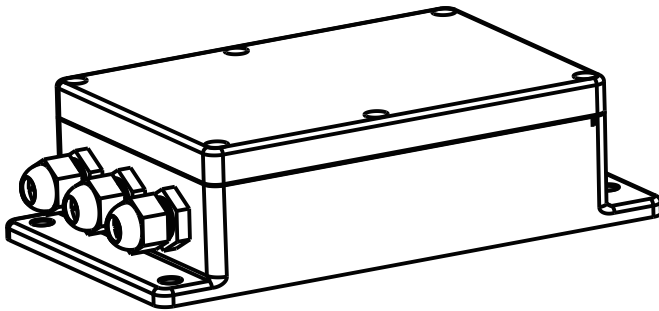


## Assembly instructions AHU-BOX - refrigerant R32

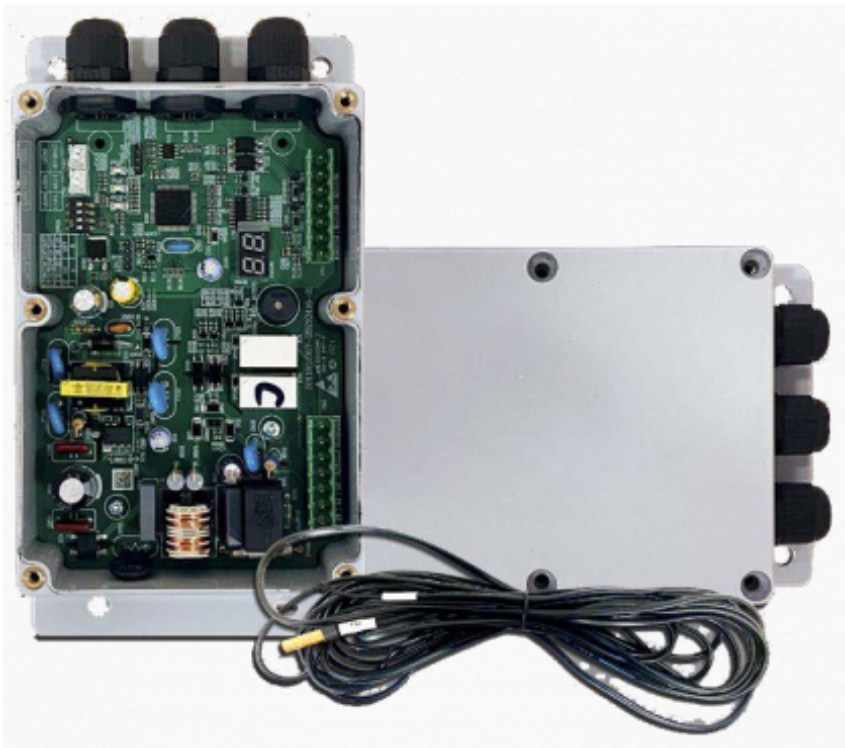


**AH1-RAC1** (2.5kW-5.0kW)

**AH1-LCAC1** (7.1kW-16kW)

# Contents

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## 1. Introduction

AHUBOX control module enables to control inverter type outdoor unit without the needs of air conditioner factory produced indoor unit. It gives possibility to control outdoor unit capacity and state to produce heat or cooling for AHU .

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

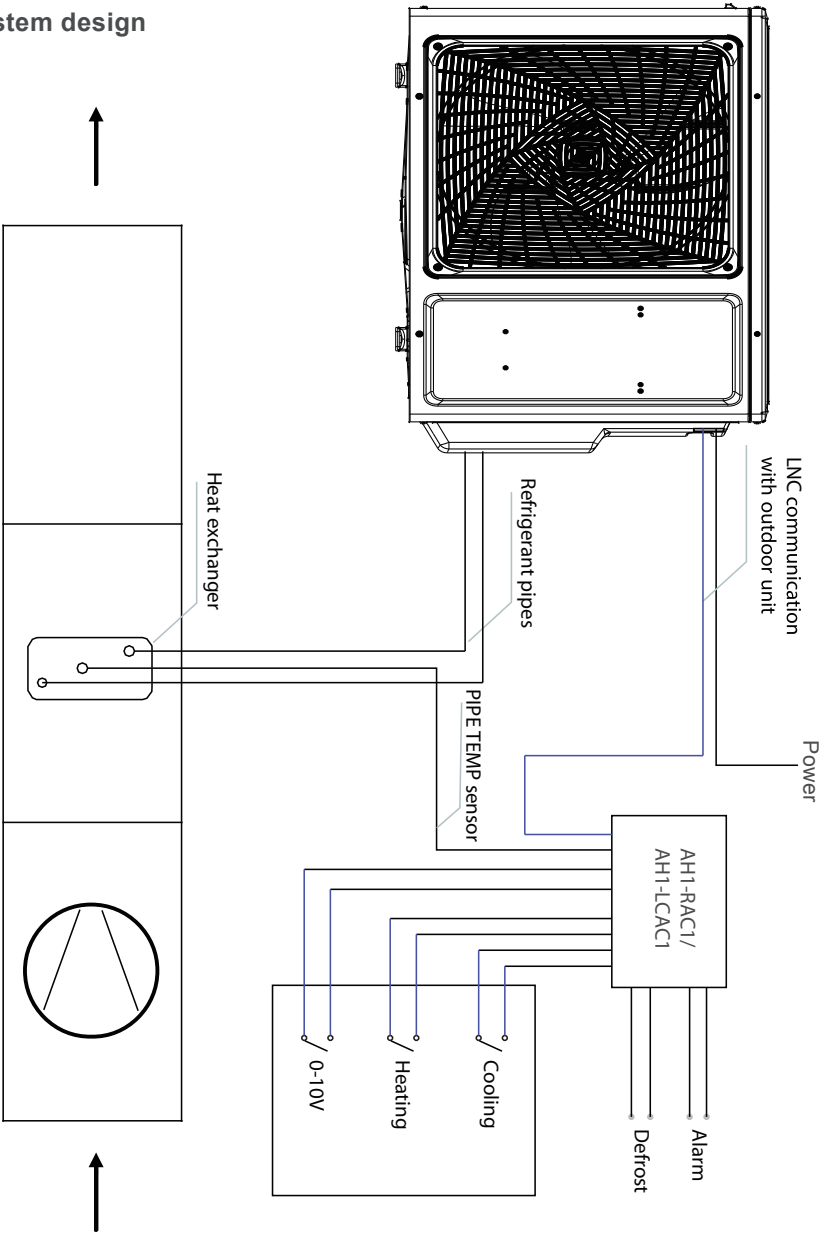
Dry contact signal is used to control outdoor unit to work in cooling or heating mode.

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).

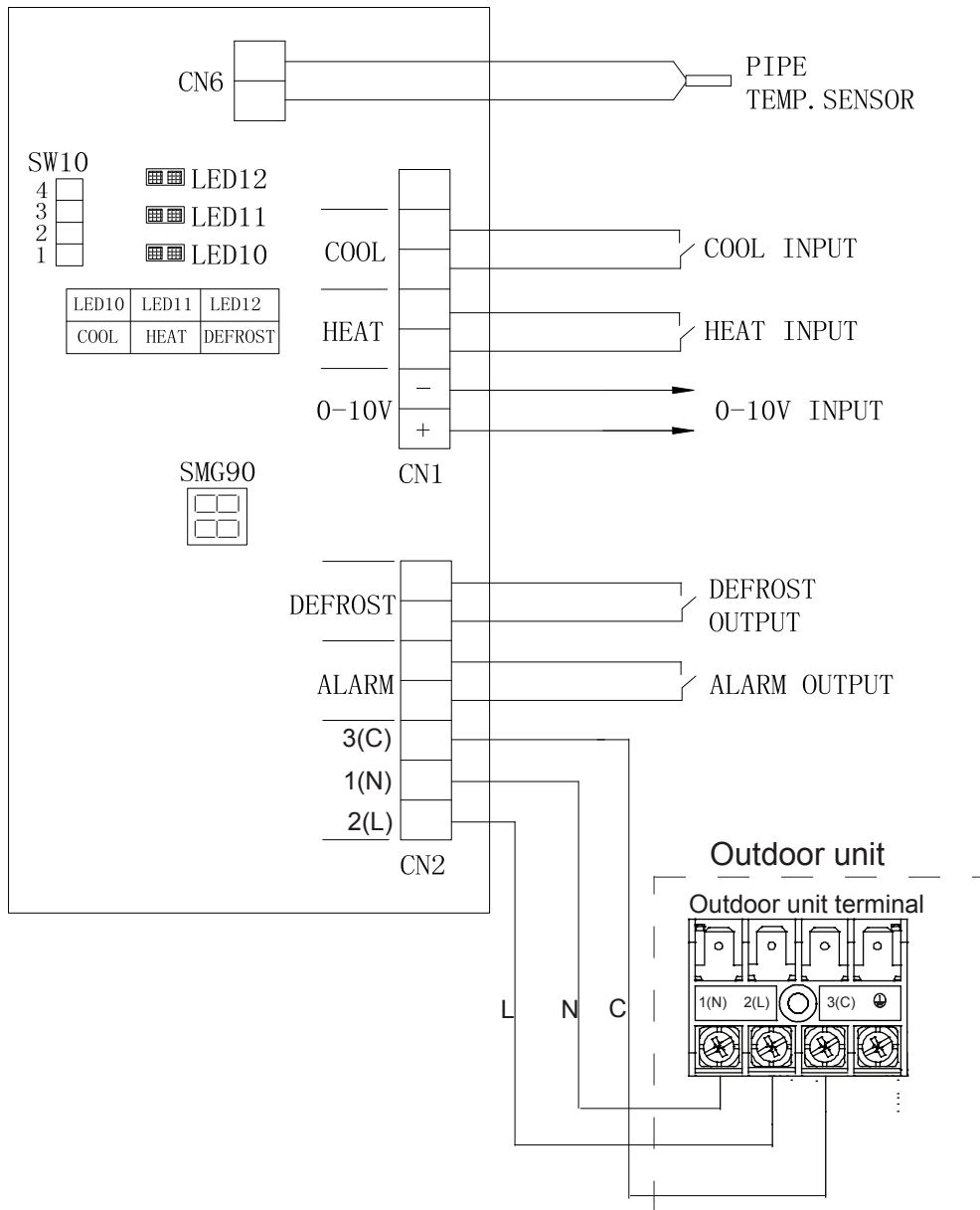
## 2. Specification and packing list

| Model                       |  | AH1-RAC1/AH1-LCAC1 |   |
|-----------------------------|--|--------------------|---|
| Casing                      |  | Plastic            |   |
| Dimension(h×w×d)            | mm   | 206×110×52.5       |   |
| weight                      | kg   | 0.4                |   |
| Operation Temperature Range | °C   | -25 ~ +55          |   |
| Operation Humidity Range    | %  | 40-90              |   |
| Power Supply                | Ph-V-Hz  | 1,220~240 ,50/60,  |   |
| Fuse                        | A  | 15                 |   |
|                             | V  | 250                |   |
| Resistance class            |  | IP54               |   |
| Packing list                | Box body                                       | piece              | 1 |
|                             | Box cover                                      | piece              | 1 |
|                             | Anti-water seal between Box body and Box cover | piece              | 1 |
|                             | Temp sensor                                    | piece              | 1 |
|                             | Gland  | pieces             | 3 |
|                             | Manual   | piece              | 1 |
|                             | Plastic cap                                    | pieces             | 5 |
|                             | Screw  | pieces             | 5 |

### 3. System design



## DIAGRAM AH1-RAC1/AH1-LCAC1



## 4.1. Connection Terminal Introduction

### 4.1.1. L, N, C

Power Supply and communication with outdoor unit 220-240V, 1-phase, 50/60Hz, through CN2.

Cable dimension 3×1.0 mm<sup>2</sup>

### 4.1.2. ALARM

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

### 4.1.3. DEFROST

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

### 4.1.4. Pipe.Temp.Sensor

Pipe temp sensor (indoor unit piping temperature sensor) terminal. Temp sensor must be placed at middle of heat changer.

### 4.1.5. 0-10V input

Analog input terminal to control outdoor unit capacity through CN1.

| Analog input | Capacity output | LED display |
|--------------|-----------------|-------------|
| 0-0.5V       | 0%              | 00          |
| 0.5-1.5V     | 10%             | 01          |
| 1.5-2.5V     | 20%             | 02          |
| 2.5-3.5V     | 30%             | 03          |
| 3.5-4.5V     | 40%             | 04          |
| 4.5-5.5V     | 50%             | 05          |
| 5.5-6.5V     | 60%             | 06          |
| 6.5-7.5V     | 70%             | 07          |
| 7.5-8.5V     | 80%             | 08          |
| 8.5-9.5V     | 90%             | 09          |
| 9.5-10.5V    | 100%            | 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 module.

#### 4.1.6. COOL

Digital input. When terminals are closed, the unit will run in cooling mode and "COOL" LED will be on.

#### 4.1.7. HEAT

Digital input. When terminals are closed, the unit will run in heating mode and "HEAT" LED will be on.

#### 4.1.8. SW10

| knob selection 1 | knob selection 2 | knob selection 3 | indoor unit capacity |
|------------------|------------------|------------------|----------------------|
| OFF              | OFF              | OFF              | 2.6KW                |
| OFF              | OFF              | ON               | 3.5KW                |
| OFF              | ON               | OFF              | 5.0KW                |
| OFF              | ON               | ON               | 7.1KW                |
| ON               | OFF              | OFF              | 9.0KW/10.5KW         |
| ON               | OFF              | ON               | 12.0KW               |
| ON               | ON               | OFF              | 14.0KW               |
| ON               | ON               | ON               | ≥16.0KW              |

The outdoor unit of the same capacity section must match the indoor unit of the same capacity section.

Knob selection 4: "ON" means having Coldair proof operation, "OFF" means no Coldair proof operation.

#### 4.1.9. LED lamps introduction:

COOL (LED10) is lightened when the unit is operating in cooling mode.

HEAT (LED11) is lightened when the unit is operating in heating mode.

DEF (LED12) is lightened when the unit is in defrost mode.

## 5. Malfunction and Error Code

| Error Code | Malfunction or Protection                               |
|------------|---|
| E5         | Internal unit antifreeze protection.                    |
| E2         | Malfunction of indoor unit piping temperature sensor    |
| E4         | EEPROM wrong of indoor PCB                              |
| E7         | Abnormal communication between indoor and outdoor units |
| E13        | Lack of refrigerant.                                    |
| F12        | Faulty of outdoor unit EEPROM                           |
| F1         | IPM overcurrent or short circuit                        |
| F22        | AC current overcurrent protection                       |
| F27        | Compressor stall / press instantaneous stop.            |

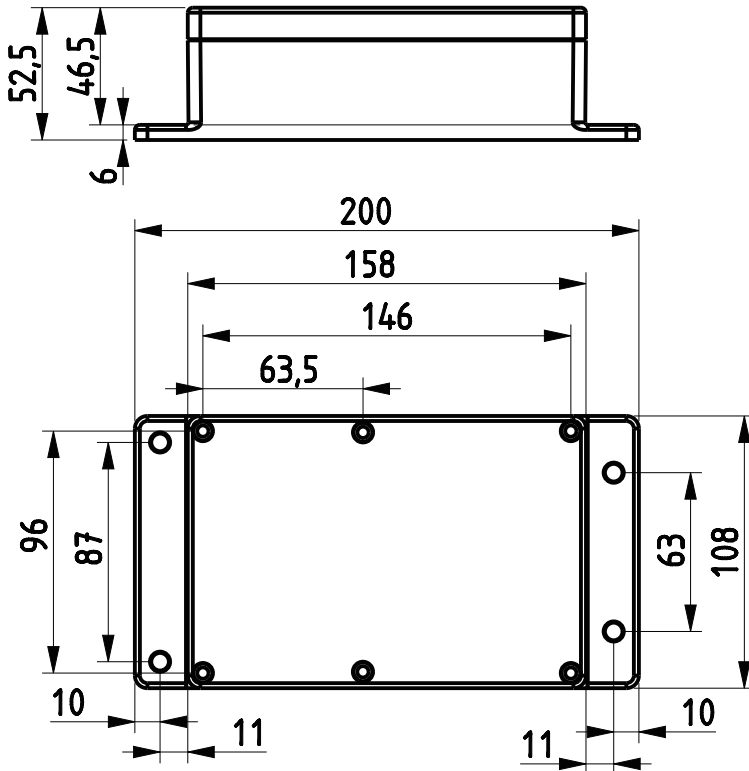
| Error Code | Malfunction or Protection  |
|------------|--|
| F3         | Communication failure between Module and ECU   |
| F20        | Module operated overload   |
| F19        | Module low or high voltage   |
| F4         | Discharging temperature overheating.Lack of refrigerant, ambient temperature too high or PMVs blocked. |
| F8         | Malfunction of the DC fan motor  |
| F21        | Malfunction of defrosting temp. sensor   |
| F7         | Malfunction of compressor suction temp. sensor   |
| F6         | Malfunction of ambient temp. sensor  |
| F25        | Malfunction of compressor discharge temp. sensor   |
| E7         | Communication failure between indoor&outdoor unit  |
| F14        | 4-way valve switching failure  |
| F11        | Loss of synchronism detection  |
| E9         | Indoor thermal overload  |
| F28        | Module PWM select circuit error.   |
| F2         | Compressor start failure   |
| F23        | Module input overcurrent   |
| F9         | MCU reset (only for multi)   |
| F24        | Module current detect circuit malfunction  |
| F10        | Malfunction of liquid pipe temp. sensor for indoor unit A  |
| F16        | Malfunction of liquid pipe temp. sensor for indoor unit B  |
| F17        | Malfunction of liquid pipe temp. sensor for indoor unit C  |
| F18        | Malfunction of liquid pipe temp. sensor for indoor unit D  |
| F29        | Malfunction of gas pipe temp. sensor for indoor unit A   |
| F30        | Malfunction of gas pipe temp. sensor for indoor unit B   |
| F31        | Malfunction of gas pipe temp. sensor for indoor unit C   |
| F32        | Malfunction of gas pipe temp. sensor for indoor unit D   |
| F26        | Malfunction of gas pipe temp. sensor for indoor unit E   |
| F35        | Malfunction of module temp.sensor<br>Momentary power failure detection                                 |



| Error Code | Malfunction or Protection  |
|------------|--|
| F36        | Malfunction of condensing temp. sensor   |
| F33        | Malfunction of liquid pipe temp. sensor for indoor unit E  |
| F39        | System high pressure switch off  |
| F40        | System low pressure switch off   |
| F41        | System high pressure protection.Refrigerant overabundance,high condensing temp. or malfunction of fan motor. |
| F42        | System low pressure protection.Refrigerant shortage,low defrosting temp. or malfunction of fan motor.        |

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  | 37.198  | 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 |

Producent:

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