ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΥΠΟΥΡΓΕΙΟ ΜΕΤΑΦΟΡΩΝ,
ΕΠΙΚΟΙΝΩΝΙΩΝ ΚΑΙ ΕΡΓΩΝ

ΤΜΗΜΑ ΟΔΙΚΩΝ ΜΕΤΑΦΟΡΩΝ
ΛΕΥΚΩΣΙΑ 1425 - ΚΥΠΡΟΣ

COMMUNICATION

concerning: [1] APPROVAL GRANTED
~~APPROVAL EXTENDED~~
~~APPROVAL REFUSED~~
~~APPROVAL WITHDRAWN~~
~~PRODUCTION DEFINITELY DISCONTINUED~~

OF A COMPONENT TYPE PURSUANT TO REGULATION NO. 122.

Approval No: **E49*122R00/06*1028*00**

SECTION I

GENERAL

1.1. Make (trade name of manufacturer):

1.2. Type: combination heater
Variant 1: FJH-4/1C-E, Variant 2: FJH-5/2C

1.3. Means of identification of type, if marked on the device [b]: Type designation

1.3.1. Location of that marking: Label pasted on the side of combination heater

1.4. Name and address of manufacturer:
Hefei Cillight Mechanical and Electrical Equipment Co., Ltd.
Room B-1A3-14, Area 6, Hefei South China City, Economic Development Zone, Feixi county, Hefei, Anhui, P.R.China

1.5. Location of the ECE approval mark: Label pasted on the side of combination heater

1.6. Address(es) of assembly plant(s):
Hefei Cillight Mechanical and Electrical Equipment Co., Ltd.
Room B-1A3-14, Area 6, Hefei South China City, Economic Development Zone, Feixi county, Hefei, Anhui, P.R.China

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ΛΕΥΚΩΣΙΑ 1425 - ΚΥΠΡΟΣ

SECTION II

1. Additional information (where applicable): see Addendum.

2. Technical service responsible for carrying out the tests:
CETOC Technical Service s.r.l.
Via della Bufalotta, 374, 00139 Roma

3. Date of test report: 05.04.2023

4. Number of test report: CN-50-17-286-COM23-06196-IR

5. Remarks (if any): None

6. Place: Nicosia, Cyprus

7. Date: 05.04.2023

8. Signature:

Iosif Miltiadous
(Road Transport Officer)

9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

(1) Strike out what does not apply (there are cases where nothing needs to be deleted, when more than one entry is applicable)

(b) If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered in this information document, such characters shall be represented in the documentation by the symbol "?" (e.g. ABC??123??)

Heating Systems (Component)

0. Legislation:

0.1.	Requirements according to	:	UNECE Regulation 122.00 to Supplement 6

1. General

1.1.	Reason for Inspection Report	:	New approval / ~~Extension of approval / Test report only / COP~~
1.2.	Manufacturer's Representative(s)	:	N/A
1.3.	CETOC TS Representative(s)	:	Dongfei Jiang
1.4.	Location of Test	:	Test Center of China Automotive Engineering Research Institute Co., Ltd. No. 9, Jinyu Avenue, Northern New District, Chongqing, China.
1.5.	Data of test	:	16.03.2023

2. Manufacturer Details

2.1.	Make	:	Refer to manufacturer's information document
2.2.	Type	:	combination heater
2.3.	Variant/Version	:	Variant 1: FJH-4/1C-E, Variant 2: FJH-5/2C
2.4.	Commercial Name	:	N/A
2.5.	Category	:	Component
2.6.	Name and Address of manufacturer	:	Hefei Cillight Mechanical and Electrical Equipment Co., Ltd. Room B-1A3-14, Area 6, Hefei South China City, Economic Development Zone, Feixi county, Hefei, Anhui, P.R.China

3. Conclusion:

3.1. Final conclusion of the inspection: The above mentioned type was tested in accordance with the above mentioned legislation and was found to comply in all respects. This Inspection report relates only to the items tested.

Signature:	:		
Name:	:	Dongfei Jiang	Massimo Peraboni
Position:	:	Type Approval Engineer	Tech. Mgr.
Place and date:	:	Hangzhou, 05.04.2023	Roma, 05.04.2023

4. List of annexes:

Annex Nr.	Page Nr.		Subject
Annex I	2	:	Appendix 1 - Test report history
Annex II	2	:	Appendix 2 - General specification
Annex III	3-6	:	Appendix 3 - Inspection results

APPENDIX 1 - TEST REPORT HISTORY

List this report and previous reports, with extension details.

Inspection Report Number	Reason for Extension	Date of Issue
CN-50-17-286-COM23-06196-IR	N/A, New approval	05.04.2023

APPENDIX 2 – GENERAL SPECIFICATION

1. Worst Case Rationale : The two variants are same, and the only difference among them is the model name. FJH-4/1C-E is selected for the tests.
The product is a combination heater of diesel fuel heater and electric heater, and can run in three modes: diesel mode, electric mode and hybrid mode.
Test procedure for temperature is performed under all three modes.
The other required tests are performed under diesel mode.

2. Significant Interpretations, Alternative Test Methods, New Technologies : N/A

3. Summary of test results :

3.1. Applicability

	PASS	FAIL	N/A	COVERED PREVIOUS EXTENSION	See approval/ Report Nr.
General Specification:	☒	☐	☐	☐	
Requirements for waste heating systems – air (Annex 3):	☐	☐	☒	☐	
Test procedure for air quality (Annex 4):	☒	☐	☐	☐	
Test procedure for temperature (Annex 5):	☒	☐	☐	☐	
Test procedure for exhaust emission of combustion heaters (Annex 6):	☒	☐	☐	☐	
Additional requirements for combustion heaters (Annex 7):	☒	☐	☐	☐	
Safety requirements for LPG combustion heaters and LPG heating systems (Annex 8):	☐	☐	☒	☐	

4. Facility and Equipment Checks

4.1. Calibration certificates checked and valid, recorded in the following table : Conform

4.2 All instruments are equipped with identification label : Yes

4.3 Calibration certificates are complete of calibration-chain with detailed information regarding primary used. : Yes

Equipment	Serial / Certificate No.	Calibration due*
Analyzer	SN ZPJ190 / CN JA2022032	10/04/2023
Smoke measurement	SN ZZC218-8 / CN 22070059	05/07/2023
Thermometer	SN ZZC216-6 / CN Z20221-G296687	26/07/2023

**Specify calibrated date + (interval) or calibration due date.*

APPENDIX 3 – INSPECTION RESULTS

		PASS	FAIL	N/A

General Specifications

6.2. Specifications: General

The requirements for heating systems are that:

-	Heated air entering the passenger compartment is no more polluted than the air at the point of inlet to the vehicle.	☒	☐	☐
-	Driver and passengers, during road use, will not be able to come into contact with parts of the vehicle or heated air liable to cause burns.	☒	☐	☐
-	The exhaust emissions from the combustion heater(s) are within acceptable limits.	☒	☐	☐

6.2.1 The following table indicates which annexes apply to each type of heating system within each vehicle category: ☒ ☐ ☐

Heating System	Vehicle Category	Annex 4 Air Quality	Annex 5 Temperature	Annex 6 Exhaust	Annex 8 LPG Safety
~~Engine waste Heat – water~~	~~M~~				
	~~N~~				
	~~O~~				
~~Engine waste Heat – air~~[(1)]	~~M~~	~~Yes~~	~~Yes~~		
	~~N~~	~~Yes~~	~~Yes~~		
	~~O~~				
~~Engine waste Heat – oil~~	~~M~~	~~Yes~~	~~Yes~~		
	~~N~~	~~Yes~~	~~Yes~~		
	~~O~~				
~~Gaseous fuel heater~~[(2)]	~~M~~	~~Yes~~	~~Yes~~	~~Yes~~	~~Yes~~
	~~N~~	~~Yes~~	~~Yes~~	~~Yes~~	~~Yes~~
	~~O~~	~~Yes~~	~~Yes~~	~~Yes~~	~~Yes~~
Liquid fuel heater[(2)]	M	Yes	Yes	Yes	
	N	Yes	Yes	Yes	
	O	Yes	Yes	Yes	
Electric heater[(2)]	M		Yes		
	N		Yes		
	O		Yes		
~~Heat pump~~[(2)]	~~M~~	~~Yes~~	~~Yes~~		
	~~N~~	~~Yes~~	~~Yes~~		
	~~O~~	~~Yes~~	~~Yes~~		

(1) Heating systems which comply with the requirements of Annex 3 are exempt from these test requirements.

(2) Heaters located outside the passenger compartment, using water as a transfer medium, are deemed to comply with Annexes 4 and 5.

Requirements for waste heating systems – air (Annex 3)

Ann 3, 1.	The requirements set out in Paragraph 6.2. of this Regulation are considered satisfied in respect of heating systems which include a heat exchanger, the primary circuit of which is passed over by exhaust gases or polluted air, provided that the following conditions are satisfied:	☐	☐	☒
Ann 3, 2.	The walls of the primary circuit of the heat exchanger must be leak tight at any pressure up to and including 2bar;	☐	☐	☒
Ann 3, 3.	The walls of the primary circuit of the heat exchanger must not include any detachable component;	☐	☐	☒

Ann 3, 4.	The wall of the heat exchanger where the exchange of heat takes place must be at least 2 mm thick if made of non-alloy steels; *Note: Al-alloy used*	☐	☐	☒
Ann 3, 4.1	In cases where other materials are used (including composite or coated materials), the thickness of the wall must be such as to ensure that the heat exchanger has the same service life as in the case referred to in Paragraph 4;	☐	☐	☒
Ann 3, 4.2	If the wall of the heat exchanger where the exchange of heat takes place is enamelled, the wall where such enamel has been applied must be at least 1mm thick and this enamel must be durable, leak tight and not porous;	☐	☐	☒
Ann 3, 5.	The pipe conducting the exhaust gases must include a corrosion test zone at least 30mm long, this zone being situated directly downstream of the heat exchanger, uncovered and easily accessible;	☐	☐	☒
Ann 3, 5.1	The wall of this corrosion test zone must not be thicker than the pipes for the exhaust gases situated inside the heat exchanger and the materials and surface properties of this section must be comparable with those of these pipes;	☐	☐	☒
Ann 3, 5.2	If the heat exchanger forms a single unit with the vehicle exhaust silencer, the external wall of the latter must be regarded as the zone complying with Point 5.1 where any corrosion should occur.	☐	☐	☒
Ann 3, 6.	In the case of waste heat heating systems using the cooling air of the engine for heating purposes, the conditions of Paragraph 6.2. of this Regulation are considered satisfied without the use of a heat exchanger provided that the following conditions are satisfied:	☐	☐	☒
Ann 3, 6.1	The cooling air which is used for heating purposes comes into contact only with surfaces of the engine which do not include any detachable part, and	☐	☐	☒
Ann 3, 6.2	The connections between the walls of this cooling air circuit and the surfaces used for the transfer of heat are gastight and oil-resistant.	☐	☐	☒

Test procedure for air quality (Annex 4)

Ann 4, 2.	In the case of type-approval of heaters as components the following test shall be carried out after the tests of Annexes 5, 6 and Paragraph 1.3. of Annex 7.	☒	☐	☐
Ann 4, 2.1	The primary circuit of the heat exchanger shall be subjected to a leakage test to ensure that polluted air cannot enter the heated air intended for the passenger compartment.	☒	☐	☐
Ann 4, 2.2	This requirement shall be considered to be fulfilled if, at a gauge pressure of 0.5hPa, the leakage rate from the heat exchanger is less than or equal to 30dm^3/h.	☒	☐	☐

Test procedure for temperature (Annex 5)

Ann 5, 1.	Operate the heater for one hour at maximum output in conditions of still air (wind speed ≤2m/s). The ambient temperature is not less than 15°C.	☒	☐	☐
Ann 5, 2.	The surface temperature of any part of the heating system likely to come into contact with any driver of the vehicle during normal road use shall be measured with a contact thermometer. No such part or parts shall exceed a temperature of 70°C for uncoated metal or 80°C for other materials.	☒	☐	☐
Ann 5, 2.1.	In the case of part or parts of the heating system behind the driver's seat, and in the case of overheating, the temperature shall not exceed 110°C.	☒	☐	☐

Ann 5, 2.2.	In the case of vehicles of Categories M1 and N, no part of the system likely to come into contact with seated passengers during normal road use of the vehicle, with the exception of the outlet grille, shall exceed a temperature of 110°C.	☒	☐	☐
Ann 5, 2.3.	In the case of vehicles of Categories M2 and M3, no part of the system likely to come into contact with passengers during normal road use of the vehicle shall exceed a temperature of 70°C for uncoated metal or 80°C for other materials.	☒	☐	☐
Ann 5, 3.	In the case of exposed parts of the heating system outside the passenger compartment, and in the case of overheating, the temperature shall not exceed 110°C. The temperature of the heated air entering the passenger compartment shall not exceed 150 °C to be measured at the centre of the outlet.	☒	☐	☐

Test procedure for exhaust emission of combustion heaters (Annex 6)

Ann 6, 1.	Operate heater for one hour at maximum output in conditions of still air (wind speed ⩽ 2 m/s) and an ambient temperature of 20 ± 10 ° C. If, however, having selected the maximum output the heater switches off automatically in less than an hour, the measurements may be made before switch-off.	☒	☐	☐
Ann 6, 2.	The dry and undiluted exhaust emissions, measured using an appropriate meter, does not exceed the values indicated in the following table:	☒	☐	☐

Table1 exhaust emissions test results

Parameter	~~Heaters Using Gaseous Fuels~~	Heaters Using Liquid Fuel	Test values	Unit
CO	~~0.1 % vol.~~	0.1 % vol.	0.05	% vol.
CO at a speed of 100 km/h	~~0.2 % vol.~~	0.2 % vol.	0.12	% vol.
NO_X	~~200 ppm~~	200 ppm	106	ppm
HC	~~100 ppm~~	100 ppm	48	ppm
Smoke value according to Bacharach RU*	~~1~~	4	2	Bacharach

**:Reference unit "Bacharach" ASTM D 2156 is used*

Additional requirements for combustion heaters (Annex 7)

Ann 7, 1.	Operating and maintenance instructions shall be supplied with every heater and, in the case of heaters intended for the after-market, installation instructions shall also be supplied.	☒	☐	☐
Ann 7, 2.	Safety equipment has been installed (either as part of the combustion heater ~~or as part of the vehicle~~) to control the operation of every combustion heater in an emergency. It shall be designed such that, if no flame is obtained at start-up or if the flame goes out during operation, the ignition and switching times for the supply of fuel are not exceeded by four minutes in the case of liquid fuel heaters or, ~~in the case of gaseous fuel heaters, one minute if the flame supervision device is thermoelectric or 10 seconds if it is automatic~~.	☒	☐	☐

Test items	Time duration (s)	Limit (s)	Test result
No flame burning at start-up	156	≤240	Fuel supply switching off
Flame goes out during operation	92	≤240	

Ann 7, 3.	The combustion chamber and the heat exchanger of heaters using water as a transfer medium are capable of withstanding a pressure of twice the normal operating pressure or 2 bar (gauge), whichever is greater. The test pressure shall be noted in the information document.	☐	☐	☒

Ann 7, 4.	The heater has a manufacturer's label showing the manufacturer's name, the model number and type together with its rated output in kilowatts. The fuel type is stated and, where relevant, the operating voltage and gas pressure.	☒	☐	☐
Ann 7, 5.	Delayed shut-off of combustion air blowers:			
Ann 7, 5.1.	If a combustion air blower is fitted a delayed shut-off must be provided even in the event of overheating and in the event of interruption of the fuel supply.	☒	☐	☐

Test items	Time duration (s)	Limit (s)	Test result
Overheating	191	--	Air blower delayed shut-off
Interruption of the fuel supply	108	--	

Ann 7, 5.2.	Other measures to prevent damage due to deflagration and exhaust corrosion can be applied if the manufacturer provides evidence to the satisfaction of the approval authority of their equivalent effect.	☐	☐	☒
Ann 7, 6.	Requirements for electrical supply:			
Ann 7, 6.1.	All technical requirements affected by the voltage are within the voltage range of ± 16 per cent of the rated figure. However, if under voltage and/or over voltage protection is provided, the requirements shall be met at rated voltage and in the immediate vicinity of the cut-off points. *Note: See table1 exhaust emissions test results*	☒	☐	☐
Ann 7, 7.	Warning light:			
Ann 7, 7.1.	There is a clearly visible tell-tale in the operator's field of view when the combustion heater is switched on or off.	☒	☐	☐
Safety requirements for LPG combustion heaters and LPG heating systems (Annex 8)		☐	☐	☒

Remarks

None

Note: CETOC TS apply measurement uncertainty to calibrated items but not test results.

Information Document

Subject:	Uniform technical prescriptions concerning the approval of component with regard to a combustion heater
Applicable No.	ECE R122.00, Supplement 6
Manufacturer:	Hefei Cillight Mechanical and Electrical Equipment Co., Ltd.
Type:	combination heater
Date:	03/03/2023

APPROVAL HISTORY

Revision No.	Reason for revision	Date of issue
00	Original Issue	03/03/2023

TEXT of Information Document

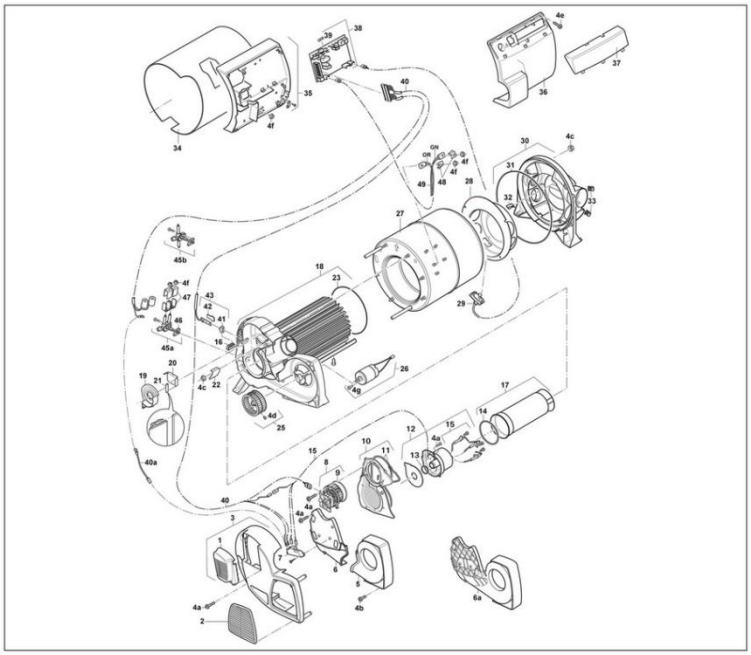
1.	GENERAL	
1.1.	Make (trade name of manufacturer)	
1.2.	Type and General commercial description(s)	Type: combination heater Variant 1: FJH-4/1C-E, Variant 2: FJH-5/2C The above variants are same, and the only difference among them is the model name. Combination heater is used to provide warm air and water in the caravan, separately or simultaneously. Usually powered by diesel, or electricity if needed.
1.3.	Name and address of manufacturer	Hefei Cillight Mechanical and Electrical Equipment Co., Ltd. Room B-1A3-14, Area 6, Hefei South China City, Economic Development Zone, Feixi county, Hefei, Anhui, P.R.China
1.4.	In the case of components, location and method of affixing of the ECE approval mark	Label pasted on the side of combination heater
1.5.	Name(s) and address(es) of assembly plant(s)	Hefei Cillight Mechanical and Electrical Equipment Co., Ltd. Room B-1A3-14, Area 6, Hefei South China City, Economic Development Zone, Feixi county, Hefei, Anhui, P.R.China

2.	**COMBUSTION HEATER (IF ANY)**	
2.1.	Make (trade name of manufacturer)	
2.2.	Type and general commercial description(s)	Type: combination heater Variant 1: FJH-4/1C-E, Variant 2: FJH-5/2C The above variants are same, and the only difference among them is the model name. Combination heater is used to provide warm air and water in the caravan, separately or simultaneously. Usually powered by diesel, or electricity if needed.
2.3.	Means of identification of type, if marked on the heating system	Type designation
2.4.	Location of that marking	Label pasted on the side of combination heater
2.5.	Name and address of manufacturer	Hefei Cillight Mechanical and Electrical Equipment Co., Ltd. Room B-1A3-14, Area 6, Hefei South China City, Economic Development Zone, Feixi county, Hefei, Anhui, P.R.China
2.6.	Address(es) of assembly plant(s)	Same as item 2.5. above
2.7.	Test pressure (in the case of a combustion heater fuelled by liquefied petroleum gas or similar, the pressure applied at the gas inlet connector of the heater)	N/A
2.8.	Detailed description, layout drawings and mounting description of the combustion heater and all its components	See Attachment No.1 to Attachment No.7

List of drawing and photographs of the combustion heater

Attachment No.1	Drawing of Combustion Heater
Attachment No.2	Drawing of Flame Chamber
Attachment No.3	Manufacturer's label
Attachment No.4	Circuit Diagram
Attachment No.5	Bill of materials
Attachment No.6	Brief description
Attachment No.7	Installation drawing

Attachment No.1: Drawing of Combustion Heater



1	Cover combustion air
2	Grill
3	Cover circulation air
6	Ignitor c/w screws
7	Combustion air motor Combi
11	Burner pot complete
14	Ignitor plug kit c/w screws
20	Heating elements
22	Fan wheel-air
23	D.C motor Combi
24	Water container Combi E
26	Air temperature sensor cable
29	Outer casing Combi
30	Electronic housing Combi
31	Electronic housing lid Combi
32	Combi connection cover
33	Electronic Combi 4 E
35	Power electronics Combi
38	Cable harness Combi 4 E
40	Thermostat plate device CB 4
41	Solenoid coils large and small
42	Solenoid valve Combi
48	Water temperature sensor
50	Control panel Combi
51	Power selector switch Combi
52	Control panel cable 3m
53	Control panel connecting
56	Exhaust duct clip
57b	ElbowfittingTBflex.10mm
58b	ElbowfittingJohnGuest12mm,red
60b	ElbowfittingTBflex.10mm
61b	ElbowfittingJohnGuest12mm,blue
62	Frost control 2,8 bar TB
63	Frost control 2,8 bar John Guest

Attachment No.2: Drawing of Flame Chamber

1Control panel, digital or analogue (no picture)

2Room temperature sensor

3Cold water connection

4Hot water connection

5Fuel line connection

6Warm air outlets

7Circulated air intake

8Exhaust gas discharge

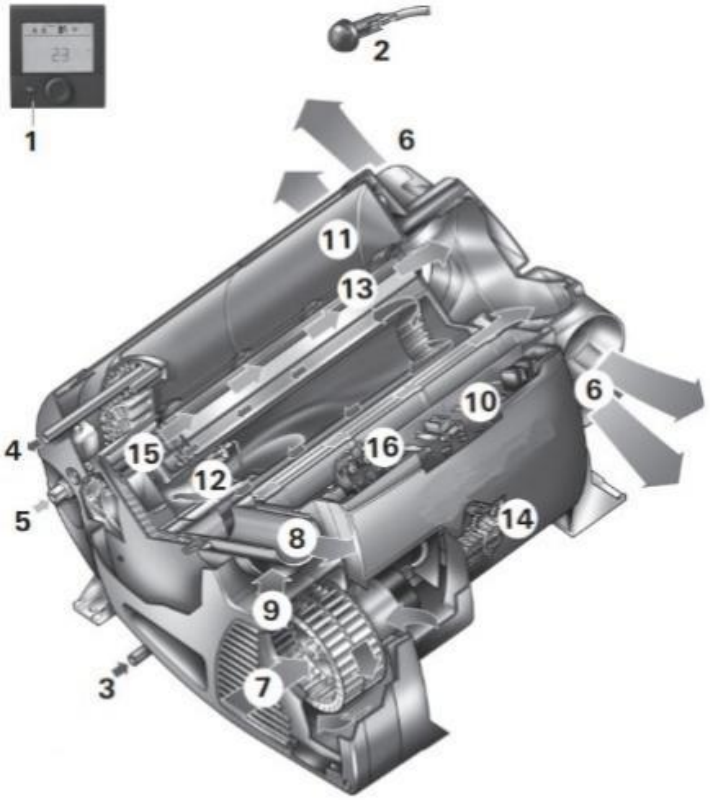
9Combustion air infeed

10Electronic control unit

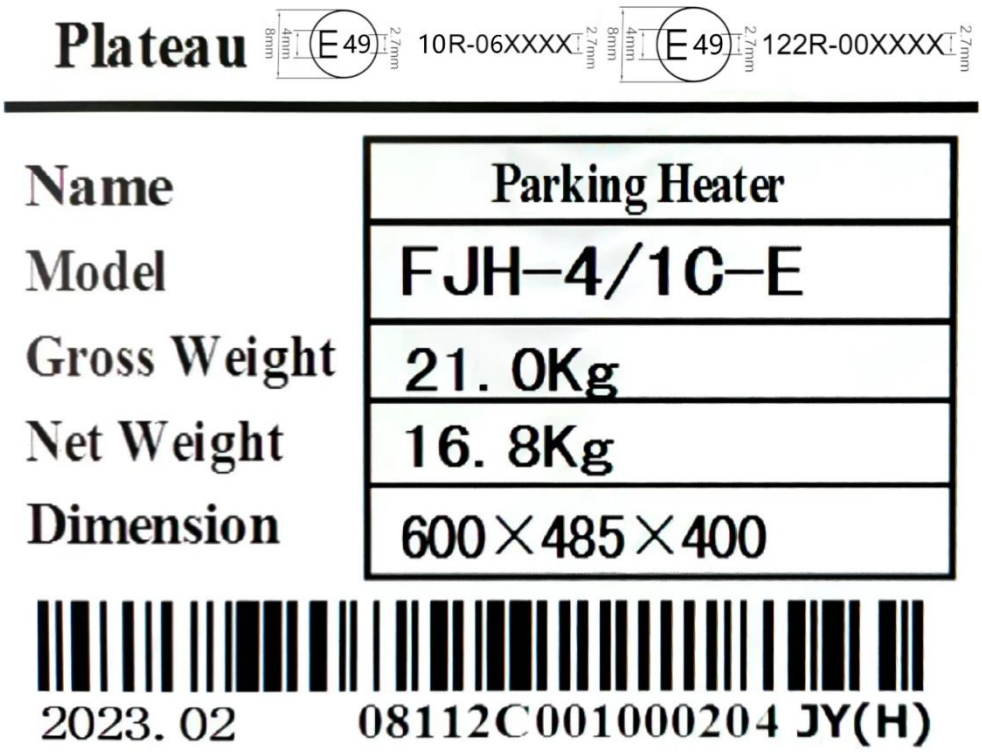
11Water container (10litres)

12Burner

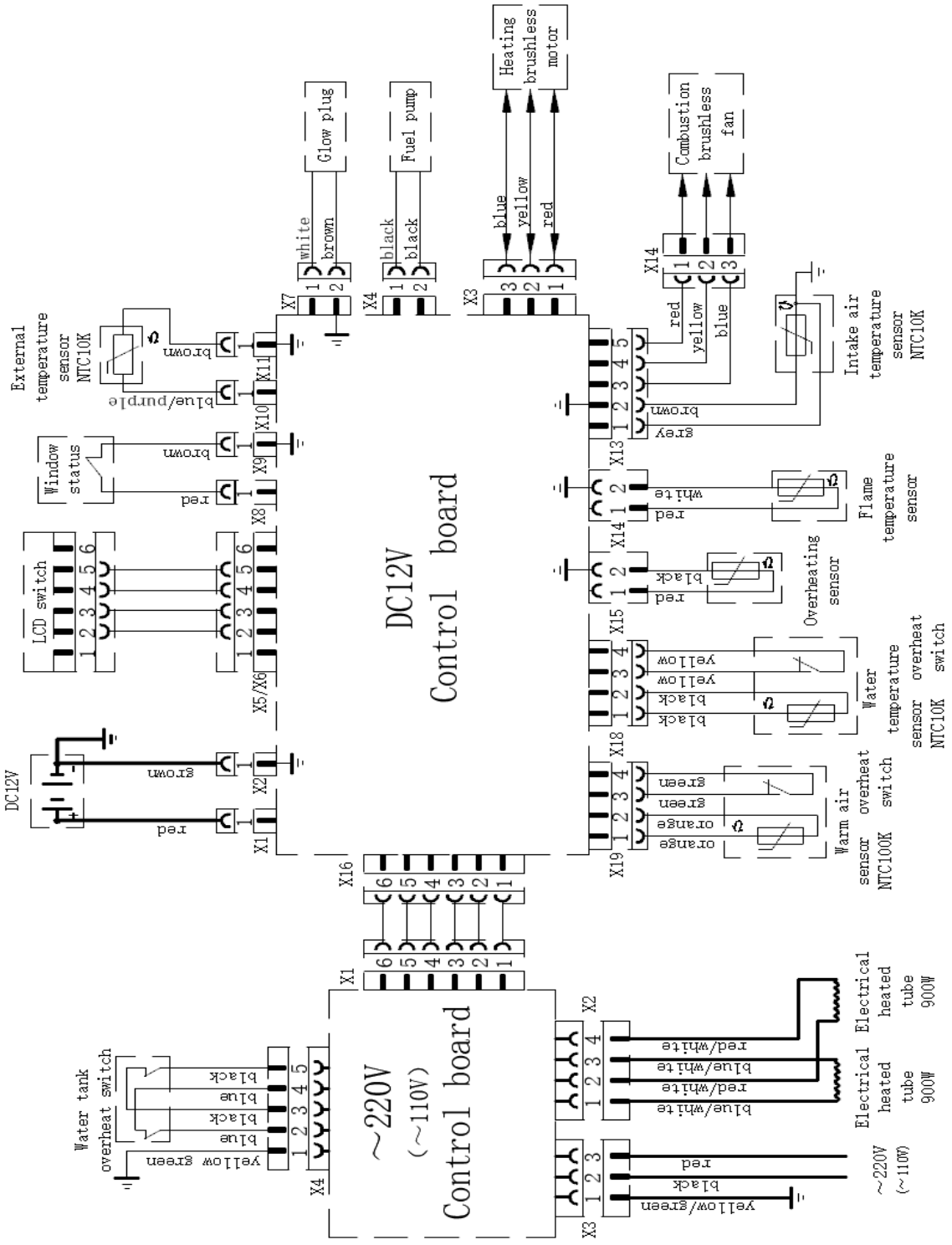
13Heat exchanger



Attachment No.3: manufacturer's label



Attachment No.4: Circuit Diagram



Attachment No.5: Bill of materials

Item No.	Comment	Specification/Description	QTY (PC)	Position	Manufacturer
1	MCU	LQFP-44,STM8S207S6	1	IC1	STMicroelectronics
2	LIN transceiver	SO-8,TJA1028T/5V0	1	IC3	NXP 恩智浦半导体
3	Pre-driver	SSOP24,TB9061AFNG	1	IC4	TOSHIBA 东芝
4	P-MOSFET	TO-252,TJ80S04M3L	5	S4、S6、S11、S12、S13	TOSHIBA 东芝
5	N-MOSFET	TO-252,TK80S04K3L	4	S8、S14、S15、S16	TOSHIBA 东芝
6	PROFET	SO-8,BSP752T	2	S1、S5	Infineon 英飞凌
7	Transistor	SOT-23,BC846B,NPN	3	V5、V6、V7	PANJIT 强茂
8	Dual transistors	SMT5,FMY1A, NPN+PNP	6	V11、V12、V13、V14、V15、V16	ROHM 罗姆半导体
9	Chip Diode	SMA,RS1G	1	D1	指日高
10	Chip Diode	SOT-23,4148	1	D5	PANJIT 强茂
11	Chip Diode	SOT-23,BAV99	1	D9	NXP 恩智浦半导体
12	Plug-in Diode	P600,5KP30A	1	D8	NANJING SUNRISE
13	Chip Resistor	2010,RL10FTNTR005	1	Rs	HEL 海利斯特
14	Chip Resistor	1210,1Ω±1%	1	R27	Yageo 国巨
15	Chip Resistor	1210,10Ω±1%	2	R29、R39	Yageo 国巨
16	Chip Resistor	0805,100Ω±1%	6	R71、R73、R75、R82、R85、R88	Yageo 国巨
17	Chip Resistor	0805,1k±1%	8	R15、R22、R34、R41、R70、R72、R74、R79	Yageo 国巨
18	Chip Resistor	0805,10k±1%	21	R1、R8、R11、R12、R13、R18、R20、R21、R23、R24、R26、R28、R30、R32、R35、R40、R44、R49、R83、R86、R89	Yageo 国巨
19	Chip Resistor	0805,100k±1%	7	R16、R17、R52、R55、R76、R77、R78	Yageo 国巨
20	Chip Resistor	0805,15k±1%	2	R51、R54	Yageo 国巨
21	Chip Resistor	0805,2k±1%	6	R14、R31、R36、R43、R47、R57	Yageo 国巨
22	Chip Resistor	0805,20k±1%	5	R33、R46、R50、R53、R56	Yageo 国巨

Item No.	Comment	Specification/Description	QTY (PC)	Position	manufacturer
24	Chip Resistor	0805,30k±1%	2	R2、R5、R25、R48	Yageo 国巨
25	Chip Resistor	0805,39k±1%	1	R45	Yageo 国巨
26	Chip Resistor	0805,56k±1%	5	R3、R6、R19	Yageo 国巨
27	NTC Resistor	Plug-in, MF52E-103F3950FA	1	RT1	AMPRON 安培龙
28	Chip Capacitor	0805，CL21B102KB	4	C2、C11、C12、C13	Yageo 国巨
29	Chip Capacitor	0805，CL21B474KB	2	C1、C62	Yageo 国巨
30	Chip Capacitor	1206，CL31B104KACNBN	3	CB1、CB2、CB3	Yageo 国巨
31	Chip Capacitor	1206，CL31B225KB	4	C6、C8、C22、C37	SAMSUNG 三星
32	Chip Capacitor	1206，CA45-106-10V	2	C27、C63	Sunlord 顺络
33	Electrolytic Capacitor	φ10×16，CD286-330μ/50V	2	C7、C21	SAMYOUNG 三莹
34	Plug-in Magnet Inductor	0.8×19,φ4×20	1	L	Haoke 豪克
35	PCB	110×115×1.5,4 layers	1		Shenzhen Hongda Youlian

Attachment No.6: Brief description

The combination heater is a hot water and warm air integrated machine, which can provide domestic hot water while heating the occupants. This heater allows use during driving. This heater also has the function of using local electricity heating.

In hot water warm air work mode, the combination heater can be used to heat both the room and the hot water. If only hot water is needed, just choose hot water working mode.

There are three energy options to choose from:

-- Diesel Mode

Heater automatic adjust the power。

--Electrical Mode

Manually select the 900W or 1800W heating mode according to the power supply capacity of the RV camp/park.

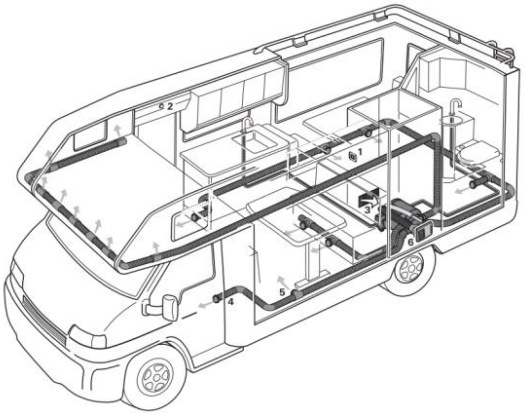
--Hybrid Mode

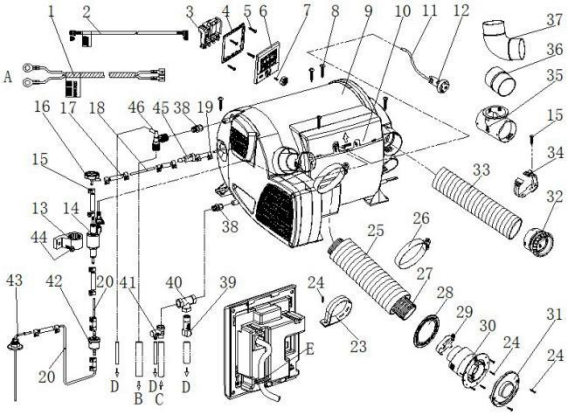
When the power demand is low (for example, maintaining the room temperature stage), the electrical heating is preferred. Until the city electricity cannot meet, the diesel heating is started, and the diesel heating function is turned off first in the power adjustment phase.

In hot water working mode， diesel mode or electrical mode is used to heat the tank. The tank temperature can be set to 40° C or 60° C.

Attachment No.7: Installation drawing

The typical installation of the heater is shown below:





General installation system

The heater installation location should be selected from load-bearing floor, double floor or underfloor.
If there is no suitable floor, you can first make a load bearing surface with plywood.
The heater must be firmly fixed to the mounting surface with screws to prevent damage to the gas pipeline during driving and cause danger