in the compressor and OFF when RS < 4°C	ON at start-up same as in frozen operation OFF during capacity control ON when RS > 5°C and AMS < 10°C OFF when RS < 4°C and AMS < 10°C	OFF	OFF	OFF	The BSV is used for quick heat up the oil in the compressor at start-up when the ambient temperature is low. Also to return the oil to the compressor at capacity control, when the suction pressure is low
LSV (Liquid Sol. Valve)	ON when the compressor is running and OFF when the compressor stops	ON	OFF	OFF	OFF	
ISV (Injection Sol. Valve)	ON when RS < 0°C and DIS < 120°C or when RS < 0°C and DIS > 120°C OFF when RS < 0°C and DIS < 103°C or when RS < 0°C and DIS > 118°C	ON when DIS < 113°C OFF when DIS > 103°C	ON when LPT < 100kPa OFF when LPT > 70kPa ON when HPT > 700kPa OFF when HPT > 800 kPa	OFF		[Symbol] SP: Set Point temperature SS: Supply air temperature Sensor RS: Return air temperature Sensor AMB: Ambient air temperature DCH: Discharge gas temperature EOS: Evaporator Inlet gas temperature LPT: Low Pressure HPT: High Pressure
HSV (Hot gas Sol. Valve)	OFF	OFF	ON	OFF	OFF	
DSV (Defrost Sol. Valve)	OFF	OFF	ON	OFF	OFF	
RSV (Re-heat Sol. Valve)	OFF	ON when the air humidity value is set and the temperature is in range OFF when the temperature is out range	ON when DIS < 5°C	OFF	OFF	The RSV will be switched ON during defrost to clear the ice on re-heat coil right fall down from the evaporator
EV (Expansion Valve)	10 to 100% open	10 to 100% open	5% open at defrost 0% open at heating	100% open at pull-down 10 to 100% open	50% open	
SMV (Suction Modulation Valve)	100% open	3 to 100% open	100% open	100% open	100% open	

* Solenoid Valves are normally closed one-way stop valves

* The coil of the solenoid valves are all the same

* The body for ESV, ISV and BSV are the same and the body for LSV, DSV, HSV, RSV are the same

NOTE: When the EV coil have to be replaced, first connect the new EV coil on the body.

After that connect electrically. Do a P/T test to check the EV on correct working.

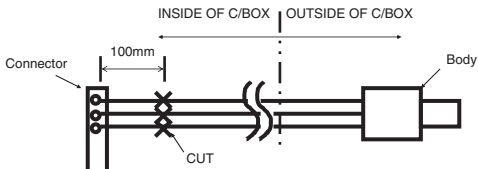
Sensor replacement procedure for connector type.

*** The part with insulator solder-less splices butt according to the following instruction.**

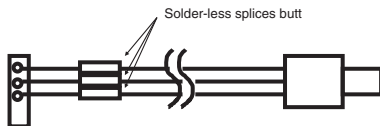
CAUTION

**CONNECT THE LEAD WIRE IN C/BOX.
APPLY CORRECT CLAMPED TOOL.**

- ① CUT THE LEAD WIRE OF PRESSURE SENSOR(CURRENT PARTS).



- ② CONNECT LEAD WIRE OF PRESSURE SENSOR(ALTERNATIVE PARTS) WITH SOLDERLESS SPLICES BUTT.



CAUTION

**CHECK THE LEAD WIRE NOT COME OFF EASY AFTER CLAMPING WITH
SOLDERLESS
SPLICES BUTT.**

