Specification and Manual

Customer : _____

Description : Air Conditioner for Equipment (Through Wall Mounting)

Customer Part No. : _____ Rev.: _____

Delta Model No. : HEC0800PC _____ Rev : _____

Sample Date Code: _____

Sample Issue Date : _____

Please send one copy of this specification back after you
signed approval for production pre-arrangement

Approved by : _____

Date : _____

Part no. :
....
Delta model no. : HEC0800PC
....

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Part no. :
Delta model no. : HEC0800PC

Description

This document is an installation and the characteristics of Delta HECX1P series. Before installing the unit, please read this manual thoroughly, and following the instructions contained in it. The document is the exclusive property of Delta Electronics, Inc. it should not be distributed, reproduced, or any other format without prior permission of Delta. Specifications are subject to change without notice.

Packing & Shipping

During handling or transport, air conditioner must be kept in upward position, "**NOT**" inverted, flat, or subject to excessive tilt and collision. The air conditioner is a precision instrument; it should be handled and transported with care. Do not stand on the box, or place heavy objects on top of the box. Pay attention to the below icons on the package.

If air conditioner is toppled, slanted or dropped, follow these steps: a. stand unit up for 12 hours to ensure refrigerant pressure stability, b. power on the unit and execute self-test to make sure no alarm condition, c. keep the air conditioner running for 1 hour to make sure there is no abnormal acoustic noise.

Safety Notes

Please read the safety notes carefully before installing the air conditioner, and be sure to install it correctly. After completing installation, check that the unit operates properly during start-up operation.
Meaning of WARNING and CAUTION notices:

⚠ **Warning**:

Failure to follow these instructions properly may result in personal injury or loss of life.

⚠ **Caution**:

Failure to observe these instructions properly may result in property damage or personal injury, which may be serious depending on the circumstance.

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⚠ **Warning**:

1. Installation work and electrical wiring should be done only by qualified personnel in accordance with all applicable codes, standards and national wiring regulations.

2. Use this unit only in the manner intended by the manufacturer. If you have questions, please contact the manufacturer.

3. Install the air conditioner in accordance with the instructions in this installation manual. Improper installation may result in water leakage, electric shock or fire.

4. Make sure that all wiring is secured, that specified wires are used, and there there is no strain on the terminal connections or wires.

5. If refrigerant gas leaks during installation, ventilate the area immediately. Do not directly touch refrigerant that has leaked from refrigerant pipes or other areas, as there is a danger of frostbite.

6. Before serving or cleaning unit, switch power off and disconnect power supply.

7. When cutting or drilling into wall or ceiling, do not damage electrical wiring or hidden utilities.

8. Be sure to use only the specified accessories and parts to complete installation.

9. Protective grounding connection: The enclosure must be grounded at the protective ground terminal. Use 2.5 mm^2 (14 AWG) wire and use spring washer to avoid loosening.

10. The air conditioner should not be accessible to the general public.

11. The installation must contain a device to disconnect all poles of the air conditioner from the power supply. The contact distance in all poles must be 3 mm minimum.

12. To reduce the risk of electrical shock: Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

13. This appliance is intended for use only by qualified personnel.

⚠ **Caution** ：

1. Install the air conditioner on a wall or door strong enough to withstand the weight of the unit.

2. Do not allow a child to mount onto the outdoor unit. Avoid placing any object on it.

3. Do not block the air inlets or exits.

4. Do not install the air conditioner at any place where there is a danger or flammable gas leakage.

5. Arrange the drain to ensure complete drainage.

6. To avoid injury, do not touch the air inlet or aluminum fins of the unit.

7. Watch your step at the time of fin cleaning or air conditioner inspection.

8. Do not topple the air conditioner while moving or in storage.

9. The hole in the bottom of the air conditioner should be connected to a sealed container through a drain pipe.

10. This appliance is not to be used by any persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given proper supervision or instruction.

11. Children should be prevented from playing with the appliance.

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Specification for Approval

Customer :

Description : Air conditioner for Equipment with 800 W Rated Cooling Capacity (Through Wall Mounting)

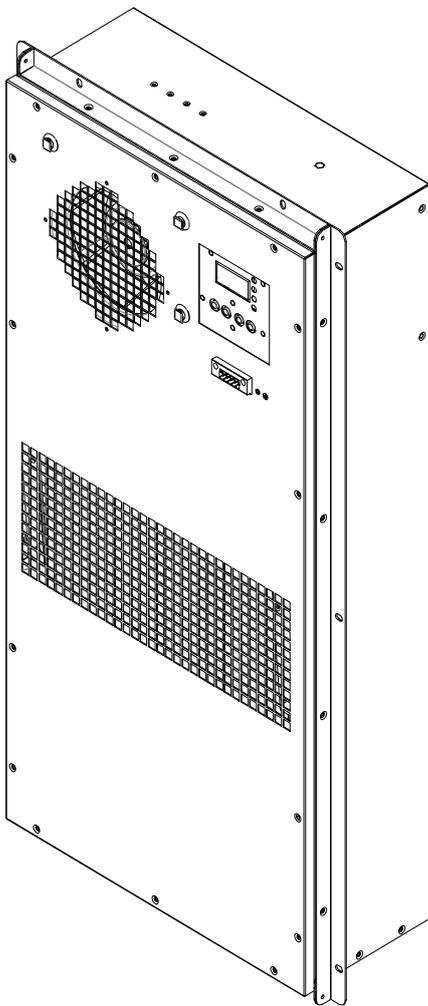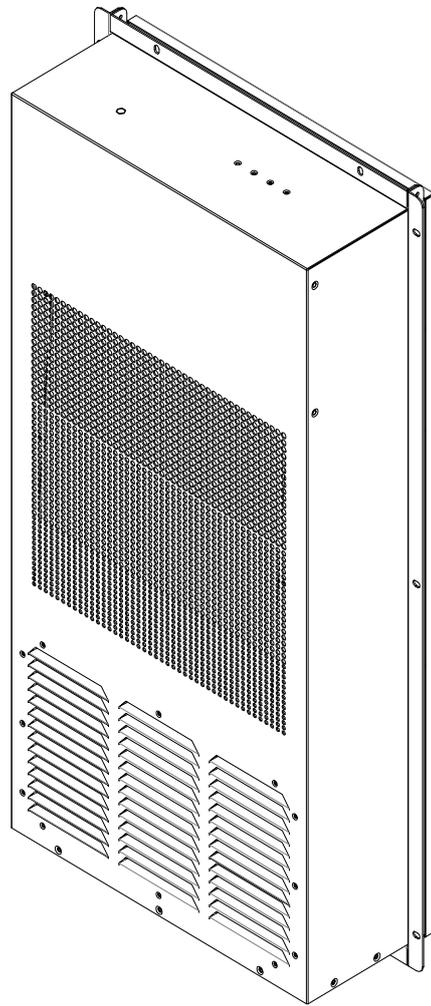|	
Customer P/N :	Rev. :
Delta model no. : HEC0800PC	Rev. :
Sample revision. :	Date Code :
Sample issue date :	Quantity : one sets

INTERNAL   EXTERNAL

Part no. :

Delta model no. : HEC0800PC

1. Product Instruction

1-1. General Description

HEC0800PC is a DC air conditioner with 48 VDC power input, it is designed for IP55 sealed outdoor telecom cabinet to provide stable and optimum internal conditions for equipment and avoid hotspot inside the cabinet.

HEC X1 P C - XXX
(1) (2) (3) (4) (5)

No	Item	Digit	Specification
(1)	Product Type	HEC	Compressor Air Conditioner
(2)	Cooling Capacity	X1	X1=0800
(3)	Operation Voltage	P	DC 48V for door
(4)	Edition	C	N/A
(5)	Customer ID	XXX	N/A

1-2. Main Feature & Model Number

Dimensions, Weight & Mounting method		
Dimension (H x W x D) (without flange)	mm (inch)	796 x 383 x 163 (31.3 x 15.0 x 6.4)
Application		Outdoor
Weight	Kg (lbs)	27 (59.5)
Mounting Method		Door/Side
Color (optional)		RAL7035
Environmental Protection & Performance		
Operating Temperature Range	°C (°F)	-10 to +55 (+14 to +131)
Operating Humidity		External : 0~100% RH Internal: 0~80% RH
Storage Temperature	°C (°F)	-40~ +70 (-4~ +158)
Storage Relative Humidity	RH	5~95%
Refrigerant		R134a, 300 g±10 g
Protection for Dust ,Wind and Water (External)	IEC 60529 /GR487	IP55 / GR487
Noise (1m)	dB-A	55 *
Operating Status	N/A	LED Indicator / Display Board
Cooling Capacity & Operational Data		
Rated Cooling Capacity at L35/L35	W (Btu/hr)	800 (2720)
Rated Cooling Current	A	3.8
Rated Internal Airflow (L35/L35)	m^3/h (CFM)	340 (200)
Rated External Airflow (L35/L35)	m^3/h (CFM)	390 (230)

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Power & Range		
Input Voltage	VDC	48
Max. Operating DC Current	A	14.3
Alarm	N/A	Dry Contact Output
Key Components		
Controller		Built-in Smart Controller
Fans		Delta High Efficiency Blowers
Compressor		Rotary, DC

* Internal fan kept non-operating
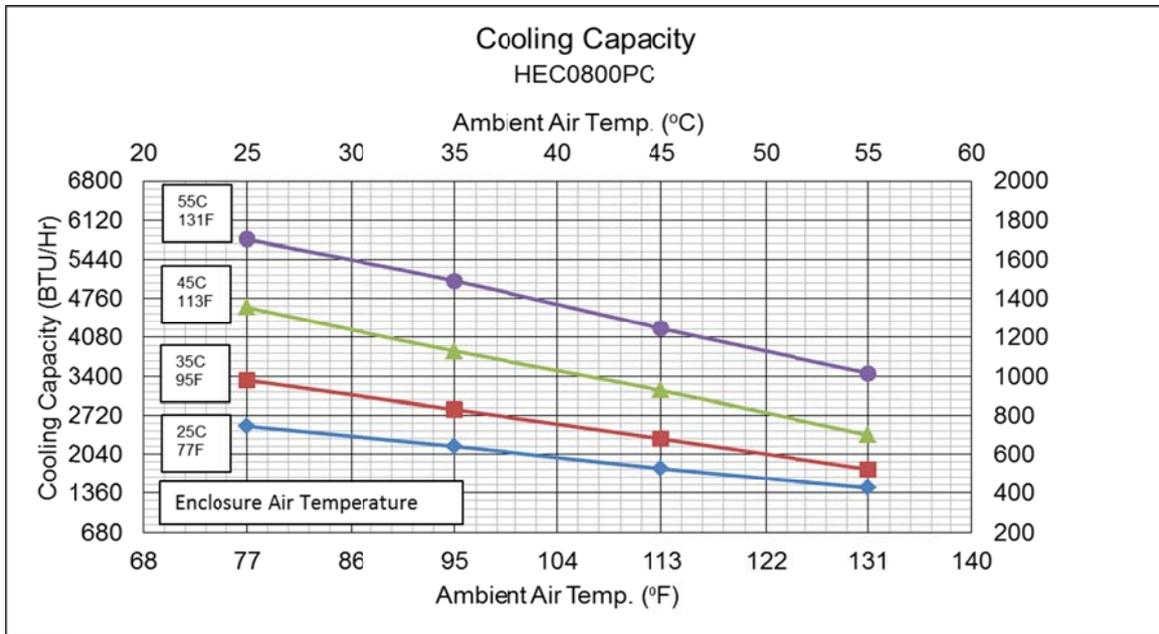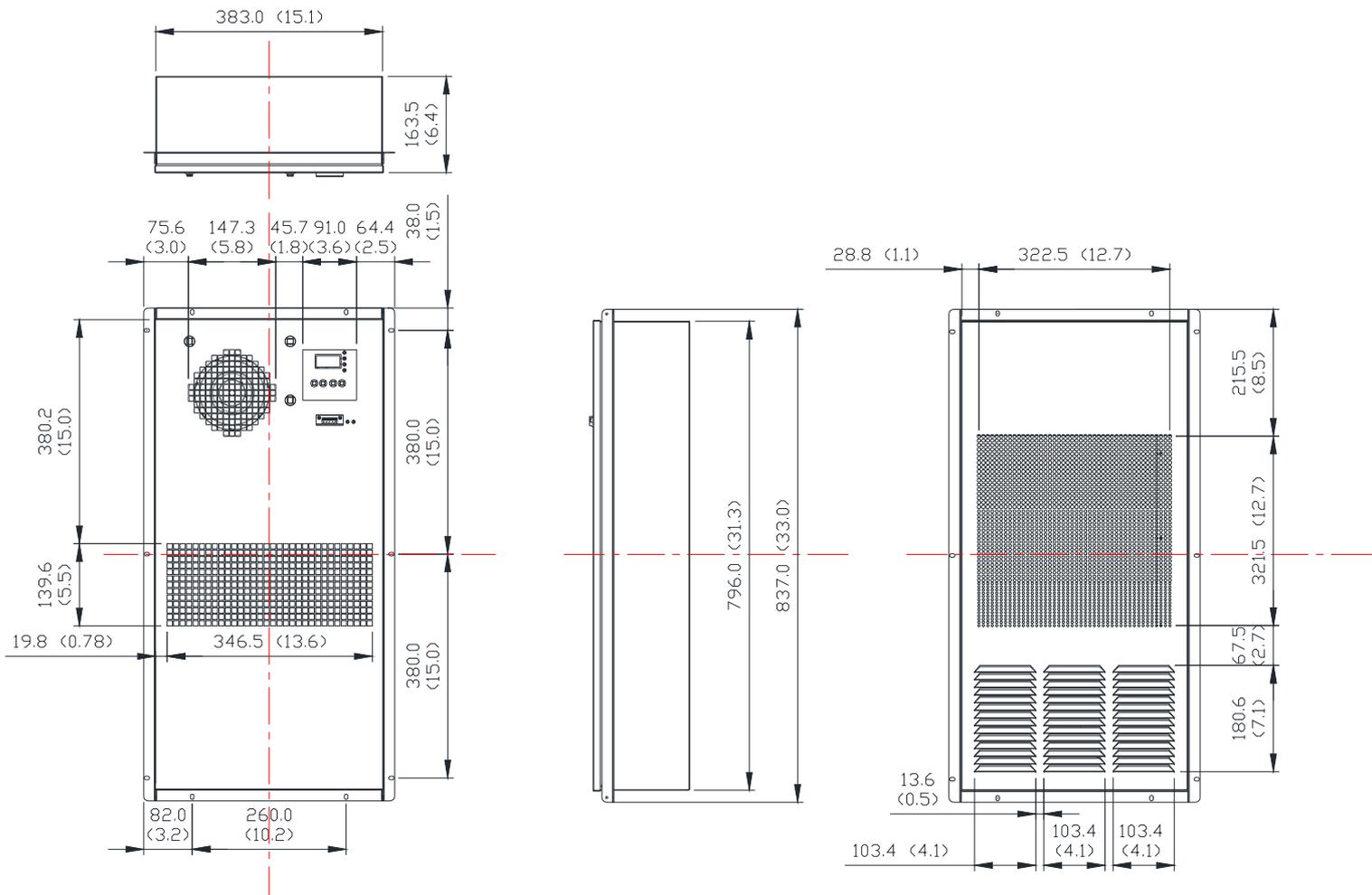
1-3. Dimension

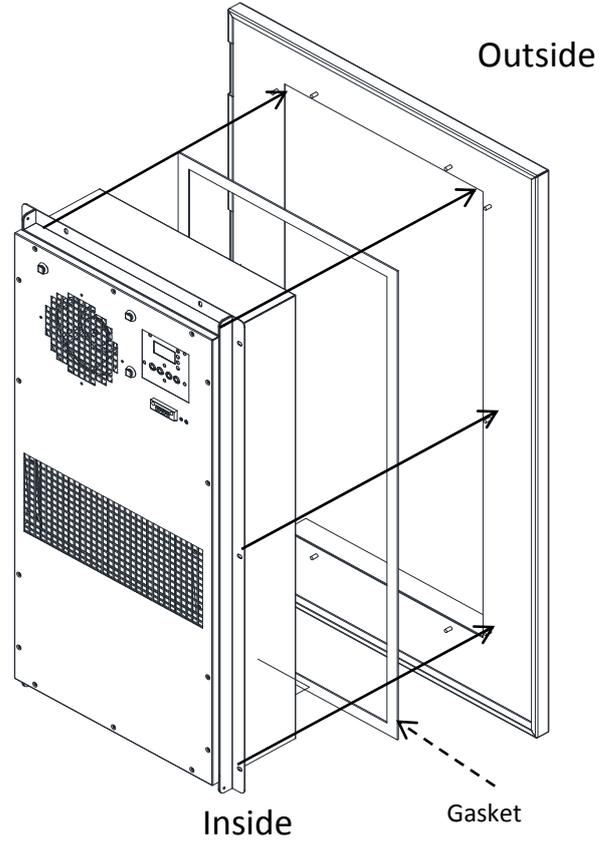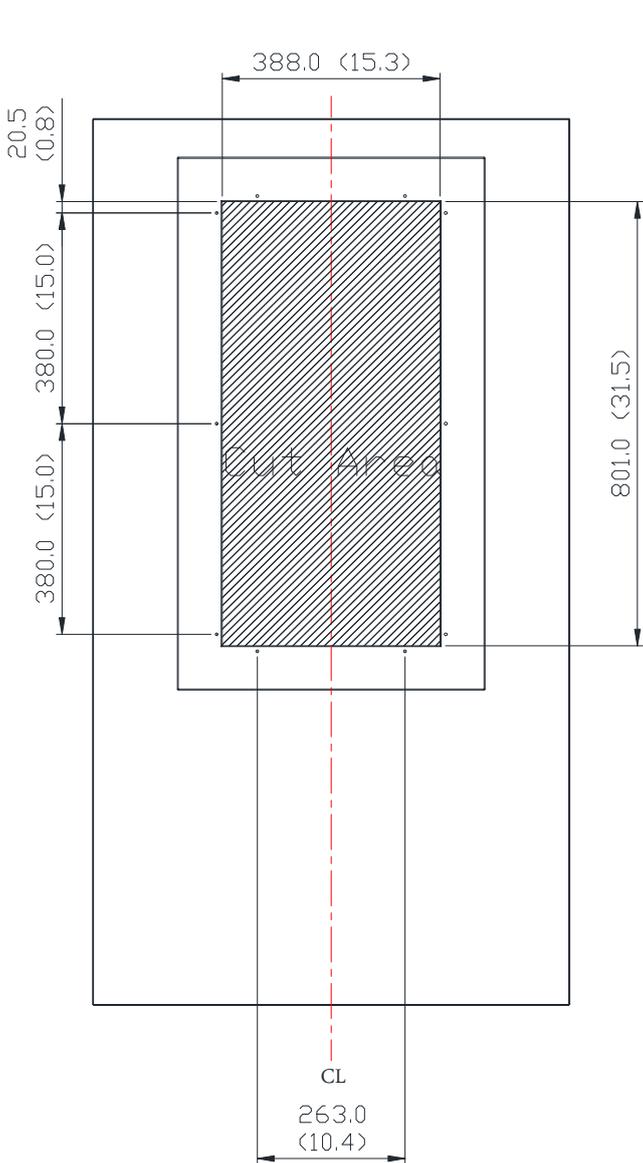mm (inch)

(1) Material : Case SGCC Sheet

(2) Finish : Power paint 75~120um,

(3) Color : RAL 7035

(4) Dimension tolerance:

    X.X   [X.XX] : ± 1.0mm [0.04"]

    X.XX [X.XXX] : ± 0.3mm [0.012"]

1-4. Mounting Panel Cutout

388.0 (15.3)

20.5 (0.8)

380.0 (15.0)

380.0 (15.0)

Cut Area

801.0 (31.5)

CL

263.0 (10.4)

Outside

Inside

Gasket

mm (inch)

1-5. Configuration & Maintenance

Make sure the air conditioner surface sealed with mounting flange to avoid water penetrates into shelter through mounting interface. It is suggested to use gaskets sticking on the mounting flange and seal the gap between flange and cabinet with silicone gel during installation. There should be **NO** any gap surround gaskets to avoid water penetrates into enclosure.

The air conditioner is composed as the following key components: they are chassis, cover, controller, heat exchanger, blowers and compressor etc. It is "**not**" recommended that the user replace the compressor, evaporator, and the condenser by themselves; it may damage the system and getting injured.
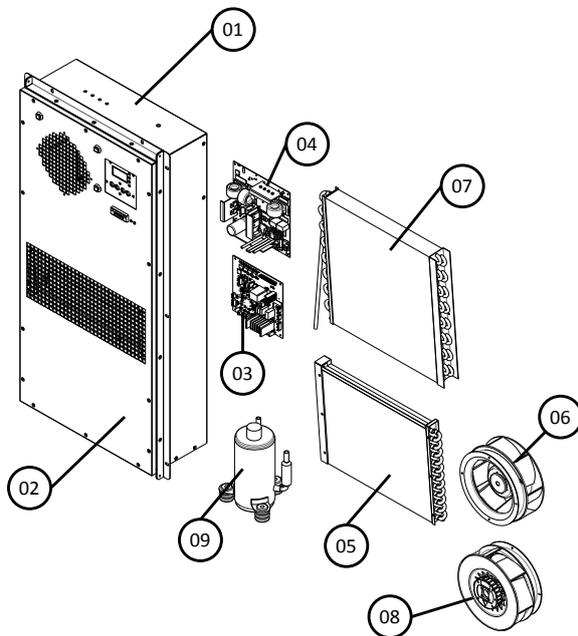
NO.	Q'TY	DESCRIPTION
1	1	Case Chassis
2	1	Case Cover
3	1	Control Board
4	1	DC Power Board
5	1	Evaporator
6	1	Internal Fan
7	1	Condenser
8	1	External Fan
9	1	Compressor

In order to assure the air conditioner running at optimal condition, the condenser should be cleaned once annually at least; user can clean the condenser with water directly. The external side fan blade can also be cleaned with normal pressure water if there is dust accumulation. Please do not use strong water jet to impact the center of fan and the surface of condenser.

The bottom hole of the air conditioner should be connected to a sealed container through a drainpipe, please clear drain holes when the maintenance. Please also notice that:

1. Check wires are connected correctly, and the insulation is not cracking or broken.

2. Use Self-test to check the unit running correctly or not. And the supplied air of internal side should be as cooled air.

3. Do not wipe the product with organic solvent, volatile substances like toluene or gasoline, it will destroy the powder-coated surface.

4. Turn off the power before maintaining.

5. Please turn off power and remove dry contact connector while non-operating for a long time.

6. If any abnormal acoustic noise from air conditioner happened, please turn off the product and contact with customer services.

7. The refrigerant is environmental friendly product of R134a. Little refrigerant leakage (< 5 g/ year) is allowed for application. If refrigerant leakage seriously, please turn off the power and wait for at least 2 hours to make sure the refrigerant fully exhaust. Please also contact the services to replace spare parts.

8. The compressor electrical protecting cover is sealed with silicon for IP55 requirement. Please do not dismantle the sealed cover or will lose the quality assurance of the compressor.

1-6. Thermal and Airflow

Internal and external air flow circulation is shown in below diagram. Counter flow design prevents mixing of internal and external air flows, but waste heat can still be dissipated from cabinet to the ambient outside air. An internal temperature sensor has been placed in the return air stream to provide reliable temperature measurement, and for safe operation.

The heated air inside the cabinet will be cooled by the evaporator. Waste heat absorbed by the refrigerant will be dissipated through the condenser at the external side.
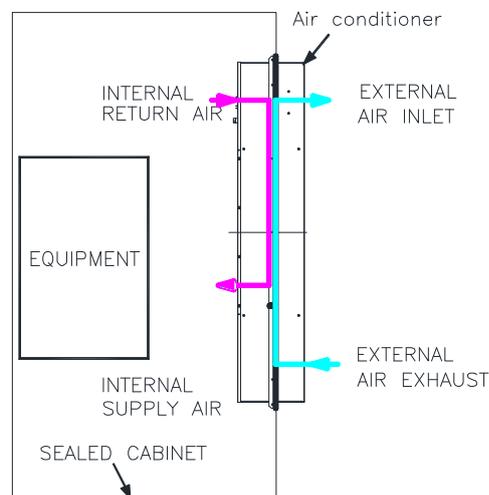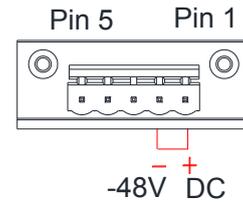
2 Electrical Specification

2-1. Indicator & Connector

➢ **Power Supply & Alarm Connector**

Pin	Description	Cable wire size
1	DC	14 AWG
2	-48 V	14 AWG
3	N/A	N/A
4	Alarm+	COM.
5	Alarm-	N.C or N.O

Pin 5   Pin 1

-48V DC

➢ **System alarm default setup**

display setup	Dry-contact output		
	normal		any alarm happen
1 (System default setup)	Common (C) —— Normally Closed (NC)		Common (C) ／ Normally Open (NO)
0	Common (C) ／ Normally Open (NO)		Common (C) —— Normally Closed (NC)

Note: Customers can setup the N.O or N.C by themselves when any alarm happen
through display board (d1.6 Dry-contact Setup).

• Specification:
Contact rating: 60 V_{dc}, 100 mA
• Normal:
PIN 3 and PIN 4 dry contact output close
• Any alarms happening:
PIN 4 and PIN 5 dry contact output open

➢ **Case Grounding**
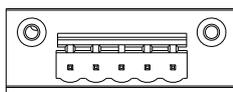
> **Panel operation**

- A*: Display:*

  Indicates the temperature inside the cabinet or system parametric setup.

- B: *LED indicator:*

  Power:

  - ❖ When the system powers on, the LED will be solid green.

  - ❖ If LED indicates alarm, the number of flashes helps identify root cause.

  Comp.:

  - ❖ When the compressor is running normally, the LED will be solid green.

  - ❖ If the system goes into self-test mode, the LED will flash green.
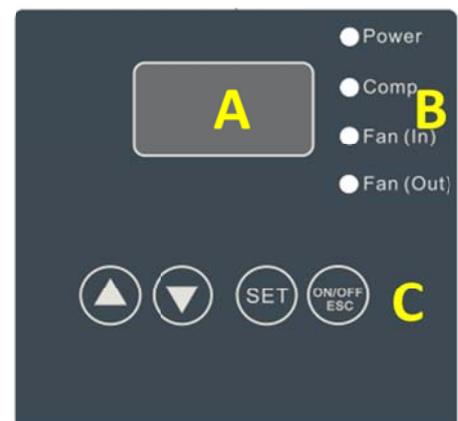
  Fan (In):

  - ❖ When the inner fan is running normally, the LED will be solid green.

  Fan (Out):

  - ❖ When the outer fan is running normally, the LED will be solid green.

- C: *Touchpad controls:*
  - ❖ ↑: UP or increase
  - ❖ ↓: DOWN or decrease
  - ❖ SET: Parametric setup
  - ❖ ON/OFF ESC: Power on/off or back

2-2 Protection

> **Over Current Protection:**
> DC power board: 20 A

> **Over Temperature Protection:**
> DC power board: 95 $\pm$ 4 ^{o}C

> **Under Voltage Protection:**
> DC power board: 40 $\pm$ 1.4 VDC

> **Reverse Polarity:**
> Allow reverse voltage: 42 ~ 58 VDC

> **Short Ckt:**
> If compressor UVW short for any both phase the compressor will not operate.

> **Compressor H/T Protection:**
> $T_{comp} \geqq 105\ ^{o}C$

> **Eva L/T Protection:**
> $T_{EVA} < 0\ ^{o}C$

> **Power on Delay for Fans & Compressor:**
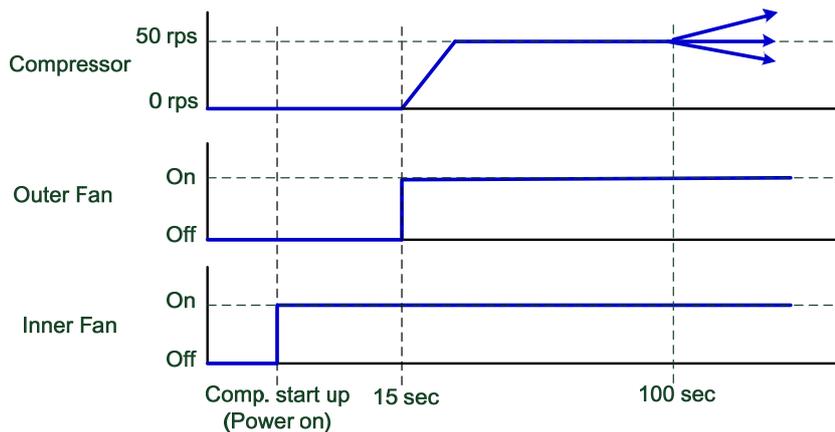
3. Environmental Condition

> **Operating Temperature**
> -10 °C ~ +55 °C (14 °F ~ 131 °F)

> **Storage Temperature**
> -40 °C ~ +70 °C (-4 °F ~ 158 °F)

> **Operation Humidity**
> External air loop: 0 ~ 100 % RH
> Internal air loop: 0 ~ 80 % RH, non-condensing

> **Ingress Protection Rating**
> IP55 (IEC60529) on external side
> GR487 on external side

4. Reliability Table

Test item	Condition
High temperature	IEC 60068-2-2
Low temperature	IEC 60068-2-1
High temp. / High humidity	IEC 60068-2-3
Temperature cycle	IEC 60068-2-14 test Nb
Vibration	ETSI 300 019-1-4 CLASS 4.1
Ingress protection (external side)	IEC 60529 IP55 / GR487
Salt fog test (external side)	IEC 60068-2-11 severity 4 , 6cycles
Package bump	IEC 60068-2-29

5. Safety Certification

6. Accessory

- Power and Alarm Cable

Pin	Description	Cable wire size
1	DC	14 AWG
2	-48 V	14 AWG
3	N/A	N/A
4	Alarm(COM.)	24 AWG
5	Alarm(N.C or N.O)	24 AWG

PIN1(+)
PIN2(-)
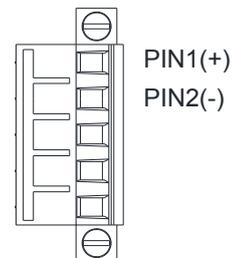
7. Parameters Table

7-1. System Setup

Item	System Parameter	Default	Range
d1.1	System Version	2.5	N/A
d1.2	Alarm Logs	0.0	N/A
d1.3	Inside over-temp. Setup	60 ^{o}C	40 ^{o}C - 70 ^{o}C
d1.4	Auto Self-Test Function	Enable	Enable/Disable
d1.5	Recovery Default	N/A	N/A
d1.6	Photo Coupler Normal Status	Close	Close/Open
d1.7	Password	000	000~999
d1.8	System Re-lock	N/A	N/A
d2.1	Target temperature	30 ^{o}C	25 ^{o}C - 40 ^{o}C
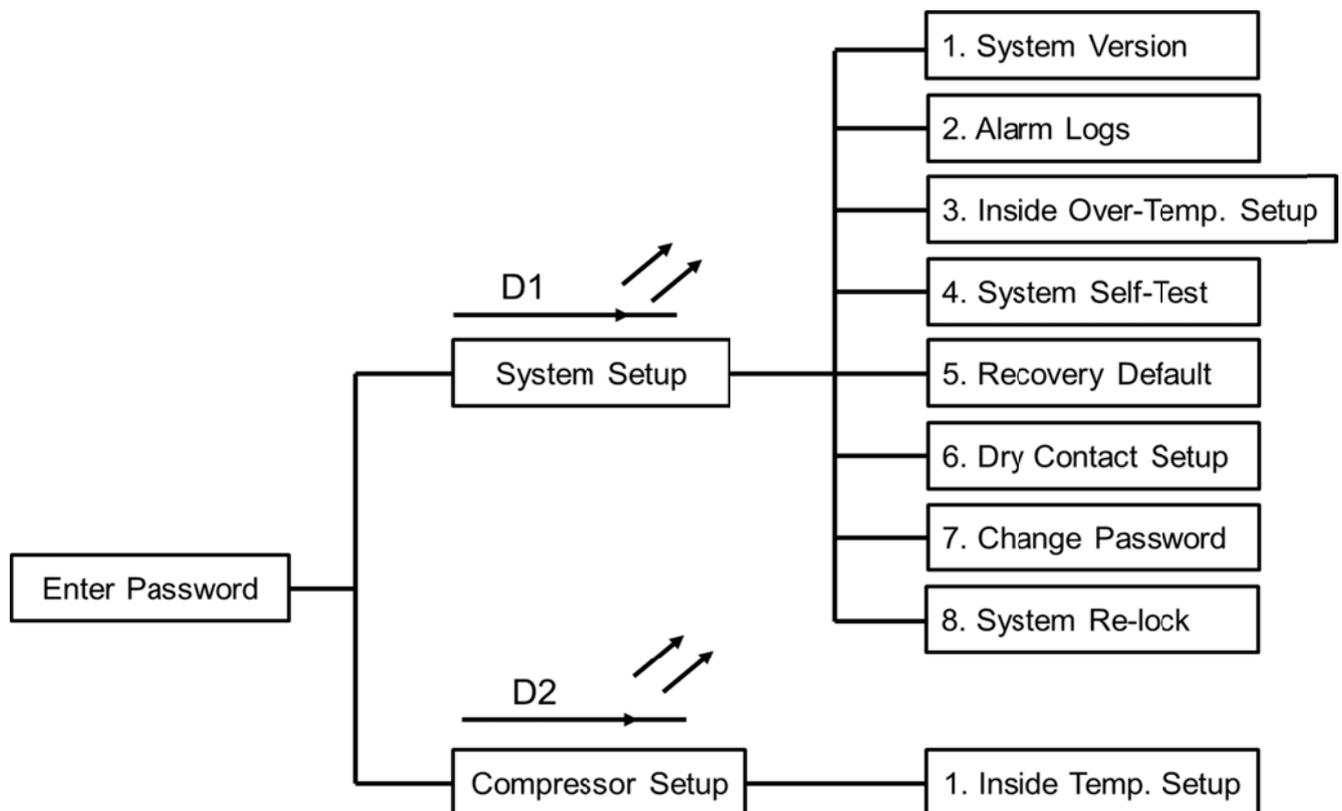
Part no. :

Delta model no. : HEC0800PC

7-2. Alarm Logs & Fault Processing

- Alarm Indicators

Flash Times (Power Led)	LV1 Alarm	LV2 Alarm	Alarm Code
--	--	Compressor 3-min Protection	--
		Compressor Power Protection	
		Low-Temp Startup Protection	
2	Temperature Abnormal Alarm	Eva Temperature Protection	2.1
		Comp-out Temperature Protection	2.2
		PWB Temperature Protection	2.3
		IPM Temperature Protection	2.4
		Amb Temperature Protection	2.5
3	Temperature Sensor Fault	Amb Temperature Sensor	3.1
		Eva Temperature Sensor	3.2
		Cond Temperature Sensor	3.3
		Comp-Out Temperature Sensor	3.4
		PWB Temperature Sensor	3.5
		IPM Temperature Sensor	3.6
4	Fan Fault	Indoor Fan	4.1
		Outdoor Fan	4.2
5	Controller Fault	EEPROM	5.1
		Current Sensor	5.2
		DC-Bus Voltage	5.3
6	Cooling System Fault	Power Board	6.1
		Startup Fail	6.2
		IPM Over Current	6.3
		Compressor Lack Phase	6.4

Part no. :

Delta model no. : HEC0800PC

- Fault Analysis and Processing

Fault State	Analysis of the Reasons	Solutions
Power on, and the cabinet temperature is too high but the air conditioner is not working	• Power failure or no power. • The target temperature is higher than inside temperature. • System failure.	• Check the power supply and the electric circuit. • Re-set the target temperature according to the system requirement. • Please contact Delta or authorized Delta service agent.
The air conditioner is running but the cabinet temperature is still high, no obvious cooling effect.	• The air conditioner capacity is not match the load of the system. • The ambient temperature is too high. • Low efficiency of the condenser. • Other system failure	• Check the heating load of the system. • Ensure the air conditioner is operating in correct temperature range. • Clean the condenser. • Please contact Delta or authorized Delta service agent.
The air conditioner stop operating, and there is no alarm signal.	• The inside temperature is lower than the target temperature. • Other system failure.	• Re-set the target temperature according to the system requirement. • Please contact Delta or authorized Delta service agent.

8. Installation Notice

Check the surrounding obstacles to make sure the product get enough space for air circulate.
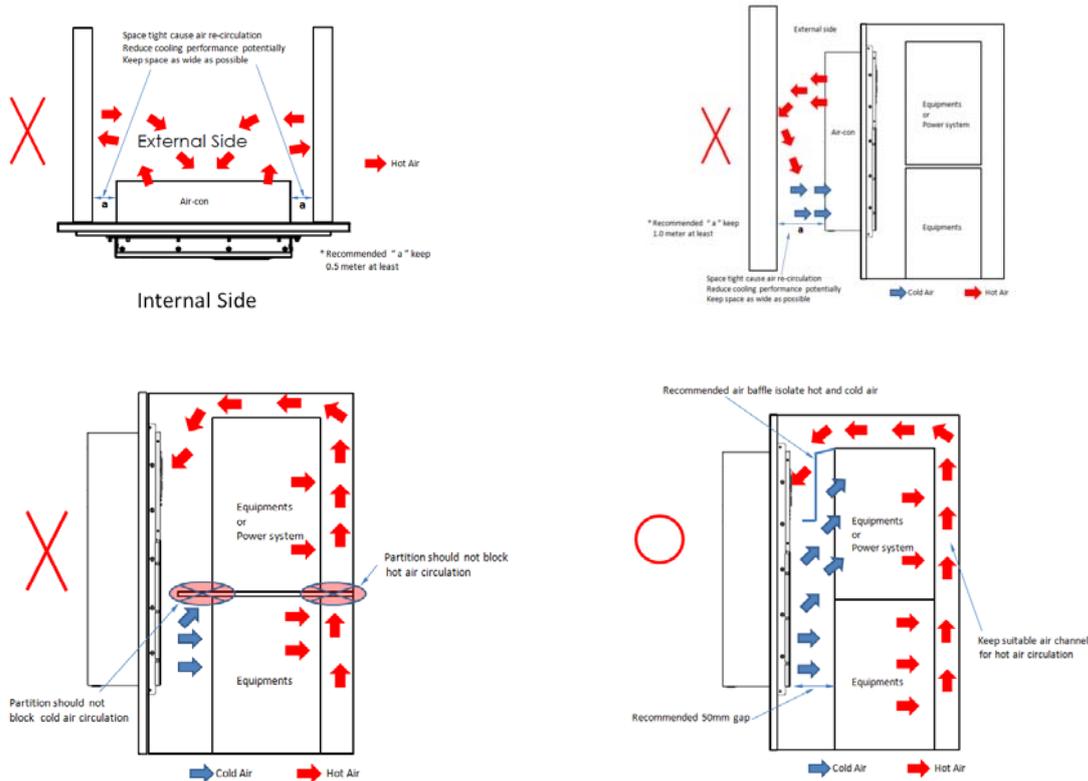
9. Warranty

Delta Electronics, Inc warrants one year (twelve months) from the date of shipment, this warranty covers customer below application: Customer follows Delta specification to install and operate the product. The product and any parts do not be modified (including both mechanical and electrical modification) by customer themselves .This warranty cover only repair, replacement or refund for defective Delta products does not include any loss of data or any costs associated with determining the source of system problems, costs for transportation, removal or reinstallation of equipment or labor for repairs or replacement made in the field.

10. Reclaim

At the end of the unit working life, the produce must not be disposed of as urban waste. It must be taken to a special local authority differentiated waste collection center or to a dealer providing this service.