ACCORRONI
Climate Technology

Heat pump heaters
for swimming pool water

# SWD 28 - 40 - 60 - 80 - 80T - 90T

Technical document of CVTE inverter driver board

1. Overview

1.1 It is designed with three operation modes including heating,cooling and automatic mode .

1.2 Applicable to single compressor system.

1.3 CVTE inverter driver board hardware is applied, which is able to be used with LED 206 display.

1.4 It is able to display and change system operating parameter and setting parameter.

1.5 It is designed with automatic protection function and automatic failure alarm function.

1.6 Function of system protection: compressor's three-minute protection, HP/LP protection, sensor protection, water flow inspection, etc.

1.7 The communication distance between the heat pump and wire controller is not less

than 100m.

1.8 Strong anti-interference (4000V group pulse interference resistance), and stable and

reliable performance.

1.9 The control precision of super heat is 0.5℃,and the other is 0.1℃.

1.10It can be set Celsius degree or Fahrenheit degree to control unit.(The specific way is

controlled by display)

| Main board | 2 → | 485 signal | ----------- | Display |
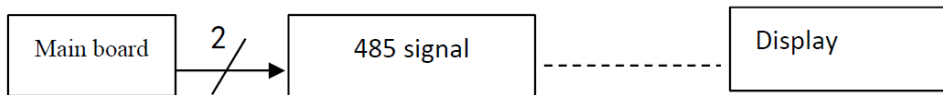
2. Interface drawing

2.1 System chart
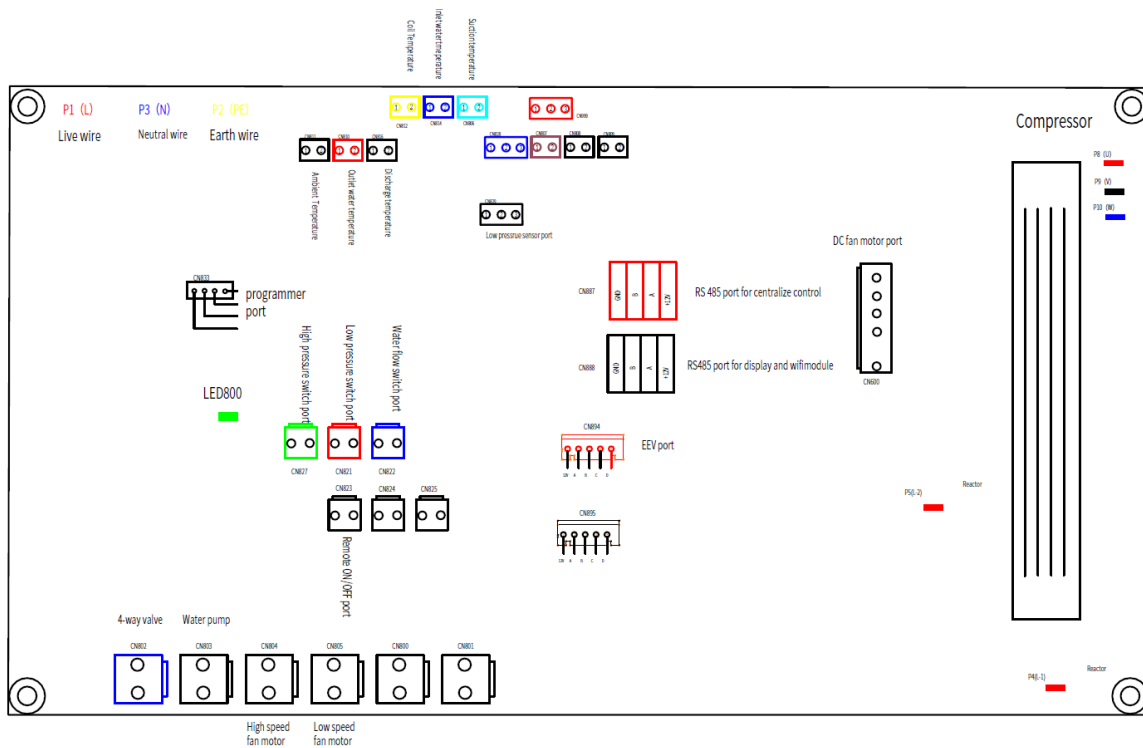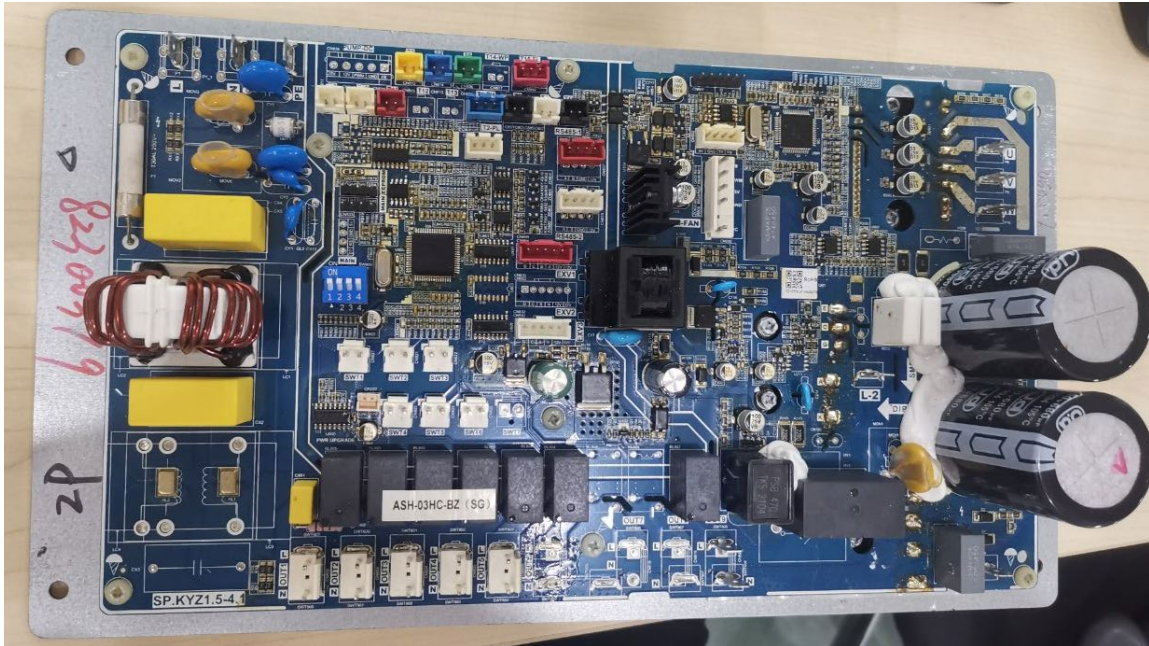
No.	Port number	Function
O01	P8-9-10-1 (U/V/W)	Controlling the inverter compressor
O02	CN803	Circulating water for air conditioning, single-phase AC output (5A/250VAC)
O03	CN802	Control the four-way change valve, single-phase AC output (5A/250VAC)
O04	CN804	Control fan's high speed
O05	CN805	Control fan's low speed
O10	CN800	Control the electrical heating,
O06	CN894	Electronic expansion valve of enthalpy increasing circuit of control system 2, DC four phase eight beat output (+12V, 400mA)
S01	CN827	HP switch can be started when switch ON; and it will be shut down with warning when the switch OFF.
S02	CN821	LP switch can be started when switch ON; and it will be shut down with warning when the switch OFF.
S03	CN822	Water flow switch can be started when switch ON; and it will be shut down with warning when the switch OFF.
S04	CN823	The unit can be started when switch ON;

T01	CN806 (T6)	Used to control the main circuit electronic expansion valve
T02	CN814 (T7)	Using for controlling the compressor and starting on the winter antifreeze protection
T03	CN810 (T10)	Using for the antifreeze protection
T04	CN812 (T8)	Using for controlling defrost and EEV
T06	CN816 (T11)	Using for discharge temperature
	CN888 （RS485-2)	Using for communicating with the display and the WIFI module
	CN887 （RS485-1)	Using for centralize control

3. Parameter list

Note: The unit of temperature in the list is Celsius

Parameter	Meanings	Default value	Modbus	Remarks
D	Parameters of defrosting			
D01	Start defrosting temperature	-7℃	1101	D01=0：-7℃ D01=1：2℃ When H12=0 it displays with ℃
	the pressure value to start defrost	5.5bar	1102	When H12≠0, it displays with bar
D02	End defrost temperature	13℃	1103	
D03	Defrosting cycle	45min	1104	
D04	Maximum defrosting time	8min	1105	
D06	Defrosting mode (0-normal/1-economy)	0	1106	
D07	The ambient temperature to start slide defrosting	-30℃	1107	
D08	The difference of coil temperature after starting slide defrosting	10℃	1108	When H12=0 or H38=0, this function is valid
	The difference of defrosting pressure after starting slide defrosting	2bar	1109	When H12≠0 and H38=1, this function is valid
D09	The difference of ambient	14℃	1110	

	temperature after starting slide defrosting			
D10	Coil temperature for ending defrost sliding	-18.4℃	1111	When H12=0 or H38=0, this function is valid
	Pressure for ending defrost sliding	3.2bar	1112	When H12≠0 and H38=1, this function is valid
E	Parameters of EEV			
E01	EEV mode (0-manual/1-automatic/2-auxiliary)	1	1116	
E02	super heat	Depend on which model	1117	
E03	initial opening		1118	
E04	the minimum opening		1119	
E05	defrosting opening		1120	
E06	cooling opening		112	
E07	the setting temperature of exhaust temperature	60℃	1122	When E01=2, this parameter is valid
E09	P value of PID control	2	1123	
E10	I value of PID control	10	1124	
E11	D value of PID control	0	1125	
E12	Super heat compensation difference	0℃	1126	
F	parameters of fan motor			
F01	parameters of fan motor(0-single speed mode(high speed)/ 1-dual speed mode / 2-AC / 3-one DC(stepless speed regulation)/ 4-two DC / 5- EC)	Depend on which model	1048	
F02	the coil temperature of fan in high speed mode when cooling	40℃	1049	When F10=0/1, it displays with ℃
	the running pressure of fan in high speed mode when cooling	15bar	1050	When H12≠0, it displays with bar
F03	the coil temperature of fan in low speed mode when cooling	15℃	1051	When F10=0/1, it displays with ℃
	the running pressure of fan in low speed mode when cooling	7bar	1052	When H12≠0, it displays with bar
F04	the coil temperature of fan stop when cooling	10℃	1053	When F10=0/1 it displays with ℃

	the running pressure of fan stop when cooling	2bar	1054	When H12≠0, it displays with bar
F05	the coil temperature of fan in high speed mode when heating	10℃	1055	When F10=0/1, it displays with ℃
	the running pressure of fan in high speed mode when heating	3bar	1056	When H12≠0 it displays with bar
F06	the coil temperature of fan in low speed mode when heating	20℃	1057	When F10=0/1, it displays with ℃
	the running pressure of fan in low speed mode when heating	9bar	1058	When H12≠0, it displays with bar
F07	the coil temperature of fan stop when heating	30℃	1059	When F10=0/1, it displays with ℃
	the running pressure of fan stop when heating	11bar	1060	When H12≠0, it displays with bar
F10	Fan speed regulating temp selection (0-coil temp/1-ambient temp)	0	1061	When F01=2, and H12=0 it will display this parameter
F11	Maximum speed fan operating duty ratio	100%	1060	When F01=2, it displays with %
	the highest speed of fan	1060r	1063	When F01=3 it displays with r
F12	Minimum speed fan operating duty ratio when in cooling	50%	1064	When F01=2, it displays with %
	the lowest speed of fan in cooling	600r	1065	When F01=3 it displays with r
F13	Minimum speed fan operating duty ratio when in heating	50%	1066	When F01=2, it displays with %
	the lowest speed of fan in heating	600r	1067	When F01=3 it displays with r
F14	the start time for silent running mode timing	0h	1068	When F17=1, it will display this parameter
F15	the end time for silent running mode timing	6h	1069	When F17=1, it will display this parameter
F16	the proportion of time connected to electricity in silent running mode in a pulse circulation	50%	1070	When F01=2, it will display this parameter

	fan speed in silent running mode	600r	1071	When F01=3, it will display this parameter
F17	if to use silent running mode timing function(0-no/1-yes)	0	1072	
F18	if to use adjust fan speed or low speed function by manual (1-no/1-yes)	0	1073	
F19	the rated operating duty ratio of AC fan motor	50%	1074	When F01=2, it displays with %
	the rated DC fan speed	600r	1075	When F01=3 it displays with r
F20	Function of port AI/DI 11 (0-PWM Detect / 1-water pipe Antifreeze temperature sensor)	Automatically changed by F01	1077	When F05 = 5, then F20 = 0.When F05≠5, then F20 = 1.
H	System and system protection parameter			
H01	If with disable automatic restart (0-no/1-yes)	1	1018	
H02	Mode (0-cooling mode only/1-automatic heating and cooling modes/2-heating mode only	1	1019	
H03	Temperature unit (0-【℃】/1-【℉】)	0	1145	
H06	The minimum frequency of compressor in heating	30Hz	1020	When H12=0, unit without this parameter
H07	The minimum frequency of compressor in cooling	30Hz	1021	When H12=0, unit without this parameter
H08	The maximum frequency of compressor in heating	85Hz	1022	When H12=0, unit without this parameter
H09	The maximum frequency of compressor in cooling	50Hz	1023	When H12=0, unit without this parameter
H10	The time of delay constant temperature for stopping unit	20min	1024	When H12=0, unit without this function

H11	Delay time for testing the inlet temperature after constant temperature stop unit in automatic mode	192min	1025	Reserve
H12	Type of compressor(0-ON OFF compressor/ 1-TNB220FLHMC_TUV/2-SNB172FJGMC_TUV/3-MNB36FAAMC_TUV/4-TNB306FPGMC_TUV/5-TNB220FUEMC_UL/6-MNB36FAUMC-L_UL/7-TNB306FVPMC_UL/8-SNB150FGAMC/9-SNB140FCAMC/ 10-MNB36FABMC/ 11-MNB42FFDMC)	Depend on which model	1026	When H12≠0, unit is inverter heat pump
H13	The frequency of compressor when defrosting	80Hz	1027	
H14	The frequency adjust cycle of 0.2℃ inlet water difference	45min	1028	
H15	The set point of compressor overcurrent protect	/	1029	When H12=0, unit has this function
H16	Type of refrigerant (0-R410a/1-R407c)	0	1030	When H12=0, unit without this function
H17	The low ambient temperature for starting compensation in cooling	15℃	1031	
H18	The low ambient temperature for ending compensation in cooling	5℃	1032	
H19	The high target frequency for low ambient compensation in cooling	40℃	1033	
H20	The high ambient temperature for starting compensation in cooling	35℃	1034	
H21	The high ambient temperature for ending compensation in cooling	43℃	1035	
H22	The high frequency for high ambient compensation in cooling	40℃	1036	

H23	The low ambient temperature for starting compensation in heating	15℃	1037	
H24	The low ambient temperature for ending compensation in heating	-10℃	1038	
H25	The high target frequency for low ambient compensation in heating	90Hz	1039	
H26	The high ambient temperature for starting compensation in heating	35℃	1040	
H27	The high ambient temperature for ending compensation in heating	43℃	1041	
H28	The highest frequency for high ambient compensation in heating	80Hz	1042	
H29	Maximum Pressure sensor value(Reserve)	20bar	1043	
H30	Minimum pressure sensor value(Reserve)	0bar	1044	
H31	The ambient temperature for starting super heat compensation	2℃	1045	
H32	The ambient temperature for ending super heat compensation	-12℃	1046	
H33	Maximum frequency of compressor in silent mode	50Hz	1047	
H34	The ambient temperature for stopping the heat pump	-15℃	1144	
H35	The temperature difference for restart the compressor(only for inverter heat pump)	5℃	1146	
H36	The start frequency when the compressor restarts	60Hz	1147	
H37	Unit address	1-247	1148	Could not be 98
H38	Pressure measurement	0-OFF/1-ON	1173	
P	Parameter of water pump			
P01	Operating mode of water pumps (0-Normal/1-Special/2-Interval)	2	1081	
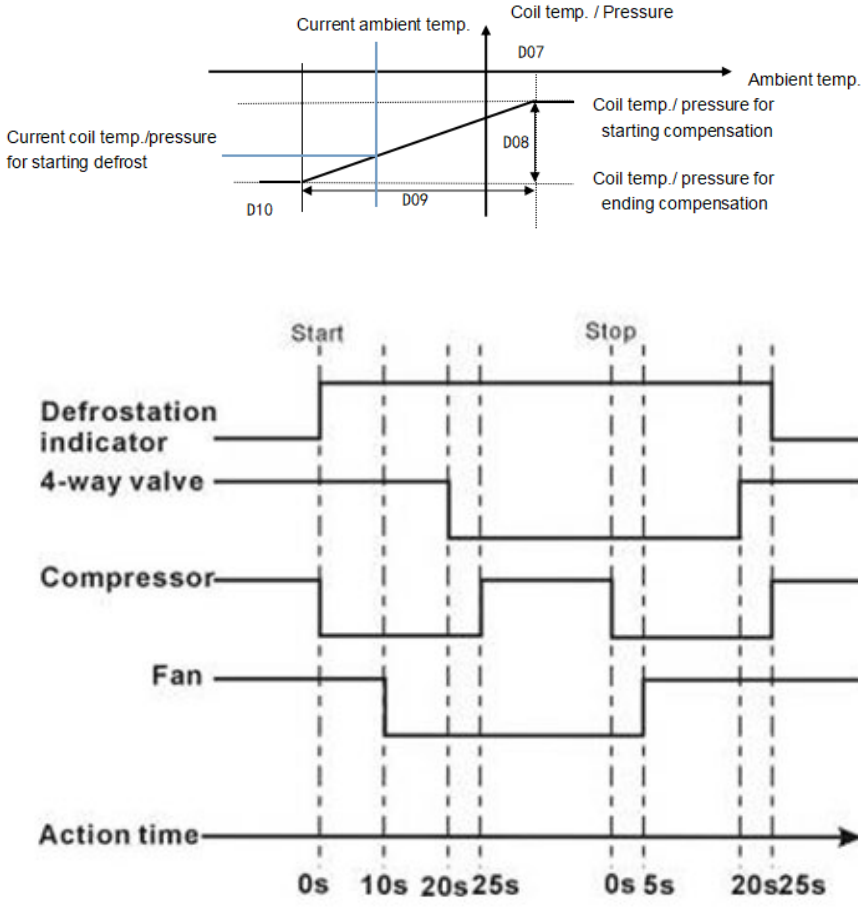
P02	Operating time interval of water pumps	30min	1082	
P03	Operating duration of water pumps	3min	1083	
P04	Advanced water pump run time of compressors	1min	1084	
P05	Water pump filtration	0-OFF/1-ON	1085	
P06	Water pump filtration start time 1	10h	1086	
P07	Water pump filtration end time 1	12h	1087	
P08	Water pump filtration start time 2	15h	1088	
P09	Water pump filtration end time 2	17h	1089	
R	Parameter of temperature			
R01	The setting value of inlet in cooling	27℃	1135	
R02	The setting value of inlet in heating	27℃	1136	
R03	Target setting temperature for automatic mode	27℃	1137	
R04	The return difference for starting unit	1℃	1138	
R05	Shutdown temp difference at constant temp	1℃	1139	
R08	Minimum cooling set point	8℃	1140	
R09	Maximum cooling set point	35℃	1141	
R10	Minimum heating set point	15℃	1142	
R11	Maximum heating set point	35℃	1143	
R12	Return temp difference	1℃	1166	
U	parameters of water flow			Reserve function
U02	The pulse number of flow gauge in 1L water	205	1149	Reserve function
U0.	Model selection	0	1162	0-default para1-HP50952T2-HP51202T3-HP50HA2_HP70HA4-HP31005T
O	Condition of load			
O01	Compressor output	on/off	2019	
O02	Circulation water pump output	on/off	2019	
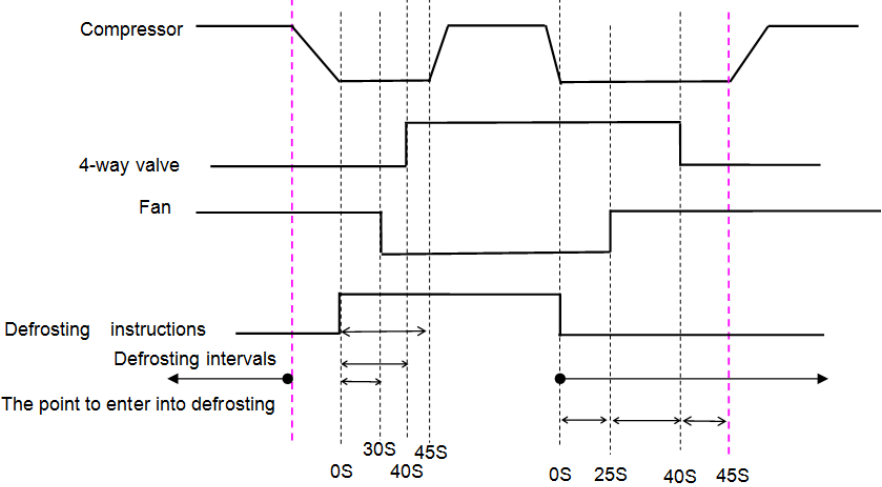
O03	4-way valve output	on/off	2019	
O04	Fan motor high speed output	on/off	2019	
O05	Fan motor low speed output	on/off	2019	
O06	EEV output	0~500N	2020	
O07	The output frequency of compressor	0Hz~H08	2021	
O08	Compressor current	0~100A	2022	
O09	IPM temperature	-55~200℃	2023	
S	Condition of switch			
S01	HP switch	on/off	2034	
S02	LP switch	on/off	2034	
S03	Water flow switch	on/off	2034	
S04	Remote switch	on/off	2034	
S05	Mode switch	on/off	2034	
S06	Master/Slave switch	on/off	2034	
T	Condition of temperature			
T01	Suction temperature	-30~99℃	2045	
T02	Inlet water temperature	-30~99℃	2046	
T03	Outlet water temperature	-30~99℃	2047	
T04	Coil temperature	-30~99℃	2048	
T05	Ambient temperature	-30~99℃	2049	
T06	Exhaust temperature	-9~140℃	2050	
T07	Current of compressor	0~50A	2051	
T08	Output of AC fan motor	0~100%	2052	
T09	Water flow(reserve)		2053	
T10	Pressure sensor	0~20bar	2054	
T11	Super heat		2060	
T12	Fan motor speed	0~1100rpm	2061	
T13	Target super heat after compensation	-20~20℃	2062	
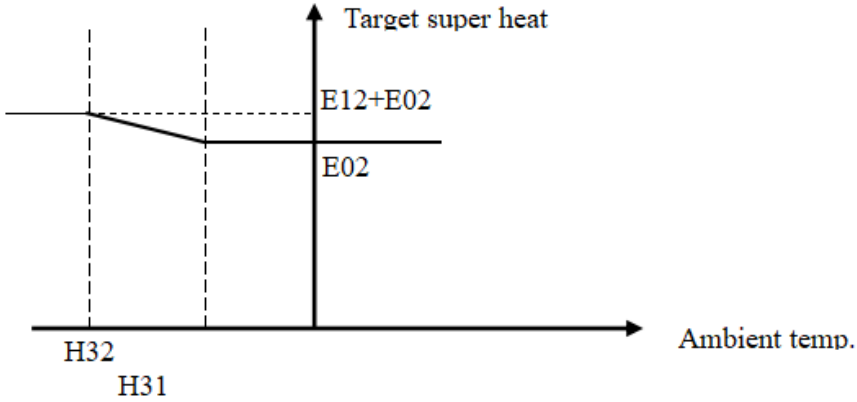
T14	Input voltage of inverter driver board	0~255V AC	2063	Only when H12≠0, it is valid
T15	Water pipe antifreeze temperature	-30~99℃	2065	Only when F20=1, it is valid
T16	EC fan motor speed	0~1100rpm	2066	Only when F20=0, it is valid
T17	Speed of fan motor1	0-1100rpm	2067	Only when F01=3/4/6/7, it is valid
T18	Speed of fan motor2	0-1100rpm	2068	Only when F01=4/7, it is valid
T19	Bus voltage		2069	
T23	Driver board running state 1	0-255	2078	
T24	Driver board running state 2	0-255	2079	
T25	Driver board running state 3	0-255	2080	
T26	Driver board running state 1	0-255	2081	

4. Meaning of each parameter

Parameter	Meaning	Application
D	Parameters of defrosting	
D01	Start defrost temperature or pressure	If H12=0 and D06=0, the start defrost temperature is -7℃If H12=0 and D06=1, the start defrost temperature is 2℃If H12=1, the start defrost pressure is 5.5barTo start the defrost cycle; the condition must be valid for the time D03.
D02	End defrost temperature	Establishes the temperature above which the defrost cycle ends.
D03	Defrosting cycle	Represents delay between two successive defrost cycle. The first time, when coil temperature is lower than D01, there must be valid for the time D03 to start defrost.
D04	Max defrosting duration	Represents the maximum duration of the defrost cycle (the defrost ends when the maximum duration has been arrived, even

		if the defrost hasn't finished)
D06	Defrosting modes	If D06=0, Defrosting mode is in normal modeIf D06=1, Defrosting mode is in economy mode
D07	the ambient temperature for starting slide defrosting	
D08	The difference of coil temperature or defrosting pressure after starting slide defrosting	If H12=0, D08 is the difference of coil temperature after starting slide defrosting.If H12≠0, D08 is the difference of defrosting pressure after starting slide defrosting.
D09	the value of coil temperature offset or coil pressure after unit started slide defrosting	Above, the actual temperature get into defrosting is D08 plus D09 Attention: The situation of defrost abnormal end
D10	The value of ambient temperature offset after unit started slide defrosting	If H12=0, D10 is the Coil temperature for ending defrost sliding.If H12≠0, D10 is the pressure value for ending defrost sliding.
Defrosting action for on/off heat pump (when H12=0)		

Defrosting action for inverter heat pump (when H12≠0)	 Compressor 4-way valve Fan Defrosting instructions Defrosting intervals The point to enter into defrosting 0S 30S 45S 40S 0S 25S 40S 45S
Defrosting protection	1) System show antifreeze protection during defrosting, then unit will be shut off and show this malfunction. After recovering it, system goes on defrosting. 2) Shut off the unit during defrosting, system will continue running defrost until it has finished. 3) HP switch has broken during defrosting, then unit will be shut off and show HP malfunction. After recovering it, system enters to normal heating mode. 4) LP switch has broken during defrosting, the unit will skip LP malfunction and exit defrosting and back to normal heating mode, then system will check LP switch after 5min. 5) Flow switch has broken during defrosting, then unit will be shut off and show Flow Malfunction. After recovering this malfunction, system goes on defrosting. 6) Exhaust temperature is too high during defrosting, then unit will be shut off and show this malfunction. After recovering it, system goes on defrosting 7) Temperature difference between inlet and outlet during defrosting, then unit will be shut off and show this malfunction. After recovering it, system goes on defrosting.
E	EEV parameter
E01	EEV mode, there are 3 modes for operating EEV	E01=0: EEV is running by manual operation;E01=1: EEV is running by automatic operation;E01=2: EEV is running by auxiliary operation;
E02	Target Super heat	
E03	Initial position	If E01=0, represents expansive valve fix

		this position always.If E01=1, represents expansive valve initiation position
E04	Minimum position	
E05	Defrost position	Fix the EEV position during system is defrosting
E06	Cooling position	Fix the EEV position during system at cooling mode
E07	Target value of exhaust temperature	It is valid when E01=2
E09	parameter P value of aperture control	
E10	parameter I value of aperture control	
E11	parameter D value of aperture control	
E12	Super heat compensation difference	

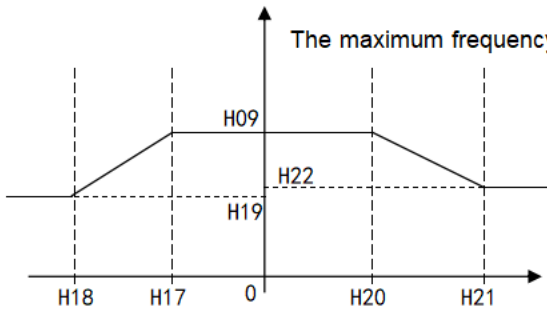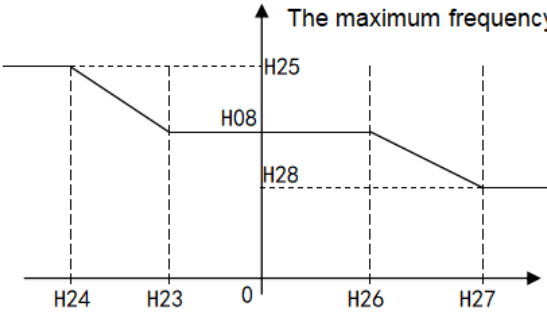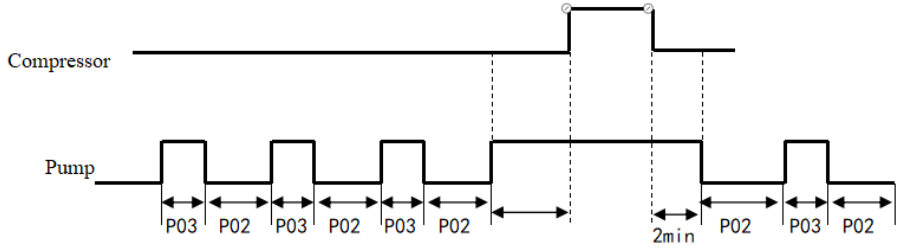| F	Fan parameterNormally, Fan will start up 5 seconds ahead of Compressor and 30 seconds later to shut off. When at defrosting, Fan running situation is according to defrosting control.
F01	Fan parameter	F01=0: in high speed fan mode;(only high speed)F01=1: in high or low speed fan mode;F01=2: the fan is a AC fan motor F01=3: the fan is a DC fan motor. Fan speed is adjusted by stepless speed regulation.F01=4: the unit has two DC fan motors. Fan speed is adjusted by stepless speed regulation.F01=5: the fan is a EC fan motor. Fan speed is adjusted by

		stepless speed regulation.
F02	Coil temperature or pressure set point for high speed fan mode (Cooling)	This represents if the temperature or pressure above F02, the fan will on high speed (Cooling)
F03	Coil temperature or pressure set point for low speed fan mode (Cooling)	This represents if the temperature or pressure below which the fans remain on at low speed (Cooling)
F04	Coil temperature or pressure set point for the fan stop (Cooling)	This represents the temperature or pressure in reference to F03 below which the fans are stopped.
	The Fan speed at cooling mode graph	

F05	Coil temperature or pressure set point for high speed fan mode (Heating)	This represents the temperature or pressure above which the fans remain on at high speed (Heating)
F06	Coil temperature or pressure set point for low speed fan mode (Heating)	This represents the temperature or pressure below which the fans remain on at low speed (Heating)
F07	Coil temperature or pressure set point for the fan stop (Heating)	This represents the temperature or pressure in reference to F06 below which the fans are stopped.

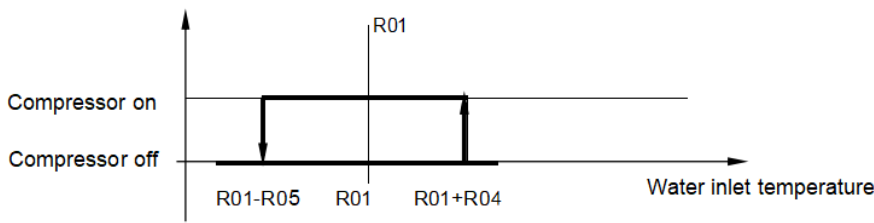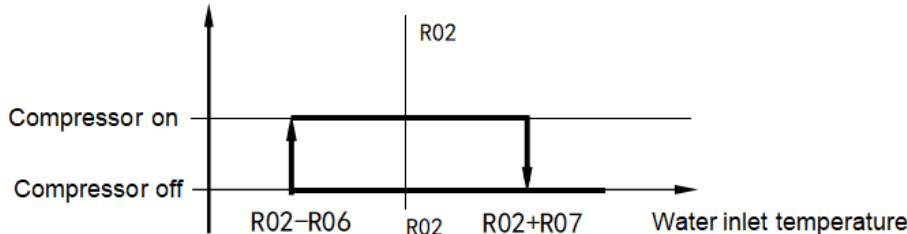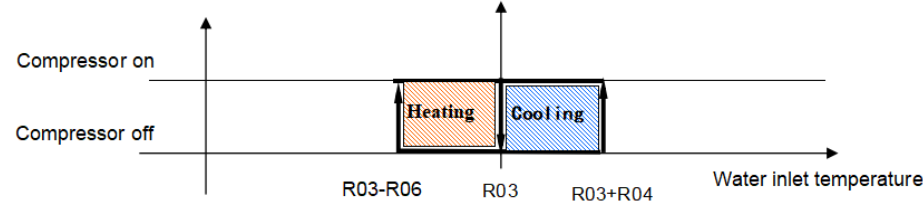|		
F10	Fan speed control temp.	When F01=0, Fan speed is controlled by coil temperature;When F01=1, Fan speed is controlled by ambient temperature. It is valid only if F01=1/2/3 and H12=0.
F11	Maximum speed fan operating duty ratio (it means in a pulse circulation the ratio of time	If F01=2, the highest ratio is 100% and the value will display by %If F01=3, the highest running speed is 1060r and the

	connected to electric) or the highest speed of fan	value will display by r.
F12	Minimum speed fan operating duty ratio (it means in a pulse circulation , the proportion of time connected to electricity) or the lowest speed of fan in cooling	If F01=2, the highest ratio is 50% and the value will display by %If F01=3, the highest running speed is 600r and the value will display by r.
F13	Minimum speed fan operating duty ratio (it means in a pulse circulation , the proportion of time connected to electricity) or the lowest speed of fan in heating	If F01=2,the highest ratio is 50% and the value will display by %If F01=3,the highest running speed is 600r and the value will display by r.
F14	the start time for silent running mode timing,	It is valid only if F17=1
F15	the end time for silent running mode timing	It is valid only if F17=1
F16	In a pulse circulation, the proportion of time connected to electricity in silent running mode or fan speed in silent running mode	If F01=2,it is 50%.If F01=3,it is 600r.
F17	if to use silent running mode timing function	If F17=0, unit without timing functionIf F17=1, unit with timing function
F18	if to use adjust fan speed or low speed function by manual	If F18=0, people can not adjust the fan speed by manualIf F18=1, people can adjust the fan speed by manual
F19	the rated operating duty ratio of AC fan motor or the rated DC fan speed	If F02=1, it is 50% and the value will display by %.If F01=3, it is 600r and the value will display by r.
F20	Function of port AI/DI 11 (0-PWM Detect / 1-water pipe Antifreeze temperature sensor)	F20 is automatically changed by F01.If F01=5, F20 is set to 0. The function of port AI/DI is 'PWM Detect'.If F01≠5, F20 is set to 1. The function of port AI/DI is 'Water pipe antifreeze temperature sensor'.
H	System Parameter	
H01	Automatic restart	H01=0: disable automatic restart; H01=1: enable automatic restart
H02	Mode	H02=0: only cooling;H02=1: heating, cooling and automatic;H02=2: only heating

H06	the over current protection of compressor	It is valid only if H12 is not 0
H07	the minimum frequency of compressor	It is valid only if H12 is not 0
H08	the maximum frequency of compressor in heating	It is valid only if H12 is not 0
H09	the maximum frequency of compressor in cooling	It is valid only if H12 is not 0
H10	the time of delay constant temperature for stopping unit	It is valid only if H12 is not 0
H11	Delay time for testing the inlet temperature after constant temperature stop unit in automatic mode	It is valid only if H12 is not 0
H12	type of compressor	If H12=0,it is a ON/OFF compressor. If H12=1, the model of inverter compressor is TNB220FLHMC_TUV.If H12=2, the model of inverter compressor is SNB172FJGMC_TUV.If H12=3, the model of inverter compressor is MNB36FAAMC_TUV.If H12=4, the model of inverter compressor is TNB306FPGMC_TUV.If H12=5, the model of inverter compressor is TNB220FUEMC_UL.If H12=6, the model of inverter compressor is MNB36FAUMC-L_UL.If H12=7, the model of inverter compressor is TNB306FVPMC_UL.If H12=8, the model of inverter compressor is SNB150FGAMC.If H12=9, the model of inverter compressor is SNB140FCAMC.If H12=10, the model of inverter compressor is MNB36FABMC.If H12=11, the model of inverter compressor is MNB42FFDMC.
H13	parameter P value of compressor control	
H14	parameter I value of compressor control	
H15	parameter D value of compressor control	
H16	type of refrigerant	There are two types of refrigerantIf H16=0,

		the refrigerant is R410aIf H16=0, the refrigerant is R407c
H17	the lowest temperature for starting compensation in cooling	
H18	the lowest temperature for ending compensation in cooling	
H19	the lowest temperature for ending compensation in cooling	
H20	the highest temperature for starting compensation in cooling	
H21	the highest temperature for ending compensation in cooling	
H22	the highest target frequency for high ambient compensation in cooling	
H23	the lowest temperature for starting compensation in heating	
H24	the lowest temperature for ending compensation in heating	
H25	the highest target frequency for low ambient compensation in heating	
H26	the highest temperature for starting compensation in heating	
H27	the highest temperature for ending compensation in heating	
H28	the highest target frequency for high ambient compensation in heating	
	Parameters from H17 to H28 are used for protecting unit when ambient temperature is too low or too high. The diagram to display the parameters are as follows：	

	1) Cooling	
	The maximum frequency of compressor in H09 H22 H19 H18 H17 0 H20 H21 Ambient temperature 2) Heating The maximum frequency of compressor in H25 H08 H28 H24 H23 0 H26 H27 Ambient temperature	
H29	Maximum Pressure sensor value(Reserve)	
H30	Minimum pressure sensor value(Reserve)	
H31	The ambient temperature for starting super heat compensationSee the graph in E parameter	
H32	The ambient temperature for ending super heat compensation	See the graph in E parameter
H33	Maximum frequency of compressor in silent mode	
H34	The ambient temperature for stopping the heat pump	When the ambient temperature is lower than H34, the unit will stop. Notice, no error code is displayed.
H35	The temperature difference for restart the compressor(only for inverter heat pump)	
H36	The start frequency when the	

	compressor restarts	
H37	Unit address	
H38	If enable the pressure sensors	
P	Water pump parameters	
P01	Water pump model	P01=0, water pump will always on except on standby and alarm.P01=1, water pump will operate depend on compressor, and has 2 minutes delay after the compressor has stopped;P01=2, water pump will be started and stopped at regular intervals after compressor stop. Depend on P02 and P03.
P02	Minimum off time before the next pump start	
P03	minimum on time that the pump remains on	
P04	the time of pump advance compressor to start up	

The action sequence of pump and compressor

P05	If enable water pump filtration function	
P06	Water pump filtration start time 1	
P07	Water pump filtration end time 1	
P08	Water pump filtration start time 2	
P09	Water pump filtration end time 2	
R	Temperature parameter	
R01	Cooling set point	Inlet water setting temp. (Cooling
R02	Heating set point	Inlet water setting temp. (Heating
R03	AUTO set point (Auto mode)	Target setting temperature for auto mode
R04	Start differential of cooling	This represents the difference between R01 and start cooling point
R05	Stop differential of cooling	This represents the difference between R01 and stop cooling point

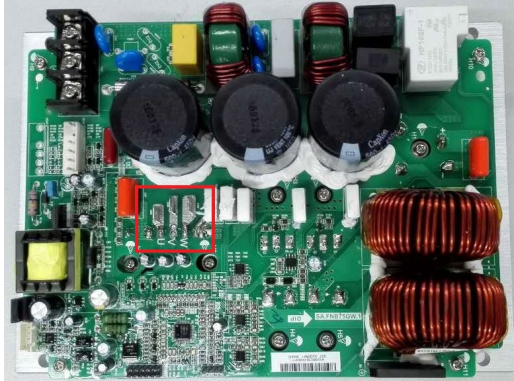|		
	Compressor action at cooling mode Compressor on / Compressor off R01-R05 R01 R01+R04 R01	Water inlet temperature
R06	Start differential of heating	This represents the difference between R02 and start heating point.
R07	Stop differential of haeating	This represents the difference between R02 and stop heating point
	Compressor action at heating mode Compressor on / Compressor off R02-R06 R02 R02+R07 R02 Water inlet temperature **Compressor action at Automatic mode** Compressor on / Compressor off Heating Cooling R03-R06 R03 R03+R04 Water inlet temperature	
R08	Min. set point in Cooling	Establishes the minimum limit for setting the Cooling set point
R09	Max. Cooling set point	Establishes the maximum limit for setting the Cooling set point
R10	Min. Heating set point	Establishes the minimum limit for setting the Heating set point
R11	Max. Heating set point	Establishes the maximum limit for setting the Heating set point
R12	Return temp difference	

Compressor frequency control in heating mode

Frequency Hz

H08

f1

(H08+50)/2

50

f2

(H06+50)/2

H06

0

R02-R12   R02   R02+R04   Inlet water temp.

Compressor frequency control in cooling mode

Frequency Hz

H09

f1

(H09+50)/2

50

f2

(H07+50)/2

H07

Inlet water temp.

0

R01-R04   R01   R01+R12

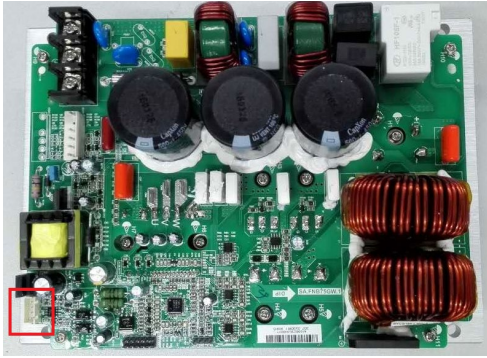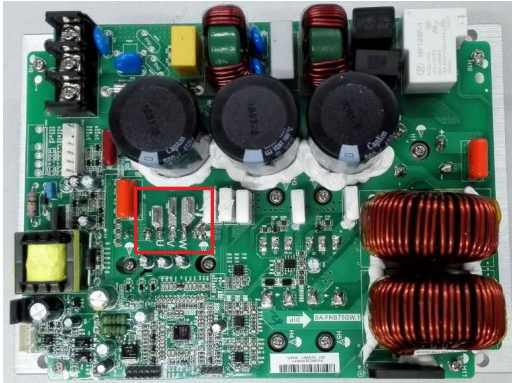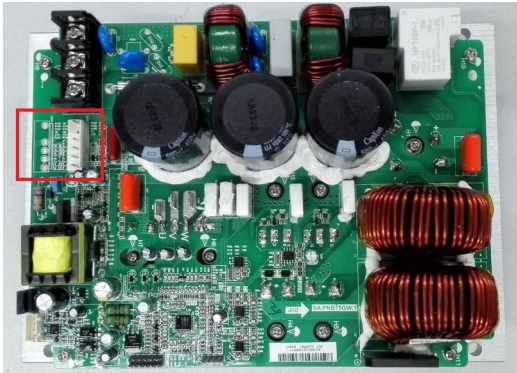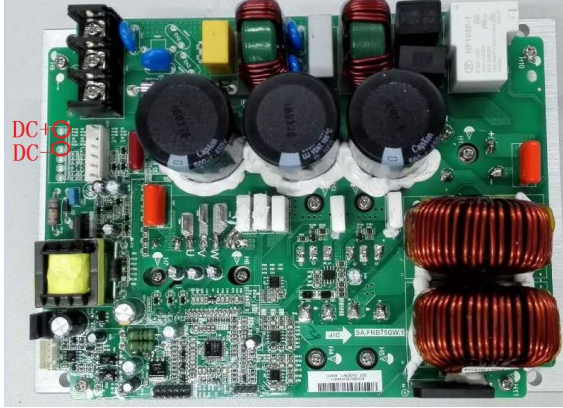| U	Flow parameter	
U02	the pulse number of flow gauge in 1L water	
U03	the model changing function	
O	Condition of load	
O01	compressor output	Whether compressor is switch on or off
O02	circulation water pump output	Whether circulation water pump is switch on or off
O03	four way valve output	Whether four way valve output is switch on or off
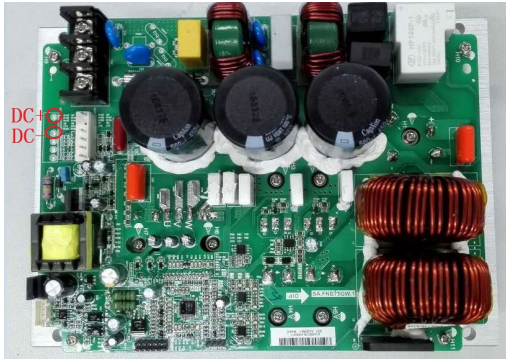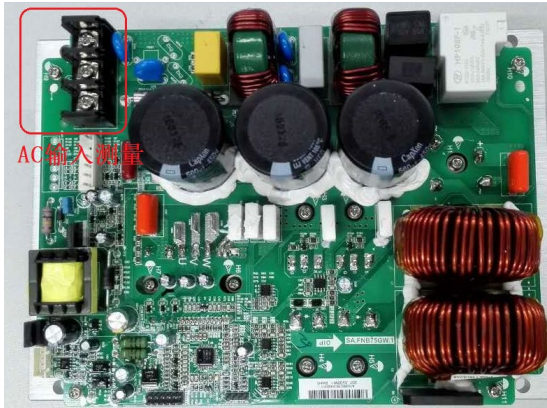
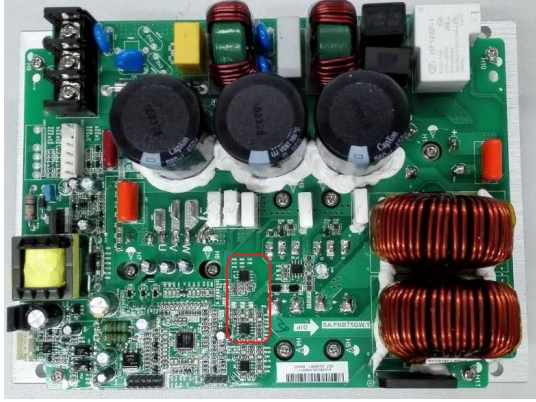| O04	fan motor high speed output	Whether fan motor high speed output is switch on or off
O05	fan motor low speed output	Whether fan motor low speed output is switch on or off
O06	EEV output	The step of EEV ranges from 0-500N
O07	the output frequency of compressor	The frequency of compressor is ranges from 0Hz-08Hz
S	Condition of switch	
S01	emergency switch	Whether the emergency switch is switch on or off
S02	water flow switch	Whether water flow switch is switch on or off
S03	LP switch	Whether LP switch is switch on or off
S04	HP switch	Whether HP switch is switch on or off
S05	Mode switch	Whether mode switch is switch on or off
S06	Master/Slave switch	Whether Master/Slave switch is switch on or off
T	Condition of temperature	
T01	suction temperature	
T02	inlet water temperature	
T03	outlet water temperature	
T04	coil temperature	
T05	ambient temperature	
T06	exhaust temperature	
T07	Check if the current of compressor is overload	
T08	output of AC fan motor	
T09	input of water flow	It is a reserve port
T10	pressure sensor	Only when H12≠0, it is valid
T11	Super heat	
T12	Target speed of fan motor	
T13	Super heat after compensation	
T14	Ac input voltage of frequency driver board	Only when H12≠0, it is valid
T15	Antifreeze Temp.	Only when F20=1, it is valid
T16	EC fan motor speed	Only when F20=0, it is valid
T17	Speed of fan motor 1	Only when F01=3/4/6/7, it is valid\
T18	Speed of fan motor 2	Only when F01=4/7, it is valid

5. Error Code and description

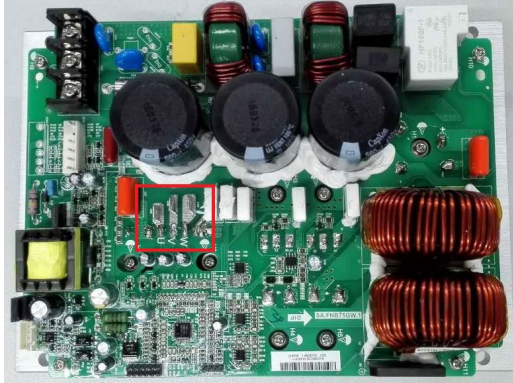| NO.	Definition	Action
P01	Water Inlet Temperature Failure	When it detects water inlet temperature sensor short circuit or open circuit, sensor error code shows.
P02	Water outlet temperature failure	
P04	Ambient temperature failure	
P05	Coil temperature failure	
P07	Suction temperature failure	
P09	Water pipe antifreeze temperature failure	
P081	Discharge temperature failure	
P082	Too high discharge temperature protection	When discharge temperature is larger than 120 degree and the compressor is running, P082 shows and the unit stops running.
E01	High pressure protection	When it detects the high pressure switch circuit open and the compressor is running, E01 shows and the unit stops running.
E02	Low pressure protection	When it detects the low pressure switch circuit open and the compressor has been running for more than 5 minutes, E02 shows and the unit stops running.
E03	Water flow failure	When it detects the water flow switch circuit open, E03 shows and the unit stops running.
E05	Water pipe antifreeze protection	When water pipe temperature is less than 2 degree and the compressor is running, E05 shows and the unit stops running.
E06	Too big difference between inlet and outlet water temperature	When difference between the outlet temp. and inlet temp. is bigger than 13℃ in cooling mode, the E06 shows and the unit stops running except the pump.
E07	Antifreeze protection	When outlet temperature is less than 4 degree and the compressor has been running for more than 1 minutes, E07 shows and the unit stops running.
E19	Primary winter antifreeze protection	When one of inlet temperature, outlet temperature, water pipe temperature is

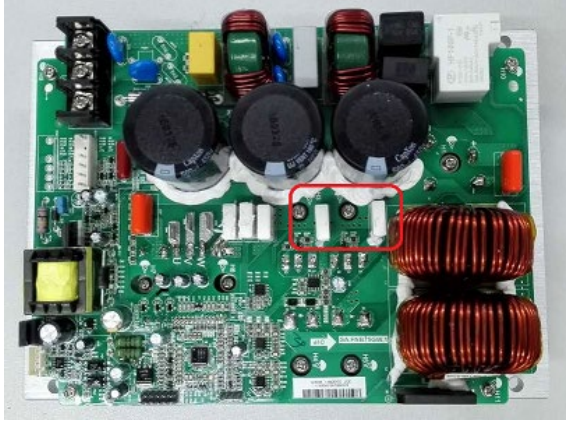|		between 2 degree and 4 degree, and the ambient temperature is less than 0 degree, and the heat pump is in standby mode, E19 shows and the circulation pump starts running.
E29	Secondary winter antifreeze protection	When one of inlet temperature, outlet temperature, water pipe temperature is less than 2 degree, and the ambient temperature is less than 0 degree, and the heat pump is in standby mode, E29 shows and the unit starts heating.
E051	Compressor Over Current Protection	Driver board real-time detect the compressor's UVW of any phase current Instantaneous value.(means the peak,it shows on the current meter of effective value), when the compressor is detected phase current instantaneous value exceeds the set value(the set value can check on specifications), then alarm the failure.
F01	MOP Drive Warning	Driver board real-time calculate the current power, when the input power is detected exceeds the set value(Single-phase Unit of 3P-4P set value is 3800W, Single-phase Unit of 5P-7P set value is 5700W, the same horses power is in the same power range), maintaining constant power, then alarm the failure.
F02	Converter Board Off-line	Logic board periodicity detect the RS485 communication signal of converter board, when not detected signal A/B,then alarm the

		failure.
F03	IPM Protection	Drive board periodically detect the pipe Fo level state of IPM module, when the Fo is detected driving down, then alarm the failure.
F04	Compressor Start-up Failure	When starting the compressor, phase current waveform feedback irregular, chaotic waveform or no current feedback.
F05	DC fan drive fault	Turn on the fan, drive board periodically detect the fan rotate speed, when the fan is detected stop,then alarm the failure.
F06	IPM input current is overcurrent protection	Drive board periodically detect the pipe Fo level state of IPM module, when the Fo is

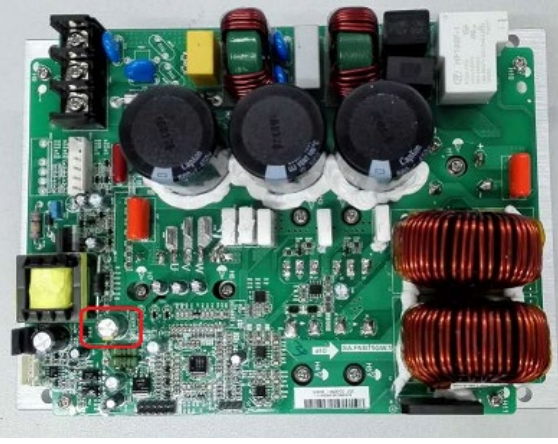|		
		detected driving down, then alarm the failure, after the power restart can clean the failure.
F07	Inverter DC Over Voltage	Drive board periodically detect the busbar DC voltage, when DC voltage is detected exceeds 420V, then alarm the failure.
F08	Inverter DC Under Voltage	Drive board periodically detect the busbar DC voltage, when DC voltage is detected under 340V, then alarm the failure.
F09	Power Input Under Voltage	Drive board periodically detect the input AC voltage effective value, when AC voltage is detected under 175V, then alarm the failure.

F10	Power Input over Voltage	Drive board periodically detect the input AC voltage effective value, when AC voltage is detected exceeds 255V, then alarm the failure. AC输入测量
F11	Sampling Voltage Failure	When Drive board get power, it periodically detect the bias voltage of sampling voltage circuit, when voltage is detected exceeds 1.75V or under 1.45V, then alarm the failure.
F12	DSP and PFC Connection Failure	Drive board periodically detect the cnk signal of PFC, when cnk signal is not detected, then alarm the failure.(none)
F13	DSO and SPPB Connection Failure	Drive board periodically detect the cnk signal of SPPB, when cnk signal is not detected, then alarm the failure.(none)
F14	DSP and MCU Connection Failure	Drive board periodically detect the cnk signal of MCU, when cnk signal is not detected, then alarm the failure.(none)
F15	IPM Overheat Protection	Drive board periodically detect the temp. of IPM Module, when the temp. of IPM Module

		is detected exceeds 95℃, then alarm the failure.
F16	Weak-magnetic Protection	Drive board periodically detect weak-magnetic current, when weak-magnetic is detected exceeds the set value of compressor, then alarm the failure.
F17	Inverter Input Lost Phase	Drive board periodically detect three-phase current, when the current of one phase is detected close to 0 , then alarm the failure.
F18	IPM Sampling Current Failure	When Drive board is power on, it periodically detect the bias voltage of sampling voltage circuit, when voltage is detected exceeds 1.75V or under 1.45V, then alarm the failure.
F19	Radiator Temperature Sensing Failure	Drive board real time detect the temp. Of IPM module, when the temp. is detected under -30℃ or exceeds 120℃, then alarm the failure.(none)
F20	Inverter Overheat Protection	Drive board periodically detect the temp. of IPM module, when temp. is detected exceeds 95℃, then alarm the failure.(none)

F22	Inverter Overheat Warning	Drive board periodically detect the temp. of IPM module, when temp. is detected exceeds 95℃, then alarm the failure.
F23	Compressor Over Current Warning	Drive board periodically detect the DC current(the effective value of UVW), when DC current is detected exceeds the set value(3P-4P set value is 10A, 5P-7P set value is 29A), then alarm the failure.
F24	Input Over Current Warning	Drive board periodically detect the effective value of AC input current, when AC current is detected exceeds the set value(3P-4P set value is 14A, 5P-7P set value is 25A), then alarm the failure.
F25	EEPROM Error Warning	1.Drive board fetch the data from EEPROM to detect if not satisfy the Check-sum, then alarm the failure.2.When the fetching data is not the same with written data, then alarm the failure.(none)
F26	Input Over Current	Drive board periodically detect the effective value of AC input current, when AC current is detected exceeds the set value(3P-4P set value is 17A, 5P-7P set value is 29A), then alarm the failure.
F27	PFC Failure	Drive board periodically detect the current instantaneous value of pipe Mos, when the instantaneous current is detected exceeds the set value(25A), then alarm the failure.
F28	V15V Over/Under Voltage Failure	Drive board periodically detect the power supply of VCC15, when VCC15 is detected under 13V or exceeds 16.5V, then alarm the

		failure.
PP	Pressure sensor failure	
E08	Communication Failure	It detects communication failure between the main cosntroller and wire controller.

NOTE:

NOTE:

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