

ORIGINAL  
MANUAL

# frigicoll

## OWNER'S AND INSTALLATION MANUAL

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Inverter Condensing Unit  
Control Module

FRIAHUKZ-LCAC-01



**IMPORTANT NOTE:**

Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

## 1. Introduction

KA8140/KA8141 control module enables to control inverter type outdoor unit without the needs of airconditioner factory produced indoor unit. It gives possibility to control outdoor unit capacity and state to produce heat or cooling for AHU or water heater/cooler.

KA8140/KA8141 control module enables to control inverter condensing unit capacity between 0 - 10%~100% by external input 0~10VDC signal.

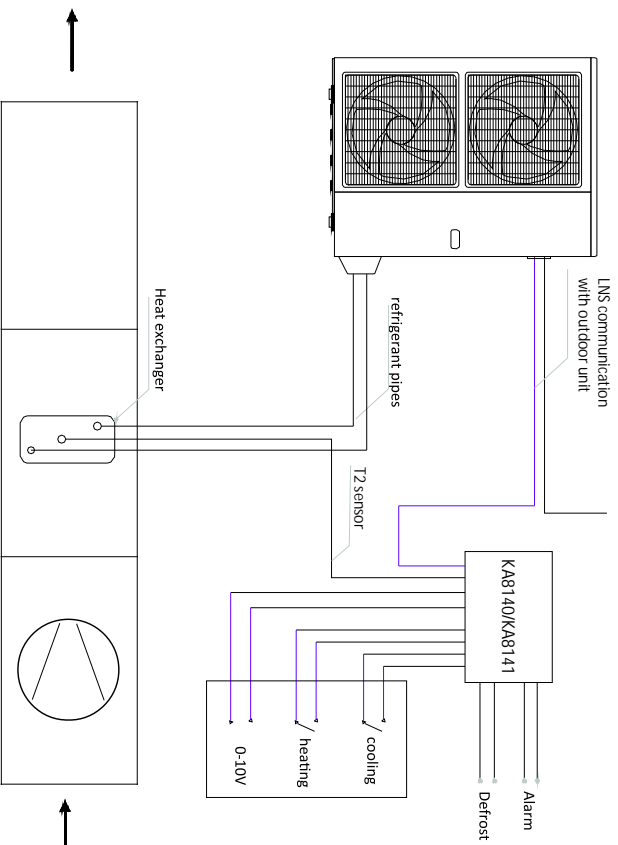
Dry contact signal is used to control outdoor unit to work in cooling or heating mode.

The installation and operation of outdoor unit as well controller must be done according to the manuals (i.e. User's manual, Installation manual, Technical Specification, Service Manual).

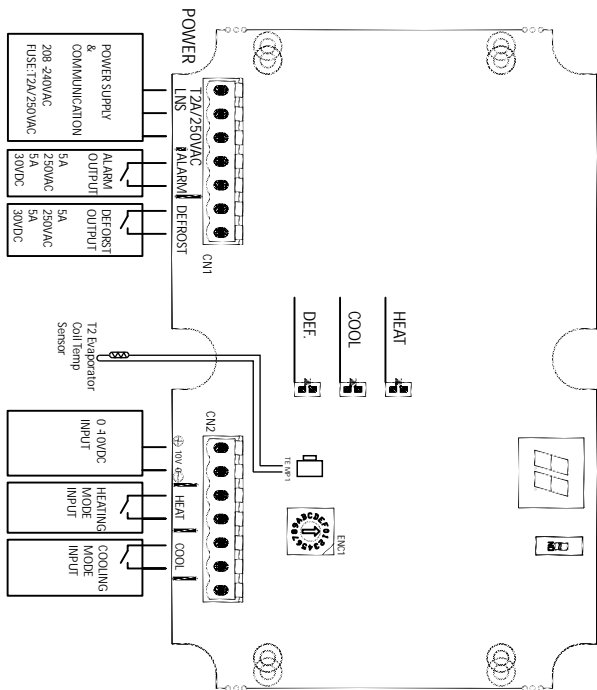
## 2. Specification and packing list

Model	KA8140/KA8141	
Casing	Plastic	
Dimension (h x w x d)	61 x100 x191mm	
Weight	0.4KG	
Operation Temperature Range	-25 ~ +45 C	
Operation Humidity Range	40-90 %	
Power Supply	230VAC, 1 Phase, 50/60Hz	
Voltage Range	208-240V	
Fuse	15A, 250V	
Resistance class	IP54	
Packing list	Box body	1 piece
	Box cover	1 piece
	Anti-water seal between box body and box cover	1 piece
	Temp sensor	1 piece
	Gland	3 pieces
	Manual	1 piece

### 3. System design



## 4.Function and Setting



## Connection Terminal Introduction:

L, N, S---Power Supply and communication with outdoor unit 230V,1-phase, 50Hz. Cable dimension 3×1.0 mm<sup>2</sup>.

ALARM---digital output 5A-250VAC or 5A-30VDC. When outdoor unit has malfunction signal is activated.

DEFROST---digital output 5A-250VAC or 5A-30VDC. When outdoor unit is in defrost mode is activated.

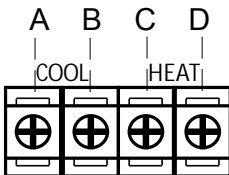
TEMP1--- T2 temp sensor (evaporator coil temperature sensor) terminal. Temp sensor must be placed at middle of heat changer.

0-10V---Analog input terminal to control outdoor unit capacity.

Analog input	Capacity output	LED display
0-0.5V	0%	None(Unit stopped)
0.5-1.5V	10%	digit 1
1.5-2.5V	20%	digit 2
2.5-3.5V	30%	digit 3
3.5-4.5V	40%	digit 4
4.5-5.5V	50%	digit 5
5.5-6.5V	60%	digit 6
6.5-7.5V	70%	digit 7
7.5-8.5V	80%	digit 8
8.5-9.5V	90%	digit 9
9.5-10.5V	100%	digit 10

**Warning:**  
Negative(0/-) and Positive(10/+) terminals can not be mixed, otherwise it may destroy this control module.  
Signal input can not exceed 10.5VDC, otherwise it may destroy this control module.

COOL---Digital input. When terminals are closed, the unit will run in cooling mode and "COOL" LED will be on. Terminal A is Positive(+) and terminal B is Negative(-)



HEAT---Digital input. When terminals are closed, the unit will run in heating mode and "HEAT" LED will be on. Terminal C is Positive(+) and terminal D is Negative(-)

Note: Terminal B and D are connected as one Negative(-), so 3 cables to control cooling/heating are feasible.

ENC1 - knob for multi split connection to select indoor unit capacity. This knob is for multi indoor units connection only. This knob will not work at one indoor to one outdoor connection.

Knob selection	Indoor unit capacity	Knob selection	Indoor unit capacity
0	2,0 kW unit	6	7,1 kW unit
1	2,6 kW unit	7	9,0 kW unit
2	3,2kW unit	8	10,5 kW unit
3	3,5 kW unit	9	14,0 kW unit
4	5,3 kW unit	A-F	16,0 kW unit
5	7,1 kW unit		

## LED lamps introduction:

HEAT LED is lightened when the unit is operating in heating mode.

COOL LED is lightened when the unit is operating in cooling mode.

DEF LED is lightened when unit is in defrost mode

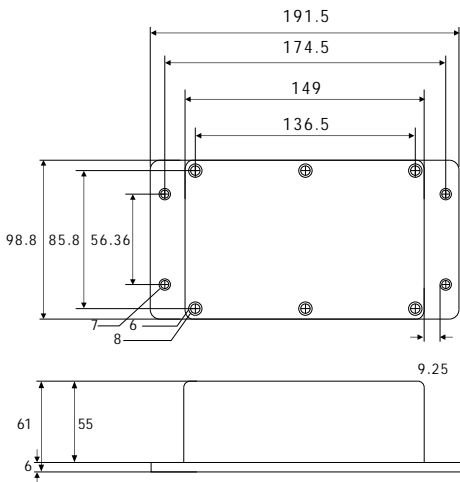
## 5.Malfunction and Error Code

Error Code	Malfunction or Protection
E1	communication error with outdoor unit.
E5	evaporator coil temperature sensor T2 malfunction
F0	current overload protection
F1	outdoor unit ambient temperature sensor T4 malfunction

F2	outdoor unit condenser pipe temperature sensor T3 malfunction
F3	outdoor unit compressor discharge temperature sensor TP malfunction
F4	outdoor unit EEPROM parameter error
F5	outdoor unit fan speed is operating outside of the normal range
F6	outdoor unit T2b temperature sensor malfunction
P0	IPM malfunction or IGBT over-strong current protection
P1	over voltage or over low voltage protection
P2	top temperature protection of compressor
P3	outdoor low temperature protection
P4	compressor protection or malfunction
--	multi split indoor units cooling/heating mode conflict
P6	low pressure protection of compressor

For troubleshooting, please refer to outdoor unit factory technical manual and solution.

## 6. Dimensions(mm)



Appendix 1 Temperature Sensor Resistance Value Table (°C--K)

°C	K Ohm	°C	K Ohm	°C	K Ohm	°C	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.0000	65	1.96532	105	0.54448
-14	79.3110	26	9.55074	66	1.89627	106	0.52912
-13	74.5360	27	9.12445	67	1.83003	107	0.51426
-12	70.1698	28	8.71983	68	1.76647	108	0.49989
-11	66.0898	29	8.33566	69	1.70547	109	0.48600
-10	62.2756	30	7.97078	70	1.64691	110	0.47256
-9	58.7079	31	7.62411	71	1.59068	111	0.45957
-8	56.3694	32	7.29464	72	1.53668	112	0.44699
-7	52.2438	33	6.98142	73	1.48481	113	0.43482
-6	49.3161	34	6.68355	74	1.43498	114	0.42304
-5	46.5725	35	6.40021	75	1.38703	115	0.41164
-4	44.0000	36	6.13059	76	1.34105	116	0.40060
-3	41.5878	37	5.87359	77	1.29078	117	0.38991
-2	39.8239	38	5.62961	78	1.25423	118	0.37956
-1	37.1988	39	5.39689	79	1.21330	119	0.36954
0	35.2024	40	5.17519	80	1.17393	120	0.35982
1	33.3269	41	4.96392	81	1.13604	121	0.35042
2	31.5635	42	4.76253	82	1.09958	122	0.3413
3	29.9058	43	4.57050	83	1.06448	123	0.33246
4	28.3459	44	4.38736	84	1.03069	124	0.32390
5	26.8778	45	4.21263	85	0.99815	125	0.31559
6	25.4954	46	4.04589	86	0.96681	126	0.30754
7	24.1932	47	3.88673	87	0.93662	127	0.29974
8	22.5662	48	3.73476	88	0.90753	128	0.29216
9	21.8094	49	3.58962	89	0.87950	129	0.28482
10	20.7184	50	3.45097	90	0.85248	130	0.27770
11	19.6891	51	3.31847	91	0.82643	131	0.27078
12	18.7177	52	3.19183	92	0.80132	132	0.26408
13	17.8005	53	3.07075	93	0.77709	133	0.25757
14	16.9341	54	2.95896	94	0.75373	134	0.25125
15	16.1156	55	2.84421	95	0.73119	135	0.24512
16	15.3418	56	2.73823	96	0.70944	136	0.23916
17	14.6181	57	2.63682	97	0.68844	137	0.23338
18	13.9180	58	2.53973	98	0.66818	138	0.22776
19	13.2631	59	2.44677	99	0.64862	139	0.22231



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