

Matsushige Electric Bus Air Conditioning Repair Guide

Songzhi BUS AirConditioner maintenance guide

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Preamble

Shanghai Kallang Songzhi Automobile Air Conditioning Co., Ltd. is a listed company specialising in the research, development, manufacture and sales of air conditioners for buses, passenger cars, railcars and refrigerated trucks, which was founded in Shanghai in 1998. Bus Air Conditioning

Since 2003, the production and sales volume has been ranked first in the industry, and the current market retains more than 170,000 units.

With the development of bus air-conditioning technology, Shanghai Songzhi's bus air-conditioning products adopt a large number of new technologies, new techniques and new materials, especially in recent years with the rapid development of the company, the company's product line is constantly enriched, in order to make our technical support engineers, service engineers, technicians of our company's contracted service stations, maintenance personnel, as well as the supporting bus factories, the customers of the company's products to be able to understand and grasp In order to make our technical support engineers, service engineers, technicians of our special service stations, maintenance personnel, as well as supporting bus factories and customers to know and master the company's products and keep pace with the development of the products, and to improve the skills of using, maintaining and repairing the products, the technical centre of the bus division of Shanghai Kallanchong Automobile Air Conditioning Co.

This manual mainly explains the new energy air conditioner failure principle, troubleshooting and other related contents, which can be used as a

Training materials for air-conditioning sales and after-sales service technicians of pure electric buses.

During the preparation of this manual, colleagues from the

Technical Centre, Marketing Department and After-sales Service Department gave a lot of guidance and help in sharing technical information and maintenance experience, especially Wang Zhiyuan, Zhang Haibin, Wu Ronghua, Chen Lizhe and Yuan Fule from the Bus Rail Division.

At the same time, due to the time rush and our limited ability, please criticize and correct any mistakes or omissions in the textbook! So that we can revise and improve it when we reprint it.

Shanghai Kallang Matsushige Automobile Air Conditioning Co. **12** January 2021

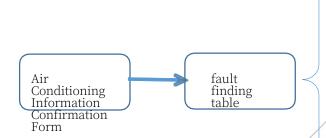
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	31	EOL Evaporator fan inverter overload	
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		FL Reverse connection fault	
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I. After-sales troubleshooting flowchart and list of commonly used tools

(1) Flowchart of after-sales troubleshooting for buses



- 1. EC1 communication failure
- 2. System pressure failure
- 3. Temperature protection faults
- 4. Temperature sensor failure
- 5. High voltage power input fault
- 6. Frequency inverter failure
- 7. Pressure sensor failure
- 8. Electronic Expansion Valve Failure

r a

(2) List of common tools for bus aftermarket

/ 6.8 %	
name (of a thing)	quantities
thermometers	1
anemometer	1
multimeter	1
13mm Sleeve	1
10mm Sleeve	1
Phillips screwdriver (i.e. with cross slit)	1
one-piece screwdriver	1
Leak Detectors/Halogen Leak Detectors	1
Water/soapy water	1
pressure gauge	1

II. Basic Information Confirmation Form

move	name (of a thing)	Recording/verification of content	Ins _j rest	pection
1	Vehicle air conditi oning manip ulator	S NGZ S NGZ		□No
2	trouble code	record (in sports etc)	□Yes	□No
3	vehicle registration number	record (in sports etc)	□Yes	□No
4	Vehicle model	record (in sports etc)		
		single return air vent	□Yes	□No

			Guide
5	Air	dual return air vent	Guide
	Conditionin g Return Air Vent		□Yes □No
6	Air conditioner	Air conditioner nameplate location	
	nameplate	Air conditioner nameplate information: coding coding 190416988 R4070 5.07 serial number	NO:

Fill in the form below with the information confirmed above:

This is the form below with the information committee above.					
trouble	vehicle	Vehicle	Air conditioner nameplate		
code	registrati	model	Conditionin		
1/	on		g Return Air		
	number		Vent		
			Single	serial number	coding
			double		
			Single	serial number	coding
		X	double		_
		7.7	Single	serial number	coding
4			double		

III. Manipulator query parameters

move	methodologies				
1	Press and hold down the "Set Temperature +" key for				
	more than 3s to enter the parameter query interface:				
	SS NGZ HEF OUT OUT OUT OUT OUT OUT OUT OU				
2	Each time you press the "Set Temperature +"				
	button, the panel will display in turn: return air				
	temperature (L1) \rightarrow outdoor temperature (0U) \rightarrow plate				
	exchange water temperature (b) \rightarrow defrost temperature				
	/ PTC out				
	Water temperature (CS) → condensing coil temperature (L)				
	\rightarrow air conditioning DC voltage (U) \rightarrow DC current (I) \rightarrow				
	return air temperature (H) \rightarrow number of valve steps (F) \rightarrow				
	compressor frequency (CF)				
	→ fan current (FI) → system				
	$Pressure(P) \rightarrow PLC \ programme \ version \ (S) \ (e.g., at \ normal$				
	power-on, long press the "Temperature +" key, and the				
	data will be displayed in a cyclic manner from there)				

Main temperature zone display represents: return air temperature zone display represents return air



Main temperature zone display represents: Outdoor



Main temperature zone display represents: Water



6 Main temperature zone display represents: Defrost





Main temperature zone display representative: Air

ம



Main temperature zone display representative: DC



Main temperature zone display represents: return air



Main Temperature Zone Display Interface



Main temperature zone display interface representative:



Main temperature zone display interface representative:



Main temperature zone display interface representative: system pressure (3MPa) high and low pressure cycle



Main temperature zone display screen representation:



When it is in the parameter query interface, it will automatically exit the parameter query interface without keystroke within 5s, and the main temperature zone will display the return air temperature.



III. Three-in-one troubleshooting (dual electronics)

3-in-1 Repair Essential Tools

/ C .1 . \	, . , .
name (of a thing)	quantities
SOP-20	1
Programme download cable (PC-	1 root
panel)	
Programme download cable (air	1 root
return)	
ordinary network cable	1 root

1 EC1 Overhead Controller and Panel Communication

Failure

malfu	Fault	Type of	fault principle
nction	name	fault	- 184 _O
S			
coding			
EC1	Тор-	commu /	This fault occurs continuously when
ECI	mounte	niçat	the overhead controller does
	d	ion	not receive the manipulator
	controll	type	message for 1min
	er with	fault	consecutively.
	panel /	My COM	
	malfunct	E. 17	
	ion of	-G2	
	commun	3"/	
	ications		

move	methodologies	Inspection	Treatment
1		results	programm
1			е

1	Whether the manipulator plug connection is normally connected and reliable, whether the yellow and green wire pin is skewed and broken	□Yes	□No	Reconn ect or replace the wiring harness
2	Check that the manipulator harness in the duct is intact and not broken (pay special attention to the bolt mounting position)	□Yes	□No	Repair or Replace ment of Wiring Harness
3	Check that the manipulator harness is properly and reliably connected to the overhead connection	□Yes	□No	Repair or Replace ment of Wiring Harness

4	Disconnect the manipulator harness from the top unit and measure the resistance between the yellow and green wires at the manipulator end to see if it is $100{\sim}150\Omega$ (communication resistance 120Ω).	□Yes □No	Replaci ng the manipul ator harness	
5	Disconnect the manipulator harness from the top unit and measure the resistance between the yellow and green wires at the top unit end for abnormality $100{\sim}150\Omega$ (120Ω)	□Yes □No		
6	Along the yellow and green lines gradually check to the top controller, the intermediate line is in act, reliable connections.	□Yes □No		

7	Connect a low-voltage filter in series with the		Guide LOW-
	24V power input of the manipulator and		voltage
	separate the manipulator harness from the high-	□Yes □No	filters in
	voltage harness in the air duct, and try for a		series
	period of time to see if the fault no longer		with top
	occurs.		controll
			er
			inputs

2 LPF Low Pressure Failure Check

1.0	Fault	Type of	fault principle	Component
malfu nctio	name	fault		Monitoring
			1F 0	
ns codin g			W. W. Co.	
8				D0820
LPF	Low	Pressure	When the low pressure	(CV801 model)
	Press	monito	is below 0.05MPa	D0564
	ure Egilur	ring	This fault occurs when	(CV800 model)
	Failur e	týpe failure	<u> </u>	

move	methodolog	gies		Inspection	operating
		/ Y 22 /			method
1	Vehicle: Po	wer up and switch	on the vehicle to		View
	verify that t	the air-conditionin	g control panel		historic
	displays LPI			□Yes □No	al faults
A	trouble cod	le			
1		R410A	R407C		
110)	0~10°C	5~8Bar	3~6Bar		
W/	10~30°C	8~18Bar	6~13Bar		
2	Tap into a	manifold pressure	gauge to see if the		Insufficie
	_	ance pressure is w			nt or
		system balance pressure is within range			leaking
		ノヘント	□Yes □No	•	
				refrigera	
		7/ 2		nt,check	
					for leaks
					and refill.

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				Air Conditionin
3 Integ	Touch to check if there is a large temperature		,	Guide
rated	difference between the pipeline before and after			that the
Electr			No.	seconda
ical	the secondary expansion valve.	Yes.		ry
pool				electron
Man				ic
				expansi
age	ahead			on valve
men				operates
t				correctl
Syste				y when
111				re-
	empress			powerin
	Chipress			g up the
				unit.
4	Whether the cooling and heating modes can be			Check
	activated properly		No.	low
		Yes.		pressure
				sensor
5	Check whether the condensing and evaporating		3 T	Replace
	fans are operating normally and the air is		No.	ment of
	strong.	Yes.		the
				corresp
		27		onding fan
6	Check whether the temperature difference	40.		System
6	between the front and back of the main	0 /		clogged
	expansion valve is large by follohing the coding			or main
	and heating mode.			electron
			No.	ic
		Yes.	110.	expansi
	EMENTO N	res.		on valve
				not
	ahead			opening
	empress		\wedge	
	The state of the s			X 1
	/ 7 20/	X		
	The diagram shows the cooling mode and the			
	opposite for the heating mode.	11		

3 HPF High Pressure Failure Check

malfu nctio ns codin g	Fault name	Type of fault	fault princ		N	Juide Component Component Conitoring
HPF	High Press ure Failur e	Pressure monito ring type failure	When the high pr is higher than 2. This fault occurs	8MPa	,	00562 800 model)
move	methodologi	es		Inspec		operating
1			nat the air- plays HPF normally.	results □Yes		method View historic al faults
2	-	nanifold pressure nce pressure is w	gauge to see if the rithin range	□Yes	□No	System refriger ant overloa d
Integ rated Electr ical pool Man age men t Syste m	difference b	eck whether the etween the pipel ansion valve is la ahead empress	ine before and after	□Yes	□No	Check that the seconda ry electron ic expansi on valve operates correctl y when re- powerin g up the unit.
4	Whether the	_	ating modes can be	□Yes	□No	Check low pressure switch

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5	Check whether the condensing and evaporating fans are operating normally and the air is strong. Check whether the temperature difference	□Yes □No	ment of the corresp onding fan System
	between the front and back of the main expansion take is 10-30°C 8~18Bar ahead empress	□Yes □No	clogged or main expansi
	The diagram shows the cooling mode and the		
	opposite for the heating mode.		

4 C7H Compressor discharge temperature protection

malfu	Fault	Type of fault	fault principle	Component
	name			Monitoring
nctio				
ns				
codin				
g				
C7H	Compre	Switch type	When the monitored	X0000
	ssor	faults	temperature exceeds	
	discharg		103°C, the protective	
	e tomporo		switch opens and this fault occurs.	
	tempera ture		fault occurs.	
	protectio		X	
	n		M. O.	

	move	methodologies	Inspection results	operating method
	1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally C7H	□Yes □No	View historic al faults
	2	Compressor outside Check if X0000 is OFF temperature status <103°C conduction	□Yes □No	Replace ment of 3-in-1
	3	Measurement of the protection switch for 24V		Check
		input	□Yes □No	and repair the protecti on switch and PLC interline
1	4	Measurement of protective switches for		Replace ment of
		compliance	□Yes □No	exhaust
				gas tempera ture protecti

protecti

on switch

			ਰੌਬੀਰਿ PLC interline
4	Measurement of protective switches for compliance	□Yes □No	Replace ment of exhaust gas tempera ture protecti on switch
5	Check and repair the wiring between PLC pin X0000 and the protection switch.		

6 P2r Compressor **2** exhaust temperature protection

malfu nctio ns	Fault name	Fault type	fault principle	Componen t Monitorin g
codin				6
P2r	Compressor 2 Discharge Temperat ure Protection	Switching faults	Disconnect when the monitored temperature is greater than 103°C	X0000 (PLC2)

move	methodologies	Inspection results	operating method
1	Vehicle: Power up and switch on the vehicle to verify that the air-conditioning control panel displays P2r normally.	□Yes □No	View historic al faults
2	Check if X0000 is OFF	□Yes □No	Replace ment of 3-in-1

3	Measurement of the pro	otection switch for 24V		Gheck
	input		□Yes □No	and
	iiipat			repair
				the
				protecti
				on
				switch
				and PLC
				interline
4	Measurement of printer	tivepwitchesforwitch		Replace
	compliance	status		ment of
	<103°C	conduction	□Yes □No	exhaust
	>103°C	turn off (electric switch)		gas
	/ 100 C	turii ori (erectire switcii)	\wedge	tempera
				ture
			6	protecti
		1	- 0	on
				switch
5	Check and repair the wi	ring between PLC pin	3/	
	X0000 and the protection switch.			
	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
		12 5		
		1 10 5		
		* 3 × 3		

7 P3r Compressor 3 Exhaust temperature protection

		Sept. 2 1/2/		
malfu	Fault name	Type of fault	fault principle	Componen
	/ Y	N. C.	/ X =	t
nctio	//	8		Monitorin
ns			IIII.	g
codin	(4"/			δ
g				
P3r	Compressor	Switch type	Disconnect when	X0000
ESI	3 exhaust	faults	monitoring	(PLC3)
	temperatu	idants	temperature	, ,
	re		exceeds	
	protection		103°C	

/				
	move	methodologies	Inspection	operating
			results	method
	1	Vehicle: power up and switch on the vehicle to		View
		verify that the air conditioning control panel	□Yes □No	historic al faults
		displays normally P3r		

				~ . 1
2	Check if x0000 is 055de	Protection switch	□Yes □No	Replace ment of 3-in-1
	temperature	status		J-111-1
3	<103°C Measurement of the pro >103°C input	conduction tection switch for 24V, turn off (electric switch)	□Yes □No	Check and repair the protecti on switch and PLC interline
4	Measurement of protection compliance	tive switches for	□Yes □No	Replace ment of exhaust gas tempera ture protecti on switch
5	Check and repair the wi			

8 POH PTC overheat protection

_		/		·	
	16	Fault	Type	fault principle	Component
P	malfu	name	of faul		Monitoring
	nctio		t		
	ns				
	codin		XXX		
	g		K . X		
	РОН	PTC	switchg	When the PLC monitors the	X0004
	РОП	overheati		PTC overheat protection open,	
		ng	ear	the PLC will detect the PTC	

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protectio n fault	overheat protection open. This fault occurs when the switch is turned on	Guide
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morro	mathodologies	Test	oporating
move	methodologies		operating
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays POH normally. trouble code	results □Yes □No	method View historic al faults
2	Check if X0004 is OFF	□Yes □No	Replace ment of 3-in-1
3	Measure the PTC temperature control switch with a multimeter for compliance.	□Yes □No	Replace ment of PTC
4	Measurement of PTC temperature control protection switch for 24V input	□Yes □No	Check wiring between temperature control switch and PLC

9 Ello Faulty front steam defrost temperature sensor

malfu	Fault	Type of	fault principle	!	Componen
	name	faul			t
nctio		t			Monitorin
ns codin					g
g					
EIIO	Return air	Resist	This condition occur		
LIIO	temperat	ance	the PLC detects that		
	ure	detec	resistance of the retu	ırn air	
	sensor	tion	temperature sensor i	s out of	
	failureemp	era tur e	Temperanue confril switmalfunctions	8ΚΩ.	
	\130)°C	conduction	= 0	·
move	methodolog	ies	turn off (electric	Test	operating
	, 10		switch)	results	method

1	Vehicle: Power on and veri control panel displays EIIC trouble code	fy that the air conditioning normally.	□Yes □No	View historic al faults
2	Multimeter to measur tetapparature seasore range 80~50°C 50~20°C 20~-0°C 0~7°C		□Yes □No	Replace ment of tempera ture sensor
3	Measure the sensor winput voltage.	ith a multimeter for 2V	□Yes □No	Check and repair wiring between sensor and controll er

10 Ell1 Return air temperature sensor failure

0000	10	Fault	Type	fault principle	Component
	malfu	name	of faul	Z/ Y/	Monitoring
/	nctio ns		t		
	codin				
	g				
	EII1	Return air	Resist	This condition occurs when	D8402
	CIIT	temperat	ance	the PLC detects that the	
		ure	detec	resistance of the return air	

I mailinchons		sensor failure	tion class	temperature sensor is out of the range of 0.6~108KΩ . malfunctions	Guide
---------------	--	-------------------	---------------	---	-------

			T4	
move	methodologies		Test results	operating method
1		resuits		
1	Vehicle: power up and swi		View historic	
	that the air-conditioning co		al faults	
	normally.			
	trtemperature range	□Yes □No		
		resistance range		
	80~50°C	0.6~2.0KΩ	_	
	50~20°C	2.0~6ΚΩ		
	<u>2</u> 0~-0°C	6~14.2KΩ		D 1
2	Multimeter to measur	e if th q4:24:20KQ ir	10	Replace the
	temperature sensor re	esistance is within	5 /	return
	range	☑Yes □No	air	
			tempera	
			ture	
		1 10 10 10 10 10 10 10 10 10 10 10 10 10		sensor
	/	A . A .		
	/ 1	40 ×		11
3	Measure the sensor w	ith a multimeter for $2V$		Check
	input voltage.			and
	7			repair wiring
	₩ 7		□Yes □No	between
	OFF OFF			sensor
/	ÃZ/BZ (HOLD	The state of the s	11	and
	V			controll
/	0.5		110	er
1	ZERO INRUSH MINI MAX			
110	FLUKE 319			
	TRUE RMS CLAMP METER CAT III 600 V	CONTROL OF THE PARTY OF THE PAR		
	COM ¥ VN			
/				

11 Ell2 Evaporator left defrost temperature sensor failure

	Fault Type	fault principle	Component
malfu	name OI		Monitoring
nctio	faul		
ns			

codin g				Guide
EII2	Evaporato r left defrost temperatu re sensing device failure	Resist ance detec tion class	This condition occurs when the PLC detects that the resistance of the return air temperature sensor is out of the range of 0.6~108κΩ. malfunctions	D8403

move	methodologies	Test	operating
		results	method
1	Vehicle: power up and switch on the vehicle to verify that the air-conditioning control panel displays EII2 normally. trouble code	□Yes □No	View historic al faults
2	Multimeter to measure if temperature sensor resistance is within range	□Yes □No	Replaci ng the Left Defrost Temper ature Sensor
3	Measure the sensor with a multimeter for 2V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

12 Ell3 Evaporator right defrost temperature sensor failure

malfu	Fault name	Type fault principle of faul		Component Monitoring	
ns codin g		t			
EII3	Evaporato r right temperatu re sensing ⁵ device ^{0~2} failur ^{20~-}	tion 0°Class 0°C	This condition occurs the PLC detects that resistance of the retu temperature selfsor is the 16~12 KΩ 0.6~108 2.9π3 ΚΩ nctions 6~14.2ΚΩ	the rn air out of	D8404
	0~7		14.2~20ΚΩ	- 10	
move	methodolog	ies	/ ANTO	Test results	operating method
1	_	_	vitch on the vehicle to verify control panel displays E113	□Yes □	View historic al faults
	trouble code				
2	Multimeter to measure if the return air temperature sensor resistance is within range			Replace the return air tempera ture sensor	

Measure the sensor with a multimeter for 2V input voltage.

□Yes □No

13 Ell4 Ottdoor temperature sensor failure

	∠0~-0 C		0°14.2N\\\\	
	Fault 0~7	Type	14f2t2PKPnciple	Component
malfu	name	of	/ XATO	Monitoring
nctio		faul	W. C.	8
ns		ι		
codin			A STORY OF THE STO	
g				
EII4	Outdoor	Resist	This condition occurs when	D8401
CII4	temperat	ance	the PLC detects that the	
	ure	Dete	resistance of the return air	~
	sensor	ction	temperature sensor is out of	
	failure	Class	the range of $0.6^{\circ}108K\Omega$.	
			malfunctions	

	move	methodologies	Test	operating
			results	method
	1 /	17.1:1		View
	/ A	Vehicle: power up and switch on the vehicle to verify		historic
/	. 400	that the air-conditioning control panel displays EII4		al faults
1000		normally.	□Yes □No	
Magane	W	trouble code		
1				
,				

2	Multimeter to measure if the outdoor temperature sensor resistance is within range	□Yes □No	Replace ment of Outdoor Temper ature Sensor
3	Measure the sensor with a multimeter for 2V temperature range Corresponding input voltage. 80~50°C 0.6~2.0KΩ 20~-0°C 2.0~6KΩ 20~-0°C 14.2×20KΩ	□Yes □No	Check and repair wiring between sensor and controll er

14 Ell5 Faulty condensate coil temperature sensor

	1.0	Fault name	Type	fault principle	Comp
	malfu	.3500	of		one
	nctio	1 1 1	faul		nt
		/ A 7 d	t		Mo
	ns	11 3			nito
	codin	/ _ ` \			ring
	g /	CAVI			
	Fur4	Condensation	numeric	When the PLC monitors the	D8400
	EII5	coil	al value	condensation temperature	
À		temperature	of	sensor resistance value, the PLC	
	10,	sensor failure	electrical	will detect the condensation	
Ų,	/ /		impedan	temperature sensor resistance	
			ce	value.	
			phylogen	This fault occurs when the	
			у	range of $0.6\sim108K\Omega$ is exceeded.	

move	methodologies		Test	operating
		XT	results	method

1	Vehicle: Power up and switthat the air-conditioning conformally. trouble code	•	□Yes □No	View historic al faults
2	Measure condensing of sensor resistance with if it is within range temperature range 80~50°C 50~20°C 20~-0°C 0~7°C		□Yes □No	Replace condens ing coil tempera ture sensor
3	Measure the sensor winput voltage.	ith a multimeter for 2V	□Yes □No	Check and repair wiring between sensor and controll er

15 Ell6 Plate change inlet water temperature sensor failure

ſ	1				
	110.7	Fault name	Type	fault principle	Comp
	malfu		of		one
	nctio		faul		nt
Ì	lictio		t		Mo
	ns				nito
	codin				ring
	g				
	FIIC	Faulty inlet	Resist	This fault occurs when the PLC	
	EII6	water	ance	detects that the resistance of	D8407
		temperatur	detec	the inlet water temperature	
		e sensor	tion	sensor is out of the range of	
	4		class	0.6~108ΚΩ.	

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move	methodologies	Test results	operating method
1	Vehicle: Power up and switch on the vehicle to verify that the air-conditioning control panel displays EII6 normally. trouble code	□Yes □No	
2	temperature range Corresponding resistance range Multimete to measure if the γεσισκο temperature Sensor resistance fix γετισκο ταπρε 0~20°C 6~2.6ΚΩ		Replace ment of water
	Tange	□Yes □No	outlet tempera ture sensor
3	Measure the sensor with a multimeter for 2V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

16 Ell7 Board swap water temperature sensor failure

И		0 /			
	10/	Fault name	Type of fault	fault principle	Component
b	malfu				Monitoring
P	nctio				
	ns				
	codin				
	g				
	EII7	Failure of	Resistance	PLC detects sensor	D8406
	LII/	board	detection	resistance exceeding	
		exchange		0.6~108KΩ range of faults	
		water	class	block	

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temperatur		Guide
e sensor		

	.1 1 1 •			
move	methodologies		Test results	operating method
1	Vehicle: Power up and switthat the air-conditioning co	,	resuits	View historic al faults
	normally. troumperature range	Corresponding resistance range	□Yes □No	
	40~50°C 20~40°C	1.2~0.9KΩ 2.6~1.2KΩ		
2	0~20°C Multimeter to measur temperature sensor re range	/ Au.)*	□Yes □No	Replace ment of water outlet tempera ture sensor
3	Measure the sensor winput voltage.	ith a multimeter for 2V	□Yes □No	Check and repair wiring between sensor and controll er

17 H1r Main circuit 1 Return air temperature sensor failure

۲.					
		Fault name	Type of fault	fault principle	Component
	malfu				Monitoring
	nctio		X		111011110111118
	ns	XSA			
	codin				
	g				

H1r	Main circuit 1 Return air	Resistance detection	resistance exceeding	Guide D8405
	temperature sensor failure	class	0.6~108KΩ range of faults block	

move	methodologies		Test	operating
		Corresponding	results	method
1	temperature range Vehicle: power up and switch & 80~50°C that the air conditioning control 50~20°C normally 10°C trouble coto °C		□Yes □No	View historic al faults
2	Multimeter to measure if to sensor resistance is within	1	□Yes □No	Replace the main circuit 1 return air tempera ture sensor
3	Measure the sensor with a input voltage.	multimeter for 2V	□Yes □No	Check and repair wiring between sensor and controll er

18 H2r Main circuit 2 Return air temperature sensor failure

16	Fault name	Type of fault	fault principle	Compone
malfu				nt
nctio				110

ns						^{Guide} Monitorin
codin	temperature r	ange	Coı	responding		g
g			resi	stance range		
112	Main & Contact	Resis	tance (0.6~2₽QK Qdetects	sensor	
H2r	2 Retu 50~21 °C		ction	2.0r€KΩ ance ex	ceeding	
	tempe20tu0°C	uete	Ction	6 O1 &: 2 K(B) C rang	ge of faults	
	sensor 0~7°C	cla	ass 1	4.2~20KΩ block	ζ	
	failure		1			

move	methodologies	Test results	operating method
1	Vehicle: power up and switch on to verify that the air- conditioning control panel displays normally H2r trouble code	□Yes □No	View historic al faults
2	Multimeter to measure if temperature sensor resistance is within range	□Yes □No	Replace main circuit 2 return air tempera ture sensor
3	Measure the sensor with a multimeter for 2V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

19 Har Sub-circuit 1 Return air temperature sensor failure

	80~50°C	0.6~2.0KΩ	
1.0	Faulionanie Ty	pe of fault 2.0~6KQult prin	ciple Component
malfu	20~-0°C	6~14.2KΩ	Monitoring
nctio	0~7°C	14.2~20KΩ	

ns codin g				Guide
H3r	Sub-circuit 1 Return air temperature sensor failure	Resistance detection class	PLC detects sensor resistance exceeding 0.6~108ΚΩ range of faults block	D8408

	.1 1 1 .		. •
move	methodologies	Test	operating
		results	method
1	Vehicle: power up and switch on to verify that the air-		
	conditioning control panel displays properly H3r	□Yes □No	
	trouble code	6	
	/ W	(0)	
2	Multimeter to measure if temperature	×/	Replace
			ment of
	sensor resistance is within range		sub-
		□Yes □No	
			return
	/ W 0 /		air
	/ 47 4 /		tempera
			ture
			sensor
3	Measure the sensor with a multimeter for 2V		Check
	input voltage.		and repair
		, X	wiring
	7	□Yes □No	
	OFF		sensor
	® months Hou		and
/ A	temperature range corresponding resistance range		controll
4	80~50°C 0.6~2.0kΩ		er
1	50~20° (max) (m) 2.0~6KΩ		
	20~-0°C= 319 6~14.2KΩ		
	THE PINS CAMP METER 7° C-CATE 452 ~ 20KO		
	com 1 Vn 1432~20K12		
/			

20 H4r Sub-circuit 2 Return air temperature sensor failure

1.0	Fault name Type of fault	fault principle	Compone
malfu			nt
nctio			

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ns codin g				Guide Monitorin g
H4r	Sub-circuit 2 Return air temperature sensor failure	Resistance detection class	PLC detects sensor resistance exceeding 0.6~108κΩ range of faults block	

		T	_
move	methodologies	Test	operating
		results	method
1	Vehicle: power up and switch on to verify that the air-		
	conditioning control panel displays properly H4r	□Yes □No	
	trouble code		
2	Multimeter to measure if the return air temperature sensor resistance is within		Replace the
	range	□Yes □No	return air
	Tunge	птеѕ шло	tempera
			ture sensor
			Selisoi
	The state of the s		
3	Measure the sensor with a multimeter for 2V		Check and
	input voltage.	, X	repair
	77		wiring
	OPF TO THE	□Yes □No	between sensor
/ A	HOD CONTRACTOR OF THE PARTY OF		and
1	- 20 9		controll er
D)	TO MUSE WE		
	FLLIKE 319 TRUE RMS CLAMP METER		
	COM UNITED TO SERVICE OF THE PARTY OF THE PA		

21 HUF High Voltage Input Power Failure Check

malfu nction s coding	Fault name	Type of fault	fault principle
HUF	High- voltage input disconne ction fault	Voltage Inspection	This fault occurs when the input voltage for load-side detection is less than 400V.

Vehicle: power up and switch on to verify that the	Test results □Yes □No	operating method View historic al faults
Vehicle: power up and switch on to verify that the air conditioning control panel displays normally. HUF Fault Code		View historic al faults
air conditioning control panel displays normally. HUF Fault Code	∃Yes □No	historic al faults
2 Measurement of fuse continuity		Renlace
Measurement of fuse continuity	⊐Yes □No	ment of fuses
Measure whether the air conditioner high voltage input is in the range of 450~750V.	⊒Yes □No	Check the air- conditio ning insuran ce at the vehicle end Contact the vehicle manufa cturer to restore air- conditio

- 94/				
SØI	NGZ	1	Matsushige Ele Air Conditionii	ectric Bus
			Tiffng power if necessa ry	Ід Керап
4	Measure whether the input voltage of 3-in-1 is between 450~750V.	□Yes □No	Check main contacto r weak coil and input voltage	

Replace the 3-in-1 and try to run for a period of time whether the fault no longer occurs

□Yes □No

22 LU Inverter undervoltage

	malfu	Fault	Type of	fault principle	
	nction	name	fault		
CC	ding		XXL		

S	<i>6</i> //	N	C	7
	v	-	•	

Matsushige Electric Bus Air Conditioning Repair

Guide	

LU Inverter underv oltage fault

Voltage Dete ction

This fault occurs when the input voltage is detected to be less than **300V** at the load side during operation.

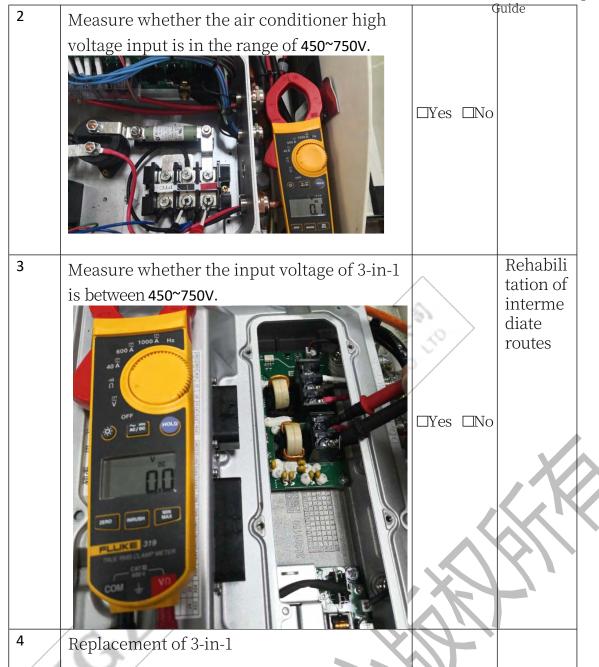
move	methodologies	Test	operatin
		results	g method
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally LU trouble code	□ _{No} Yes.	0.
2	Measurement of fuse continuity	□ No	Replace ment of fuses
3	Measure whether the air conditioner high voltage input is in the range of 450~750V.	□ No	Check the air- conditio ning insuran o. ce of the whole vehicle Contact the vehicle manufa cturer to restore the air- conditio ning power supply if necessa ry

				ruida
4	Measure whether the input voltage of 3-in-1 is between 450~750V .			main contacto r weak coil and input voltage
		Yes.	No.	
	OFF WOLD			
5	Replace the 3-in-1 and try to run for a period of time, whether the fault no longer occurs	ĽYes	s 🗆 No	

23 OU Inverter overvoltage

malfu	Fault	Type of	fault principle
nction	name	fault	
coding			
OU	Inverter over pressure failure	Voltage Detection resemble	This fault occurs when an input voltage higher than 750V is detected on the load side during operation.

move	methodologies	Test	operatin
		results	g method
1	Vehicle: Power up and switch on the vehicle to		View historic
	verify that the air conditioning control panel displays OU normally.	□Yes □No	al faults
	trouble code		



24 COC Compressor Inverter Overcurrent

malfu	Fault	Type of	fault principle
nction	name	fault	
coding		X	
COC	Compres	current	When the inverter detects that the
COC	sor	detection	compressor turn-to-turn current
	variants	resemble	exceeds the setting

Frequenc	This fault occurs when the maximum
у	value
converter	
overcurr	
ent	

100	months adologica	Transcation	Twooters
move	methodologies	Inspection results	Treatment
		resuits	programm
1			e View
1	Vehicle: power up and switch on the vehicle to verify		historic
	that the air conditioning control panel is displaying	□Yes □No	al faults
			arraans
	COC normally.		
2	No abnormal noise during compressor operation		
		□Yes □No	
			Tichton
3	Check compressor wiring connections for reliable		Tighten connecti
	connections and correct wire sequence (U.),	□Yes □No	ons or
	(v, w correspond to red, black and white)		correct
			wiring
			sequenc
			e
	100		
	- F		
	The state of the s		
4	Check that the compressor three-phase wiring is		Repair
		□Yes □No	or
	intact, no damage, short circuit		replace
			ment of
			wiring

		-	An Conunionii	16 110.
5	Measure the compressor turn-to-turn	1	Guide Replace	
	resistance, three lines of two measurements,		ment of	
	three groups of resistance value is equal and		compres	
	less than 10Ω	□Yes □No	sor	
	6			
6		~	Replace]
6	Multimeter to measure whether the resistance) /	ment of	
	between the compressor phase line and the shell		compres	
	is more than $5M\Omega$.	□Yes □No	sor	
		LIYES LINO	501	
	Diagra Utoria			
	AUC Transferred to the Control of th			
	TOP RAYS MUITINEERS			
	MILA PAR			
	My Man		X'\'	
	18222€(USB) 18Anux mapa			
	Court Avoir	W.		
			_	
7	Replacement method, replace the three in one,	80	Replace	
riffs.	test run for a period of time, whether the fault	- 0	ment of	
	no longer occurs	~ ~ /	compres	
		□Yes □No	sor	

25 LOC condensing fan inverter overcurrent

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			
LOC	Conden sing fan inverter over stream of water or sth. resemblin g one	Current detec tion class	This fault occurs when the triplex detects a DC output current greater than 100A

move	methodologies	Inspection results	Treatment programm e
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays properly LOC trouble code	□Yes □No	View historic al faults
2	Check the appearance of the fan is intact, no damage, no blockage, fan blade rotation freely	□Yes □No	Replace or remove the blockag e
3	Check the condensing fan line connections, whether the connection is reliable, no skewed plugs, back pins	□Yes □No	Tighten connecti ons or correct wiring sequenc

Air Conditioning		
Guide		
□Yes □No or replace ment of wiring	4 Check that the condensing fan wiring is intact and free of damage and short circuits.	4
	Remove and disconnect the condensing fan inserts one by one, and test each condensing fan disconnected by switching it on and testing whether the fault no longer occurs;	5
ment of 3-in-1	1,Connect the condensing fan (OUT2 power cord) to the evaporating fan (OUT1) and remove the original evaporating fan (OU1 power cord). 2,Swap AVO1 and AVO2 pins in the PLC interface; 3, whether the fault no longer occurs after a period of ventilation mode operation;	6
ace;	original evaporating fan (OU1 power cord). 2,Swap AVO1 and AVO2 pins in the PLC interface; 3, whether the fault no longer occurs after a period of ventilation mode operation; OUT2 OUT1	

8	Replace the		Guide
	appropriate		
	condensing fan	□Yes □Ne	

26 EOC Evaporator fan inverter overcurrent

malfu	Fault	Type of	fault principle
nction	name	fault /	2 19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
S	Haine	Tautt	W G
coding		23	
EOC	Evapora	Current	When the triplex detects that the
EUC	tor fan	detec	evaporator fan output current is greater
	inverter	tion	than the
	over	class	This fault occurs at 100A
	stream of	30V	
	water or	5	
	sth.		
	resemblin		
	g one		

move	methodologies	Inspection	Treatment
Attach		results	programm
			е
1	Vehicle: power up and start to verify that the air		View
			historic
	conditioning control panel displays EOC normally.	□Yes □No	al faults
	trouble code		
	arsubic code		
2	Check the appearance of the fan is intact, no		Replace
	damage, no blockage, fan blade rotation freely		or
		□Yes □No	remove
			the
			blockag
			е
	XSA		

3	Check the evaporator fan line connections, whether the connection is reliable, no skewed plugs, back pins	□Yes	□No	Tighten connecti ons or correct wiring sequenc e
4	Check that the evaporator fan wiring is intact and free of damage and short circuits	□Yes	□No	Repair or replace ment of wiring
5	Remove and disconnect the evaporator fan inserts one by one, and test the fault by switching on the machine once for each evaporator fan disconnected to test if the fault does not occur again;	□Yes	□No	Replace ment of the appropr iate evapora tor fan
6	1, the condensing fan (OUT2 power cord) into the evaporating fan (OUT1) feet and remove the original evaporating fan (OUT1 power cord); 2, ventilation mode operation for a period of time whether the fault no longer occurs; OUT2 OUT1	□Yes	□No	Replace ment of 3-in-1

		=	Air Conditionii	ng Repair
7	Replacement of the appropriate evaporator fan		Guide	
		□Yes □No		

Matsushige Electric Bus

SØNGZ



27 LOH condensing fan inverter overheating

malfu nction s	Fault name	Type of fault	fault principle
coding			
LOH	Conden sing fan inverter over heat up	Temper ature Dete ction	This fault occurs when the detection value of the 3-in-1 internal temperature sensor reaches or exceeds the set maximum value.

		\triangle		
move	methodologies	Inspe		Treatment
		result	S	programm
1	Vehicle: power up and switch on the vehicle to verify that the air-conditioning control panel displays LOH normally. trouble code	□ Yes.	No.	View historic al faults
2	Turn on the machine and run it for a while to check if the heat fan in the appliance compartment is running.	☐ Yes.	No.	Replace ment of 3-in-1
3	Check that the air inlet and outlet of the electrical compartment are cleared.	☐ Yes.	No.	Clear the blockag e

Check that the electrical compartment insulation foam is intact and has not fallen off.

No. Yes.

28 EOH Evaporator fan inverter overheating

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			
EOH	Evapora	Temper	This fault occurs when the detection
LOII	tor fan	ature	value of the 3-in-1 internal
	inverter	Dete	temperature sensor reaches or
	over	ction	exceeds the set maximum
	heat up		value.

move	methodologies		ection	Treatment
	/ A)V	resul	ts/	programm
		5/		е
1	Vehicle: Power on and verify that the air conditioning			View
	control panel displays EOH normally.		N.T.	historic
	trouble code		No.	al faults
	/ 34 32 /	Yes.		
2	Switch on and run for a period of time to check			Replace
	whether the heat fan in the appliance			the
	compartment (including stand-alone fans and		No.	cooling
	fans supplied with the appliance) is running.	Yes.		fan or
				corresp onding
				compon
				ents
				01165
/				
3	Check that the inlet and outlet of the electrical			Clear
1	compartment are not blocked			the
110)	compartment are not brocked			blockag
W /		Ш	No.	е
		Yes.		
	0			

4	Check that the electrical compartment		Replace
	insulation foam is intact and has not fallen off.		or reapply
			insulati
			on foam
		\square No.	
		Yes.	

29 COH Compressor inverter overheat

malfu	Fault	Fault type	fault principle
nction	name	75 100	
s coding	name	My Tion	
	Compres	Temperatu	When the 3-in-1 internal temperature
СОН	sor	re	sensor detection value reaches or
	variants	Detection	exceeds the
	Frequenc	resemble	This fault occurs when the set
	У		maximum value is exceeded.
	converter		
1	overheati		
	ng		

move	methodologies	Inspection	
		results	programm
			е
1	Vehicle: power up and switch on the vehicle to verify		
	that the air-conditioning control panel displays COH		
	normally.	□Yes □No	
	trouble code		

2	Switch on and run for a period of time to check whether the heat fan in the appliance compartment (including stand-alone fans and fans supplied with the appliance) is running.	ment of cooling fans or corresp onding compon ents
3	Check that the air inlet and outlet of the electrical compartment are cleared.	Clear the blockag To e
4	Check that the electrical compartment insulation foam is intact and has not fallen off.	Replace or reapply insulati on foam

30 LOL condensing fan inverter overload

,	malfu nction	Fault	Type of	fault principle
	S	name	fault	
	coding			

1.01	Conden	Current	This fault occurs when the triplex
LOL sing fan		detec	detects that the condensing fan
	inverter	tion	output (DC2) current is greater
	over	class	than the rated fan current
	year		

move	methodologies	Inspection results	Treatment programm e
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays properly LOC trouble code	□Yes □No	View historic al faults
2	Check the appearance of the fan is intact, no damage, no blockage, fan blade rotation freely	□Yes □No	Replace or remove the blockag e
3	Check the condensing fan line connections, whether the connection is reliable, no skewed plugs, back pins	□Yes □No	Tighten connecti ons or correct wiring sequenc e
4	Check that the condensing fan wiring is intact and free of damage and short circuits.	□Yes □No	Repair or replace ment of wiring

5	Remove and disconnect the condensing fan	(Replace
	inserts one by one, and test each condensing fan		the
	disconnected by switching it on and testing		appropr
		Yes □No	iate
	whether the fault he foliger occurs,	162 (71/0)	condens
			ing fan
	Committee of the Commit		iiig iaii
	ALE -		
6	1,Connect the condensing fan (OUT2 power cord)		Replace
	to the evaporating fan (OUT1) and remove the		the
	original evaporating fan (OU1 power cord).	Yes □No	appropr
	2,Swap AVO1 and AVO2 pins in the PLC interface;		iate
	3, whether the fault no longer occurs after a		condens
	period of ventilation mode operation;		ing fan
	period of ventuation mode operation,		
	OUT2 OUT1		
			< 21
8			
8	Replace the 3-in-1 and try it for a while, does the	X	
	fault no longer occur		
		Yes □No	
/		100 1110	
/ /			
4		•	

31 EOL Evaporator fan inverter overload

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			
EOL	Evapora	Current	This fault occurs when the triplex
	tor fan	detec tion	detects that the evaporator fan
	inverter		output (DC1) current is greater
	over	class	than the rated fan current
	year		

move	methodologies	Inspection	Treatment
		results	programm
		9)	е
1	Vehicle: Power up and switch on the vehicle to verify	- 0	View
	venicle: Power up and switch on the venicle to verify	~ / /	historic
	that the air conditioning control panel displays	□Yes □No	al faults
	properly LOC		
	trouble code		
2	Check the appearance of the fan is intact, no		Replace
	damage, no blockage, fan blade rotation freely		or
		□Yes □No	remove
			the
			blockag
			е
	The state of the s		
3	Check the evaporator fan line connections,		Tighten
1	whether the connection is reliable, no skewed		connecti
	plugs, back pins	□Yes □No	ons or
			correct
			wiring
			sequenc
			е
4	Check that the evaporator fan wiring is intact		Repair
	and free of damage and short circuits	□Yes □No	or
			replace
	X-N '\		ment of
			wiring

5	Remove and disconnect the evaporator fan inserts one by one, and test the fault by switching on the machine once for each evaporator fan disconnected to test if the fault does not occur again;	□Yes	□No	the appropriate condens ing fan
6	1,Connect the condensing fan (OUT2 power cord) to the evaporating fan (OUT1). Foot position and removal of the original evaporator fan (OU1 power cord); 2,Swap AVO1 and AVO2 pins in the PLC interface; 3, whether the fault no longer occurs after a period of ventilation mode operation; OUT2 OUT1	□ Yes.	No.	Replacem ent of the correspon ding Evaporatio n fans

SØI	NGZ			Matsushige Ele	
				Air Conditionii	ng Repair
8	Replace the 3-in-1 and try it for a while, does the			Guide	
	fault no longer occur				
			No.		
		Yes.			

32 COL Compressor inverter overload

SØNGZ

malfu	Fault	Type of	fault principle
nction	name	fault	
S		iaar	\wedge
coding			
COL	Compres	current	When the triplex detects that the
COL	sor	detection	compressor output current is greater
	variants	resemble	than the motor
	Frequenc		This fault occurs at rated current
	У		W 180
	converter		/ AT 5" /
	overload		

move	methodologies	Inspection	Treatment
		results	programm
			е
1	Vehicle: power up and switch on to verify that		View
			historic
	the control panel displays properly COL	□Yes □No	al faults
2	No abnormal noise during compressor operation		
1		□Yes □No	

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		1	Guide
3	Check compressor wiring connections for reliable		Guide Tighten
	connections and correct wire sequence (U.),		connecti
	(V, W correspond to red, black and white)	□Yes □No	ons or
	(v, vv correspond to rea, black and white)		correct
			wiring
			sequenc
			e
	FAN		
		\wedge	
		4	D :
4	Check that the compressor three-phase wiring is		Repair
	intact, no damage, short circuit	□Yes □No	or
	, , ,	0/	replace
	W. O.		ment of
			wiring
5	Measure the compressor turn-to-turn		Replace
	resistance, three lines of two measurements,		ment of
	three groups of resistance value is equal and		compres
	less than 10Ω	□Yes □No	sor
			/ . K
	0.0		
		, X	
		$\langle \langle \langle \langle \rangle \rangle \rangle$	
/			
/		114	
		*	
The "	2		
		1	

6	Multimeter to measure whether the resistance	Replace
	between the compressor phase line and the shell	ment of
	is more than 5MO	compres
	Is more than 5Mc2. □Yes □No	sor
	LIMATE UTGIE	
	L OL. "	
	The Control of the Co	
	True May Multimeters MIL A MILE	
	One was an analysis of the state of the stat	
	Vr Ang.	
	ori As	
	Attricture	
	CA COM 4-YORK	
7	Replacement method, replace the three in one,	Replace
	test run for a period of time, whether the fault	ment of
	no longer occurs	compres
	□Yés □No	sor
	/ W 67 /	

33CHF Compressor Inverter Hardware Failure

malfu	Fault	Type of	fault principle
nction	name	fault	
S	/ A " o	3	
coding	(1)		
CHF	Compre	Three-	3-in-1 internal detection and feedback of
CHE	ssor	in-one	fault codes
	Inverter	interna	raun codes
	Hardwa	1	
	re	malfun	
	malfuncti	ction	
	ons		

т.	/				
/	move	methodologies		Inspection	Treatment
			\times	results	programm
					е

SØ	N	\mathbf{G}	\mathbf{Z}
----	---	--------------	--------------

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1	Vehicle: power up and switch on the vehicle to verify that the control panel displays CHF normally.	□Yes □No	Twiew historic al faults
2	Replacement method, replace the three in one, test run for a period of time, whether the fault no longer occurs	□Yes □No	

34FL Reverse connection fault

malfu	Fault	Fault type	fault principle
nction s	name		
coding			
FL	reverse	Voltage	When the triplex detects that the
'-	polarity	Detection resemble	polarity of the input power supply is opposite to the marking
	fault		This fault occurs

move	methodologies	Inspection	Treatment
		results	programm
			е
1	Complete vehicle: power up and start to verify	2)	View
	Complete venicle, power up and start to venity	- 10	historic
	that the control panel displays properly FL	□Yes □No	al faults
	TAME C		
2	Check that the polarity of the air-conditioning		Correcti
	input power supply matches the marking.		ng
	input power supply materies the marking.	□Yes □No	power
			supply
			polarity
3	Check that the polarity of the 3-in-1 input power		Correcti
	supply matches the marking.		ng
	supply materies the marking.	□Yes □No	power
	/ Y & /		supply
			polarity

35 C5F Pressure Sensor Failure

District of the last	malfu	Fault	Type of	fault principle
	nction	name	fault	
/	coding			
	C5F	pressure	Voltage	The triplex detects that the pressure
		sensing	Detection	sensor feedback voltage exceeds
		device	Detection	This fault occurs in the 0~5V range
		failure		

move	methodologies		Inspection	Treatment
			I I	

					All Collaitioilli
				results	Guide programm e
1	Vehicle: power up that the air-condi normally.	□Yes □No	View historic		
3	Measure the sensor for 5V input voltage			□Yes □No	Check wiring from sensor to PLC
4	Measure whethe		High Pressure Sensing Feedback Voltage (V)	ĤYes □No	Check sensor to PLC feedbac k signal line
	0~1.6	0.5~1.88	0.45~2.13		
5	Replacement of 3.0~4.0	the pressure ser 3.09~3.93	2,13~3.61 SOF 3.61~4.03		
		1 / E TO TO	3		

36 S1r Pressure sensor failure

malfu	Fault	Type of	fault principle
nction	name	fault	
coding	\V/		
S1r	pressure	Voltage	Triplex detects pressure transducer 1
-	sensing	Detection	feedback voltage exceeded
	device	Detection	This fault occurs in the 0~5V range
	failure		\times \times

move	methodologies			Inspection	Treatment
			<u> </u>	results	programm

				(Guide e
1	Vehicle: Power up that the air condit properly S1r		ne vehicle to verify nel displays	□Yes □No	View historic al faults
3	Measure the sen	sor for 5V input	voltage	□Yes □No	Check wiring from sensor to PLC
4	Measure whether in the strange (MPA)		dback voltage is High Pressure Sensing Feedback Voltage (V) 0.45~2.13	□Yes □No	Check sensor to PLC feedbac k signal line
	0~1.6		/ a. b. Tills		
5	Replacement of 3.0~4.0	the pressure ser 3.09~3.93	2,13~3.61 sor 3.61~4.03	r	

37 S2r Pressure sensor failure

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			
car	pressure	Voltage	Triplex detects pressure transducer 1
S2r	sensing	Detection	feedback voltage exceeded
Alleman	device	Detection	This fault occurs in the 0~5V range

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l tailiiro	
lanuic	

move	methodologies	Inspection	Treatment
		results	programm e
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays properly S2r	□Yes □No	View historic al faults
3	Measure the sensor for 5V input voltage	□Yes □No	Check wiring from Sensor 2 to PLC.
4	Measure whether the sensor feedback voltage is in the range of 0~5V	□Yes □No	Check Sensor 2 to PLC feedback signal wire
5	Replacement of pressure sensor 2		

38 S3r Pressure sensor failure

malfu	Fault	Fault type	fault principle
nction s	name		
coding			
S3r	pressure sensing	Voltage Detection	Triplex detects pressure transducer 3 feedback voltage exceeded
	device	Detection	This fault occurs in the 0~5V range
	failure		

move	methodologies			Inspection	Treatment
IIIOVC	Pressure (MPa)	Low Pressure	High Pressure	results	programm
	, , ,	Sensor	Sensing	resurts	e e
1	Vehicle: Power i	Reverse pand switch or	Feedback Voltage the vehicle to		View historic
	verify that the ai	r(V)nditioning c	ontrol panel	□Yes □No	al faults
	0~1.6 displays properl 1.6~3.0	0 53°1 .88 y 53°1 1.88°3.09	0.45~2.13 2.13~3.61		
3	3.0~4.0 Measure the sen				Check
		Jai j	•	□Yes □No	wiring from Sensor 3
					to PLC.
4	Measure whether in the range of 0 °		dback voltage is	□Yes □No	Check Sensor 3 to PLC
					feedback signal wire

	/ 608-4 -30 /		
5	Replacement of pressure sensor 3	Guide	
			S
	THE MILE WILLIAM		

39 S4r Pressure sensor failure

	ma	lfu	Fault	Type of	fault principle
/	nct	ign,	esaura (MPa)	Low Pressu	1 1
e d	S	" /	Tiairie /	Sensor	Sensing
	coding			Reverse	Feedback Voltage
	S4r		pressure	Fyedtagltag	ge Triplex detects pressure transducer 4
J	341		sensing	(Y) etection	feedback voltage exceeded
			.6 device	0.5~1.88	This fault occurs in the 0~5V range
		1.6	~3. €ailure	1.88~3.09	2.13~3.61
		3 0	~4.0	3 09~3 93	3 61~4 03

Inspection Treatment methodologies move results programm View 1 Vehicle: Power up and switch on the vehicle to historic verify that the air conditioning control panel □Yes □No al faults displays properly **S4r** Check 3 Measure the sensor for **5V** input voltage wiring from □Yes □No Sensor 4 to PLC.

4	Measure the ser is within range	nsor feedback vo	ltage to see if it	□Yes □No	to PLC
					feedback signal wire
5	Replacement of	pressure sensor	4		
	Pressure (MPa)	Low Pressure	High Pressure		
		Sensor Reverse	Sensing Feedback Voltage		
		Feed voltage (v)	(V)	9	
	0~1.6	0.5~1.88	0.45~2.13		
	1.6~3.0	1.88~3.09	2.13~3.61		
	3.0~4.0	3.09~3.93	3.61~4.03		

40 UHF Electronic Expansion Valve Failure

malfu	Fault	Fault type	fault principle
nction s	name		
coding			
UHF	electronic	CullCit	Three-in-one detection of electronic
UHF	expansion	detection	expansion valve coil output current
	valve	actection	overfan
	failure		This fault occurs when you are
			surrounded by

move	methodologies	Inspection	Treatment
		results	programm
			e
1	Vehicle: posseit up and switchs on to verify that the	27	View
			historic
	air conditioning control panel displays normally.	□Yes □No	al faults
	guide oran pink porn ferro pessimistic		
	wire ge ogra us		
2	Measurites electronic papansion valve coil		Replace
	r resistançe)		electron
			ic
	nume rical 92 Ω (± 3) 92 Ω (± 3) 46 Ω (± 3)		expansi
	value		on valve
	of value		coil
	electron		
	ical		
	impe	□Yes □No	
	danc		
	e III		
/	7 11		
	46±3Ω		
	Λ6±3Ω	<u> </u>	
	46±30		
	46±3Ω 46±3Ω 46±3Ω 46±3Ω		
	40		
3	Check and repair miswiring and short circuits		
	between the PLC and the expansion valve coil.		

41 F1r Electronic Expansion Valve 1 Fault

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malfu	Lauit	Type of	fault principle Guide
nction s	name	fault	
coding			
F1r	electroni	current	Three-in-one detection of electronic
LII	c expansio	detection	expansion valve coil output current overfan
	n		This fault occurs when you are
	Valve 1		surrounded by
	Failure		

move	methodologies	Inspection	Treatment
lilove	inculodologies	results	programm
		resurts	e e
1	Vehicle: Power up and switch on the vehicle to verify that the air-conditioning control panel displays normally F1r	□Yes □No	View historic al faults
	Coil 1 Coils 2 Common		
2	Measuring electronic expansion valve (Qsie)		Replace
			electron
			ic
	guide oran pink porn ferro pessimistic		expansi
	colou ge ogra us	\wedge	on valve
	(colo phic /		coil
	r ur	9)	
	nume rical value of electrical impedance e $\mathbf{A6}^{\mathbf{t}3\Omega}$	□Yes □No	
3	Check and repair miswiring and short circuits		
	between the PLC and the expansion valve coil.		

42 F2r Electronic Expansion Valve **2** Fault

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			
F2r	electroni	current	Three-in-one detection of electronic
1 21	C	detection	expansion valve coil output current
	expansio		overfan
	n		This fault occurs when you are
	Valve 2		surrounded by
	Failure		-

					/		
move	method	dologies		/		Inspection	Treatment
					70	results	programm
		Coil 1	Coils 2	common	1	2,	е
1	Wohiele	· Dower up o	ad cavitch on the	(use)	fs7		View
	venicie	rower up ai	nd switch on the	(Neutral)	шу		historic
	thatithe	ajranhditin	ing control pane	l displays		□Yes □No	al faults
	nWithfal		ogra us	100			
	colou	(colo	phic	0			
2	у Меаsu	ring electron	nic expansion va	lve coil			Replace
			/	Y			electron
		n 92 Ω (±3)/	92 Ω (± 3)	46 Ω (±3)			ic
	rical value	/ 👑	A OW				expansi
	of	17 11/2	77				on valve
	electr	/ The	1/				coil
	ical						
	impe						
	danc					□Yes □No	
	e						
		1			1		
1			1 -03				
	//		46±3Ω 46±3Ω 46±3Ω 46±3Ω	1//			
			46±352				
			46±312				
			46±354				
1		<u></u>					
3	Check	and repair m	niswiring and sh	ort circuits			
			the expansion				
		in the second					
		XM					

43 F3r Inefficient Water Circulation Failure

malfu nction	Fault name	Type of fault	fault principle
S			
coding			
F3r	Failure of inefficie nt water circulati on	logical judgemen t	When D8405 is detected to be less than 10°C after 3 min of operation and D8406 minus D8405 is greater than 10°C for 20S, this condition occurs. malfunctions

		2, /	
move	methodologies	Inspectio results	n Treatment programm e
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally F3r	□ No Yes.	View historic al faults
2	Take the manifold pressure gauge tube in forced plate change mode and drain the valve core at the plate change to see if any water comes out.	□ No Yes.	
3	Observe the status of the drainage tube to see if it appears to be columnar and flows out forcefully	□ No Yes.	Continuo usly empty the drain tube until the drainage is columnar

44 F4r Water inlet and outlet reverse connection fault

nc s codin		Fault name Water	Type of fault logical	fault : Detecting D8406	principle is greater th	an D8407
F4		inlet and outlet reverse polarity fault	judgement	after 3min operation and the differen		lifference perature is
move	met	hodologies			Inspection results	Treatment programm e
1	that	-	on the vehicle to verify ol panel displays	□Yes □No	View historic al faults	
2	Unplug the water temperature sensor and check that the D8406 value is positive! Inlet water temper ature sensor Outlet Temper ature Sensor				□Yes □No	Inlet and outlet water temperat ure sensors are reversed.

3	Observe the inlet and outlet water temperature D8406 , D8407 values for multiple runs for any changes.	□Yes □No	ment of sensors with no value change
4	Communicate and assist vehicle personnel in making corrections to the water system		

45PFF Water pump failure

	T				
malfu	Fault	Type of	fault principl	le	Componen
	name	fault	/4/1		t
nctio			JAN C		Monitorin
ns 1:					g
codin					
g			When the PLC mon	itors the	
		0 1 1	X03 status OFF	itors the	
PFF	Water	Switch type	This fault occurs when	n(pump	X0003
	pump	faults	ov feedback)	`` 1	
	failure	Mariton	When the PLC monit	ors the	
		The state of the s	X03 state ON		
		Y Silos	This fault occurs (p	oump	
		5	24V feedback)		
move	methodologi	ies		Inspection	
	1 3 /			results	method
1	Vehicle: Pov	ver on and veri	fy that the air	111.	View historic
1	conditioning	g control panel	displays PFF normally.	□Yes □No	
113			XXIV	, LIC3 LIVE	ar raures
2	/				Check
	Measure for	24V input to pu	mp in 777 (forced	□Yes □No	and
	plate change) mode.				repair
		. XA			wiring and
	_	LXX.			fuses
					1 - 310 00

3	Pump operation with 24	v input			Replacem
			Lites		ent of
					water
					pumps
4	Take the manifold pressu plate change mode and diplate change to see if any	rain the valve core at the	□Yes	□No	Purge air from the water system
5	Test whether the curren	t during pump operation			Check
	≤ rated power/27	4 1 0 m			and
		10,00	Lives	□No	remove water
		W G			line
		A Sale of the sale			blockage s
6	SOP-20 Check that the XO	003 status is consistent			Check
	with the feedback signa	1,/			and repair
	The St.	<i>'</i>	Lites	ГПЛО	the line
	11 3			7	betwee
					n the
	Dumn Foodbook Cignal	VOOO2 Ctatus			pump
/_A	Pump Feedback Signal 0V or Suspended	X0003 Status OFF			feedbac k signal
1	24V	ON			and PLC
D					pin x03 . kind
7	Replacement of water p	umps			
	1				

46LLF Liquid Level Fault

malfu	Fault	Type of	fault principle	Componen
	name	fault		t
nctio				Monitorin
ns				g
codin				0
g				
			When the PLC monitors the	
LLF	Liquid	Switch type	X01 status OFF	X0001
LLI	1		This fault occurs when	70001
	level	faults	(normally closed)	
	failure		When the PLC monitors the	
			X01 state ON	
			This fault occurs (normally	
			open)	

move	methodologies		W. C.	Inspection results	operating method
1	Vehicle: power userify that the aidisplays LLF norm	r-conditionin	on the vehicle to g control panel	□Yes □No	View historic al faults
2	Check that the k	S" /	not below the low	er 🗆 Yes 🗆 No	711
3		/	h or without 24V malfunctions normalcy	□Yes □No	Check and repair the level switch and PLC (X01, (DCM) interline kind
4	SOP-20 Check that level switch state The above table	us.	atus matches the	□Yes □No	Check and repair the level switch and PLC

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	switches, normally open type fault status is the opposite of this	Guidenterlin e (X01, DCM)
5	Replacement of level switch	

V. Three-in-one troubleshooting (single electronic)

1 **EC1** Overhead Controller and Panel Communication Failure

malfu	Fault	Fault type	fault principle
nction s	name		
coding			
FC1	Тор-	Commu	This fault occurs continuously when
EC1	mounte	nicat	the overhead controller does
	d	ion	not receive the manipulator
	controll	faults	message for 1min
	er with		consecutively.
	panel		Mr Mr
	malfunct		A 17 .0"
	ion of		
	commun		16 T
	ications	/ 5	

move	methodologies	Inspection	Treatment
	A THE CHILD	results	programm
	W. W. Jing		е

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1	Whether the manipulator plug connection is normally connected and reliable, whether the yellow and green wire pin is skewed and broken	□Yes		Air Conditioning Gride Reconn ect or replace the wiring harness
2	Check that the manipulator harness in the duct is intact and not broken (pay special attention to the bolt mounting position)	□Yes	□No	Repair or Replace ment of Wiring Harness
3	Check that the manipulator harness is properly and reliably connected to the overhead connection	□Yes	□No	Repair or Replace ment of Wiring Harness
4	Disconnect the manipulator harness from the top unit and measure the resistance between the yellow and green wires at the manipulator end to see if it is $100{\sim}150\Omega$ (communication resistance 120Ω).	□Yes	□No	Replaci ng the manipul ator harness

inputs

Guide Disconnect the manipulator harness from the 5 top unit and measure the resistance between the yellow and green wires at the top unit end for abnormality $100\sim150\Omega$ (120Ω) □Yes □No Along the yellow and green lines gradually 6 check to the top controller, the intermediate line is intact, reliable connection □Yes □No Connect a low-voltage filter in series with the 1 Low-24V power input of the manipulator and voltage separate the manipulator harness from the high-□Yes □No filters in voltage harness in the air duct, and try for a series period of time to see if the fault no longer with top occurs. controll er

2 LPF Low Pressure Failure Check

	Fault	Type of	fault principle	Component		
malfu	name	fault		Monitoring		
nctio						
ns						
codin						
g				D0564		
				D0564		
LPF	low	Pressure	When the low pressure	(CV800 model)		
	pressure	monitoring	is below 0.05MPa			
	malfunctio	block	This fault occurs when			
	ns					

move	methodolo	gies	/ 1/11/10	Inspection	operating
			\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \	results	method
1	Vehicle: Po	wer up and switch	on the vehicle to		View
	verify that	verify that the air-conditioning control panel			historic
	displays LPH normally.			□Yes □No	al faults
	trouble cod	le			
		R410A	R407C		
	0~10°C	5~8Bar	3~6Bar		
	10~30°C	8~18Bar	6~13Bar		OUI
		# 12			X'\
2	Tap into a	manifold pressure	gauge to see if the	, X	Insufficie
	/ ///	ance pressure is w			nt or
	System Bur	arree pressure is	Tillii Tuiige		leaking
	CAV			□Yes □No	_
/ 4					refrigera
. 4000				1	nt, check
1					for leaks
			XIIV		and refill.

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3	Touch to check whether the temperature	(Guide Check
Integ			that the
rated	difference between the pipeline before and after	□Yes □No	seconda
Electr	the sub-expansion valve is large.		ry
ical			electron
pool			ic
Man			expansi
age	ahead		on valve
men	aneau		operates
t			correctl
Syste			y when
m			re-
			powerin
	empress		g up the
		\wedge	unit.
4	Wilesthauthaushaussinaussinaussinaussinaussi		Check
•	Whether the cooling and heating modes can be	□Yes □No	low
	activated properly		pressure
	/ X 100		sensor
5	Check whether the condensing and evaporating		Replacem
	fans are operating normally and the air is		ent of the
	strong.		correspon
	otrong.		ding
		□Yes □No	ventilator
	/ 43 / /		ventilator
6	Check whether the temperature difference		System
	between the front and back of the main		clogged
	expansion valve is large by touching the cooling		or main
	and heating mode.		electron
		□Yes □No	ic
			expansi
	CUTTYCON		on valve
/			not
/ A	about 7		opening
A	ahead	11.	
1	empress		
110,	D4404		
W /	R410A R407C		
	0~10°C 5~8Bar 3~6Bar The diagram shows the cooling mode and the		
	The diagram shows the cooling mode and the opposite for the heating mode		

3 HPF High Pressure Failure Check

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1.0	Fault	Type of	fault principle	Guide Component
malfu nctio	name	fault		Monitoring
ns codin				
g				
				D0562
HPF	High	Pressure	When the high pressure	(CV800 model)
	pressure	monitoring	is higher than 2.8MPa	
	malfunctio	block	This fault occurs when	
	ns			

move	methodologies	Inspe	ction	operating
		result	S	method
1	Vehicle: Power on and verify that the air- conditioning control panel displays HPF normally. trouble code	□Yes	□No	View historic al faults
2	Tap into a manifold pressure gauge to see if the system balance pressure is within range	□Yes	□No	System refriger ant overloa d
Integrated Electrical pool Manage ment System	Touch to check whether the temperature difference between the pipeline before and after the sub-expansion valve is large. empress	□ Yes.	No.	Check that the seconda ry electron ic expansi on valve operates correctl y when re- powerin g up the unit.
4	Whether the cooling and heating modes can be activated properly	□ Yes.	No.	Check low pressure switch

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5	Check whether the condensing and evaporating fans are operating normally and the air is strong.	□ Yes.	No.	Replace ment of the corresp onding fan	
6	Check whether the temperature difference between the front and back of the main expansion valve is large by touching the coding mode ahead empress The diagram shows the cooling mode and the opposite for the heating mode.	☐ Yes.	No.	System clogged or main expansi on valve not opening	

4 C7H Compressor discharge temperature protection

malf	Fault	Type of fault	fault principl	le		nponent
nctic	name				MO	nitoring
ns codii g	n	*>				
C7H	Compre ssor discharg e tempera ture protectio n	Switch type faults	When the monitor temperature exce 103°C, the protect switch opens and fault occurs.	eds tive)	X0001
move	methodolog	ies		Inspecti		perating
				results	r	nethod

					111111
1	Vehicle: Power up and sw	itch on the vehicle to verify		1	View
	that the air conditioning c	ontrol panel displays			historic
	_	officer displays	□Yes	□No	al faults
	normally C7H				
2					Replace
	Check if X0001 is OFF		□Yes	□No	ment of
					3-in-1
3	Measurement of the pro	otection switch for 24V			Check
	input		□Yes	□No	
	p are				repair
					the
					protecti
					on
					switch
	Compressor outside	Protection switch			and PLC
	temperature	status			interline
4	Measurement of protec	ive switches for			Replace
	compliance >103°C	turn off (electric switch)			ment of
	comphance		□Yes	□No	exhaust
					gas
			6		tempera
		/ 17	.0		ture
			17.		protecti
		_ A d	3 /		on
		O. B.			switch
5	Check and repair the wi	ring between PLC pin			
	x0001 and the protection				
	r	/ No 5" /			
		20			
	/ 1	W . Y /			
	1				< / 17

5 P1r Compressor 1 exhaust temperature protection

	1.0	Fault name	Type of fault	fault principle	Component
	malfu	/ (1)			Monitoring
	nctio	CAVI		17.17-	1
	ns				
	codin				
M	g	/			
l b	P1r	Compressor	Switch type	Disconnect when	X0001
	ETI	1 Discharge	faults	monitoring	
7			Tauro	temperature	
		temperatu		exceeds	
		re		103°C	

move	methodologies	Inspection	operating
	Compressor outside Protection switch	results	method
1	Vehicle: Power up and switch on the vehicle to <103°C conduction verify that the air conditioning control panel turn off (electric switch) displays P1r normally.	□Yes □No	View historic al faults
2	Check if X0001 is OFF	□Yes □No	Replace ment of 3-in-1
3	Measurement of the protection switch for 24V input		examine and fix
		□Yes □No	Duplex protecti on switch with PLC interline
4	Measurement of protective switches for compliance	□Yes □No	Replace ment of exhaust gas tempera ture protecti on switch
5	Check and repair the wiring between PLC pin X0000 and the protection switch.		

6 P2r Compressor **2** exhaust temperature protection

malfu	Fault name Type of fault Compressor putside Protection switch	Componen
	temperature status	t
nctio	<103°C conduction	Monitorin
ns	>103°C turn off (electric switch)	g
codin		

g				Guide
P2r	Compressor 2 Discharge Temperat ure Protection	Switch type faults	Disconnect when the monitored temperature is greater than 103°C	X0001 (PLC2)

	I			
move	methodologies		Inspection	operating
			results	method
1	Vehicle: Power up and	switch on the vehicle to		View
	_			historic
	verify that the air-cond	itioning control panel	□Yes □No	al faults
	displays P2r normally.		6	
2		1	- 10	Replace
	Check if X0001 is OFF	/ 2 PM	□Yes □No	ment of
		- M C	2/	3-in-1
		- 10 mg		01 1
3	Measurement of the pro	otection switch for 24V		Check
	input	1200	□Yes □No	
	1	/ W 5 /		repair
	/	3 B		the
		か ご /		protecti
		47		on
	/ A	AND I		switch
	~ MP . UT	~/		and PLC
		/		interline
4	Measurement of protec	tive switches for	, X	Replace
	compliance			ment of
	Compressor outside	Protection switch	□Yes □No	exhaust
	temperature	status		gas
/ /	<103°C	conduction		tempera
400	>103°C	turn off (electric switch)		ture
1	7 103 0	turii ori (ciccure switch))	protecti
1113		XX		on
				switch
5	Check and repair the w	iring between PLC pin		
	x0000 and the protection	n switch.		
	XX	+		

7 P3r Compressor 3 Exhaust temperature protection

malfu	Fault name	Type of fault	fault principle	Guide Componen
nctio				t M
ns codin				Monitorin g
P3r	Compressor 3 exhaust temperatu re protection	Switch type faults	Disconnect when monitoring temperature exceeds 103°C	X0001 (PLC3)

move	methodologies	Inspection results	operating method
1	Vehicle: power up and switch on the vehicle to verify that the air conditioning control panel displays normally P3r	□Yes □No	View historic al faults
2	Check if X0001 is OFF	□Yes □No	Replace ment of 3-in-1
3	Measurement of the protection switch for 24V input	□Yes □No	Check and repair the protecti on switch and PLC interline
4	Measurement of protective switches for compliance	□Yes □No	Replace ment of exhaust gas tempera ture protecti on switch
5	Check and repair the wiring between PLC pin X0001 and the protection switch.		

8 POH PTC overheat protection

16	Fault	Type	fault principle	Component
malfu	name	of faul		Monitoring
nctio		t		
ns 1.				
codin				
	PTC	switchg	When the PLC monitors the	X0004
POH	overheati	ear	PTC overheat protection open,	
	ng	car	the PLC will detect the PTC	
	protectio		overheat protection open.	
	n fault		This fault occurs when the	
			switch is turned on	

move	methodologies	Test	operating
	Mark How	results	method
1	Vehicle: Power up and switch on the vehicle to verify		View
	that the air conditioning control panel displays POH	\mathcal{X}	historic
	normally.	□Yes □No	al faults
/	trouble code		
2/ 🗚	Check if X0004 is OFF		Replace
. 400			ment of
16		□Yes □No	3-in-1
117)			

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3	Measure the PTC temp with a multimeter for	perature control switch compliance.	□Yes □No	Replace Replace ment of PTC
	PTC Temperature <150°C >150°C	Temperature control switch status conduction turn off (electric switch)		
4	Measurement of PTC temperature control protection switch for 24V input		□Yes □No	Check wiring betwee n tempera ture control switch and PLC

9 Ello Faulty front steam defrost temperature sensor

	temperature range	Corresponding	
1.6	Fault Type	resistante pringiple	Componen
malfu	name ^{80~50°C of}	0.6~2.0ΚΩ	t
nctio	50~20°C faul	2.0~6ΚΩ	Monitorin
ns	20~-0°C t	6~14.2KΩ	Wioiiitoiiii
codin	0~7°C	14.2~20ΚΩ	g
g		** ** /	/ . K

FIIO	Return air	Resist	This condition occurs when	Guide
EIIO	temperat	ance	the PLC detects that the	
	ure	detec	resistance of the return air	
	sensor	tion	temperature sensor is out of	
	failure	class	the range of 0.6~108κΩ .	
			malfunctions	

	1 1 1 .		_
move	methodologies	Test	operating
		results	method
1	Webiale: Dower on and werify that the air conditioning		View
	Vehicle: Power on and verify that the air conditioning		historic
	control panel displays EIIO normally.		al faults
	trouble code		
		□Yes □No	
		300	
	(A)	. 30	
2	Multimeter to measure if the return air		Replace
	temperature sensor resistance is within		ment of
			tempera
	range	□Yes □No	ture
	3 m		sensor
	45 8		/ X
	A MO		
	" M. 140		
			Claral,
3	Measure the sensor with a multimeter for 2V	, X.N	Check
	input voltage.		
			repair wiring
	7	□Yes □No	between
/ 4	OFF		sensor
-	(S) Paris Hou		and
1	temperature range Corresponding)	controll
	resistance range		er
	80 ~50° C _{muss}		
	50 <mark>~20°C=</mark> 319 2.0~6 ΚΩ		
	TO CAMP METER 20 CAMP A CAMP		
	14.2-20KΩ		
	14.2 ZUN1		

10 Ell1 Return air temperature sensor failure

malfu nctio ns codin	Fault name	Type of faul t	fault principle	Guide Component Monitoring
EII1	Return air temperat ure sensor failure	Resist ance detec tion class	This condition occurs when the PLC detects that the resistance of the return air temperature sensor is out of the range of 0.6~108KΩ. malfunctions	D8402

move 1	Methodologies Vehicle: power up and switch on the vehicle to verify that the air-conditioning control panel displays EII1 normally. trouble code	Test results □Yes □No	operating method View historic al faults
2	Multimeter to measure if the return air temperature sensor resistance is within range	□Yes □No	Replace the return air tempera ture sensor

Measure the sensor with a multimeter for 2V input voltage.

□Yes □No

□Yes □No

□THERMS CLARP LETTER

CHECK and repair wiring between sensor and controll er

11 Ell2 Evaporator left defrost temperature sensor failure

1f.,	Fault	Type	fault principle	Component
malfu	name	of faul	X 100	Monitoring
nctio		laul +	O My	
ns		ι		
codin				
g			1 2 2 2	
EII2	Evaporato	Resist	This condition occurs when	D8403
EIIZ	r left	ance	the PLC detects that the	/ X
	defrost	detec	resistance of the return air	/< / N
	temperatu	tion	temperature sensor is out of	
	re sensing	class	the range of 0.6~108KΩ .	
	device		malfunctions	1 7 1
	failure	1 250		
	/ /	et /		

move	methodologies		Test	operating
			results	method
1/	77-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	.ldl. : .l		View
	Vehicle: power up and swit	3	11,	historic
1	that in paraturation seco	ntro Collies and Marie E12	, _	al faults
The ?		resistance range		
W /	normally _{80~50°C}	0.6~2.0ΚΩ	□Yes □No	
	trouble 50d20°C	2.0~6ΚΩ		
	20~-0°C	6~14.2KΩ		
	0~7°C	14.2~20ΚΩ		

2	Multimeter to measure if temperature sensor resistance is within range	□Yes □No	Replaci ng the Left Defrost Temper ature Sensor
3	Measure the sensor with a multimeter for 2V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

12 Ell3 Evaporator right defrost temperature sensor failure

16	Fault	Type	fault principle		Component
malfu	name	of faul			Monitoring
nctio	/1	t			
ns	$\wedge V$				
g	6				•
EII3	Evaporato	Resist	This condition occur		D8404
LIIS	r right temperatu	ance re range	the PLC detects that resistance ording retu		
	temperatu	tion	temperature sensor i		
	re sensing 5	0°C _{lass}	the 627 0K 0.6~10		
	device0~20 failun20~-0	0°C	2.ΩγαβΩnctions 6~14.2KΩ		
	0~7		14.2~20ΚΩ		
move	methodolog	ies		Test	operating
			T	results	method

1	Vehicle: power up and switch on the vehicle to verify that the air-conditioning control panel displays EII3 normally• trouble code	□Yes □No	Wiew historic al faults
2	Multimeter to measure if the return air temperature sensor resistance is within range	□Yes □No	Replace the return air tempera ture sensor
3	Measure the sensor with a multimeter for 2V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

13 Ell4 Outdoor temperature sensor failure

		⊑ u+ ∨uu		mperature senso r famul	. C
/	1 Towns	temperatu		Corresponding	
	10)	Fault	Туре	resistange rangeple	Component
Ŷ	malfu	80~5	0°C of	0.6~2.0KΩ ¹	1 1
	nctio	name 50~20)°C faul	2.0~6ΚΩ	Monitoring
d	ns	20~-0)°C t	6~14.2ΚΩ	
/	_	0~7	C	14.2~20ΚΩ	
	codin				
	g				
	EII4	Outdoor	Resist	This condition occurs when	D8401
	EII4	temperat	ance	the PLC detects that the	
		ure	detec	resistance of the return air	
		sensor	tion	temperature sensor is out of	
	•	failure	class	the range of $0.6^{\sim}108$ K Ω .	

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		ı	
move	methodologies	Test results	operating method
1	Vehicle: power up and switch on the vehicle to verify that the air-conditioning control panel displays EII4 normally. trouble code	□Yes □No	View historic al faults
2	Multimeter to measure if the outdoor temperature sensor resistance is within range	□Yes □No	Replace ment of Outdoor Temper ature Sensor
3	Measure the sensor with a multimeter for 2V input voltage. Corresponding esistance range 0.6~2.9 KΩ 22 MC VIII VIII CONTRACTOR OF 14.260	□Yes∖□No	Check and repair wiring between sensor and controll er

14 Ell5 Faulty condensate collegement were sensor

	Fault name Type	fault principle	Comp
malfu	of	Total principle	one
nctio	faul		nt
	T I		Mo
ns			nito

codin			Gu	^{ide} ring
g				
FUE	Condensation	numeric	When the PLC monitors the	D8400
EII5	coil	al value	condensation temperature	
	temperature	of	sensor resistance value, the PLC	
	sensor failure	electrical	will detect the condensation	
		impedan	temperature sensor resistance	
		ce	value.	
		phylogen	This fault occurs when the	
		у	range of $0.6\sim108$ K Ω is exceeded.	

move	methodologies	Test	operating
		results	method
1	Vehicle: Power up and switch on the vehicle to verify that the air-conditioning control panel displays EII5 normally. trouble code	□Yes □No	View historic al faults
2	Measure condensing coil temperature sensor resistance with a multimeter to see if it is within range.	□Yes □No	Replace condens ing coil tempera ture sensor
3	Measure the sensor with a multimeter for 2V input voltage. The first camp Meter of the control	□Yes □No	Check and repair wiring between sensor and controll er

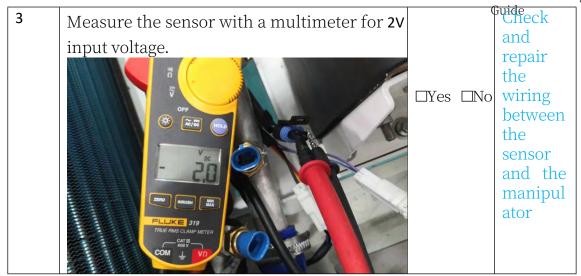
15 Ell6 Plate change inlet water temperature sensor failure

	Fault name	Type	fault principle	Comp
malfu	radit manne	of	radic principie	one
nctio		faul		nt
lictio		t		Mo
ns				nito
codin				ring
g				
FIIC	Faulty inlet	Resist	This fault occurs when the PLC	
EII6	water	ance	detects that the resistance of	D0332
	temperatur	detec	the inlet water temperature	
	e sensor	tion	sensor is out of the range of	
		class	0.6~108ΚΩ.	

move	methodologies	Test	operating
		results	method
1	Vehicle: Power up and switch on the vehicle to verify		
	that the air-conditioning control panel displays EII6		
	normally.	□Yes □No	
	trouble code		
	F. W. Mosey	/	KI
2	Multimeter to measure if the water		Replace
	temperature sensor resistance is within		ment of
	range	□Yes □No	water outlet
			tempera
	CAV/	117-	ture
			sensor

/ /		
	temperature range	Corresponding
ALL A		resistance range
W /	40~50°C	1.2~0.9KΩ
	20~40°C	2.6~1.2KΩ
	0~20°C	6~2.6KΩ
/		

Matsushige Electric Bus Air Conditioning Repair



16 Ell7 Board swap water temperature sensor failure

16	Fault name	Type of fault	fault principle	Component
malfu			_ M 00 /	Monitoring
nctio			A War War	
ns		/	A 1 0 1	
codin			15 " D	
g		/_ %	0	
EII7	Failure of	Resistance	PLC detects sensor	D0336
EII7	board	detection	resistance exceeding	./ . K
	exchange	\$ 10° /	0.6~108κΩ range of faults	
	water	class	block	
	temperatur	13 m		(K)
	e sensor	3		
	/ A " S	5 /		7

	/ ////			
move	methodologies		Test	operating
			results	method
1	77-1-: -1- D			View
/	Vehicle: Power up and swi	ich on the venicie to venity	///-	historic
1	that the air-conditioning co	ontrol panel displays EII7		al faults
The ?	temperature range normally.	Corresponding		
U1 7	/	resistance range	□Yes □No	
	trouble 40d5 0°C	1.2~0.9KΩ		
	20~40°C	2.6~1.2KΩ		
	0~20°C	6~2.6KΩ		

2	Multimeter to measure if the water temperature sensor resistance is within range	□Yes □No	ment of water outlet tempera ture sensor
3	Measure the sensor with a multimeter for 2V input voltage.	□Yes □No	Check and repair the wiring between the sensor and the manipul ator

17 H1r Main circuit 1 Return air temperature sensor failure

malfu	Fault name Type of	fault	fault princ	ciple	Component
mant	1	~ /			Monitoring
nctio	- No 110				
ns	1 2 2				
codin	A 55				
g					
H1r	Main circuit Resista	ance	PLC detects		D8405
/	1 Return air temperature rangetect temperature	ioforres	esistance ex conding ~108KO rang	ceeding	
-	sensor clas	resistan	onding ~108KO rang ce fange	c of faults	
1	failure	0.6~2	2.0KΩ block		
ш	50~20°C	2.0~	6ΚΩ		
	1 120~-0°C	6~14	.2ΚΩ	I m	
move	methodologies		·20ΚΩ	Test	operating
	0 7 0	14.2	20132	results	method
1	Vehicle: Power up and switch	h on thorsol	aiala ta marifu		View
	verlicle: Power up and switch	n on the ver	nicie to verny		historic
	that the air conditioning cont	trol panel d	isplays	□Yes □No	al faults
	normally H1r				
	trouble code				

SØNGZ	Matsushige Electric Bus
	Air Conditioning Repair

2	Multimeter to measure if temperature	(Replace
	sensor resistance is within range		the
	believe resistance is within range		main
		□Yes □No	circuit 1
			return
			air
			tempera
			ture
			sensor

Matsushige Electric Bus Air Conditioning Repair

3	Measure the sensor with a multimeter for 2V		Check
3	Measure the sensor with a multimeter for 2V input voltage.	□Yes □N	and repair wiring between sensor and controll er
	FLUKE 319 TRUE MAIS CLAUP METER COM VI		el

18 H2r Main circuit 2 Return air temperature sensor failure

16	Fault name	Type of fault	fault principle	Compone
malfu			Who The	nt
nctio		/	WALL OF	Monitorin
ns		/_	13, " D	g
codin		/ **		
g		1 2 3 4	Ø /	
H2r	Main circuit	Resistance	PLC detects sensor	.< , N
1121	2 Return air /	detection	resistance exceeding	
	temperature	9. 40.	0.6~108κΩ range of faults	
	sensor /	class	block	
	failure	G2		
	/A '55			

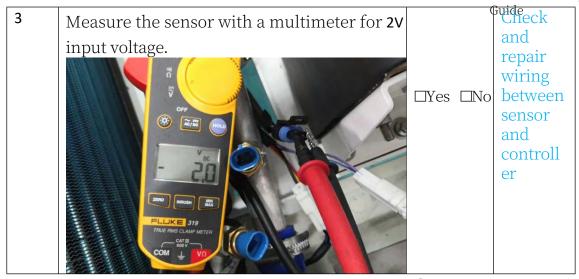
move	methodologies	Test results	operating method
1	Vericle prover ange in resistance range conditioning control panel displays no mark H2r trouble 50d 20°C 20~-0°C 20~20KΩ 20~20KΩ 14.2~20KΩ	□Yes □No	View historic
2	Multimeter to measure if temperature sensor resistance is within range	□Yes □No	Replace main circuit 2 return air tempera ture sensor

3	Measure the sensor with a multimeter for 2V			Check
	input voltage.	⊒Yes	□No	and repair wiring between sensor and controll er

19 H3r Sub-circuit 1 Return air temperature sensor failure

16	Fault name	Type of fault	fault principle	Compone
malfu			A NO WE	nt
nctio		/	W. Co.	Monitorin
ns codin		/_ %		g
g		12.70	<i>\$</i> * /	
H3r	Sub-circuit 1 Return air temperature	Resistance detection	PLC detects sensor resistance exceeding 0.6~108KΩ range of faults	
	sensor failure	class	block	

move	methodologies		Test results	operating method
1	temperature range Vehicle: power up and swi	Corresponding tch on to verify that the air- resistance range		
1	conditioning 50° Grol panel	display of the displa	□Yes □No	
	trouble 50720°C	2.0~6KΩ		
	20~-0°C	6~14.2KΩ		
2	0~7°C Multimeter to measur sensor resistance is w		□Yes □No	Replace ment of sub-circuit 1 return air tempera ture
				sensor



20 H4r Sub-circuit 2 Return air temperature sensor failure

		1		
1.0	Fault name	Type of fault	fault principle	Compone
malfu			A WA WE	nt
nctio		/	W. C.	Monitorin
ns				g
codin		/ _ %	3	8
g		12.30	<i>\$</i> /	
H4r	Sub-circuit 2	Resistance	PLC detects sensor	< > N
1171	Return air /	detection	resistance exceeding	
	temperature	0. 40.	0.6~108κΩ range of faults	
	sensor /	class	block	
	failure	G2		
	/A '55			

move	methodologies		Test	operating method
	AV/		results	method
1	temperature range Vehicle: power up and swi	Corresponding tch on to verify that the air- resistance range		
	conditionsing 50 n Grol panel	displayopeopok(H4r	□Yes □No	
	trouble 50720°C	2.0~6ΚΩ		
	20~-0°C	6~14.2KΩ		
	0~7°C	14.2~20KΩ		

2	Multimeter to measure if the return air temperature sensor resistance is within range	□Yes □No	tempera ture sensor
3	Measure the sensor with a multimeter for 2V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

21 HUF High Voltage Input Power Failure Check

		7 993		
	malfu	Fault	Type of	fault principle
	nction	name	fault	
	s coding	V/		
		3/		
	HUF	High-	Voltage	This fault occurs when the input voltage
H		voltage	Inspection	for load-side
		input		detection is less than
		disconne ction		400V.
7		fault		

move	methodologies	Test	operating
		results	method

1	Vehicle: power up and switch on to verify that the air conditioning control panel displays normally. HUF Fault Code		□No	Wiew historic al faults
2	Measurement of fuse continuity	□Yes	□No	Replace ment of fuses
3	Measure whether the air conditioner high voltage input is in the range of 450~750V.	□Yes	□No	Check the air- conditio ning insuran ce at the vehicle end Contact the vehicle manufa cturer to restore air- conditio ning power if necessa ry

Measure whether the input voltage of 3-in-1 is between 450~750V.

The sequence of 3-in-1 is

22 LU Inverter undervoltage

т.	/			
/	malfu	Fault	Type of	fault principle
	nction	name	fault	
	s coding		XX	
	country			
		Inverter	Voltage	This fault occurs when the input
	LU	underv	Dete	voltage is detected to be less than 300V
		oltage	ction	at the load side during operation.
		fault		



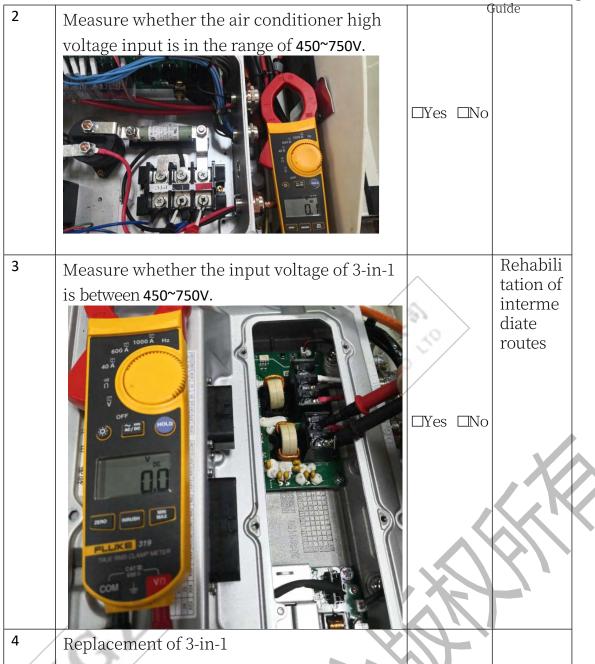
move	methodologies	Test	operatin
		results	g method
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally LU trouble code	□ No. Yes.	
2	Measurement of fuse continuity	No. Yes.	Replace ment of fuses
3	Measure whether the air conditioner high voltage input is in the range of 450~750V.	□ No. Yes.	Check the air- conditio ning insuran ce of the whole vehicle Contact the vehicle manufa cturer to restore the air- conditio ning power supply if necessa ry

				ruida
4	Measure whether the input voltage of 3-in-1 is between 450~750V .			main contacto r weak coil and input voltage
		Yes.	No.	
	OFF WOLD			
5	Replace the 3-in-1 and try to run for a period of time, whether the fault no longer occurs	ĽYes	s 🗆 No	

23 OU Inverter overvoltage

malfu	Fault	Type of	fault principle
nction	name	fault	
coding			
OU	Inverter over pressure failure	Voltage Detection resemble	This fault occurs when an input voltage higher than 750V is detected on the load side during operation.

move	methodologies	Test	operatin
		results	g method
1	Vehicle: Power up and switch on the vehicle to		View historic
	verify that the air conditioning control panel displays OU normally.	□Yes □No	al faults
	trouble code		



24 COC Compressor Inverter Overcurrent

	malfu	Fault	Type of	fault principle	
	nction	name	fault		
	coding		X		
COC		Compres	current	When the inverter detects that the	
		sor	detection	compressor turn-to-turn current	
		variants	resemble	exceeds the setting	

Frequenc	This fault occ	curs when the maximum
у		value
converter		
overcurr		
ent		

100	months adologica	Transcation	Tuontes
move	methodologies	Inspection results	Treatment
		resuits	programm
1			e View
1	Vehicle: power up and switch on the vehicle to verify		historic
	that the air conditioning control panel is displaying	□Yes □No	al faults
			arraans
	COC normally.		
2	No abnormal noise during compressor operation		
		□Yes □No	
			Tichton
3	Check compressor wiring connections for reliable		Tighten connecti
	connections and correct wire sequence (U.),	□Yes □No	ons or
	(v, w correspond to red, black and white)		correct
			wiring
			sequenc
			e
	100		
	- F		
	The state of the s		
4	Check that the compressor three-phase wiring is		Repair
		□Yes □No	or
	intact, no damage, short circuit		replace
			ment of
			wiring

	5	Measure the compressor turn-to-turn		Guide Replace	
		resistance, three lines of two measurements,		ment of	
		three groups of resistance value is equal and		compres	
		less than 10Ω	□Yes □No	sor	
			6		
	6	Multimeter to measure whether the resistance	~ ~ /	Replace	
		between the compressor phase line and the shell	7/	ment of	
				compres	
		is more than $5M\Omega$.	□Yes □No	sor	
		LINEY UTSIE			
		nı			P
		ANG Installation of the Control of t		(, N	
		Tree Mass Multimeters			•
		MAG PAR			
		No. 10 May	. < \	X'\	
		oyi sha			
		Shau maya cou status			
			11-		
	/ /				
/	7	Replacement method, replace the three-in-one,		Replace	
		test run for a period of time, whether the fault		ment of	
		no longer occurs	0./	compres	
			□Yes □No	sor	
þ					
/					
		\mathbf{X}_{λ} \mathbf{Y}			

25 LOC condensing fan inverter overcurrent

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			
LOC	Conden sing fan inverter over stream of water or sth. resemblin g one	Current detec tion class	This fault occurs when the triplex detects a DC output current greater than 100A

move	methodologies	Inspection results	Treatment programm e
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays properly LOC trouble code	□Yes □No	View historic al faults
2	Check the appearance of the fan is intact, no damage, no blockage, fan blade rotation freely	□Yes □No	Replace or remove the blockag e
3	Check the condensing fan line connections, whether the connection is reliable, no skewed plugs, back pins	□Yes □No	Tighten connecti ons or correct wiring sequenc

			All Collaitioning
			Guide
4	Check that the condensing fan wiring is intact and free of damage and short circuits.	□Yes □No	Repair or replace ment of wiring
5	Remove and disconnect the condensing fan inserts one by one, and test each condensing fan disconnected by switching it on and testing whether the fault no longer occurs;	□Yes □No	Replace the appropr iate condens ing fan
6	 1,Connect the condensing fan (OUT2 power cord) to the evaporating fan (OUT1) and remove the original evaporating fan (OU1 power cord). 2,Swap AVO1 and AVO2 pins in the PLC interface; 3, whether the fault no longer occurs after a period of ventilation mode operation; 	□Yes □No	Replace ment of 3-in-1
	OUT2 OUT1		

8	Replace the		Guide
	appropriate		
	condensing fan	□Yes □No	
		(A)	

26 EOC Evaporator fan inverter overcurrent

malfu	Fault	Type of	fault principle
nction	name	fault /	16 TH 15 TH
S			Z A
coding		123	
EOC	Evapora	Current	When the triplex detects that the
EUC	tor fan	detec	evaporator fan output current is greater
	inverter	tion	than the
	over	class	This fault occurs at 100A
	stream of	2Gr	
	water or	3	
	sth.		
	resemblin		
	g one		

/			
move	methodologies	Inspection results	Treatment programm e
1	Vehicle: Power on and verify that the air conditioning control panel displays EOC normally. trouble code	□Yes □No	View historic al faults
2	Check the appearance of the fan is intact, no damage, no blockage, fan blade rotation freely	□Yes □No	Replace or remove the blockag e

3	Check the evaporator fan line connections, whether the connection is reliable, no skewed plugs, back pins	□Yes	□No	connecti ons or correct wiring sequenc e
4	Check that the evaporator fan wiring is intact and free of damage and short circuits	□Yes	□No	Repair or replace ment of wiring
5	Remove and disconnect the evaporator fan inserts one by one, and test the fault by switching on the machine once for each evaporator fan disconnected to test if the fault does not occur again:	□Yes	□No	Replace ment of the appropr iate evapora tor fan
6	1, the condensing fan (OUT2 power cord) into the evaporating fan (OUT1) feet and remove the original evaporating fan (OUT1 power cord); 2, ventilation mode operation for a period of time whether the fault no longer occurs; OUT2 OUT1	□Yes	□No	Replace ment of 3-in-1

			Air Conditionir	ıg Repair
7	Replacement of the appropriate evaporator fan		Guide	
		□Yes □No		

Matsushige Electric Bus

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27 LOH condensing fan inverter overheating

malfu	Fault	Type of	fault principle
nction	name	fault	
coding			
LOH	Conden	Temper	This fault occurs when the detection
LOH	sing fan	ature	value of the 3-in-1 internal
	inverter	Dete	temperature sensor reaches or
	over	ction	exceeds the set maximum
	heat up		value.

move	methodologies	Inspe		Treatment
		resul	ts	programm
		- 10.		е
1	Vehicle: power up and switch on the vehicle to verify	5 /		View
	that the air-conditioning control panel displays LOH	/_		historic
	normally.		No.	al faults
	trouble code	Yes.		
2	Turn on the machine and run it for a while to			Replace
	check if the heat fan in the appliance			ment of
			No.	3-in-1
	compartment is running.	Yes.		< / N
	WELLENGTH WITH THE PARTY OF THE			
			\wedge	
		, X		
3	Check that the air inlet and outlet of the			Clear
	electrical compartment are cleared.			the
	ciccincar compartment are cicarea.			blockag
110			No.	е
		Yes.		
	G.			

Check that the electrical compartment insulation foam is intact and has not fallen off.

No. Yes.

28 EOH Evaporator fan inverter overheating

malfu	Fault	Type of	fault principle
nction	name	fault	
coding			
ЕОН	Evapora tor fan	Temper ature	This fault occurs when the detection value of the 3-in-1 internal
	inverter over	Dete ction	temperature sensor reaches or exceeds the set maximum
	heat up	Ction	value.

		_		
move	methodologies		ection	Treatment
	/ A.)V	resul	ts	programm
		3//		е
1	Vehicle: Power on and verify that the air conditioning			View
	control panel displays EOH normally.	_		historic
	trouble code	Ш	No.	al faults
		Yes.		
2	Switch on and run for a period of time to check			Replace
	whether the heat fan in the appliance	_		the
	compartment (including stand-alone fans and		No.	cooling
	fans supplied with the appliance) is running.	Yes.		fan or
				corresp
	32			onding
		, X		compon
				ents
/ /				
3	Check that the inlet and outlet of the electrical	1 12		Clear
1	compartment are not blocked			the
110 >	compartment are not brocked			blockag
W /		Ш	No.	е
		Yes.		

4	Check that the electrical compartment insulation foam is intact and has not fallen off.		Guide Replace or reapply insulati
		□ No. Yes.	on foam

29 COH Compressor inverter overheat

malfu	Fault	Fault type	fault principle
nction		z droize e) pe	man principie
S	name	My 10m	
coding	.30	E. M. 17.	
СОН	Compres	Temperatu	When the 3-in-1 internal temperature
СОП	sor	re	sensor detection value reaches or
	variants	Detection	exceeds the
	Frequenc	resemble	This fault occurs when the set
	у		maximum value is exceeded.
	converter		
	overheati		
	ng		

move	methodologies	Inspection	
		results	programm
			е
1	Vehicle: power up and switch on the vehicle to verify		
	that the air-conditioning control panel displays COH		
	normally.	□Yes □No	
	trouble code		

2	Switch on and run for a period of time to check		Replace .
	whether the heat fan in the appliance		ment of
	compartment (including stand-alone fans and fans supplied with the appliance) is running.	□Yes □No	cooling fans or
	turis supplied with the appliance, is running.		corresp
			onding
			compon
			ents
3	Check that the air inlet and outlet of the		Clear
	electrical compartment are cleared.		the
	A CONTRACTOR OF THE PARTY OF TH		blockag
		□Yes □No	е
		30/	
) /	
	0		
4	Check that the electrical compartment		Replace
	insulation foam is intact and has not fallen off.		or
			reapply insulati
			on foam
			OH TOURT
		□Yes □No	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
		114-	
/ 4			
_A0000			

30 LOL condensing fan inverter overload

malfu nction	Fault	Type of	fault principle	
S	name	fault		
coding				

1.01	Conden	Current	This fault occurs when the triplex
LOL	sing fan	detec	detects that the condensing fan
	inverter	tion	output (DC2) current is greater
	over	class	than the rated fan current
	year		

move	methodologies	Inspection results	Treatment programm e
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays properly LOC trouble code	□Yes □No	View historic al faults
2	Check the appearance of the fan is intact, no damage, no blockage, fan blade rotation freely	□Yes □No	Replace or remove the blockag e
3	Check the condensing fan line connections, whether the connection is reliable, no skewed plugs, back pins	□Yes □No	Tighten connecti ons or correct wiring sequenc e
4	Check that the condensing fan wiring is intact and free of damage and short circuits.	□Yes □No	Repair or replace ment of wiring

5	Remove and disconnect the condensing fan inserts one by one, and test each condensing fan disconnected by switching it on and testing whether the fault no longer occurs:	□Yes □No	Replace the appropr iate condens ing fan
6	1,Connect the condensing fan (OUT2 power cord)		Replace
	to the evaporating fan (OUT1) and remove the original evaporating fan (OU1 power cord). 2,Swap AVO1 and AVO2 pins in the PLC interface; 3, whether the fault no longer occurs after a	□Yes □No	the appropr iate condens
	period of ventilation mode operation; OUT2 OUT1		ing fan
8	Replace the 3-in-1 and try it for a while, does the		7
	fault no longer occur	□Yes □No	

31 EOL Evaporator fan inverter overload

malfu	Fault	Type of	fault principle
nction	name	fault	
coding			
EOL	Evapora	Current	This fault occurs when the triplex
LOL	tor fan	detec	detects that the evaporator fan
	inverter	tion	output (DC1) current is greater
	over	class	than the rated fan current
	year		

move	methodologies	Inspection	Treatment
	// /	results	programm
		6	e
1	771:1 7	- 40	View
	Vehicle: Power up and switch on the vehicle to verify	~ > /	historic
	that the air conditioning control panel displays	□Yes □No	al faults
	properly LOC		
	trouble code		
2	Check the appearance of the fan is intact, no		Replace
	damage, no blockage, fan blade rotation freely		or
		□Yes □No	
			the
			blockag
			6
	The Control of the Co		
3	Check the evaporator fan line connections,		Tighten
1	whether the connection is reliable, no skewed		connecti
	plugs, back pins	□Yes □No	ons or
			correct
			wiring
			sequenc
			e
4	Check that the evaporator fan wiring is intact		Repair
	and free of damage and short circuits	□Yes □No	
	XXXT		replace
	X-N'		ment of
			wiring

5	Remove and disconnect the evaporator fan inserts one by one, and test the fault by switching on the machine once for each evaporator fan disconnected to test if the fault does not occur again;	□Yes	□No	the appropriate condens ing fan
6	1,Connect the condensing fan (OUT2 power cord) to the evaporating fan (OUT1). Foot position and removal of the original evaporator fan (OU1 power cord); 2,Swap AVO1 and AVO2 pins in the PLC interface; 3, whether the fault no longer occurs after a period of ventilation mode operation; OUT2 OUT1	□ Yes.	No.	Replacem ent of the correspon ding Evaporatio n fans

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				Air Conditionii	ng Repair
8	Replace the 3-in-1 and try it for a while, does the			Guide	
	fault no longer occur				
			No.		
		Yes.			

32 COL Compressor inverter overload

malfu	Fault	Type of	fault principle
nction	name	fault	
S			\wedge
coding			
COL	Compres	current	When the triplex detects that the
COL	sor	detection	compressor output current is greater
	variants	resemble	than the motor
	Frequenc		This fault occurs at rated current
	У		Web and
	converter		
	overload		

move	methodologies	Inspection	Treatment
		results	programm
			е
1	Vehicle: power up and switch on to verify that		View
			historic
	the control panel displays properly COL	□Yes □No	al faults
2	No abnormal noise during compressor operation		
1		□Yes □No	

3	Check compressor wiring connections for reliable connections and correct wire sequence (U.), (V, W correspond to red, black and white)	□Yes □No	Guide Tighten connecti ons or correct wiring sequenc e
4	Check that the compressor three-phase wiring is intact, no damage, short circuit	□Yes □No	Repair or replace ment of wiring
5	Measure the compressor turn-to-turn resistance, three lines of two measurements, three groups of resistance value is equal and less than 10Ω	□Yes □No	Replace ment of compres sor

6	Multimeter to measure whether the resistance	Replace
	between the compressor phase line and the shell	ment of
	is more than 5MO	compres
	Is more than 5Mc2. □Yes □No	sor
	DAY UTOLE	
	L OL. **	
	turnihammiammiaha o	
	True Ray Multimeters	
	On the part of the	
	Vr Ang.	
	ori An	
	Attricture	
	CA COM 4-YORK	
7	Replacement method, replace the three-in-one,	Replace
	test run for a period of time, whether the fault	ment of
	no longer occurs	compres
	□Yés □No	sor
	/ W 67 /	

33CHF Compressor Inverter Hardware Failure

malfu nction	Fault	Fault type	fault principle
ilction	name	ing.	X
coding	1	3	
country	0	ml	
CHF	Compre		3-in-1 internal detection and feedback of
5/11	ssor	in-one	fault codes
	Inverter	interna	Tauri code,s
	Hardwa	1	
	re	malfun	
	malfuncti	ction	
	ons		

move	methodologies		Inspection	Treatment
		\times	results	programm
				е

SØNG	\mathbb{Z}
------	--------------

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1	Vehicle: power up and switch on the vehicle to verify that the control panel displays CHF normally.	□Yes □No	historic al faults
2	Replacement method, replace the three in one, test run for a period of time, whether the fault no longer occurs	□Yes □No	

34FL Reverse connection fault

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			
FL	reverse	Voltage	When the triplex detects that the
'-	polarity	Detection resemble	polarity of the input power supply is opposite to the marking
	fault		This fault occurs

move	methodologies	Inspection	Treatment
		results	programm
			е
1	Complete vehicle: power up and start to verify	2)	View
	Complete venicle, power up and start to venity	- 10	historic
	that the control panel displays properly FL	□Yes □No	al faults
	TAME C		
2	Check that the polarity of the air-conditioning		Correcti
	input power supply matches the marking.		ng
	input power supply materies the marking.	□Yes □No	power
			supply
			polarity
3	Check that the polarity of the 3-in-1 input power		Correcti
	supply matches the marking.		ng
	supply materies the marking.	□Yes □No	power
	/ Y & /		supply
			polarity

35 C5F Pressure Sensor Failure

District of the last	malfu	Fault	Type of	fault principle
	nction	name	fault	
/	coding			
	C5F	pressure	Voltage	The triplex detects that the pressure
		sensing	Detection	sensor feedback voltage exceeds
		device	Detection	This fault occurs in the 0~5V range
		failure		

	21 1 1 1			
move	methodologies		Inspection	Treatment
			I I	

					All Collultionii
				results	Guide programm e
1	Vehicle: power up that the air-condi normally.	-	ne vehicle to verify anel displays C5F	□Yes □No	View historic
3	Measure the ser	asor for 5V input	voltage	□Yes □No	Check wiring from sensor to PLC
4	Measure whethe		High Pressure Sensing Feedback Voltage (V)	ĤYes □No	Check sensor to PLC feedbac k signal line
	0~1.6	0.5~1.88	0.45~2.13		
5	Replacement of 3.0~4.0	the pressure ser 3.09~3.93	2,13~3.61 SOF 3.61~4.03		
		12.70	3		

36 S1r Pressure sensor failure

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding	A. V /		
S1r	pressure	Voltage	Triplex detects pressure transducer 1
211	sensing	Detection	feedback voltage exceeded
1	device	Detection	This fault occurs in the 0~5V range
	failure		\times

move	methodologies		Inspection	Treatment
			 results	programm

					(Guide e
1	Vehicle: Power up that the air condi- properly S1r	-	ne vehicle to verify nel displays	□Yes	□No	View historic al faults
3	Measure the ser	isor for 5V input	voltage	□Yes	□No	Check wiring from sensor to PLC
4	Measure whether in the state of		dback voltage is High Pressure Sensing Feedback Voltage (V) 0.45~2.13	□Yes	□No	Check sensor to PLC feedbac k signal line
5		the pressure ser 3.09~3.93				
		/ 4 7				

37 S2r Pressure sensor failure

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			
S2r	pressure	Voltage	Triplex detects pressure transducer 1
321	sensing	Detection	feedback voltage exceeded
	device	Detection	This fault occurs in the 0~5∨ range

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failure		Guide

move	methodologies	Inspection results	Treatment programm e
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays properly S2r	□Yes □No	View historic al faults
3	Measure the sensor for 5V input voltage	□Yes □No	Check wiring from Sensor 2 to PLC.
4	Measure whether the sensor feedback voltage is in the range of 0~5V	□Yes □No	Check Sensor 2 to PLC feedback signal wire
5	Replacement of pressure sensor 2		

38 S3r Pressure sensor failure

malfu	Fault	Fault type	fault principle
nction s	name		
coding			
S3r	pressure sensing	Voltage Detection	Triplex detects pressure transducer 3 feedback voltage exceeded
	device	Detection	This fault occurs in the 0~5V range
	failure		

move	methodologies			Inspection	Treatment
move	Pressure (MPa)	Low Pressure	High Pressure	results	
	Pressure (IVIPa)	Sensor	Sensing	resurts	programm
1		Reverse	Feedback Voltage		e View
1	Vehicle: Power u	ıp and şwitch or	the vehicle to		historic
	verify that the ai	r(Manditioning o	ontrol panel	□Yes □No	al faults
			0.45~2.13	LITES LINO	arrauns
	0~1.6 displays properl 1.6~3.0	y \$3r ^{1.88}			
		1.88~3.09	2.13~3.61		
3	3.0~4.0 Measure the sen	3.09~3.93 sor for 5V input	3.61~4.03 voltage		Check
		Sam.			wiring
				□Yes □No	from
					Sensor 3
					to PLC.
	9		E		
					$\wedge \wedge \wedge$
			000		K.1.
			ABB Comme		
			1		
		12.4			
		-	140		
4	Measure whethe	er the sensor fee	dback voltage is		Check
	in the range of 0			□Yes □No	Sensor 3
	in the range of 0	JV		"	to PLC
			$\langle \rangle$		feedback
			X		signal
			A /		wire

5	Replacement of pressure sensor 3	Guide

39 S4r Pressure sensor failure

		30000	3000		
	ma	700	Fault	Type of	<u>fault</u> principle
1	nct	iqn	esaura (MPa)	Low Pressu	re High Pressure
	5	" /	Tidille ,	Sensor	Sensing
	coding			Reverse	Feedback Voltage
.000	S4r		pressure	Feedtagltag	e Triplex detects pressure transducer 4
200000	341		sensing	Detection	feedback voltage exceeded
/		0~:	.6 device	0.5~1.88	This fault occurs in the 0~5V range
		1.6	~3. €ailure	1.88~3.09	2.13~3.61
		2.0	~4.0	2.00~2.02	2 61~4 02

	3.0~4.0	3.09~3.93	3.61~4.03		
move	methodologies			Inspection	Treatment
				results	programm
		>			е
1	 Vehicle: Power	up and switch o	n the vehicle to		View
		•			historic
	verify that the a	ir conditioning	control panel	□Yes □No	al faults
	displays proper	ly S4r			
		J			
3	Measure the se	nsor for 5V inpu	t voltage		Check
		S Sales			wiring
				□Yes □No	from
					Sensor 4
			4		to PLC.
	2		E		
	Cite Cite Cite Cite Cite Cite Cite Cite				
	1 6 3		100 BB 100 100		
			10 BU		
			10 10		

4	Measure the ser is within range	nsor feedback vo	ltage to see if it	□Yes □No	to PLC
					feedback signal wire
5	Replacement of	Replacement of pressure sensor 4			
	Pressure (MPa)	Low Pressure	High Pressure		
		Sensor Reverse	Sensing Feedback Voltage		
		Feed voltage (v)	(V)	9	
	0~1.6	0.5~1.88	0.45~2.13		
	1.6~3.0	1.88~3.09	2.13~3.61		
	3.0~4.0	3.09~3.93	3.61~4.03		

40 UHF Electronic Expansion Valve Failure

malfu nction s	Fault name	Type of fault	fault principle
coding			
UHF	electronic expansion valve	CullCill	Three-in-one detection of electronic expansion valve coil output current overfan
	failure		This fault occurs when you are surrounded by

move	methodologies	Inspection	Treatment
		results	programm
			e
1	Vehicle: posseit up and switchs on to verify that the	27	View
			historic
	air conditioning control panel displays normally.	□Yes □No	al faults
	guide oran pink porn ferro pessimistic		
	wire ge ogra us		
2	Measurites electronic papansion valve coil		Replace
	r resistançe)		electron
			ic
	nume rical 92 Ω (± 3) 92 Ω (± 3) 46 Ω (± 3)		expansi
	value		on valve
	of value		coil
	electron		
	ical		
	impe	□Yes □No	
	danc		
	e III		
/	7 11		
	46±3Ω		
	Λ6±3Ω	<u> </u>	
	46±30		
	46±3Ω 46±3Ω 46±3Ω 46±3Ω		
	40		
3	Check and repair miswiring and short circuits		
	between the PLC and the expansion valve coil.		

41 F1r Electronic Expansion Valve 1 Fault

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malfu	Fault	Fault type	fault principle Guide
nction s	name		
coding			
F1r	electroni	current	Three-in-one detection of electronic
LTI	c expansio	detection	expansion valve coil output current overfan
	n		This fault occurs when you are
	Valve 1		surrounded by
	Failure		

move	methodologies	Inspection	Treatment			
111000	methodologies	results	programm			
		resurts	e programmi			
1			View			
*	Vehicle: Power up and switch on the vehicle to verify		historic			
	that the air-conditioning control panel displays	□Yes □No	al faults			
			arraans			
	normally F1r					
	Coil 1 Coils 2 common					
2	Measuring electronic expansion valve (1936)		Replace			
	resistance (Neutral)		electron			
	guide oran pink porn ferro pessimistic		ic .			
	wire		expansi			
	colou ge ogra us	\wedge	on valve			
	r (colo phic		coil			
	ur)	3,				
	nume 920 (±3) 46Ω (±3)					
	rical	□Yes □No				
	value					
	of	1				
	electr					
	ical $46\pm3\Omega$					
	danc $A6\pm3\Omega$					
	e 46±3Ω					
			M'			
			$\triangle V$			
3	Check and repair miswiring and short circuits					
	between the PLC and the expansion valve coil.					
	/A 8/					

42 F2r Electronic Expansion Valve **2** Fault

malfu nction	Fault	Type of	fault principle
S	name	fault	
coding			
F2r	electroni	current	Three-in-one detection of electronic
1 21	С .	detection	expansion valve coil output current
	expansio	actection	overfan
	n		This fault occurs when you are
	Valve 2		surrounded by
	Failure		•

move	method	dologies		/		Inspection	Treatment
					75	results	programm
		Coil 1	Coils 2	common	, ,	27	е
1	Vehicle	· Power up and	switch on the	vehicle to veri	fv		View
	11 11	. 10 wer ap ara	owner on the	(Neutral)	1		historic
	rigatil et e	oran pink	ig control pane	l displays pessinistic		□Yes □No	al faults
	nWithfal	lygE2r	ogra us	" D'			
	colou	(colo	phic	8 /			
2	Measu	ring electronic	expansion va	alve coil			Replace
		n 92Ω (±3)	92 Ω (±3)	46Ω (±3)			electron
	rical	/ 4		,			ic expansi
	value	1 1/4	140.				on valve
	of	1 1 1 1	F /				coil
	electr	A Y EST				, X	
	ical	1	a_				
	impe danc					□Yes □No	
	e						
		1347					
	-	7111					
	/	1111	46±3Ω 46±3Ω 46±3Ω 46±3Ω				
		111	_46±351				
		110	46±312				
			46±314				
3	Check	and repair mis	swiring and sh	ort circuits			
			he expansion				
		XXX					
		AM					

43 F3r Inefficient Water Circulation Failure

nction na	me fault	
S S		
J		
coding		
F3r of ine	ilure logical efficie judgeme water t culati	When D8405 is detected to be less than 10°C after 3 min of operation and D8406 minus D8405 is greater than 10°C for 20S, this condition occurs. malfunctions

		20.0		
move	methodologies	Inspe result		Treatment programm e
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally F3r	□ Yes.	No.	View historic al faults
2	Take the manifold pressure gauge tube in forced plate change mode and drain the valve core at the plate change to see if any water comes out.	□ Yes.	No.	Check that the pump is running
3	Observe the status of the drainage tube to see if it appears to be columnar and flows out forcefully	□ Yes.	No.	Continuo usly empty the drain tube until the drainage is columnar

44 F4r Water inlet and outlet reverse connection fault

malfu nction		Fault	Type of	fault	principle	
S		name	fault			
coding F4r		Water inlet and outlet reverse polarity fault	logical judgement	Detecting D8406 is greater than D84 after 3min operation and the different value Failure occurs when the temperature greater than 1. 5°C		lifference
move	met	hodologies			Inspection results	Treatment programm e
1	Vehicle: power up and switch on the vehicle to verify that the air conditioning control panel displays normally F4r				□Yes □No	View historic al faults
2		the D8406 va	□Yes □No	Inlet and outlet water temperat ure sensors are reversed.		

3	Observe the inlet and outlet water temperature		Replace
	D8406, D8407 values for multiple runs for any	□Yes □No	ment of
	changes.		sensors
			with no
			value
			change
4	Communicate and assist vehicle personnel in		
	making corrections to the water system		

45PFF Water pump failure

malfu	Fault	Fault type	fault principle	Componen
	name		(A A)	t
nctio			W. Co.	Monitorin
ns codin				g
g				
			When the PLC monitors the	
PFF	Water	Switch type	X03 status OFF	X0003
PFF	Water	/ 327	This fault occurs when (pump	X0003
	pump	faults	ov feedback)	
	failure	140 HO.	When the PLC monitors the	
		-M. 12	X03 state ON	1 / / 1
		Y Sign	This fault occurs (pump	
	/1	9	24V feedback)	

move	methodologies	Inspection	operating
4		results	method
1	Vehicle: Power on and verify that the air		View
	conditioning control panel displays PFF normally.	□Yes □No	historic al faults
2			Check
	Measure for 24V input to pump in 777 (forced	□Yes □No	and
	plate change) mode.		repair
			wiring
	XX		and fuses

3	Pump operation with 24	V input		Replacem
			□Yes □No	ent of
				water
				pumps
4	Take the manifold pressu			Purge
	plate change mode and d			air from
	plate change to see if any	water comes out.	□Yes □No	the
				water system
				System
	HIL			
		4 1111		
	2		\wedge	
			30	
		(A)	10	
		Mary Control) /	
5	Test whether the curren	t during pump operation		Check
	≤ rated power/27	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		and
		100	□Yes □No	remove water
	/	/ K 3 /		line
				blockage
		7 3 /		S
6	SOP-20 Check that the X0	003 status is consistent		Check
	with the feedback signa	1,/		and
	L'The Cl		□Yes □No	repair the line
	1 5			betwee
	/(1)/			n the
			11-	pump
/ 4	Pump Feedback Signal	X0003 Status		feedbac
	0V or Suspended	OFF		k signal and PLC
	24V	ON		pin X03 .
				kind
7	Replacement of water p	umps		
	YY			

46LLF Liquid Level Fault

o 1£	Fault	Type of	fault principle	Componen
malfu	name	fault		t
nctio				Monitorin
ns codin				g
g			When the PLC monitors the	
LLF	Liquid	Switch type	X07 status OFF This fault occurs when	X0007
	level	faults	(normally closed)	
	failure		When the PLC monitors the	
			X07 state ON	,
			This fault occurs (normally	
			open)	

move	methodologies		40	Inspection results	operating method
1	Vehicle: power verify that the a displays LLF norm	ir-conditionin	on the vehicle to	□Yes □No	View historic al faults
2	Check that the l	S"/	not below the lowe	r □Yes □No	711
3	Mtals Grement le inputurn off (electric switch) short circuit	OFF	th or without 24V malfunctions normalcy	□Yes □No	repair the level switch and PLC (X07, (DCM) interline kind
4	SOP-20 Check that level switch state The above table	us.	atus matches the	□Yes □No	Check and repair the level switch and PLC

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	switches, normally open type fault status is the opposite of this	Guidenterlin e (X07, DCM)
5	Replacement of level switch	

Six, two-in-one troubleshooting

2-in-1 Essential Tools

<u> 2 111 1 L33C11t1d1 1 0013</u>	
name (of a thing)	quantities
RS232 (USB to interface)	1
Crystal Head 485 Cable	1 root
laptops	1 unit

1 **EC1** Overhead Controller and Panel Communication Failure

malfu	Fault	Type of	fault principle
nction s	name	fault	
coding			10 July 30
F.C.1	Тор-	Commu	This fault occurs continuously when
EC1	mounte	nicat	the overhead controller does
	d	ion	not receive the manipulator
	controll	faults	message for 1min
	er with		consecutively.
	panel	.55	X
	malfunct	143	
	ion of	1 55 0	×/ \
	commun	-E 4 110	
	ications	Mg (0.	

move	methodologies	Inspection Treatment
	11 3	results programm
		e

1	Whether the manipulator plug connection is			Guide Reconn
1				
	normally connected and reliable, whether the			ect or
	yellow and green wire pin is skewed and broken			replace
				the
				wiring
				harness
		□Yes [⊐No	
2	Check that the manipulator harness in the duct			Repair
	is intact and not broken (pay special attention to	□Yes [□No	or
	the bolt mounting position)			Replace
				ment of
				Wiring
				0
				Harness

				Air Conditionin
3	Check that the manipulator harness is properly			Guide Repair
	and reliably connected to the overhead			or
	connection	7		Replace
	No.	□Yes	∐No	ment of
				Wiring Harness
				114111633
	0			
	A Dec			
4	Disconnect the manipulator harness from the			Replaci
	top unit and measure the resistance between			ng the
	the yellow and green wires at the manipulator			manipul
	end to see if it is $100\sim150\Omega$ (communication			ator
	resistance 120Ω).	7		harness
		□Yes	∐No	
	1 121			
	to 1000 market for			
5	Disconnect the manipulator harness from the			Failure
	top unit and measure the resistance between			occurs
	the yellow and green wires at the top unit end			between
	for abnormality $100\sim150\Omega$ (120 Ω)			the
	750			disconne
				ct point
	ентинастинетого нец. 2005	7		and the
		□Yes	∐No	top PLC

6	Along the yellow and green lines gradually check to the top controller, the intermediate line is in act, reliable connections.	□Yes □No	Guide
7	Connect a low-voltage filter in series with the 24V power input of the manipulator and	\wedge	Low- voltage
	separate the manipulator harness from the high- voltage harness in the air duct, and try for a	□Yes □No	filters in series
	period of time to see if the fault no longer	50/	with top
	occurs.		controll
			er
			inputs

2 EC2 Overhead Controller Internal Communication Failure

Г	1.0	/ 65	J. C. L.	
	malfu	Fault	Type of	fault principle
	nction	name	fault	X
	S	Hanne	radit	
	coding/			
	-62	Overhea	commu	This fault occurs continuously when
	EC2	d /	nicat	the overhead controller does
	ATTENNANT OF	controll	ion	not receive feedback from the
	Therman	er and	type	compressor for 1min
		compre	fault	continuously.
T		ssor		
		commu		
1		nication		
/		failure		
		block	X	

move	methodologies	In	nspection	Treatment
	X < /	re	esults	programm
				е

SØ]	NGZ		Matsushige Ele	
			Air Conditioni	ng Repair
1	Vehicle: Power on and verify that the air		Guide View	
	conditioning control panel displays EC2 normally.		historic	
	trouble code	□Yes □No	al faults	

SØNGZ

				All Collultions	
2	Unplug the compressor low voltage			Guide Correcti	
	harness and measure the 24V supply for			ng the	
	proper wiring sequence.			wire	
				sequenc	
				e or	
				checkin	
				g for	
				breaks	
	Source Control of the			along the	
		□Yes		route	
	La	Lites		Toute	
	10 700	\wedge			
	1 0 0 0 7	5,			
		500			
		0 /			
1					
3	Measure the compressor communication			Replace	
3	Measure the compressor communication			Replace ment of	
3	Measure the compressor communication resistance value within $100\sim150\Omega$.				
3	_ /			ment of	
3	_ /			ment of compres	2
3	_ /	□Yes		ment of compres	
3	_ /	□Yes	□No	ment of compres	
3	_ /	□Yes	□No	ment of compres	
3	_ /	□Yes	□No	ment of compres	
3	_ /	□Yes	□No	ment of compres	
3	_ /	□Yes	□No	ment of compres	
3	_ /	□Yes	□No	ment of compres	
	resistance value within 100~150Ω.	□Yes	□No	ment of compres sor	
3	resistance value within 100~150Ω. Check whether the communication wires	□Yes	□No	ment of compres sor	
	resistance value within 100~150Ω. Check whether the communication wires (yellow and green wires) between the low	□Yes	□No	ment of compres sor Repair or	
	resistance value within 100~150Ω. Check whether the communication wires (yellow and green wires) between the low voltage harness of the compressor and the			ment of compres sor Repair or Replace	
	resistance value within 100~150Ω. Check whether the communication wires (yellow and green wires) between the low voltage harness of the compressor and the overhead controller are intact, reliably	□Yes		ment of compres sor Repair or Replace ment of	
	resistance value within 100~150Ω. Check whether the communication wires (yellow and green wires) between the low voltage harness of the compressor and the			ment of compres sor Repair or Replace ment of Wiring	
	resistance value within 100~150Ω. Check whether the communication wires (yellow and green wires) between the low voltage harness of the compressor and the overhead controller are intact, reliably			ment of compres sor Repair or Replace ment of	

5 Connect high and low voltage filters in series on the compressor high and low voltage wiring harness, try for a period of time, whether the fault no longer occurs



voltage filter in series

Wes No with the high-voltage input of the compres sor

3 LPF Low Pressure Failure

molfu.	Fault	Type of fault	fault princíple	PLC foot
malfu	name			position
nctio			Mary - Charles	
ns		25%		
codin		1 40		
g		1 15 2		
LPF	Low	Switch type	When the PLC monitors that	X3, COMO
LFI	Press	faults	the pressure switch is open	
	ure	Taurts	This fault occurs	
	Failur	Pressure	This fault occurs when the	5V, AI1,
	/e	monito	low pressure is	AICOM
	/AIV	ring	less than 0.05	
	(4"	type	MPa.	
/ 4		failure		

resul	spection operating ults method
-------	--------------------------------

	R410A	R407C
0~10°C	5~8Bar	3~6Bar
10~30°C	8~18Bar	6∼13Bar

1	Vehicle: power on and verify that the air conditioning control panel displays LPF normally. trouble code	□Yes		Wiew historic al faults
2	Tap into a manifold pressure gauge to see if the system balance pressure is within range	□Yes	□No	Insufficie nt or leaking system refrigera nt, check for leaks and refill.
3	Small temperature difference between the pipeline before and after the secondary expansion valve is detected by touch. empress	□ Yes.	No.	Check that the seconda ry electron ic expansi on valve operates correctl y when re- powerin g up the unit.
4	Whether the cooling and heating modes can be activated properly	□ Yes.	No.	Check low pressure switch/se nsor
5	Check that the condensing and evaporating fans are operating normally and that the air is coming out strongly.	□ Yes.	No.	Replace ment of the corresp onding fan

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Guide System Check whether the temperature difference 6 between the front and back of the main clogged or main electron No. ic expansi Yes. on valve not opening The diagram shows the cooling mode and the opposite for the heating mode.

4 HPF High Pressure Failure

malfu nctio ns codin g	name	Type of fault	fault princi		PLC foot position
HPF	High Press ure Failur e	Switch type faults Pressure monitoring block	When the PLC morning high pressure This fault occur disconnect When the high property higher than 2	switch es when ing essure is .8MPa	X2, COM0 5V, AI2, AICOM
move 1		er on and verify th control panel disp	at the air- lays HPF normally.	Inspection results □Yes □No	method View historic



2	Tap into a manifold pressure gauge to see if the system balance pressure is within range	□Yes	□No	System refriger ant overloa d
3	Small temperature difference between the pipeline before and after the secondary expansion valve is detected by touch. empress	□Yes	□No	Check that the seconda ry electron ic expansi on valve operates correctl y when re- powerin g up the unit.
4	Whether the cooling and heating modes can be activated properly	□Yes	□No	Check high pressure pressure switch/se nsor
5	Check whether the condensing and evaporating fans are operating normally and the air is strong.	□Yes	□No	Replace ment of the corresp onding fan
6	Check whether the temperature difference between the front and back of the main expansion valve is large by touching and heating mode ahead empress	□Yes	□No	System clogged or main expansi on valve not opening

The diagram shows the cooling mode and the
opposite for the heating mode.

	R410A	R407C
0~10°C	5~8Bar	3~6Bar
10~30°C	8~18Bar	6~13Bar

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5 LP1 Left low pressure fault

malfu nctio ns codin g	Fault name	Type of fault	fault principle	PLC foot position
LP1	Left low pressur e fault	Switch type faults	When the PLC monitors the pressure open This fault occurs when the switch is turned on	
		Pressure monito ring type failure	When the low pressure is below 0.05MPa block	5V, AI1, AICOM

move	methodologies	10 P	Inspection results	operating method
1	Vehicle: Power up and switch verify that the air replaitionin displays LPI normally thousand the second sec		□Yes □No	View historic
2	Tap into a manifold pressure system balance pressure is w		□Yes □No	Insufficie nt or leaking system refrigera nt, check for leaks and refill.

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			All Collaitioning
3	Small temperature difference between the		Guide Check
	pipeline before and after the secondary		that the
	expansion valve is detected by touch.	□Yes □No	
			ry electron
			ic
			expansi
	ahead		on valve
	ancary		operates
			correctl
			y when
			re-
	empress		powerin
		\wedge	g up the unit.
4	7771 d d l l l l l l l		Check
4	Whether the cooling and heating modes can be	□Yes □No	l l
	activated properly		pressure
	/ W. S	0	switch/se
	O. THE		nsor
5	Check whether the condensing and evaporating		Replace
	fans are operating normally and the air is	□Yes □No	ment of
	strong.		the
			corresp onding
			fan
6	Check whether the temperature difference		System
	between the front and back of the main		clogged
	expansion valve is large by follohing it in colling		or main
	and heating mode.	, X.N	electron
		□Yes □No	ic .
			expansi
			on valve not
/_^			opening
	ahead f		opening
	empress		
	The diagram shows the cooling mode and the		
	opposite for the heating mode.		

6 LP2 Right side low pressure fault

malfu nctio	Fault name	Type of fault	fault principle	PLC foot position
ns codin g				
LP2	Right side low pressur e fault	Switch type faults	Fires when the pressure switch is disconnected failures of this kind occur	X3, COM0
		Pressure monito ring type failure	When the low pressure is below This fault occurs at 0.05MPa	

move	methodologies	Inspection results	operating method
1	Vehicle: Power up and switch on the vehicle to verify that the air-conditioning control panel displays LP2 normally. trouble code	□Yes □No	View historic al faults

2	Tap into a manifold pressure gauge to see if the system balance pressure is within range	□Yes		Insufficie nt or leaking system refrigera nt, check for leaks and refill.
3	Small temperature difference between the pipeline before and after the secondary expansion valve is detected by touch. ahead empress	□Yes	□No	Check that the seconda ry electron ic expansi on valve operates correctl y when re- powerin g up the unit.
4	Whether the cooling and heating modes can be activated properly	□Yes	□No	Check low pressure switch/se nsor
5	Check whether the condensing and evaporating fans are operating normally and the air is strong.	□Yes	□No	Replace ment of the corresp onding fan
6	Check whether the temperature difference between the front and back of the main expansion valve is large by touching the colling and heating mode. A part of the main expansion valve is large by touching the colling and heating mode. A part of the main expansion valve is large by touching the colling the	□Yes	□No	System clogged or main electron ic expansi on valve not opening

opposite for the heating mode. R410A R407C 0~10°C 5~8Bar 10~30°C 8~18Bar 6~13Bar	The diagra	The diagram shows the cooling mode and the			
R410A R407C 0~10°C 5~8Bar 3~6Bar	opposite fo	or the heating mod	le.		
10~30°C 8~18Bar 6~13Bar	0~10°C	5~8Bar	3~6Bar		
10 00 0 0 100 01 0 100 01	10~30°C	8~18Bar	6~13Bar		

7HP1 Left side high pressure fault

	Fault	Type of	fault princ	rinle	PLC foot
malfu			Tautt print	.ipic	
	name	fault	181		position
nctio					
ns		R410A	R407C		
codin	0~10°C	5~8Bar	3~6Bar		
g	10~30°C	8~18Bar	6~13Bar		
HP1	High	Switch type	This fault occur	rs	X2, COMO
LLI	pressur	oressur faults when the high-		/ / N	
	e failure	lauits	pressure		
	on the	My 20.	pressure swi	itch	
	left side	W. 60	is disconnec	ted	$\langle \langle $
		Pressure	When the hig	gh	
		monito	pressure is hig	her	
		ring	than		
	CAV	type	This fault occur	rs at	
/ A		failure			
			2.8MPa		

<u></u>				
ď	move	methodologies	Inspection	operating
To the second			results	method
	1 /	Vehicle: Power up and switch on the vehicle to		View
1		verify that the air-conditioning control panel		historic
/		displays LPH normally.	□Yes □No	al faults
		trouble code		

2	Tap into a manifold pressure gauge to see if the system balance pressure is within range	□Yes □No	refriger ant overloa d
3	Small temperature difference between the pipeline before and after the secondary expansion valve is detected by touch. empress	□Yes □No	Check that the seconda ry electron ic expansi on valve operates correctl y when re- powerin g up the unit.
4	Whether the cooling and heating modes can be activated properly	□Yes □No	Check high pressure pressure switch/se nsor
5	Check whether the condensing and evaporating fans are operating normally and the air is strong.	□Yes □No	Replace ment of the corresp onding fan
6	Check whether the temperature difference between the front and back of the main expansion valve is large by touching the country of the main ahead empress	□Yes □No	System clogged or main electron ic expansi on valve not opening

8HP2 Right side high pressure fault

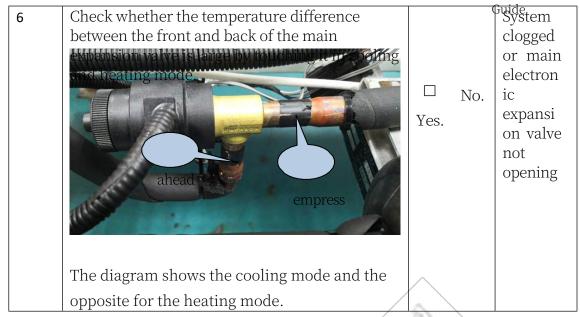
SØNGZ

malfu	Fault	Type of fault	fault principle	PLC foot position
	name		/ X 0 /	
nctio			W. O	
ns				
codin				
g			The State of the S	
LID1	Right	Switch type	When the PLC monitors	X2, COM0
HP1	side	faults	the high pressure open	
	high	Taurts	This fault occurs when	X
	pressur	H H	the switch is turned on	
	e	Pressure	When the high pressure	
	pressur	monito	is below 0.05MPa	
	e failure	ring	This fault occurs when	
	4	type failure	Dilli	

	move	methodolog	gies		Inspection	operating
/	. 400				results	method
	1	Vehicle: Po	wer up and switch	h on the vehicle to		View
×.	117	verify that t	the air-conditioni	ng control panel		historic
		displays LPI	normally.		□Yes □No	al faults
7		trouble cod	R410A	R407C		
		0~10°C	5~8Bar	3~6Bar		
		10~30°C	8~18Bar	6~13Bar		

2	Tap into a manifold pressure gauge to see if the system balance pressure is within range	□Yes	□No	refriger ant overloa d
3	Small temperature difference between the pipeline before and after the secondary expansion valve is detected by touch. empress	☐ Yes.	No.	Check that the seconda ry electron ic expansi on valve operates correctl y when re- powerin g up the unit.
4	Whether the cooling and heating modes can be activated properly	□ Yes.	No.	Check high pressure pressure switch/pr essure sensing tool
5	Check that the condensing and evaporating fans are operating normally and that the air is coming out strongly.	□ Yes.	No.	Replace ment of the corresp onding fan

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9 POH PTC overheat protection

o 1 <i>C</i>	Fault	Type	fault principle	PLC foot position
malfu nctio	name	of faul	W of	
ns		t		
codin		72	F 188	
g		1	40°	
РОН	PTC	switchg	When the PLC monitors the	X0, COM0
1 011	overheati	ear /	PTC overheat protection, the	
	ng /	ear	PLC will detect the PTC	
	protectio	13/	overheat protection.	
	n fault		This fault occurs when the	
	(1)		switch is disconnected	

move	methodologies	Test	operatin
1	Vehicle: Power up and switch on the vehicle to verify	results	g method View
1	that the air conditioning control panel displays POH normally. trouble code	□Yes □No	historic al faults
2	Measure the PTC temperature control switch		Replace
	with a multimeter for compliance.		ment of
			PTC
	PTC Temperature Temperature control switch status <150°C conduction >150°C turn off (electric switch)	□Yes □No	
3	Measurement of PTC temperature control		Check
	protection switch for 24V input	X	wiring betwee
	/1059/	□Yes □No	n
		114.	tempera ture
A			control
1			switch and PLC

10 Ell1 Return air temperature sensor failure

16	Fault	Type	fault principle	PLC foot position
malf	ا name	OÍ		
nctio		faul		
ns				
codir				

C	<i>6</i> //	N	C	7
	v	-	•	<i>E</i>

Matsushige Electric Bus Air Conditioning Repair

g				Guide
EII	Return air	Resist	This condition occurs when	
	- temperat	ance	the PLC detects that the	RT3, RT-
	ure	detec	resistance of the return air	
	sensor	tion	temperature sensor is out of	
	failure	class	the range of 0.6~108κΩ .	
			malfunctions	

move	methodologies	Test results	operating method
1	Vehicle: power up and switch on the vehicle to verify that the air-conditioning control panel displays EII1 normally. trouble code	□Yes □No	View historic al faults
2		□Yes □No	Replace the return air tempera ture sensor
3	Measure the sensor with a multimeter for 5V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

11 Ell2 Evaporator left defrost temperature sensor failure

	/				
	1.0	Fault	Type	fault principle	PLC foot position
	malfu	name	of		
	nctio	XS	faul		
	ns				
	codin				
٠.				1	

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g				Guide
FIIO	Evaporato	Resist	If the PLC detects that the	
EII2	r left	ance	resistance value of the	RT4, RT-
	defrost	detec	return air temperature	
	temperatu	tion	sensor is out of the range	
	re sensing	class	of 0.6~108κΩ , it sends a	
	device		message to the PLC.	
	failure		failures of this kind occur	

move 1	methodologies	Test results	operating method View
1	Vehicle: power up and switch on the vehicle to verify that the air-conditioning control panel displays EII2 normally. trouble code	□Yes □No	historic al faults
2	Muchi preterute racasure if temperatureing sensor resistance is with Fesistance range $90^{\circ}50^{\circ}\text{C}$ $0.5^{\circ}2.0\text{K}\Omega$ $50^{\circ}20^{\circ}\text{C}$ $2.0^{\circ}6\text{K}\Omega$ $20^{\circ}-0^{\circ}\text{C}$ $6^{\circ}14.2\text{K}\Omega$ $0^{\circ}7^{\circ}\text{C}$ $14.2^{\circ}20\text{K}\Omega$	□Yes □No	Replaci ng the Left Defrost Temper ature Sensor
3	Measure the sensor with a multimeter for 5V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

12 Ell3 Evaporator right defrost temperature sensor failure

1	Fault	Type fault principle	_
malfu	name	of	PLC foot
nctio	name	faul t	position
ns			
codin		7)	
g			

FIIO	Evaporato	Resist	This fault occurs when the PLC	Guide
EII3	r right	ance	detects that the resistance	RT5, RT-
	defrost	detec	value of the return air	
	temperatu	tion	temperature sensor is outside	
	re sensing	class	the range of 0.6~108KΩ .	
	device			
	failure			

move	methodologies		Test	operating
1110 V C	memodologico		results	method
1	Vehicle: power up and swittemper at ure range that the air-conditioning conormally: 50~50°C 50~20°C trouble code 0~7°C	tch on the vehicle to verify Corresponding ontroesisted despirate EH3 0.5~2.0KΩ 2.0~6KΩ 6~14.2KΩ 14.2~20KΩ	□Yes □No	View historic al faults
2	Multimeter to measur temperature sensor re range	esistance is within	□Yes □No	Replace the return air tempera ture sensor
3	Measure the sensor winput voltage.	ith a multimeter for 5V	□Yes □No	Check and repair wiring between sensor and controll er

13 Ell4 Outdoor temperature sensor failure

malfu nctio ns codin	Fault name	Type of faul t	fault principle	Guide PLC foot position
EII4	Outdoor temperat ure sensor failure	Resist ance detec tion class	When the PLC detects that the resistance of the return air temperature sensor is out of the range of 0.6~108KΩ, the PLC will detect the return air temperature sensor. This fault occurs when	RT2, RT-

move	methodologies	Test results	operating method
1	Vehicle: power up and switch on the vehicle to verify that the air-conditioning control panel displays EII4 normally. trouble code	□Yes □No	View historic al faults
2	Multimeter to measure if the outdoor temperature sensor resistance is within range	□Yes □No	Replace ment of Outdoor Temper ature Sensor

3	Measure the sensor wi	ith a multimeter for 5v	,	Check
	input voltage.			and
	OFF OFF OFF OFF OFF OFF OFF OFF	Corresponding resistance range	□Yes □No	repair wiring between sensor and controll er
	50~20°C	2.0~6ΚΩ		
	20~-0°C	6~14.2ΚΩ	6	

14 Ell5 Faulty condensate2coll temperature sensor

malfu	Fault name	Type of	fault principle	DIC
IIIaiiu			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PLC
nctio		faul	A 1 2 1	
		t	1 25 5	
ns		/	16 To 10 To	
codin		/ 2	A. a.	
g		1 1/4		
	Faulty	Resist	When the PLC detects that	~ / / N
EII5	condensing/	ance	the condensation	RT1, RT-
	coil	detec	temperature sensor	
	temperatur	tion	resistance value is out of	
	e sensor	class	the range of 0.6~108KΩ ,	
	1 4 8		the PLC will detect the	
	/ (1) /		condensation	
/	CAV		temperature sensor	
/ /			resistance value.	
/			This fault occurs when	

1.00			
move	methodologies	Test	operating
		results	method
1	Vehicle: Power up and switch on the vehicle to verify that the air-conditioning control panel displays EII5 normally. trouble code	□Yes □No	View historic al faults

2	Measure condensing coil temperature sensor resistance with a multimeter to see if it is within range.	□Yes		Replace condens ing coil tempera ture sensor
3	Measure the sensor with a multimeter for 5V input voltage range Corresponding resistance range 90~50°C 0.5~2.0ΚΩ 2.0~6ΚΩ 2.0~	□Yes	□No	Check and repair wiring between sensor and controll er

15 Ell6 Plate change inlet water temperature sensor failure

malfu nctio ns codin	Fault name	Type of faul t	fault principle	PLC
EII6	Faulty inlet water	Resist ance	Occurs when the PLC monitors that the	RT9, RT-
	temperatur	detec	resistance of the inlet water	,
	e sensor	tion class	temperature sensor is outside the range	
			of 0.6~108KΩ . this fault	

move	methodologies		Test	operating
			results	method

				a • 1
1	Vehicle: power up and swithat the air-conditioning conformally. trouble code	•	□Yes □No	Guide
2	Multimeter to measur tetappeature season range 40~50°C 20~40°C 0~20°C		□Yes □No	Replaci ng the water inlet tempera ture sensor
3	Measure the sensor winput voltage.	ith a multimeter for 5V	□Yes □No	Check and repair wiring between sensor and controll er

16 Ell7 Board swap water temperature sensor failure

The state of the s	malfu nctio ns codin g	Fault name	Type of fault	fault principle	PLC
	EII7	Failure of board exchange water temperatur	Resistance detection class	PLC detects sensor resistance outside the range of 0.6~108KΩ. breakdown	RT10, RT-

SØNGZ Matsushige						ectric Bus
					Air Conditioni	ng Repair
	e sensor				Guide	

	.1 1 1 •		- ·	
move	methodologies		Test results	operating method
1	Vehicle: Power up and switthat the air-conditioning co	3	resurts	View historic al faults
	normally. troumperature range	Corresponding	□Yes □No	
	40~50°C 20~40°C	resistance range 1.2~0.9KΩ 2.6~1.2KΩ		
	0~20°C	6~2.6KΩ		
2	Multimeter to measur temperature sensor re range	e if the water esistance is within	□Yes □No	Replace ment of water outlet tempera ture sensor
3	Measure the sensor winput voltage.	ith a multimeter for 5V	□Yes □No	Check and repair wiring between sensor and controll er

17 H1r Main circuit 1 Return air temperature sensor failure

malfu nctio	Fault name	Fault type	fault principle	PLC foot
ns codin				position

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H1r	Main circuit 1 Return air temperature	Resistance detection class	PLC detects sensor resistance exceeding 0.6~108KΩ range of faults	Guide RT7, RT-
	sensor failure	Class	block	

move	methodologies		Test	operating
		rrognonding	results	method
1	Vehicle: Power up and switch 69% 90~50°C that the air conditioning control part 50~20°C normally 10°C	rresponding istatise Early 0.5~2.0 KΩ incl displays 2.0~6 KΩ 6~14.2 KΩ 14.2~20 KΩ	□Yes □No	View historic al faults
2	Multimeter to measure if ter sensor resistance is within r	1	□Yes □No	Replace the main circuit 1 return air tempera ture sensor
3	Measure the sensor with a minput voltage.	nultimeter for 5V	□Yes □No	Check and repair wiring between sensor and controll er

18 H2r Main circuit 2 Return air temperature sensor failure

ma	15	Fault name	Fault type	fault principle
	~			
nct	10			

ns					Guide
codin	temperature r	ange	Cor	responding	
g			resi	stance range	2
	Main & Concount	Resis	tance (0.5∀₽a0KΩctio	on when PLC detects
H2r	2 Retution 20°C	doto	ction	2.0~6KΩ	sensor resistance
	tempezotuore	uete	Ction	6~14.2KΩ	outside the range of
	sensor _{0~7°C}	Cl	ass 1	4.2~20KΩ	0.6 ~108KΩ.
	failure				

100 0170	mathodologica	Test	anaratina
move	methodologies	results	operating method
1	Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally H1r trouble code	□Yes □No	View historic
2	Multimeter to measure if temperature sensor resistance is within range	□Yes □No	Replace main circuit 2 return air tempera ture sensor
3	Measure the sensor with a multimeter for 5V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

19 H3r Sub-circuit 1 Return air temperature sensor failure

	90~50°C	0.5~2.0KΩ		
1.0	Faul50ra20°C Typ	e of fault 2.0~6K © ault pr	inciple	X//
malfu	20~-0°C	6~14.2KΩ		PLC
nctio	0~7°C	14.2~20KΩ		

ns codin g				Guide
H3r	Sub-circuit 1 Return air temperature sensor failure	Resistance detection class	The PLC sends a message when it detects that the sensor resistance value is out of the range of 0.6~108KΩ. malfunction	RT6, RT-

1 Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally H1r trouble code 2 Multimeter to measure if temperature sensor resistance is within range	ults	Replace ment of sub-
1 Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally H1r trouble code 2 Multimeter to measure if temperature sensor resistance is within range	es 🗆 No	Replace ment of sub-
Vehicle: Power up and switch on the vehicle to verify that the air conditioning control panel displays normally H1r trouble code 2 Multimeter to measure if temperature sensor resistance is within range		Replace ment of sub-
normally H1r trouble code 2 Multimeter to measure if temperature sensor resistance is within range		Replace ment of sub-
trouble code Multimeter to measure if temperature sensor resistance is within range	es □No	ment of sub-
Multimeter to measure if temperature sensor resistance is within range	es □No	ment of sub-
sensor resistance is within range	es □No	ment of sub-
/_ % /	es □No	sub-
	es 🗆 No	
		CIICUIL 1
		return
		air tempera
A H ONO		ture
		sensor
Measure the sensor with a multimeter for 5V		Check
input voltage.		and repair
ā		wiring
temperature range Corresponding	es 🗆 No	
resistance range		sensor
90-50°C		and
50 -20°C 2.0-6KΩ 20-0°C 6.14.2KΩ		controll er
7°C 14.2-2000		C1
FLLIKE 319 TRUE RIMS CLAMP METER CATE		
COM LOVE VO		

20 H4r Sub-circuit 2 Return air temperature sensor failure

malfu	Fault name	Type of fault	fault principle Guide
nctio			
ns codin g			
H4r	Sub-circuit 2 Return air temperature sensor failure	Resistance detection class	PLC detects a malfunction when the sensor resistance value exceeds the range of 0.6~108ΚΩ.

	.1 1 1 .		. •
move	methodologies	Test	operating method
1	Vehicle: power up and switch on to verify that the air-	results □Yes □No	method
	conditioning control panel displays properly H4r trouble code	Lifes Lino	
2	Multimeter to measure if temperature sensor resistance is within range	□Yes □No	ature Sensor
3	Measure the sensor with a multimeter for 5V input voltage.	□Yes □No	Check and repair wiring between sensor and controll er

Matsushige Electric Bus Air Conditioning Repair Guide HUF High Voltage Input Power Failure Check 21

malfu	Fault	Type of	fault principle
nction	name	fault	
coding			
HUF	High-voltage input disconne ction fault	Voltage Inspection	This fault occurs when the input voltage for load-side detection is less than 400V.

	.1 1 1 .	m ·	. •
move	methodologies	Test	operating
		results	method
1	Vehicle: power up and switch on to verify that the air conditioning control panel displays normally. HUF Fault Code	□Yes □No	View historic al faults
2	Measurement of fuse continuity	□Yes □No	Replace ment of fuses
3	Measure whether the air conditioner high voltage input is in the range of 450~750V.	□Yes □No	Check the air- conditio ning insuran ce of the whole vehicle Contact the vehicle manufa cturer to

			Air Conditionir	ing ite
			the air- conditio ning power supply if necessa ry	
5	Measure the low voltage input of the HELI compressor between 18 and 32V.	□Yes □No	Find and repair breaks and false connecti ons along the line.	
6	The first time you switch on the power manipulator to start the machine, that is to say, to measure whether the high voltage input of the HELI compressor (DC) is at (based on the rated voltage range of the nameplate of the compressor).		Replace Compre ssor High Pressur e Harness	

7	Check the communication line between the compressor and the PLC for breaks, shorts and false connections.	□Yes □No	Replace ment of compress ion
---	---	----------	---------------------------------------

22 LU Inverter undervoltage

malfu	Fault	Type of	fault principle
nction	nction name fault		
coding			
LU	Inverter underv oltage fault	Voltage Dete ction	This fault occurs when the input voltage is detected to be less than 300V at the load side during operation.

move	methodologies	Test	operatin
		results	g method
1	Vehicle: Power up and switch on the vehicle to		
	verify that the air conditioning control panel	□Yes □No	
	displays normally LU		
	trouble code		
2	Measurement of fuse continuity		Replace
		□Yes □No	ment of fuses

3	3.6 1 .1 .1 . 1 1 . 1		Check
3	Measure whether the air conditioner high		the air-
	voltage input is in the range of 450~750V .		conditio
			ning insuran
		□Yes □No	
			whole
			vehicle
			Contact
			the
			vehicle
			manufa
			cturer to
			restore
			the air- conditio
			ning
			power
			supply if necessa
			ry Check
4	Measure whether the input voltage of 2-in-1		main
	is between 450~750V .	□Yes □No	
			r weak
			coil and
			input
			voltage
5	The first time the power-up manipulator is		Replace
	switched on, the 2-in-1 input voltage is		Compre
	measured at the		ssor
	400~750V range		High
	400 730V Tange	□Yes □No	_
			е
			Harness
1			



Check the communication line between the compressor and the PLC for breaks, shorts and false connections. 7

□Yes □No

Replace ment of compres sion

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23 OU Inverter overvoltage

malfu	Fault	Fault type	fault principle
nction	name		
coding			
OU	Inverter overvol tage fault	Voltage Dete ction	This fault occurs when an input voltage higher than 750V is detected on the load side during operation.

		\wedge	
move	methodologies	Test	operatin
		results	g method
1	Vehicle: Power up and switch on the vehicle to		View historic
	verify that the air conditioning control panel	□Yes □No	al faults
	displays OU normally.		
	trouble code		
2	Measure whether the air conditioner high		
	voltage input is in the range of 450~750V.		
		□Yes □No	
3	Measure whether the input voltage of 2-in-1		Replace
	is between 450~750V.		ment of 2-in-1
		□Yes □No	



24 EOC Evaporator fan inverter øvercurrent

malfu	Fault	Type of	fault principle
nction	name	fault	3 / N
coding	/	一世界的	
FOC	Evapora	Current	When the 2-in-1 detects that the
EOC	tor fan	detec	evaporator fan output current is greater
	inverter	tion	than the
/	over	class	This fault occurs at 100A
	stream of		
	water or		
/ 4 9	sth.		
. 4	resemblin		
	/ g one		

П				
	move	methodologies	Inspection	Treatment
			results	programm
P				е
/	1	Vehicle: Power on and verify that the air conditioning		View
		venicle: Power on and venity that the air conditioning		historic
		control panel displays EOC normally.	□Yes □No	al faults
		trouble code		
		X-7/)'		

2	Check the appearance of the fan is intact, no		(Guide Replace
2	damage, no blockage, fan blade rotation freely	□Yes	□No	or
3	Check the evaporator fan line connections, whether the connection is reliable, no skewed plugs, back pins	□Yes	□No	Tighten connecti ons or correct wiring sequenc e
4	Check that the evaporator fan wiring is intact and free of damage and short circuits	□Yes	□No	Repair or replace ment of wiring
5	Remove and disconnect the evaporator fan inserts one by one, and test for faults by switching on the machine once for each evaporator fan disconnected;	□Yes	□No	Replace ment of the appropriate evapora tor fan

6	1, Disconnect the evaporator fan power connection plug;		Replace ment of
	2, Swap AO1 and AO2 pins in the PLC interface;	□Yes □No	the
	3, Ventilation mode run for a period of time		appropr iate
	failure occurs or not;		evapora
	THE REAL PROPERTY OF THE PROPE		tor fan
7	Replace the 2-in-1 and try it for a while, does the	1	
	fault no longer occur	- 30	
	THE WALL	□Yes □No	

25 EOH Evaporator fan inverter overheating

	malfu Fault		Type of	fault principle
	nction	name /	fault	
	coding	2		
	ЕОН	Evapora	Temper	This fault occurs when the inverter
	EOH	tor fan	ature	internal temperature sensor
		inverter	Dete /	detection value reaches or
		over	ction	exceeds the set maximum
9		heat up	/ 42	value.

/			
move	methodologies	Inspection	Treatment
	May Com	results	programm
	180° 100°		е
1	Vehicle: Power on and verify that the air conditioning		View
	control panel displays EOH normally.		historic
	trouble code	□Yes □No	al faults
		UT,	

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2	Switch on and run for a period of time to check	(Replace
	whether the heat fan in the appliance compartment (including stand-alone fans and	□Yes □No	the cooling
	fans supplied with the appliance) is running.		fan or
			corresp
			onding
			compon ents
3	Check that the air inlet and outlet of the		Clear
	electrical compartment are clear and free from		the blockag
	blockage	□Yes □No	e e
		₽	
	The state of the s	: 0	
		5/	
4	Check that the electrical compartment		Replace
-	insulation foam is intact and has not fallen off.		or
	insulation foam is intact and has not railed off.		reapply
			insulati
			on foam
		□Yes □No	
/			
1			

26 EOL Evaporator fan inverter overload

malfu	Fault	Type of	fault principle
nction	name	fault	
S	X		
coding			

FOL	Evapora	Current	This fault occurs when the 2-in-i
tor fan detec det		detects that the fan output	
	inverter	tion	current is greater than the
	over	class	rated fan current of 100A .
	year		

movo	methodologies	Inspection	Treatment
move	memodologies	results	programm
		resurts	e
1			View
	Vehicle: Power up and switch on the vehicle to verify		historic
	that the air conditioning control panel displays	□Yes □No	al faults
	properly LOC		
	trouble code		
2	Check the appearance of the fan is intact, no		Replace
	damage, no blockage, fan blade rotation freely		or
		□Yes □No	
			the
			blockag e
	The state of the s		
3	Check the evaporator fan line connections,		Tighten
	whether the connection is reliable, no skewed		connecti
	plugs, back pins	□Yes □No	ons or
			correct
			wiring
			sequenc
			е
4	Check that the evaporator fan wiring is intact		Repair
	and free of damage and short circuits	□Yes □No	or replace
			ment of
			wiring
		1	O

5	Remove and disconnect the evaporator fan		(Replace
	inserts one by one, and test the fault by			the
	switching on the machine once for each			appropr
	evaporator fan disconnected to test if the fault	□Yes		iate
	does not occur again;	Lites		condens
	does not occur again,			
	ACCUS			ing fan
	A 100 (100)			
	The state of the s	\wedge		
6	1 Disconnect the even present for payor	91		Replace
Ь	1,Disconnect the evaporator fan power	- 10.		ment of
	connection plug;		□No	the
	2, Swap AO1 and AO2 pins in the PLC interface;	Lives		
	3, Ventilation mode run for a period of time			appropr iate
	failure occurs or not;			evapora
	CONTRACTOR OF THE PROPERTY OF			tor fan
				tor rarr
				/ . K
	OUT2 OUT1			
8	Penlacothe 2 in Land try it for a while downth			
	Replace the 2-in-1 and try it for a while, does the	14		
	fault no longer occur			
		□Yes	\square No	
	(4 ⁷ /	<u> </u>		
/ /				
1				

27 C5F Pressure Sensor Failure

malfu nction	Fault	Type of fault	fault principle	PLC
S	name	rauit		
coding				
C5F	Pressur	Voltage	When 2-in-1 detects that	
CSF	е	Detection	the pressure sensor	5V, AI1,
	sensor	Detection	feedback voltage is out	AICOM
	failure		of the 0~5V range	
			This fault occurs	

move	methodologies		Inspection	Treatment
111010	illetilodologies		results	programm
			1000.2.0	е
1	1 . 1		- 0	View
	Vehicle: power uj	o and switch on the vehicle to verify	2	historic
	that the air-condi	tioning control panel displays C5F	□Yes □No	al faults
	normally.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
	11011114119•	A 10 10 10 10 10 10 10 10 10 10 10 10 10		
3	Massura the san	sor for 5V input voltage		Check
	Measure the sen	sor for 5v input voltage		wiring
		-	□Yes □No	from
				sensor
				to PLC
	2			OIII
	N. C.			X 1
		10 AD 12 m	, X	
	Pressure (MPa)	Low Pressure High Pressure		
	11c3sure (Wir a)	Sensor Sensing		
		Reverse Feedback Voltage		
/ /		Feed voltage (V)		
4	Measure whethe	erYhe sensor feedback voltage is		Replace
1	0~1.6	0.5~1.88	□Yes □No	ment of
	0~1.6 in the range of 0 1.6~3.0	1.88~3.09 2.13~3.61		the
	3.0~4.0	3.09~3.93 3.61~4.03		pressure
				sensor
		X		
5	Replace pressur	e transducer Check transducer to		
	PLC feedback sig	narme		

28 S1r Pressure sensor failure

malfu	Fault	Type of	fault principle	PLC
nction	name	fault		
coding				
S1r	Pressur	Voltage	2-in-1 detected to pressure	5V, AI1,
311	e sensor	Detection	sensor 1	AICOM
	1 fault	Beteetien	When the feedback voltage	
			is out of the 0~5V range	
			This fault occurs	

	.1 11 .			A	.
move	methodologies		/	Inspection	Treatment
			/ A)1	results	programm
			1 1 1 1 1 1		е
1		1 . 1 .1	1.17		View
	Vehicle: Power up	o and switch on th	ne vehicle to verify		historic
	that the air condit	ioning control pá	nel displays	□Yes □No	al faults
			The state of the s		
	properly S1r	/ %	M 3" /		
		/ * **	~ /		
3	Measure the sen	sor for 5V input	voltage		Check
		S Sant			wiring
				□Yes □No	from
			100		sensor
					to PLC
			E		
			Call Dr. Com		
	Pressure (MPa)	Low Pressure	High Pressure		
/ /	1 1 CBB (IVII U)	Sensor	Sensing		
. 400		Reverse	Feedback Voltage		
1		Feed voltage			
			(V)		01 1
4	Measure whether	er the sensor fee	lback voltage is		Check
	. 0~1.6 in the range of 0 1.6~3.0	0.5~1.88 5V	0.45~2.13	□Yes □No	sensor
	1.6~3.0	1.88~3.09	2.13~3.61		to PLC
	3.0~4.0	3.09~3.93	3.61~4.03		feedbac
		X			k signal
					line
	X.	XI			

SØNGZ Matsushige Electric				
		Air Conditionii	ng Repair	
5	Check sensor to PLC feedback signal line		Guide	

29 S2r Pressure sensor failure

malfu	Fault	Type of	fault principle	PLC foot position
nction	name	fault		
s coding				
S2r	Pressur	Voltage	2-in-1 detects	
321	e sensor 2 fault	Detection	pressure sensor 1 feedback voltage	5V, AI2, AICOM
			exceeds 0~5V	
			This fault occurs when	
			the range	

		233	
move	methodologies	Inspection	Treatment
	/2/14	results	programm
		7/	е
1	Vehicle: Power up and switch on the vehicle to		View
	- C. Y.A. /		historic
	verify that the air conditioning control panel	□Yes □No	al faults
	displays properly S2r		
3	Measure the sensor for 5V input voltage		Check
			wiring
		□Yes □No	
			Sensor 2
			to PLC.
	Pressure (MPa) Low Pressure High Pressure	111-	
/ /	Pressure (MPa) Low Pressure High Pressure Sensor Sensing		
A 3000	Reverse Feedback Voltage		
1	Feed voltage (v)		
	(V)		
4	Meassure whetherothers sansor feed bask 2x03 tage is		Replace
	in 1.6 Pange of 0 488~3.09 2.13~3.61	□Yes □No	
	3.0~4.0 3.09~3.93 3.61~4.03		pressure
	X		sensor 2
	V2/\\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
	Y Y Y Y		
	XSA N		

5	Check Sensor 2 to PLC Feedback Signal Wire	(Guide

30 S3r Pressure sensor failure

malfu	Fault	Type of	fault principle	
nction	name	fault		
coding				
S3r	pressure sensing Instrume nt 3 Failure	Voltage Detection	2-in-1 detects pressure sensor 3 feedback voltage exceeded This fault occurs in the 0~5V range	

move	methodologies	12.3	3	Inspection results	Treatment
		The same		results	programm e
1	Vehicle: Power	up and switch or	the vehicle to		View historic
	verify that the a	ir conditioning c	ontrol panel	□Yes □No	
	displays properl	y S3r			
3	Measure the ser	nsor for 5V input	voltage	117-	Check
//					wiring
4				□Yes □No	from Sensor 3
1					to PLC.
עוט (וו			E		10126.
	Pressure (MPa)	Low Pressure	High Pressure		
1	TTCSSCC (IVII a)	Sensor	Sensing		
		Reverse	Feedback Voltage		
		Feed voltage	(V)		
		(V)			
	0~1.6	0.5~1.88	0.45~2.13	•	
	1.6~3.0	1.88~3.09	2.13~3.61		
	3.0~4.0	3.09~3.93	3.61~4.03		

4	Measure whether the sensor feedback voltage is in the range of 0~5V	□Yes	□No	Replace ment of pressure sensor 3
5	Check Sensor 3 to PLC Feedback Signal Wire			

31 S4r Pressure sensor failure

malfu	Fault	Fault type	fault principle
nction name			
coding			
S4r	pressure	Voltage	2-in-1 detects pressure transducer 4
	sensing 4 Faults	Detection	feedback voltage exceeded This fault occurs in the 0~5V range

move	methodologies	Inspection	Treatment
	/ W 25 /	results	programm
			е
1	77 1: 1 D		View
	Vehicle: Power up and switch on the vehicle to		historic
	verify that the air conditioning control panel	□Yes □No	al faults
	displays properly S4r		

Pressure (MPa)	Low Pressure	High Pressure
	Sensor	Sensing
	Reverse	Feedback Voltage
	Feed voltage	(V)
	(V)	
0~1.6	0.5~1.88	0.45~2.13
1.6~3.0	1.88~3.09	2.13~3.61
3.0~4.0	3.09~3.93	3.61~4.03

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3	Measure the sensor for 5V input voltage	□Yes □No	wiring from Sensor 4 to PLC.
4	Measure the sensor feedback voltage to see if it is within range	ÛYes □No	Check Sensor 4 to PLC feedback signal wire
5	Replacement of pressure sensor 4 Coil 1 Coils 2 common		
32	guide oran pink porn ferro pessimistic UHF Electronic Expansion Valve colou (colo phic	Failure	
1 5	If Γ Fault Type of fault princip ion numer $\Theta \Omega$ (± 3) fau $\Theta \Omega$ (± 3) $\Theta \Omega$ (± 3) $\Theta \Omega$ (± 3)		PLC foot position
UH	responsion valve dance Failure responsion to the problem of when the output of the electron expansion valve exceeds the range two-in-one detection to the problem of when the output of the electron expansion valve exceeds the range two-in-one detection to the problem of the p	current M nic +1 e coil e of the	A+, MA-, B+, MB-, 2V

move	methodologies	Inspection	Guide Treatment
	J	results	programm
			e
1	Vehicle: power up and switch on to verify that the		View
	air conditioning control panel displays normally.		historic
	HUF	□Yes □No	al faults
	1101		
2	Measuring electronic expansion valve coil		Replace
	resistance		electron
	resistance		ic .
			expansi
			on valve coil
			COII
		□Yes □No	
	11-46±312		
	46±3Ω 46±3Ω		
	46±312 46±30		
	4620		
3	Check and Capitair miswiringitant short amounts		
3	between the PLC and the expansion valvered.		
	(Neutral)		
	guide oran pink porn ferro pessimistic		
	wire ge ogra us		
	colou colo phic		
	r ur)		
	nume $92\Omega (\pm 3)$ $92\Omega (\pm 3)$ $46\Omega (\pm 3)$		
33	Figal Electronic Expansion Valve 1	Fault	
malfur	Fault type fault principle	P	LC Foot
ctions	limme		
coding	Flectron 2-in-1 detection occi	ırs ev1a+	, ev1a-,
F1r	II 1C	2000.00	•
	expansi detection expansion valve co	CV_D.	, EVID-,
	on output current is o		
	Valve 1 of range		
	Failure this fault		

move 1	methodologies Vehicle: Power up and switch on the vehicle to verify that the air-conditioning control panel displays normally F1r	Inspection results □Yes □No	Treatment programm e View historic al faults
2	Measuring electronic expansion valve coil resistance $\begin{array}{c} A6^{+}3\Omega \\ A6^{+$	□Yes □No	Replace electron ic expansi on valve coil
3	Check and repair miswiring and short circuits between the PLC and the expansion valve coil.		

34 F2r Electronic Expansion Valve **2** Fault

malfu nction	Fault name	Fault type	fault principle	PLC f	
coding					
F2r	Electron ic Expansi on Valve 2 Failure	current detection	2-in-1 detection occurs when the electronic expansion valve coil output current is out of range this fault	ev2a+, ev2b+, ecom	ev2a-, ev2b-,

move	methodologies	Inspection	Treatment
	/ N	results	programm
		~//	e View
1	Vehicle: Powerlup and switchion the vehicle to Verify		historic
	that the air conditioning control panel displays al)	□Yes □No	al faults
	novidely Far pink porn ferro pessimistic		
2	Measuring electronic expansion valve coil		Replace
	resistance resistance		electron
	nume $92\Omega (\pm 3)$ $92\Omega (\pm 3)$ $46\Omega (\pm 3)$		ic .
	rical 9207 (±3) 9207 (±3) 4002 (±3)		expansi on valve
	value		coil
	of	X	
	eleco		
	ical impe	□Yes □No	
	danc		
1	2+30		
	$-46\pm 3\Omega$ $-46\pm 3\Omega$ $-46\pm 3\Omega$		
	46±3Ω		
) /	46±3Ω		
3	Check and repair miswiring and short circuits		
	between the PLC and the expansion valve coil.		

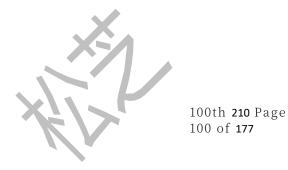
35 F3r Inefficient Water Circulation Failure

malfu nction s	Fault name	Type of fault	fault principle
coding			
F3r	Failure of inefficie nt water circulati on	logical judgement	When the return air temperature is detected to be less than 10°C after 3min of operation and the outlet water temperature minus the inlet water temperature is more than 10°C for 20S. this fault

		\wedge	
move	methodologies	Inspection	Treatment
		results	programm
		* 10	e
1	Vehicle: Power up and switch on the vehicle to verify	0//	View
		□Yes □No	historic al faults
	that the air conditioning control panel displays	r Lives Lino	arrauns
	normally F3r		
2	Take the manifold pressure gauge tube in forced		Check
	plate change mode and drain the valve core at		that the
	the plate change to see if any water comes out.		pump is
			running
		□Yes □No	
	HT.		
/		1111	
1			
3	Observe the status of the drainage tube to see if		Continue
	it appears to be columnar and flows out	□Yes □No	1 2
	forcefully		the drain tube until
			tube unui the
			drainage is
			columnar
	XXI		COTATITION

36 F4r Water inlet and outlet reverse connection fault

nc s	alfu tion	Fault name	Type of fault	fault	principle	
F4		Water inlet and outlet reverse polarity fault	logical judgement	of the outlet water		than the er and the r is greater e outlet
move					Inspection results	Treatment programm e
1	Vehicle: power up and switch on the vehicle to verify that the air conditioning control panel displays normally F4r				□Yes □No	View historic al faults
2	Unplug the water outlet temperature sensor and check if the water outlet temperature value is positive				□Yes □No	Inlet and outlet water temperat ure sensors are reversed.
3	Multiple runs to observe if there is a change in the value of the outlet water temperature			□Yes □No	Replace	
4	Communicate and assist vehicle personnel in making corrections to the water system					J



			W W CO	
SØNGZ 37PFF W		mp failure	2	Matsushige Elec Air Conditioning Guide
faulty generati on classifier for length or distance (yard), happenings etc	Fault name	Type of fault	fault principle	PLC foot position
PFF	Water pump failure	Switching faults	When the PLC monitors the X5 input This fault occurs at 24V (water pump) (0V feedback) When the PLC monitors that X5 is not entered This fault occurs at 24V (water pump) (24V feedback)	Х5

move	methodologies	Inspection results	operating method
1	Vehicle: Power on and verify that the air conditioning control panel displays PFF normally.	□Yes □No	View historic al faults
2	Measure for 24V input to pump in 777 (forced plate change) mode.	□Yes □No	Check and repair wiring and fuses
3	Pump operation with 24V input	□Yes □No	Replacem ent of water pumps

		/	^]
4	Take the manifold pressure gauge tube in forced plate change mode and drain the valve core at the		Purge air from
	plate change to see if any water comes out.	□Yes □No	the
	place change to bee in any water confess out.		water
			system
			,
	HTT.		
5	Test whether the current during pump operation		Check
	≤ rated power/27	□Yes □No	and remove
	_ N	Lies Livo	water
	X 88		line
	W. C.		blockage
		(S
6	Test pump for 24V feedback (faulty		Replacem
	disconnected pumps)	□Yes □No	ent of
	1 2 3 /		water
			pumps
	F 110		
	(reverse of fault feedback 24V model)		OII
7	Check the wiring between PLC pin X5 and the		
	pump.		-
/			

38LLF Liquid Level Fault

malfu	1 auit	Type of	fault principle	PLC foot
nction s	name	fault		position
coding		\times_{\wedge}		
			This fault occurs	
LLF	Liquid	Switch type	when the PLC	
LLI	Liquid	5 witch type	monitors that 24V is	X4
	level	faults	not being input to pin	
			X4 (normal).	

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SØNGZ	Matsushige Electric Bus
	Air Conditioning Repair

failure	(closed)	Guide
	When the PLC	
	monitors the X4 pin	
	input	
	This fault occurs at	
	24V (normal)	
	(open)	

move	methodologies			Inspection	operating
				results	method
1	Vehicle: power		View		
	verify that the air-conditioning control panel				historic
	displays LLF norr	_	1	□Yes □No	al faults
	aropiayo . Iron				
2	Check that the l	kettle level is no	t below the lower	□Yes □No	
	limit when the p	oump is running))		
3	Measurement le	vel switch with	or without 24V		Check
	input	ver avviceir veitir	or without 211	□Yes □No	and
	Input				repair
					the level
				10/	switch and PLC
			_ M d) /	(X4 ,
	level state	Level switch	fault state		COMO)
		status			bus route
4	fluid shortage Check that the l	turn off (electric evel status is co switch)	malfunctions nsistent with the		Check and
	levelswitghstat	us conduction	normalcy	□Yes □No	
		1 40 0			the level
	,	N. 35			switch
	The above table	is for normally	closed level		and PLC
	Sind	1, 70			(X4,
	switches, norma	33" /	iuit status is tile		COM0) Interline
	opposite of this				IIICIIIIC
5	Replacement of	level switch			
	(4)				
/ A					
1			\mathcal{N}		
	/				

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VII, Standalone Thermal Management Troubleshooting Chart

<u>Essential Tools for Battery Thermal</u>	<u>Management Repair</u>
name (of a thing)	quantities
CAN_test	1
laptops	1 unit
Commissioning Panel (Thermal	1
Management)	

1 Busbar undervoltage fault

malfu	Fault	Type of	fault principle
nction	name	fault	
S		radic	(W) LO (
coding			
01	Busbar	Voltage	This error occurs when the compressor
0x01	undervolt	Detection	test output voltage falls below 400V.
	age	Detection	block
	malfuncti		10 / 10 /
	ons		* ° ′

122 OT 10	mathodologica	Increation	Trootmont
move	methodologies	Inspection	
	The same of the sa	results	programm
	LAMP LUTTO		e
1	Measure whether the HV+ and HV- input voltage		Check the
	is >400V.		vehicle's
	13 > 400 V.	No.	power-up
		Yes.	condition
	(4) X		and
/ /			communi
. 400			cate with
1			the whole
	\times		vehicle
	< X		after-
			sales
			service if
1			necessary
	X.X.		

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2	Measure the voltage between the back end of the fuse and the HV-voltage in the unit for >400V.	☐ Yes.	No.	Replace ment of fuses after power failure
3	Access to debug panel and power on/transmit: ID: OCFFFFDA Data: 03 00 00 32 00 00 00 00 00 Measure the voltage between CM+ and CM- after the pre-charging contactor is engaged. 400V	□ Yes.	No.	Replace ment of High Voltage Electric al Board
4	Unplug the compressor high pressure plug-in Access to debug panel and power on/transmit: ID: OCFFFDA Data: 03 00 00 32 00 00 00 00 00 Measure the voltage between the compressor high-voltage plug-in 1 (negative) and 2 (positive) pins to see if it is >400V after the pre-charging contactor is engaged.	□ Yes.	No.	Repair or replace compres sor high pressur e harness

				All Collandonin
į	5	Measure the low voltage input of the HELI		Guide Checked
		compressor between 18 and 32V .		and
		Compressor Services 15 and 52 v.		repaired
				wiring
			□Yes □No	
		7612		
		A COLUMN TO THE PART OF THE PA		
		** *** *** *** *** *** **** **** ******		
			^	
			9) /	
			- 10	
			0 //	
		7-10. To VE		
		12.0007		
		TO BE SEED BY		
		And the second s		< 1 N
-	6	Disconnect the compressor low voltage		Replace
`		harness and measure the resistance of the		the
		compressor CAN wire (yellow and green) for		compres
		120 <u>0</u> .	□Yes □No	
				checkin
			W.	g the
				low
	Allen		11	voltage
				wiring harness
		/ X		for
	1	X X		correctn
)				ess
7	7	Measure the resistance of the CAN lines (7 and 8)		Replace
		on the module side for 120Ω .		the CAN
		on the module side for 12012.	□Yes □No	module
		V ~ ~		after
		XSA NI		checking
				the
				wiring

S€	NGZ	Matsushige Ele	
		Air Conditionii	ng Repair
8	Replacement of compressor	Guide	
2	Busbar overvoltage fault		

malfu	Fault	Fault type	fault principle			
nction	name					
S						
coding						
02	Busbar	Voltage	This fault occurs when the compressor			
	overv	Detection	detection output voltage is >720V.			
0x02	oltage fault	Detection	detection output voltage is 7720 v.			

move	methodologies	Inspection	Treatment
		results	programm
			e
1	Measure whether the HV+ and HV- input voltage		Check the
	is >400V.		vehicle's
	*** ****	□Yes □No	1
	7, 201		condition and
	1		communi
			cate with
	(C4)/		the whole
/ /			vehicle
			after-
The ?			sales service if
			necessary
2	Measure the voltage between the back end of the		Replace
	fuse and the HV-voltage in the unit for >400V.	□Yes □No	
	Tuse and the IIV voltage in the amit 101 7400V.		fuses
			after
	XX		power failure
	X 2/1) T		Tallule

3	Access to debug panel and power on/transmit: ID: OCFFFFDA Data: 03 00 00 32 00 00 00 00 00 Measure the voltage between CM+ and CM- after the pre-charging contactor is engaged. 400V	□Yes	□No	Replace ment of High Voltage Electric al Board
4	Unplug the compressor high pressure plug-in Access to debug panel and power on/transmit: ID: OCFFFDA Data: 03 00 00 32 00 00 00 00 00 Measure the voltage between the compressor high-voltage plug-in 1 (negative) and 2 (positive) pins to see if it is >400V after the pre-charging contactor is engaged.	□Yes	□No	Repair or replace compres sor high pressur e harness
5	Measure the low voltage input of the HELI compressor between 18 and 32V.	□Yes	□No	Checked and repaired wiring

6	Disconnect the compressor low voltage		Replace
	harness and measure the resistance of the		the
	compressor CAN wire (yellow and green) for		compres
	120Ω.	□Yes □No	sor after
			checkin
			g the low
			voltage
			wiring
			harness
			for
			correctn
			ess
7	Measure the resistance of the CAN lines (7 and 8)	\wedge	Replace
	on the module side for 120Ω .		the CAN
	off the module side for 1202.	□Yes □No	module
	/ 1		after
		0	checking
			the
	- MI - D		wiring

		Air Conditioni	ing Repair
8	Replacement of compressor	Guide	

Matsushige Electric Bus

3 24V Low voltage undervoltage fault

SØNGZ

hap	fault	fault	fault principle	Module
peni		type		Footprint
ng	steelyar	type (e.g.	\wedge	Tootpilit
trouble	d	blood		
code		type)		
03			AJF PO	CN1-1 (VCC)
	24V Low	Voltag	This fault occurs when the	CN1-2 (GND)
0x03	undervo	е	CAN module detects	
	ltage	Det	an input voltage <18V.	
	malfunc	ecti	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	tions	on	/_ 3/ 2/	

move	methodologies	Inspection	operating
		results	method
1	Measure whether the input voltage between		Replacem
	pin 1 (redand pin 2 (black) of the module is		ent of CAN
	<18V.		module (in
	/ Y 30 /	□Yes □No	software)
	/ 1 3 /		
/		UT.	
/ /			
2	Check that the wiring is free of short-circuit and)	Replacem
	disconnection faults		ent of
		□Yes □No	modules

SØN	NGZ]	Matsushige Ele Air Conditionir	ectric Bus ng Repair
3	Repair or replacement of wiring	(Guide	
		□Yes □No		

4 24V low voltage overvoltage fault

malf uncti ons		Type of fault	fault principle	Module Footprint
coding				
04				CN1-1 (VCC)
	24V Low	Voltage	Occurs when the CAN	CN1-2 (GND)
0x04	overpres sure	Detectio	module detects (pins 1 and 2) that the input	
	malfunct	n	voltage is >32V.	
	ions		this fault	

	/		
move	methodologies	Inspection	operating
		results	method
1	Measure whether the input voltage between	30	Replacem
	pin 1 (redand pin 2 (black) of the module	5 /	ent of CAN
	is >32V.		module (in
	4 Ph. 3 H	□Yes □No	software)
2	Check that the wiring is free of short-circuit and	. <	Replacem
	disconnection faults		ent of
	Y. W. G.L.	□Yes □No	modules
3	Repair or replacement of wiring		
		□Yes □No	

5 Compressor failure

malfu Fault	Type of	fault principle
nction name	fault	

s coding			Guide
05			
	Compre	current	This fault occurs when the
0x05	ssor failur	detection	compressor detects too much
	е		current

move	methodologies	Inspection	operating
	-	results	method
1	Check compressor high pressure harness connection for reliability	□Yes □No	Repair or Replace ment of Wiring Harness
2	Measure whether the insulation resistance value of the compressor high voltage line to the body is $>10M\Omega$.	ÛYes □No	Replace ment or repair of devices at insulati on value points
4	Replacement of compressor		

6 Water pump failure

hap	fault	fault type	fault principle	Module
peni	name	type (e.g.		Footprint
ng	steelyard	blood		Pootpriit
trouble	1	type)		
code	1.5	31 /		
06				CN2-12
	Water	Switc	Module CN2-12 24V detected	
0x06	pu	h	This fault occurs during	
	mp	Тур		
	fail	е	input	
	ure			

move	methodologies	Inspection	operating
		results	method
1			Check
	Measurement of the pump in self-	□Yes □No	wiring
	circulation/cooling mode with 24V input		and
	circulation/cooling mode with 24v input		fuses

				<u> </u>
3	Check that the pump	is running by touching		Guide Excludi
			□Yes □No	"
				pump idle
				protecti
				on
				Replacem
				ent of
				water
	Comparative results	Treatment		pumps
4		current during pump		Check
		aWthersweterurrent (ra	ated	the
	power).	evacuation	□Yes □No	wiring
	(√27V) is significantly o	li ffrexan tent		from the
	>Rated current			feedback
	> Rated current	Plumbing system		signal to
5		blockage		the PLC
5	Comparison of measu	radayresatanagrated		
	current			
6	Measure the water pu	ımp fault feedback line	for	Replacem
	no voltage output	/	W (0)	ent of
	no voitage output	/54	8/ 5/	
			□Yes □No	
		W Ho "		pumps
		W. O.		
		/ W 8 /		

7 Refrigeration system pressure failure

			March .			
mal		R134A		R407C	le	Module
ncti	0~10°C					Footprint
ns	10~30°C				_ `	Tootpillit
coding	/ 4	e P /				
07		> /			V	CN2-10 (HLP)
	Refrig	Switch	N	Module CN2-10 No	OV	CN1-2 (GND)
0x07	eratio	Type		detected		
	syste		Th	is fault occurs du	ring	
	m			input		

SØNGZ		Matsushige Ele	ectric Bus
		Air Conditioni	ng Repair
press		Guide	
ure			
malfuncti			
ons			

move	methodologies	Inspection results	operating method
1	Tap into a manifold pressure gauge to see if the system balance pressure is within range	□Yes □No	Refrigera nt
2	Start the refrigeration mode operation, observe whether the system pressure appears ultra-low pressure,ultra-high pressure phenomenon Ultra-low pressure Low Pressure Failure phenomenon (<0.5bar) Ultra-high pressure High Pressure Failure phenomenon (>26 bar)	□Yes □No	Evacuati on of waterwa y systems
3	Checking the cause of the malfunction		
4	Measure the pressure switch status in accordance with the following table	□Yes □No	Replace the appropr iate pressur e switch

SØN	IGZ				
5	Measurer	nent c	of pressi	ure sw	vitch input voltage
	pressi	ıre fai	lure	F	Failure causes
			ouro Egiluro		isted
	Low Pres	ssure Failure			e pump is not
					ing; 2 , the water
					system is ng to cycle; 3 .
					system is
				clogg	
	High Dro	celiro	Failura	1. the	e condensing fan
	syste	m	Low P	ressu	condensing fan Coperagh Pressure
	pressu	ıre	5	l'Yrne s	system ig witch
	1			01250	rsd. state of affairs
	<0.05b	ar	"	n off	1)
	> 261		(electri	c swite	/
	>26b	ar			turn off (electric switch)
					(electric switch)
	pressure	1	Measure	ement	troubleshooting
	switch		esults	-3%	8
	mountai	1	Courts	毛	4. T
	n pass		/ 1	F 2	7/
		Inpu	t 12V on	pin 1	Normal wiring to
]	/ 4	12 m		PLC
	High	Pin 1	Input 0	/Hold	Broken/short
	Press	· 6	25		circuit with PLC kind
	ure	-		· .	with low
	Switc	Inpu	t ov on p	01n 2	voltage
/ 4	h				switching
1.400					lines
1					normalcy
		Pin 2	Input		with low
		12/Hc	-		voltage
1		12/110)1G	X	switching
					lines
			X	. 1	Break/Short
			~ ~	$\overline{}$	Circuit
		24V ir	iput on	pin 1	High-voltage
					switching line positive
Low					ever
	Press	Inne	t on nin	1	with high-
	ure		t on pin	100tł	1 √2281 Pa⊗⇔
	Switc	70/70	erhead	100 c	fs.Witching
	h	7			lines
					Droots/Chart

Break/Short Circuit

8 Defrost sensor failure

ma		fault type		fault principle		M	odule
uncti name		type (e.g.		1 1		Fa	ootprint
ons steelyard						1 \	богринг
coding	ָר פֿי	type)					
08						CN2-	2 (RT1)
	Defro	Resist		e module sends		CN2-1	(digital
0x08	st	anc		age when it det		earth)
	Senso	е		that the defrost		carti	
	r	Det		nperature sens			
	block	ecti		stance is out of			
	Songer for	on Moog		nge of 0.6~108K			
	Sensor fo		ие пасни г sults	es o frthiblkshd q ting	ccur		
	1		.3V	Positive wiring	Z		
122 0770	1 Foot		.5 v	toPLC	Traces	otion	on onetin a
move	methodolog	gies		ever	resul	ection	operating method
1	λ ((1 OV/0110	noncion 1	/ 1 6 5 8 10 10	resur	ıs	Illetiiou
	Measuring	tne sensous	Tada fast and 1	Line break with PLC	r I		
				/short circuit			
	2 feet		0V %	Positive wiring			
	2 1000		-3/-	toPLC			
			20	ever			/ · . K
		No	ot 0V	Line break with			\\\'\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
		100	, OM	PLC			
		14 My 12	8 /	/short circuit			$\langle \cdot \rangle$
		L. TO.					
	/ /	5			10		
2		>/	• .	1 1		1	Poplace
2	Measure th	/				-	Replace defrost
wittem plee at ungerange			responding			tempera	
/ /	00 50°C			stance range	ПУес	: □No	ture
1		~50°C		0.5~2.0KΩ			sensor
	/	~20°C		2.9~6ΚΩ			
		~-0°C	9	.2~14.2ΚΩ			
		-7°C	17/	20ΚΩ			

9 CAN communication failure

malf	fault	fault type	fault principle	PLC foot
uncti	name	type (e.g.	1 1	position
ons	steelyard	blood		position
coding		type)		

09				canh)cn-11
	CAN	Com	This fault occurs when a	(canl)
0x09	pass	mu	BMS control	
	malfun	nica	message is not	
	manun	tion	received after	
	ction	Det	wakeup	
		ecti		
		on		

move	methodologies	Inspection results	operating method
1	Check that the communication lines between the module and the vehicle are correct.	□Yes □No	Repair connecti on lines
2	Communicating and assisting with full vehicle processing	□Yes □No	

10 Faulty water discharge sensor

	Sensor fo	ot Measur	ement	troubleshoo	6	
mal	f po satuo tn	fault tymesu	ılts	faul ^{ing} rinciple	31	PLC foot
unc	ti n amet	type (e.g3.3	V	Positive wiring	~ V	position
ons	steelyard	blood		toPLC	30/	position
coding		type)		ever		
10		0V/susp	ension	Line break with		0№ (CSWD)
	Outflo	Resist	/	n the n ro dule d		CN2-1 (digital
0x0A	W	anc	that th	ne/s boistoincei tva	lue of	`
	S epso	e ov	1 3/4	lipositate worthe	t	earth)
	r	Det	temp	eratu repse nsor	is out	/ * W
	block	ecti	of the	rangeeof:0.6~10	8ΚΩ , it	
		on Not	ov ser	idspubre mess a	ge.	
	tempera	ture range	failor	esopohicikend	occur	
		3 1	resi	stanco-rement		
	90^	~50°C	(0.5~2.0KΩ		
move	methodo#0g	i20°C		2.9~6KΩ	Inspe	ection operating
10~-0°C			9	.2~14.2KΩ	result	ts method
	1	7°C		20ΚΩ		

			-	
SØN	NGZ		<mark>Matsushige Ele</mark> Air Conditionir	
				ig Kepaii
1	Measuring the sensor input voltage		Guide	
2	Measure the sensor resistance value to be within the range	□Yes □No	Replace ment of water outlet tempera ture	

sensor

11 Faulty water inlet sensor

ma un on coding 11	cti nai s steel	me tyard ter let	type (e.g. blood type) Resist When the module detects cnz that the resistance value of		CN2-3	C foot osition (JSWD) (digital		
	blo	ock	Det ecti	of the	erature sensor range of 0.6~10 ads out a messa	8ΚΩ , it		
	Sense	or foot	on Measur		es of this since			
	posit		rest		ting	becar		
		oot	3.3	BV	Positive wiring	F 10		
move	method	C			toPLC ever	Inspe result		operating method
1	Measui	ring the	e s 0N\$849 F	ભાશંજા	Lage break with PLC /short circuit			
	2 f	eet	0'		Positive wiring toPLC ever			
			Not	:0V	Line break with PLC /short circuit		X	
		1 3	Sign /		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
2	Measu	re the s	ensor res	istance v	value to be			Replaci
wittein pleratungerange			resi	responding stance range		□No	ng the water inlet	
		90~5		(0.5~2.0KΩ	Lires	ШΝО	tempera
		40~20			2.9~6ΚΩ			ture
		10~-(-7°(9	.2~14.2KΩ 20KΩ			sensor

12 Low water level alarm

malf fau	ılt fault type	fault principle	PLC foot
uncti nar	ne type (e.g.	1 1	position
ons steely	yard blood		position
coding	type)		

12				0029(YWGZ)CN1-
	Low	switchg	This fault occurs when	2 (0V)
0x0C	wate	ear	there is no 0V	
	r	Cai	input at the	
	level		module pin	
	alar		position	
	m			

move	methodologies	Inspection	operating
		results	method
1			
	Check that the kettle level is not below the lower	Yes □No	
	limit when the pump is running		
2	Measurement of the level switch for 24V input (to ground when single wired)	□Yes □No	Check and repair level switche s and module s (CN2-9) interline
4	Measurement of level switch on state (to ground in case of single line) level state switching state normalcy conduction below the turn off (The table is for normally closed level switch, (electric normally open type; ielthe opposite)	□Yes □No	Replace ment of level switch

13 Relay Bonding Failure

	malf		fault type	fault principle	PLC foot
	uncti	name	type (e.g.	_	position
þ	ons	steelyard	blood		position
	coding		type)		
	15				CN2-8 (NLGZ)
		Relay	switchg	This fault occurs when	CN1-2 (0V)
	0x0F	bondi	ear	there is no 0V	
		ng	ear	input at the	
		block	\mathcal{A}	module pin	
				position	

move	methodologies	Inspection	operating
		results	method
1	Check that the high voltage fuse is intact		Replace
		□Yes □No	-
			Voltage
			Fuse
2	Measurement of the HV board HV+ and CM+ in		Replace
	the power off state	□Yes □No	
	are power or state		High
			Voltage
			Board
4	Check the reliability of the wiring between the		Rehabilita
	high voltage board CN3-5 and the module CN2-8.		tion of
		□Yes □No	lines
	(.4)	20	
	/ % · ·	0 /	
	Replacement of High Voltage Board		
	/ ANT 5" /		
	/ # 5 /		
	/ W 5 /		
	1 2 2		
			/ K

14 CMP CAN communication failure

					0			
		compresso	r 120Ω		To the inter-			X. I
	mal	 compresso f	y	1	faadmprissiople		Pl	LC foot
		/ / /	type (e.g.		line		n	osition
	ons		blood		road normal		Р	03111011
	coding	MIN	ty pe)		Abnormal			
	17	0			wiring to			B (CANH,
		CMP	Com	This fa	whopeessowhe			3, CN1-8,
	0x11	CAN	mu		thepresedule d	oes	CN1-8	3)
	III >	pass	nica		excepeiceive a		CM)	
	W /	malfunc modular si tion	de $tin200$		Tompressor		CN-7	(CANL.
		tion	Det		ntedegrammes			CM)
Ì			ecti	X	normalcy			,
			$\partial \Omega$		To inter-			
				A 1 7	module lines			
					Exception/Mo			
	move	methodolog	gies	7	dule Exception	Inspe	ection	operating
		X				resul	ts	method

S		N	G	7
\sim	~	_	~	_

1	Measure the compressor for 24V input	□Yes □No	Repairin g lines to restore power to compres sors
2	Disconnect the harness insert between the compressor and the module during power failure and measure the communication resistance.		

3	3.5 .1		·	1	Guide
3	Measure the co	mmunication re			
	module and cor				
		on Resistance	g		
	compactors	120Ω	Positive		
			machine		
			communicatio		
			n resistance		
			ever		
		0Ω	Replacement		
			of compressor		
4	Replacement m	e tl<u>20ф</u>, r eplace t	1	7	Replace
	to run whether				ment of
	(software) enter		on resistance	☐Yes ☐No	compres
			is normal		sor
		00	D 1	_	

15 Anti-freezing protection Replacement of modules

malf	fault	fault type	fault principle	PLC foot
uncti	name	type (e.g.	A 100 /	position
ons	steelyard	blood		position
coding	-	type)	4 4 6	
18				CN2-2 (RT1)
	Anti-	Temp /	This fault occurs when the	CN2-1 (digital
0x12	freez	erat	defrost	earth)
	ing	ure	temperature is	eartii)
	prote	Det	below -5°C	
	ction	ecti		
	/ .	on		

_					
	move	methodologies		Inspection	operating
				results	method
	1 /	Measure the sensor resi		Replace	
	/ 4				defrost
/	400	within the range range	Corresponding		tempera
	1		resistance range	☐Yes ☐No	ture
	113 '	90~50°C	0.5~2.0KΩ		sensor
	W /	40~20°C	2.9~6ΚΩ		
9		10~-0°C	9.2~14.2KΩ		
		-7°C	20ΚΩ		
	2	Defrost temperature is t			
		eliminated after recover			

16 Pre-charge Failure Fault

malf	fault	fault type	fault principle	Guide PLC foot
uncti	name	type (e.g.	1 1	position
ons	steelyard	blood		position
coding		type)		
21				
	Pre-	Voltag	Compressor detection	
0x15	charg	е	voltage during pre-charging	
	е	Det	,	
	Failur	ecti	<	
	е	on	This fault occurs at 400V	
	Fault			

move	methodologies	Inspection	Treatment
		results	programm
			е
1	Measure whether the HV+ and HV- input voltage		Check the
	is >400V.		vehicle's
		□ No.	power-up condition
		Yes.	and
			communi
			cate with
			the whole vehicle
		\wedge	after-
			sales
	/ =		service if
		100	necessary
2		0 /	Popless
2	Measure the voltage between the back end of the	□ No.	Replace ment of
	fuse and the HV-voltage in the unit for >400V.	Yes.	fuses
		103.	after
			power
3	Assess to dehive possil and never on /transmit. ID.		failure
3	Access to debug panel and power on/transmit: ID: OCFFFFDA		Replace ment of
	Data: 03 00 00 32 00 00 00 00 00		High
	Measure the voltage between CM+ and CM- after	□ No.	Voltage
	the pre-charging contactor is engaged.	Yes.	Electric
	400V		al Board
		$\langle O_{+} \rangle$	
4	Unplug the compressor high pressure plug-in		Repair
	Access to debug panel and power on/transmit: ID:	///	or
	OCFFFFDA Data: 03 00 00 32 00 00 00 00 00	□ No.	replace compres
	Measure the voltage between the compressor	Yes.	sor high
	high-voltage plug-in 1 (negative) and 2 (positive)	103.	pressur
	pins to see if it is >400V after the pre-charging		e
	contactor is engaged.		harness

SØNGZ			Matsushige Electric Bus	
_		Air Conditioning	ng Kepair 	
5	Replacement of compressor			

17 High voltage reversal fault

ma	alf fault	fault type		fault principle			PI	C foot
un		type (e.g. blood					n	osition
							Ρ	
coding	g	type)				\wedge		
23				,	/			-7 (FJ)
	High	switchg	This f	ault occurs who	en	81	CN1	-2 (0V)
0x17	voltag	ear		there is no	3.75			
	е	ear		input at tl		~/		
	revers			module p	in			
	al			position	/			
	fault		/	AV.5"/				
move	methodolog	gies		12 S		Inspe	ction	operating
			/ %	7.9		result	S	method
1		+ (HV input						Repair/r
	input negat	ive) for corr	ect HV polarity. □Yes		□Yes	□No		
		1 25	100	, 11 1	1			ent of
	Sensor fo	/	rement	troubleshoo				wiring
	position	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	ults	ting				harness
4	Check F99etr	eliability of	the wiri	Positive wiring ng between the				Rehabilita
	/	20 mars /		e module CN2-7.				tion of
		\ \		evei		□Yes	□No	lines
		/	pension	Line break with		I		IIIIes
/ 4	Replaceme	nt of High V	oltage B	oard /short circuit	X			
4	2 feet	0	V	Positive wiring				
				toPLC				
111 7	/				r			

18 Ambient temperature failure with

mal	temperature rang	ge Correspo n cing resistance rangat	PLC foot
unc	name ⁰ 50°C (e.g	0.5~2.0ΚΩ	
ons	steelyard 20 blood	2.9~6KΩ	position
coding	10~-0°(ype)	9.2~14.2KΩ	
	-7°C	20ΚΩ	

25				CN2-5 (JSWD)
	Ambi	Resist	When the module detects	CN2-1 (digital
0x19	ent	anc	that the resistance value of	earth)
	tempe	е	the water outlet	earui)
	rature	Det	temperature sensor is out	
	failur	ecti	of the range of 0.6^{108} K Ω , it	
	е	on	sends out a message .	
			failures of this kind occur	

	1 11 :	т ,.	
move	methodologies	Inspection	operating
		results	method
1	Measuring the sensor input voltage		
2	Measure the sensor resistance value to be within the range	□Yes □No	Replaci ng the ambient tempera ture sensor

concluding remarks

This repair manual covers the construction, working principle, application method of bus air-conditioning products (including use, maintenance, repair) and other knowledge, the combination of theoretical knowledge plus practical experience, compared with the previous textbook has been greatly improved, is a practical bus air conditioning maintenance well-known but compared to textbook. some foreign counterparts, we are also aware of the inadequacy of the content of the textbook, with the accumulation of our experience, in the bus air conditioning maintenance technology research and training and education, the editors hope that in the future in the passenger car With the accumulation of our experience and investment in the research and training of bus airconditioning technology, the editors hope that in the future, they will be able to make more contributions in the preparation of teaching materials in the field of airconditioning application technology (use, maintenance and repair) so that more readers can be benefited.

compiler
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