



Specification For Approval

Customer : _____
Description : DC 48V Heater 500W
Customer Part No. : _____ Rev. : _____
Delta Model No. : HEH050PA Rev : 07
Sample Issue No. : _____
Sample Issue Date : Jan. 14, 2018

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

Approved by : _____

Date : _____

Delta Electronics, Inc.
252, Shang Ying Road, Kuei San
Taoyuan Hsien 333, Taiwan, R. O. C.

TEL : 886-(0)3-3591968
FAX : 886-(0)3-3591991

*** SAMPLE HISTORY ***

CUSTOMER :

CUSTOMER P/N :

DELTA MODEL : HEH050PA

REV.	DESCRIPTION	DRAWN	CHECKED			APPROVED	ISSUE DATE
			ME	EE	CE		
00	ISSUE SPEC	李武奇 10/02'15	李武奇 10/02'15	賴世育 10/02'15	-----	楊家瑋 10/02'15	10/02'15
01	Modify contents.	李武奇 10/11'16	李武奇 10/11'16	賴世育 10/11'16	-----	楊家瑋 10/11'16	10/11'16
02	Modify section 1-2 inrush current to start current	李武奇 12/15'16	李武奇 12/15'16	賴世育 12/15'16	-----	楊家瑋 12/15'16	12/15'16
03	Modify section 1-3 dimension.	李明遠 2/13'17	李明遠 2/13'17	賴世育 2/13'17	-----	楊家瑋 2/13'17	2/15'17
04	Add safety mark.	李明遠 3/10'17	李明遠 3/10'17	賴世育 3/10'17	-----	楊家瑋 3/10'17	3/16'17
05	Modify rated current in section 1-2.	李明遠 4/20'17	李明遠 4/20'17	賴世育 4/20'17	-----	楊家瑋 4/20'17	4/21'17
06	Add section1-2 inrush current and 2-2 waveform table.	徐振凱 08/28'18	李武奇 08/28'18	徐振凱 08/28'18	-----	陳李龍 08/28'18	08/28'18
07	Add section.5 Power sourcing wire connection	李武奇 01/14'19	李武奇 01/14'19	徐振凱 01/14'19	-----	陳加偉 01/14'19	01/14'19

Table of content

1. Description	2
1-1. General description	2
1-2. Main feature & Model number	2
1-3. Dimension.....	3
1-4. Airflow baffle	4
1-5. Mounting orientation	4
1-5-1 Vertical mounting.....	4
1-5-2 Horizontal mounting	5
2. Electrical specification.....	5
2-1. Electrical connection.....	5
2-2. DC power supply	5
2-3. Startup average current and inrush current	6
3. Environmental condition.....	6
3.1. Operating temperature.....	6
3.2. Storage temperature	7
3.3. Humidity.....	7
3.4 Ingress Protection rating.....	7
3.5. MTBF	7
3.6. Reliability table.....	7
4. Safety Certification.....	7
5. Power sourcing wire connection	7
6. Delta Electronics, Inc. Warranty for Cabinet Thermal Solutions Products.....	8

Part no. :

Delta model no. : HEH050PA

Specification For Approval

Customer :

Description : DC48V Heater 500W

Customer P/N :

rev. :

Delta model no. : HEH050PA

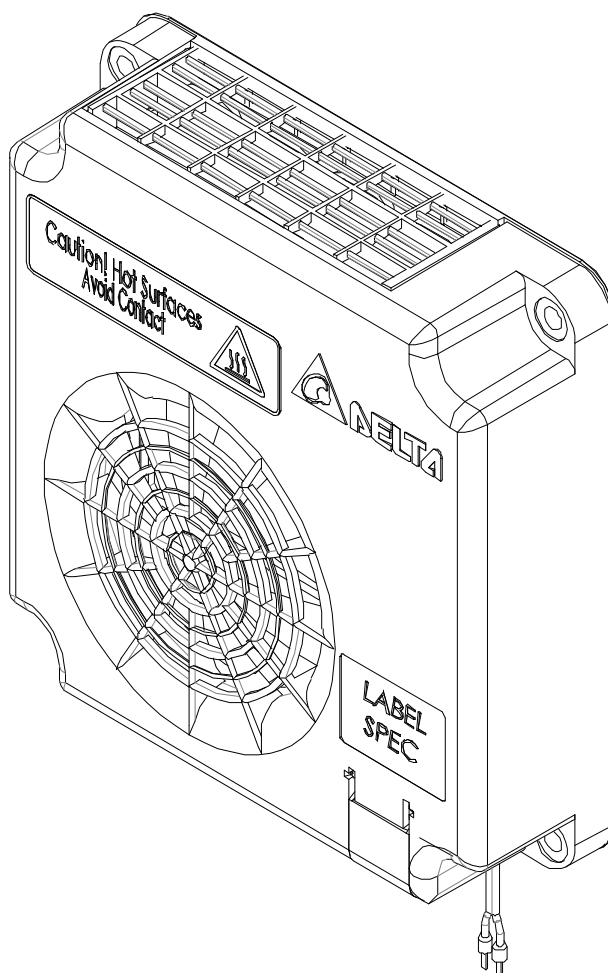
rev. : 07

Sample revision :

Issue no. :

Sample issue date :

Quantity : sets



Part no. :

Delta model no. : HEH050PA

1. Description

1-1. General description

The heater is designed for warming up air in the cabinet. It warms air to avoid equipment damaged at much lower temperature. The heater can be mounted on the wall of cabinet.

1-2. Main feature & Model number

Main feature	Unit	Model Number
		HEH050PA
Outline Dimension	Mm	150 L x 145 W x 43 D
Weight	Kg	0.6
Heating Capacity (*Note1)	W	500
Rated Voltage	VDC	48
Rated Current	A	12.5 (at 48VDC)
Operating Voltage Range	VDC	46-56
Operating Temperature range	°C	-40 ~ +65
Startup average current (*Note 2)	A	18(max.)
Inrush Current (*Note 3)	A	200A(max.)
Mounting Location	N/A	Wall / Bottom

**Note1 : The Heating capacity (W) is defined as $W=V \cdot A$ at 20 °C*

W : power consumption

V: Operating Voltage

A : Operating current

**Note2 : The startup average current is peak current of PTC element, the duration is less than 5 sec. Please check the notice at section 2 – Electrical specification.*

**Note3 : Test condition are DC input 48Vdc that is cold start at ambient temperature 25 °C. Please check the notice at section 2 – Electrical specification.*

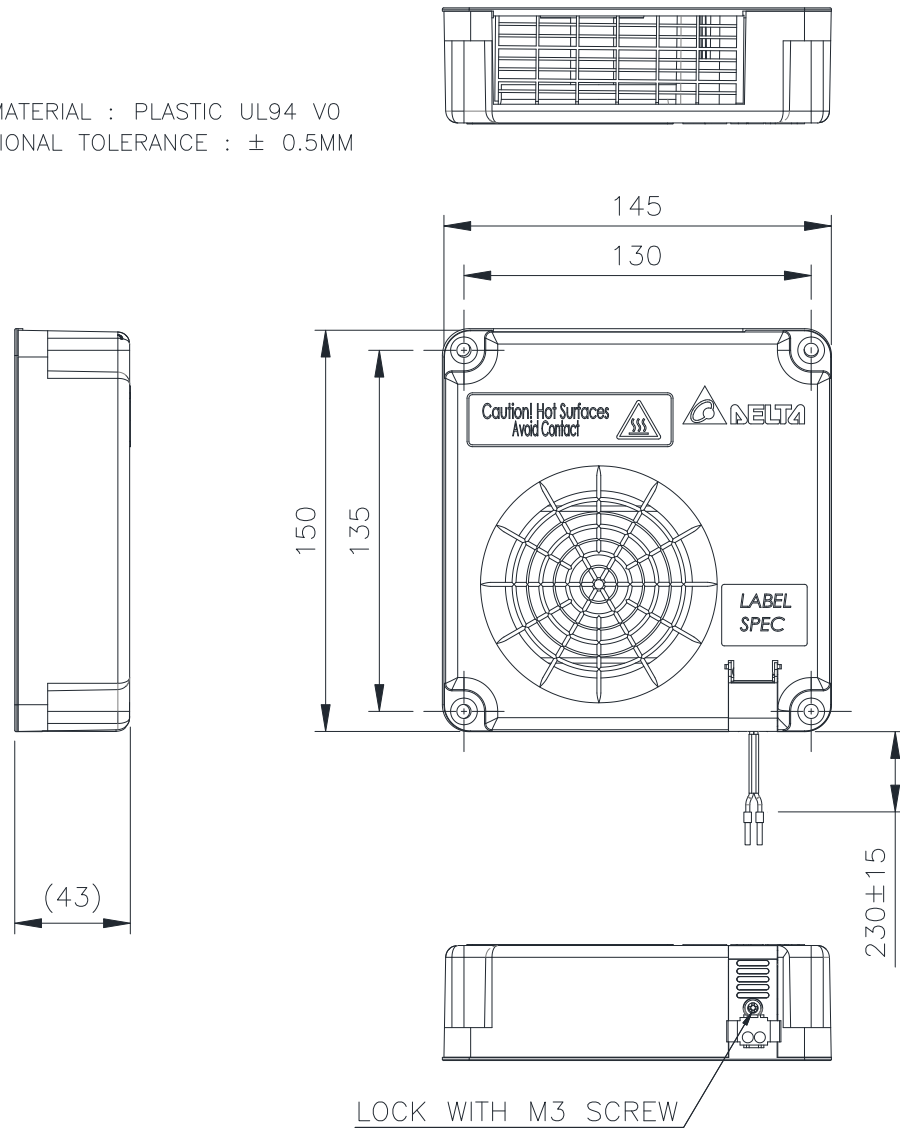
Part no. :

Delta model no. : HEH050PA

1-3. Dimension

NOTE :

- (1) CASE MATERIAL : PLASTIC UL94 V0
- (2) DIMENSIONAL TOLERANCE : $\pm 0.5\text{MM}$

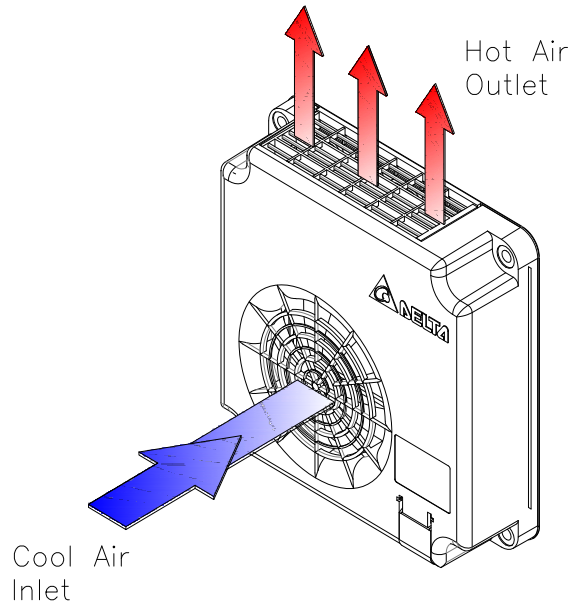


Part no. :

Delta model no. : HEH050PA

1-4. Airflow baffle

The cool air flow into the heater, and warm up by PTC heating element inside of case, then flow out into the system.

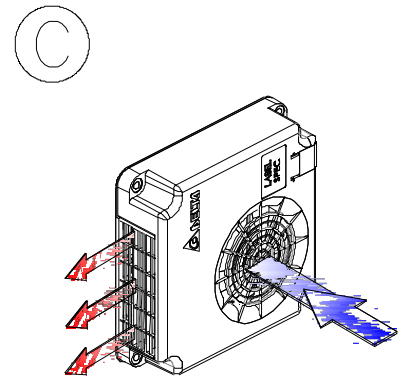
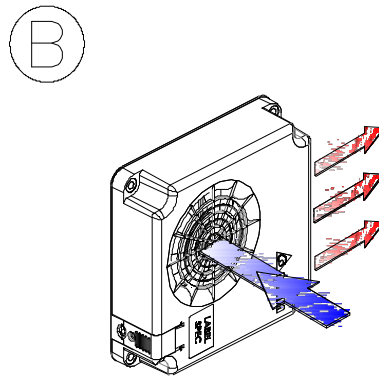
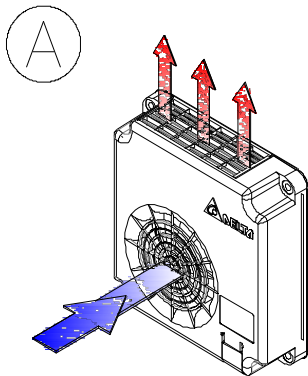


1-5. Mounting orientation

1-5-1 Vertical mounting

Orientation condition:

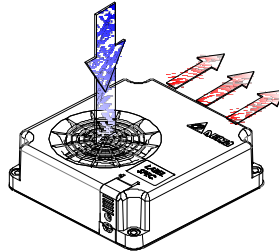
- A: Hot air flow blow upward
- B: Hot air flow blow backward
- C: Hot air flow blow forward



Part no. :

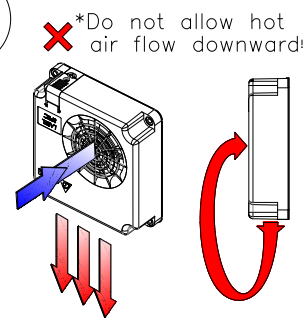
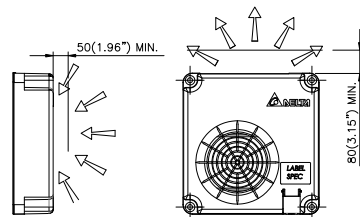
Delta model no. : HEH050PA

1-5-2 Horizontal mounting



*Note A. Minimum gap for air inlet and exit is required to avoid the damage caused from blocked air passage

*Note B. Please avoid air flow short circulation otherwise it will shut down for high temperature self-protection



2. Electrical specification

2-1. Electrical connection

Power input : DC power input with blade terminal.

Red wire : DC +48V input

Black wire : DC -0V input

2-2. DC power supply

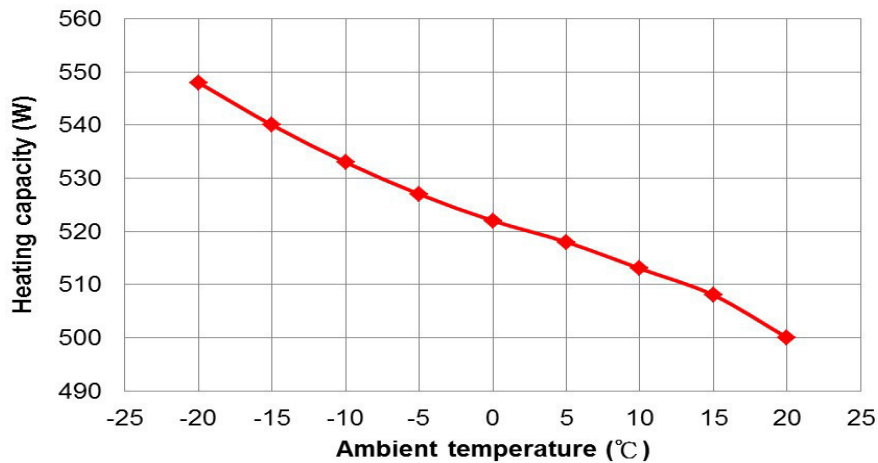
HEH050PA was designed for DC 48V power supply in accordance with the following parameters:

Nominal Voltage:DC 48 V

Power Consumption:

Part no. :

Delta model no. : HEH050PA



2-3. Startup average current and inrush current

The startup average and inrush current waveform are defined as bellow table. These test are all finished at ambient 20°C at 48Vdc shown in table 2-1.

Table 2-1. Tested waveform to startup average current and inrush current.

Item	Current and time	Wave form
Startup average current	Maximum Current : 18A Max. Duration Time:5sec Measuring methods: The PTC element maximum transient current RMS value after power on.	
Inrush current	Maximum current: 200A Max. Duration Time: 200usec Measuring methods: Power on DC input then measure the peak current value.	

3. Environmental condition

3.1. Operating temperature

-40°C to +65°C

Part no. :

Delta model no. : HEH050PA

3.2. Storage temperature

-40°C to +75°C

3.3. Humidity

0 ~ 90% RH, non-condensing

3.4 Ingress Protection rating

IP20(IEC60529)

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.

3.6. 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
Package bump	IEC 60068-2-29

4. Safety Certification



5. Power sourcing wire connection

Blade connectors was included in heater products. It is needed to install blade connectors into screw terminal blocks or screwless terminal blocks, the capacity

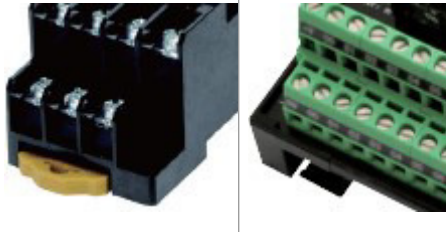


Part no. :

Delta model no. : HEH050PA

of terminal block must be 300V, 20A min.

Terminal Block Types and Connection Methods

General terminal block types and how to connect them are shown in the following table.

Terminal block type	Screw terminal blocks	Screwless terminal blocks	
Securing method	Screws	Springs	
Terminal blocks			
Connection steps	Three-step connection (1) Loosen the screw with the tool. (2) Insert the terminal. (3) Tighten the screw with the tool.	Three-step connection (1) Insert the tool. (2) Insert the terminal. (3) Remove the tool.	One-step connection (1) Insert the terminal.

NOTE: disconnect power to device before inserting or removing connector.

6. Delta Electronics, Inc. Warranty for Cabinet Thermal Solutions Products

Delta Electronics, Inc warrants that HEATER and accessories within its Cabinet Thermal Solutions product family and manufactured by Delta Electronics, Inc., herein referred to as (“products”), will be free from defects in material and workmanship for a period of one (1) year from the date of shipment by Delta Electronics, Inc. This warranty covers repair or replacement of product at the sole discretion of Delta Electronics, Inc. and is subject to the following Conditions and Exclusions:

Part no. :

Delta model no. : HEH050PA

A. Conditions.

- All products must be installed and operated according to Delta product Specification(s) and product Instruction/User Manual(s):
- Maximum voltage variation is no greater than normal operation and instruction in Delta product Specification(s) and product Instruction/User Manual(s), with avoidance to power line disturbances of any kind.
- Application is not to exceed minimum and maximum stated operation temperatures and humidity range as indicated in the Delta product Specification(s) and product Instruction/User Manual(s).
- Filters (if applicable) must be cleaned regularly.
- Products and any parts thereof must not be modified, unless prior written authorization is received from Delta Electronics, Inc.
- All products must be installed and grounded in accordance with all relevant electrical and safety codes, as well as the National Electric Code and OSHA rules and regulations.
- All products must be installed in a stationery application, free of vibration and shock.
- A violation of any one of these conditions shall render the warranty hereunder void and of no effect.

B. Exclusions.

This warranty does not cover the following:

- Applications where products are being misapplied. This includes inappropriate selection of products for the environment and conditions in which it is to be used.
- Damages caused by shipping carrier or any other accident after products have left Delta Electronics, Inc. manufacturing facility. Shipping claims are the responsibility of the customer and are to be completed in a timely manner.
- Reimbursement of labor for installation or removal of any warranted products, or for parts and labor resulting from repairs performed by any other source besides Delta Electronics, Inc.

This is the complete warranty and is in lieu of any other warranty expressed or implied, including but not limited to any implied warranty of merchantability or

Part no. :

Delta model no. : HEH050PA

fitness for a particular purpose. Delta Electronics, Inc. will in no way be liable for incidental or consequential damage whatsoever or for any other claims by the customer for damages in connection with Delta Electronics Inc. products, even if advised in advance of the possibility of such damage.

Return Procedure

All returns require a Return Material Authorization number (RMA #), regardless of reason for return, whether it be for warranty or out of warranty repair. Returns without an RMA # will be refused by Delta Electronics, Inc. Approval for return requests are at the sole discretion of Delta Electronics, Inc.

Buyer should provide the following information at the time of RMA request:

1. Complete Model Number, Serial Number and description of damaged unit requested to be returned.
2. Original Buyer Purchase Order number and date product was received by Buyer.
3. Quantity to be returned and a brief description of failure for each unit, if different.

All returns to Delta Electronics, Inc must be securely packed, using original cartons if possible. All returns must have the RMA number visible on the outside of the carton. Delta Electronics, Inc. is not responsible for material damaged in transit.

Shipping cost for all non-warranty repairs is the responsibility of the sender and must be shipped prepaid. Shipping costs for all warranty related repairs will be covered by Delta Electronics, Inc. provided the products are returned using a Delta Electronics, Inc approved carrier. If after diagnosis, products determined by Delta Electronics, Inc. are not covered under warranty, Buyer will be responsible for all shipping charges and will be billed accordingly.

LIMITATION OF LIABILITY

DELTA ELECTRONICS, INC. WILL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY LOST

Part no. :

Delta model no. : HEH050PA

PROFITS OR LABOR COSTS, ARISING FROM THE SALE, USE OR INSTALLATION OF THE GOODS, FROM THE PRODUCTS BEING INCORPORATED INTO OR BECOMING A COMPONENT OF ANOTHER PRODUCT, FROM ANY BREACH OF THIS AGREEMENT OR FROM ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON WARRANTY (EXPRESSED OR IMPLIED) OR OTHERWISE BASED ON CONTRACT, OR ON TORT OR OTHER THEORY OF LIABILITY, AND REGARDLESS OF ANY ADVICE OR REPRESENTATIONS THAT MAY HAVE BEEN RENDERED BY DELTA ELECTRONICS, INC. CONCERNING THE SALE, USE OR INSTALLATION OF THE PRODUCTS.