



## **Specification For Approval**

Customer : \_\_\_\_\_  
Description : Heat Exchanger 45W/K  
Customer Part No. : \_\_\_\_\_ Rev. : \_\_\_\_\_  
Delta Model No. : HEX050PA Rev. : 02  
Sample Issue No. : \_\_\_\_\_  
Sample Issue Date : Apr 08 2016

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

Approved by : \_\_\_\_\_

Date : \_\_\_\_\_

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STATEMENT OF DEVIATION  
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NONE

DESCRIPTION :

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Specification For Approval

Customer :

Description : Heat Exchanger 45W/K

Customer P/N :

rev. :

Delta model no. : HEX050PA

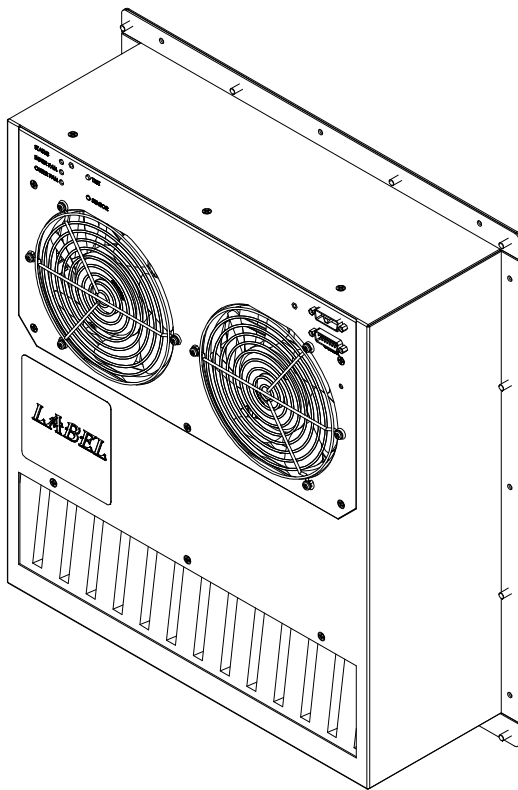
rev. : 02

Sample revision :

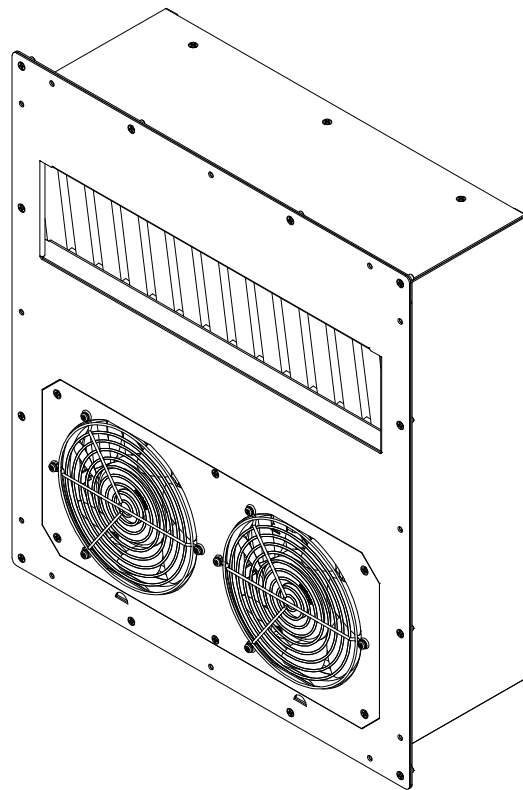
Issue no. :

Sample issue date :

Quantity : sets



Internal



External

Part no. :

Delta model no. : HEX050PA

## 1. Description

### 1-1. General description :

The Heat Exchanger (HEX) is designed for direct air to air heat exchange to remove the heat from the cabinet . It is easy to be installed in the cabinet with the nuts. (Recommended on the door of the cabinet)

The internal and the external air circulation loops of the HEX are separated to prevent the introduction of dust, humidity and dirt. The fan on the external air loop conforms to IP55 protection rating.

### 1-2. Main feature & Model number (Operation 48VDC)

Main feature	Unit	Model Number
		HEX050PA
Outline Dimension	Mm	500 W x 445 H X 152 D
Weight	Kg	10 ± 0.5
Cooling Capacity (*Note 1)	W/K	45 (MAX.)
Rated Voltage	VDC	48 (TYP.)
Operating Voltage Range	VDC	40 ~ 60
Rated current (Safety current on label)	A	1.2 (1.44 MAX.)
Consumption	W	62.4 (MAX.)
Maximum Ambient Temperature	°C	65
Maximum Return Temperature	°C	50
Internal Airflow Rate	CFM	210 (TYP.)
External Airflow Rate		210 (TYP.)
Mounting Location		Internal door / Wall
Fan Speed Control	N/A	PWM 5 ~ 100% duty cycle
Controller	N/A	Built-in
Operating Status	N/A	LED indicator
Fan Over Temperature Alarm	N/A	Dry contact output
Acoustic Noise at 1.5M (SPL)	dB-A	65.0 (TYP.)

\*Note 1 : The cooling capacity (W/K or W/°C) is defined as  $Q / (T_I - T_A)$

Q : Heat dissipation (W) from inside

T<sub>I</sub> : Return temperature of internal air circuit (K OR °C)

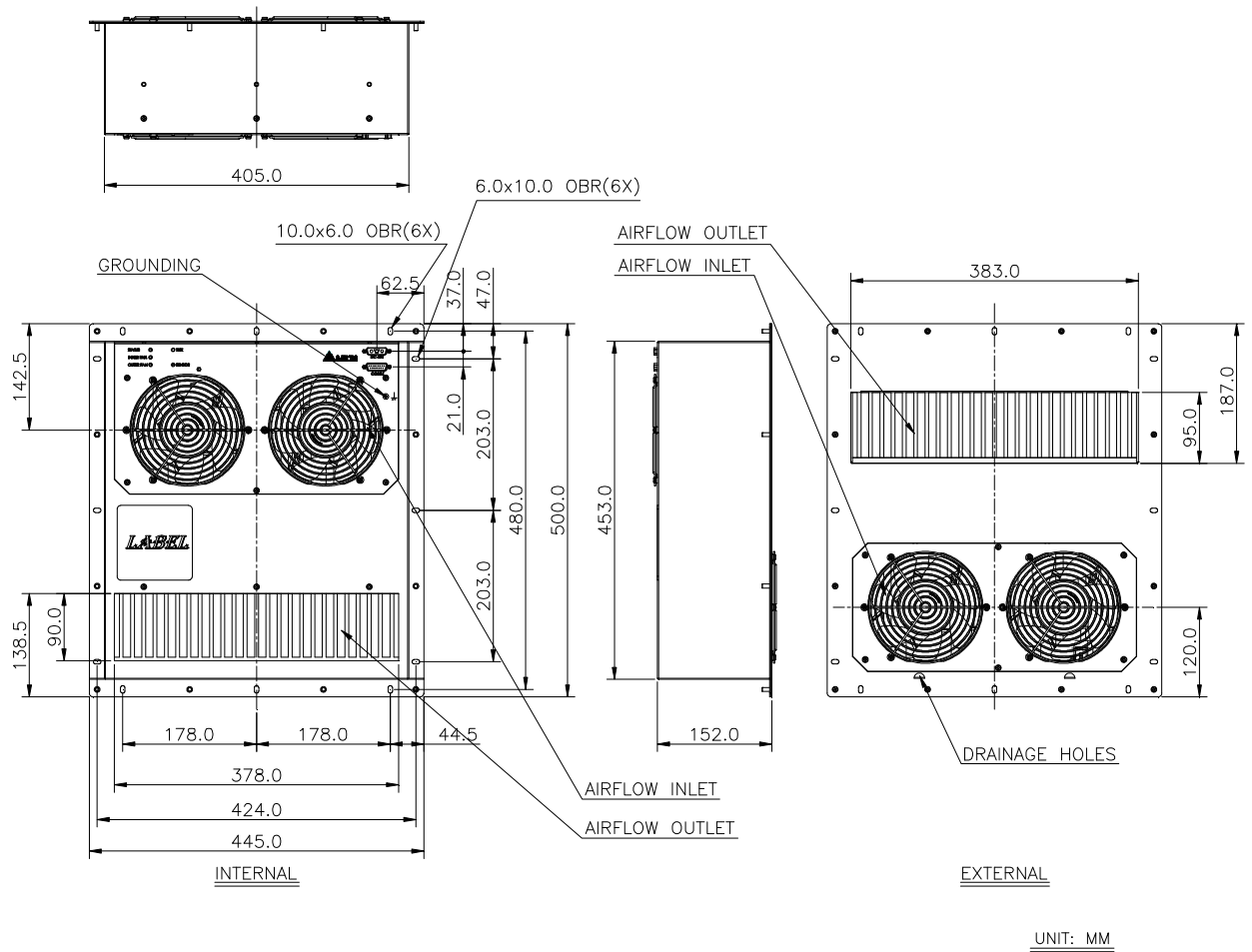
T<sub>A</sub> : Ambient temperature of external air circuit (K OR °C)

Part no. :

Delta model no. : HEX050PA

### 1-3. Dimension

#### 1-3-1 Drawing



(1) Material : Aluminum sheet t=1.5mm

(2) Finish : Powder paint 75~120um, Color RAL 7032.

(3) Dimensional tolerance :

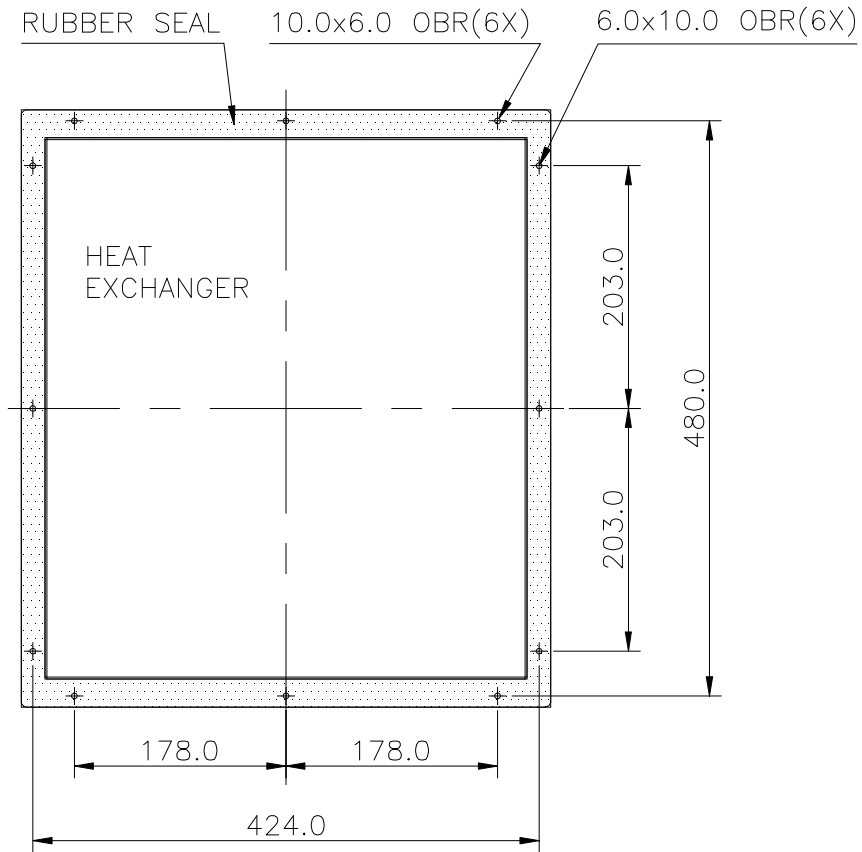
X.X [X.XX] : ± 1mm [0.04"]

X.XX [X.XXX] : ± 0.3mm [0.012"]

Part no. :

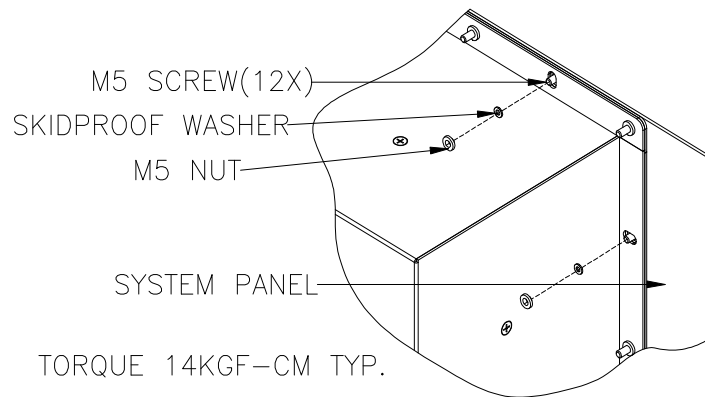
Delta model no. : HEX050PA

1-3-2 Mounting panel cutout



TOLERANCE  $\pm 0.5\text{mm}$

UNIT: MM





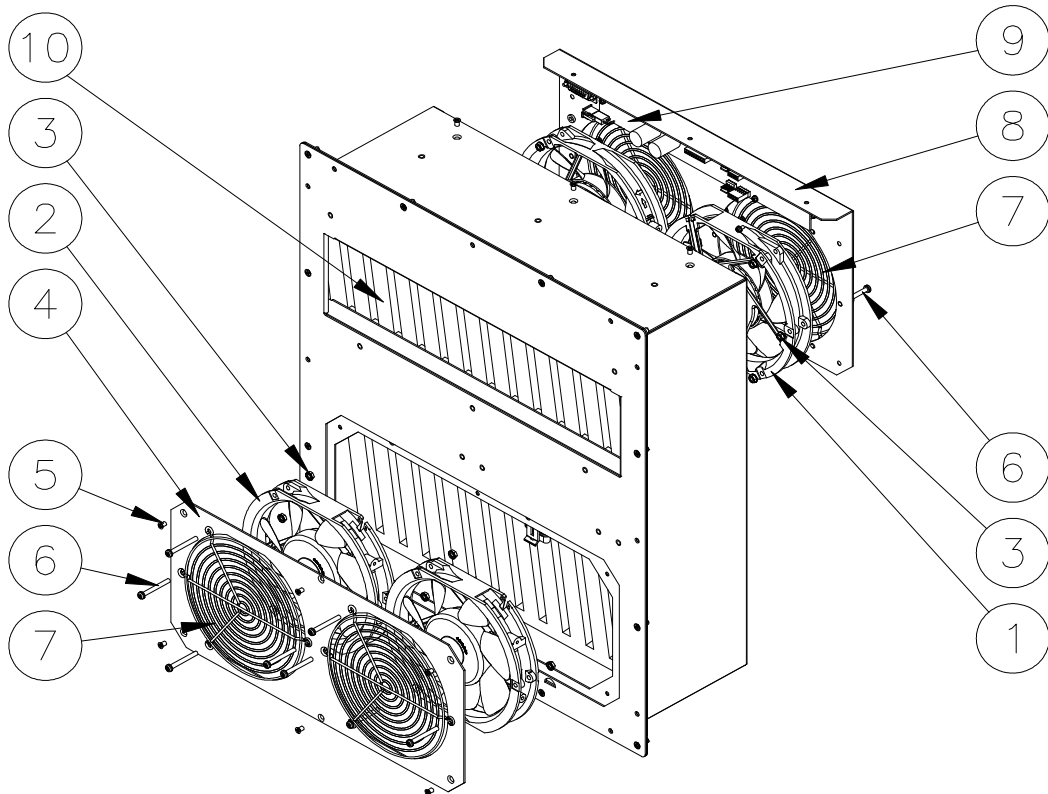
Part no. :

Delta model no. : HEX0050PA

#### 1-4. Configuration & Maintenance

The HEX is composed of the key components as the following:

Chassis , Heat Exchange Core , Controller and Fan Tray . The user can slide out the fan tray easily for replacement of the controller and fans .



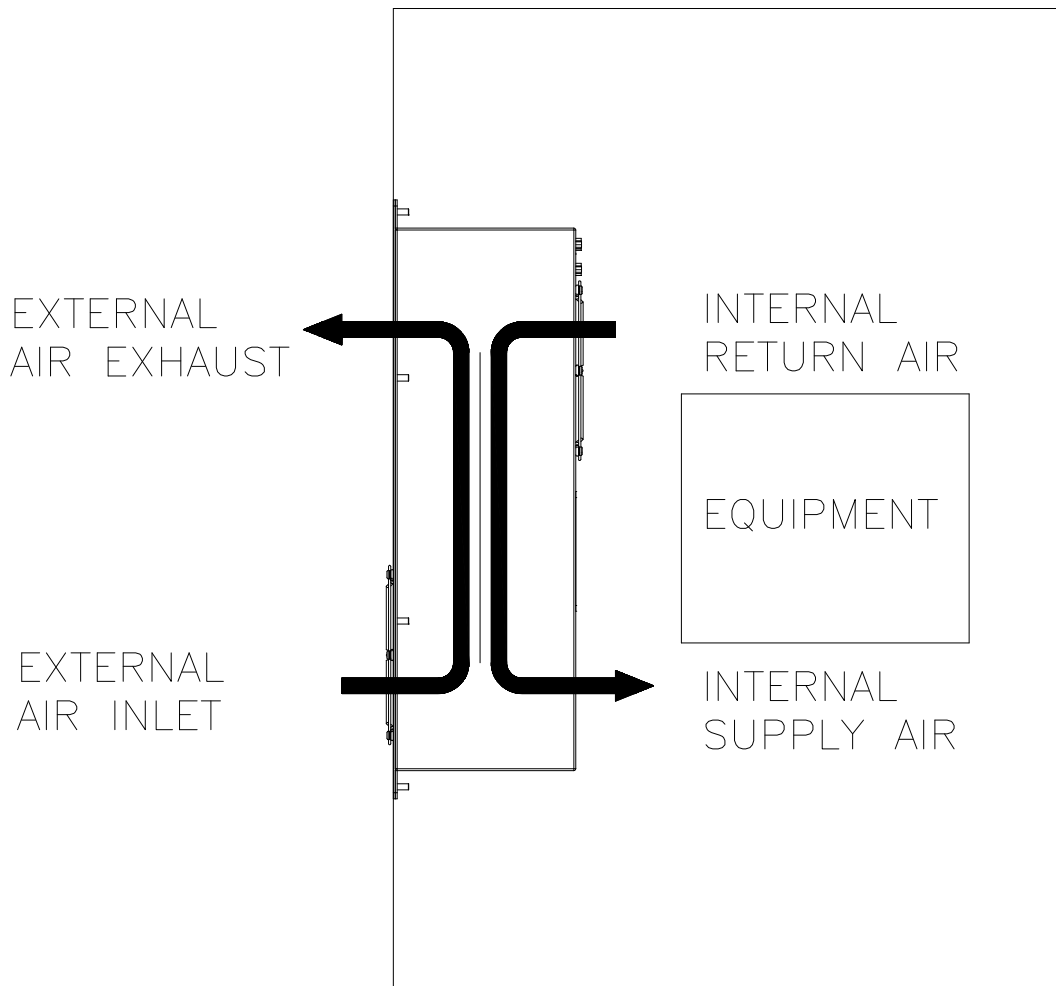
Item	Q'ty	P/N	Description
1	2	3815332400	Internal fan (BJ51)
2	2	3815332200	External fan (AL1F)
3	16	3110125400	Mounting nut (M4)
4	1	3323121100	External fan plate
5	14	3105553300	Mounting screw (M4)
6	16	3102383500	Mounting screw (M4)
7	4	3462494900	Fan guard
8	1	3900212800	Internal fan plate
9	1	5509557321	Controller
10	1	3346847100	Heat exchange CORE

Part no. :

Delta model no. : HEX050PA

### 1-5. Thermal path and Airflow baffle

With the forced convection using the axial fan , the warm air generated by the equipment will be blowing into the upper inlet and pass through the HEX core, the temperature will be lower on the other side of the core. The air return of the cold air will be used to cool down the system ; While on the opposite side , cooler air from the out environment will be drawn into the lower inlet and bring the heat of the HEX core out from the upper outlet . The thermal exchange path is shown in the figure below.



Part no. :

Delta model no. : HEX050PA

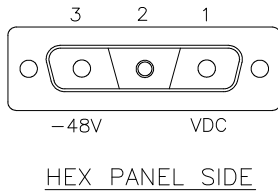
## 2. Electrical specification

### 2-1. Indicator & Connector

Connector " -48V VDC "

on panel plate : CVILUX 3W3CS0000100000

mate with : CVILUX 3W3CP0000100000

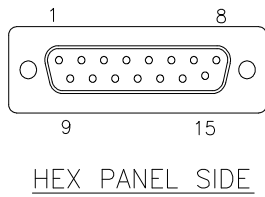


PIN	FUNCTION
1	0V
2	NA
3	-48V

Connector "COMM"

on panel plate : CVILUX CD5115PA100

mate with : CVILUX CD5115SA100



PIN	FUNCTION	PIN	FUNCTION
1	NA	9	NA
2	NA	10	ALARM_C
3	NA	11	STATUS_ALARM
4	NA	12	NA
5	NA	13	TO BE DEFINED
6	NA	14	TO BE DEFINED
7	(reserved for EXTERNAL NTC) GND	15	TO BE DEFINED
8	(reserved for EXTERNAL NTC)		

Alarm logic depends on user setting ( Normal Close )

- Normal  
Pin11 and Pin10 dry contact output close
- Fan failed  
Pin11 and Pin10 dry contact output open
- NTC fail (only work in standalone mode)  
Pin11 and Pin10 dry contact output open

Connector "COMM"

Pin11 to Pin10 ----- MAX. ( ± 75VDC )50mA

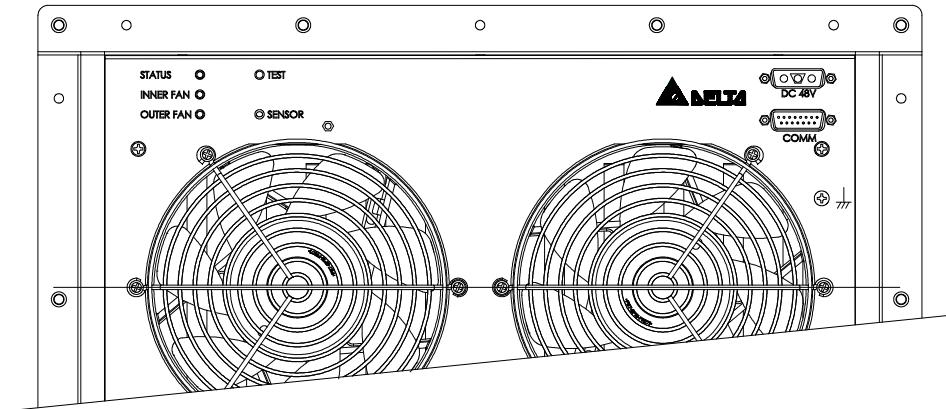
Part no. :

Delta model no. : HEX050PA

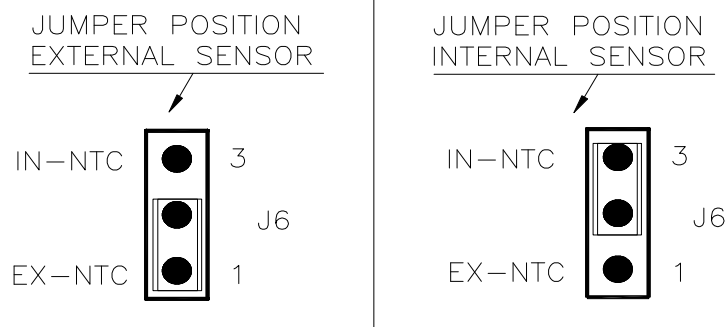
### Switch "TEST"

When pressing the "TEST/CLEAN" button, both outer fans and inner fans will run from low speed to high speed for testing purpose . The testing process is around 2 minutes, and the LED of INNER FAN and OUTER FAN will be blinking in GREEN color.

When the fan failed, the LED will be blinking in RED . and it can be turned off by pressing the "TEST/CLEAN" button again .



- LED of "INNER FAN & OUTER FAN"
  - (GREEN) : Fan normal
  - (RED) : Fan failed
  - (Blinking GREEN) : Fan is normal during test
  - (Blinking RED) : Fan failed during test
- LED of "STATUS"
  - (GREEN) : NTC normal at Standalone mode
  - (RED) : NTC open or short at Standalone mode
- NTC position : J6 for choosing
  - Inner sensor (on control panel) or
  - External sensor (COMM port Pin7 & Pin8 )



Part no. :

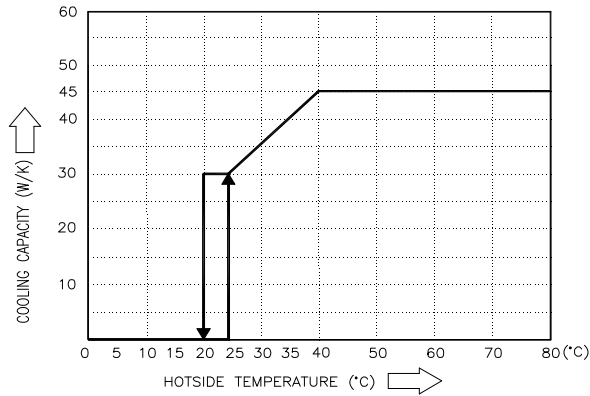
Delta model no. : HEX050PA

## 2-2. Standalone control mode

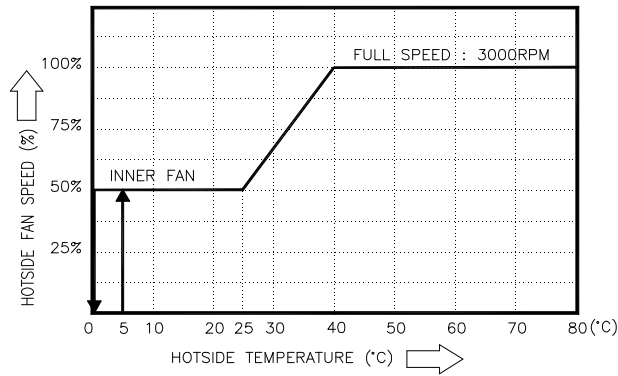
HEX detects ambient temperature to control cooling capacity.

User can choose inner-sensor on panel or outer-sensor on cable to detect ambient temperature by changing J6 jumper position ( inside of controller)

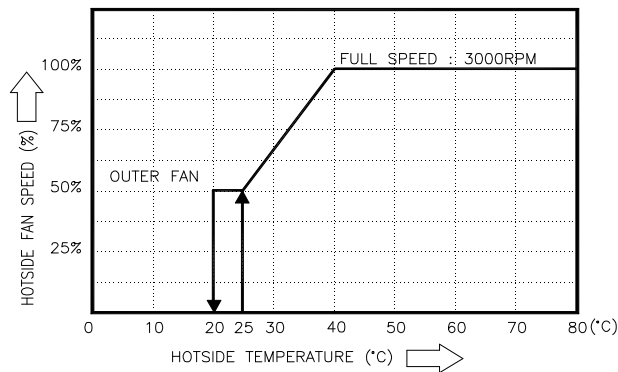
Cooling capacity (W/K) V.S Temperature



Inner fan speed V.S. Temperature



Outer fan speed V.S. Temperature



Part no. :

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Delta model no. : HEX050PA  
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### 3. Environmental condition

#### 3-1. Operating temperature

-10°C ~ +65°C (14°F ~ 149°F)

#### 3-2. Storage temperature

-40°C ~ +70°C (-40°F ~ 158°F)

#### 3-3. Humidity

External air loop : 0 ~ 100% RH

Internal air loop: 0 ~ 90% RH, non-condensing

#### 3-4. Ingress Protection rating

IP55 (IEC60529) on external side

#### 3-5. MTBF

The L10 Fan life is expected to be at least 80,000 hours continuous operation at 40°C with 15 ~ 65%RH @ label rated voltage

### 4. Reliability table

Test item	CONDITION
High temperature	IEC 60068-2-2
Low temperature	IEC 60068-2-1
High temp. / High humidity	IEC 60068-2-14 TEST Nb
Temperature cycle	IEC 60068-2-3
Vibration	ETSI 300 019-1-4 CLASS 4.1
Ingress protection (External side)	IEC 60529 IP55
Salt fog test (External side)	IEC 60068-2-52 severity 4 , 6cycles
Package bump	IEC 60068-2-29
ESD(TO CASE)	air +/-8KV 10 times / point contact +/-6KV 10 times / point
EFT	+/-2KV , 10 times at power input
EMI	CISPR 22 CLASS B

### 5. Safety Certification

5-1. UL , CUL, TUV, CE

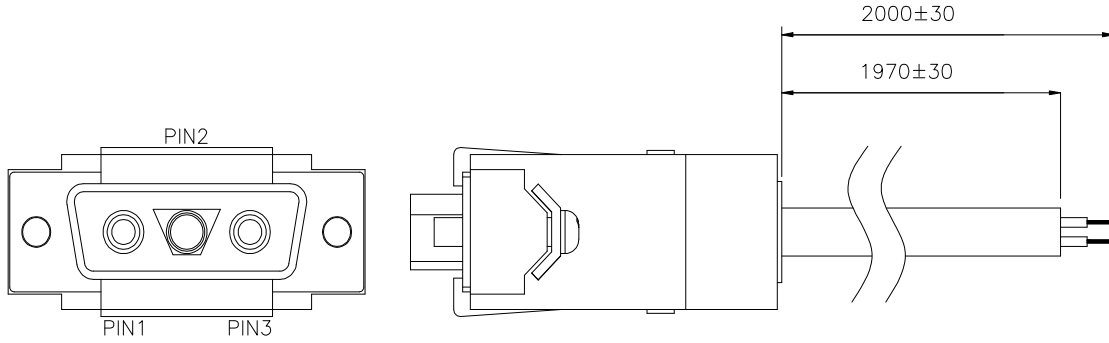


Part no. :

Delta model no. : HEX050PA

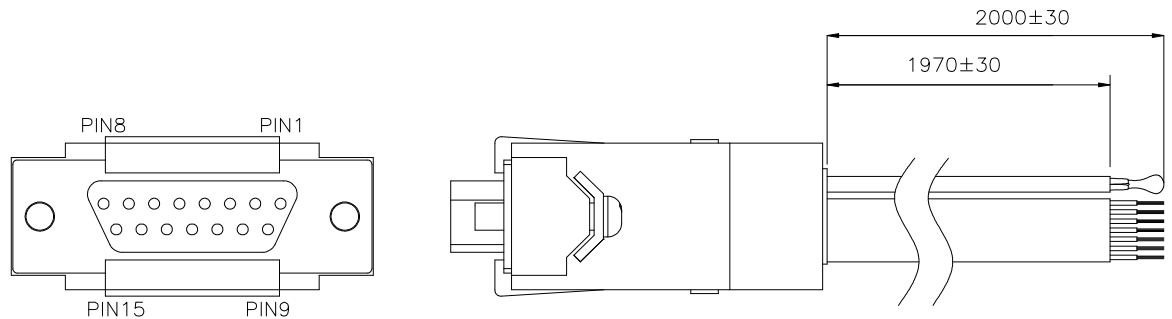
## 6. Accessory

### 6-1. Power cable



PIN	FUNCTION	COLOR
1	0V	RED
2	NA	
3	-48V	BLACK

### 6-2. Function cable



PIN	FUNCTION	COLOR	PIN	FUNCTION	COLOR
1	NA		9	NA	
2	NA		10	ALARM_C	BROWN
3	NA	BLUE	11	STATUS_ALARM	RED
4	NA	GREEN	12	NA	
5	NA		13	TO BE DEFINED	ORANGE
6	NA		14	TO BE DEFINED	YELLOW
7	(RESERVED for EXTERNAL NTC)	BLACK	15	TO BE DEFINED	GREY
8	(RESERVED for EXTERNAL NTC)	WHITE			

Part no. :

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Delta model no. : HEX050PA  
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## **7. 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.





## ***Application Notice***

- 1. Delta will not guarantee the performance of the products if the application condition falls outside the parameters set forth in the specification.**
- 2. A written request should be submitted to Delta prior to approval if deviation from this specification is required.**
- 3. Please exercise caution when handling fans. Damage may be caused when pressure is applied to the impeller, if the fans are handled by the lead wires, or if the fan was hard-dropped to the production floor.**
- 4. Except as pertains to some special designs, there is no guarantee that the products will be free from any such safety problems or failures as caused by the introduction of powder, droplets of water or encroachment of insect into the hub.**
- 5. The above-mentioned conditions are representative of some unique examples and viewed as the first point of reference prior to all other information.**
- 6. It is very important to establish the correct polarity before connecting the fan to the power source. Positive (+) and Negative (-). Damage may be caused to the fans if connection is with reverse polarity, if there is no foolproof method to protect against such error specifically mentioned in this spec.**
- 7. Delta fans without special protection are not suitable where any corrosive fluids are introduced to their environment.**
- 8. Please ensure all fans are stored according to the storage temperature limits specified. Do not store fans in a high humidity environment. We highly recommend performance testing is conducted before shipping, if the fans have been stored over 6 months.**
- 9. Not all fans are provided with the Lock Rotor Protection feature. If you impair the rotation of the impeller for the fans that do not have this function, the performance of those fans will lead to failure.**
- 10. Please be cautious when mounting the fan. Incorrect mounting of fans may cause excess resonance, vibration and subsequent noise.**
- 11. It is important to consider safety when testing the fans. A suitable fan guard should be fitted to the fan to guard against any potential for personal injury.**
- 12. Except where specifically stated, all tests are carried out at room (ambient) temperature and relative humidity conditions of 25°C, 65% RH. The test value is only for fan performance itself.**
- 13. Be certain to connect an “ 4.7μF or greater” capacitor to the fan externally when the application calls for using multiple fans in parallel, to avoid any unstable power.**