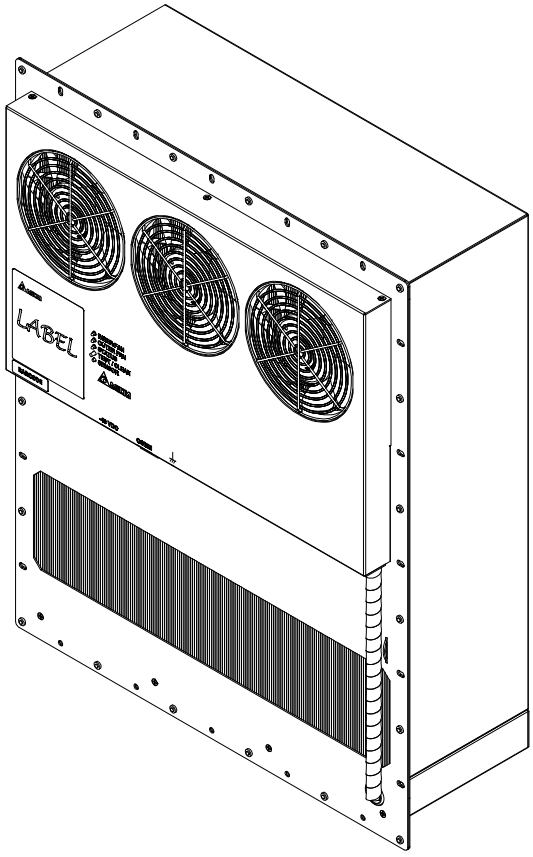
HEX150PC Heat Exchanger

Instruction Manual



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1. Version

Rev.	Description	Drawn	Approved	Issue date
00	Issue spec.	Nick Wang	Adam Chen	2016/1/25
01	Add sectioni 10	Nick Wang	Adam Chen	2016/6/10

2. Description

2-1. General

Delta Heat Exchanger (HEX) is designed for direct air to air heat exchange to remove heat from 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.

2-2. Specification

Main feature	Unit	Model Number	
		HEX150PC	
Outline Dimension (H x W x D)	mm (in)	690 x 550 x 242 (27 x 22 x 10)	
Cooling Capacity (*Note 1)	W/K (W/°F)	100 (56)	135 (75)
Rated Voltage	VDC	48	
Rated Current (*Note 2)	A	6.3	
Operating Voltage Range	VDC	40 - 60	
Operating Current	A	2.6	5.8
Operating Power Consumption	W	125	279
Acoustic Noise at 1.5M (SPL)	dB-A	65.0	73.0
Weight	Kg (Lb)	20 (44)	

* Note1 : The cooling capacity (W/K , W/°C or W/°F) is defined as Q/ (TI-TA)

Q : Heat dissipation (W) from inside of cabinet

TI : Return temperature of internal air circuit (K , °C or °F)

TA : Ambient temperature of external air circuit (K , °C or °F)

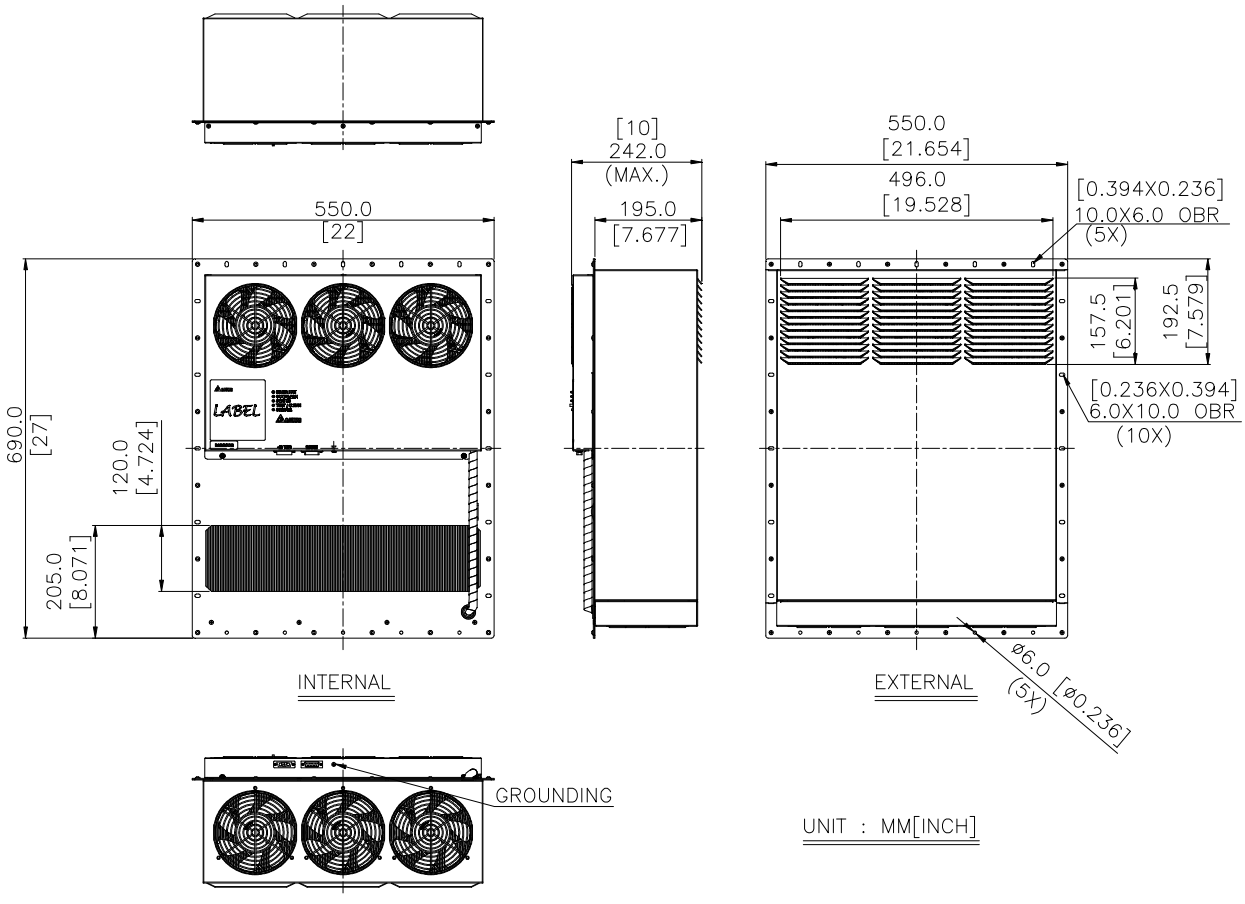
*Note 2 : Rated current is announcement of safety

2-3. Environmental condition

Description	Specification
Operating	-10℃ ~ +65℃ (-14℉ ~ 149℉)
Storage	-40℃ ~ +70℃ (-40℉ ~ 158℉)
Humidity	External air circuit: 0 ~ 100% RH
Ingress protection (on external side)l	IEC60529 IP55 (NEMA 3) GR-487 720hrs salt spray

3. Installation

3-1. Outline drawing

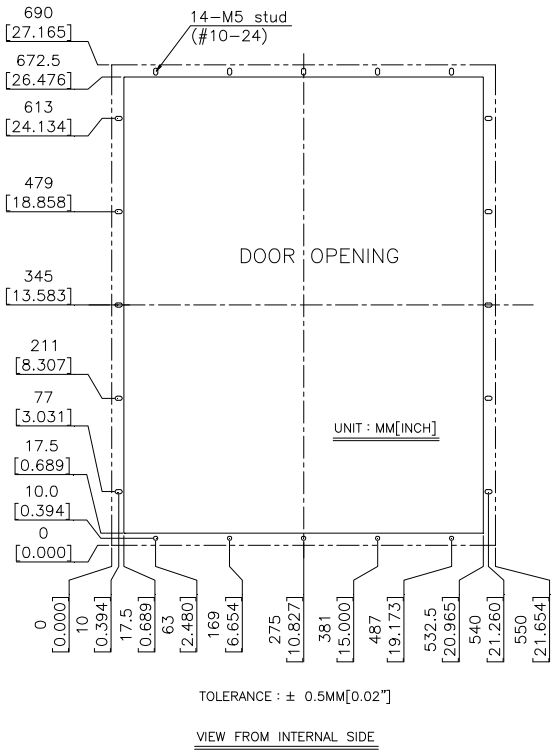


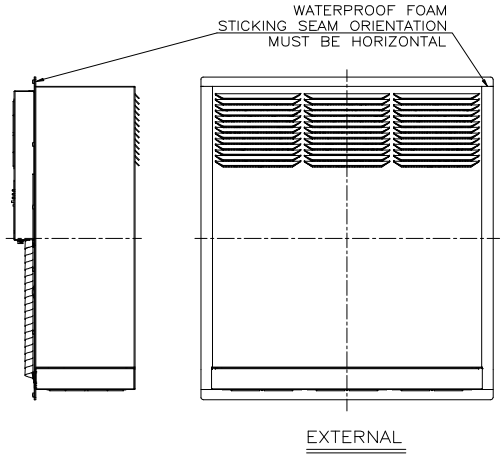
(1) Material : Aluminum sheet t=1.5mm

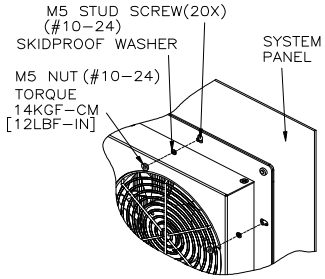
(2) Finish : Power paint , Color RAL7032

(3) Dimensional tolerance : ± 1mm [0.04”]

3-2. Mounting panel cutout and waterproof foam sticking







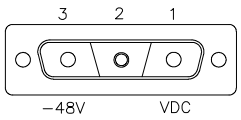
4. Electrical specification

4-1. Connection and LED indicator (on HEX panel)

Power Connection

on panel plate : CVILUX 3W3CS0000100000

mate with : CVILUX 3W3CP0000100000



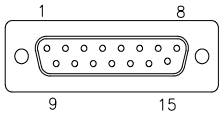
HEX PANEL SIDE

PIN	FUNCTION
1	0V
2	NA
3	-48V

COMM connection

on panel plate : CVILUX CD5115PA100

mate with : CVILUX CD5115SA100



HEX PANEL SIDE

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)		

User can follow dry contact definition that is Normal Close (N.C.) to detect abnormal status from pin 10 & pin 11

Definition	N. C
Connection	Pin 10 & Pin 11
Control board, NTC and fan are in normal status	CLOSE
NTC resistance is over range such as “open circuit” or “short circuit”	OPEN
Fan speed is lower than 50% of definition or fan is locked	OPEN

Dry contact max. rating : **75VDC/50mA**

LED indicator

◎ INNER FAN
◎ OUTER FAN
◎ STATUS
○ TEST / CLEAN
○ SENSOR

INNER FAN / OUTER FAN / STATUS LEDs indicate fan and NTC sensor status .

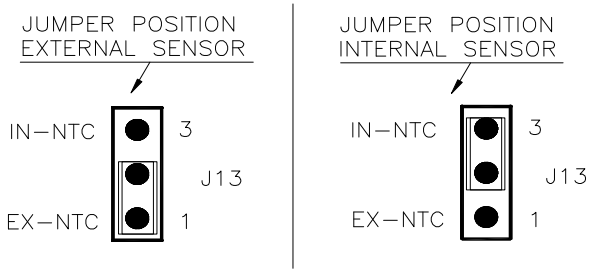
Depress "TEST" button to start auto-test of outer and inner fans running from low to high speed. Turn off by depressing the “TEST” button again .

	INNER FAN	OUTER FAN	STATUS
Normal	GREEN	GREEN	GREEN
Failed*	RED	RED	RED
Normal (touch TEST / CLEAN)	Blinking GREEN	Blinking GREEN	N/A
Failed* (touch TEST / CLEAN)	Blinking RED	Blanking RED	N/A

* FAN failed : Fan speed is lower than 50% of definition or fan is locked
* STATUS Failed : NTC resistance is over range such as “open circuit” or “short circuit”

NTC temperature sensor

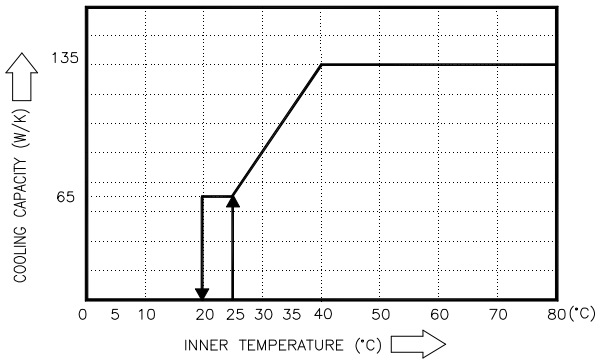
User can switch inner sensor (on control panel) or external sensor (COMM port Pin7 & Pin8) via J13 connector on controller as shown below to change sensor location .



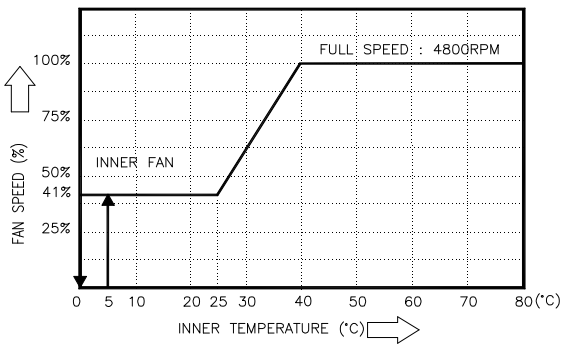
4-2. Standalone control mode

HEX can detect ambient temperature to control cooling capacity . Internal fan and external fan speed default settings are shown below

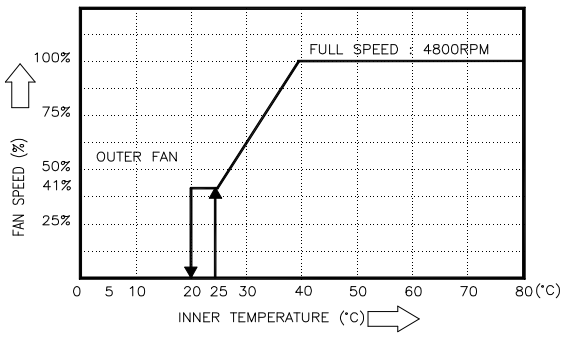
Cooling capacity (W/K) vs. Temperature



Inner fan speed vs. Temperature



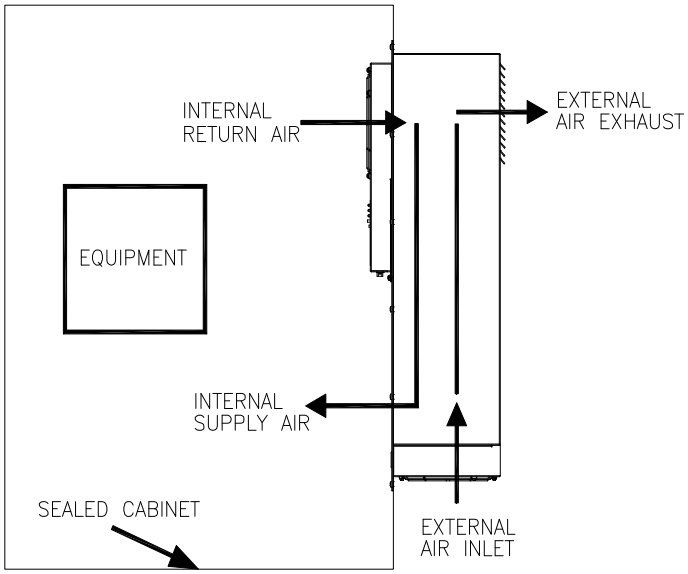
Outer fan speed vs. Temperature



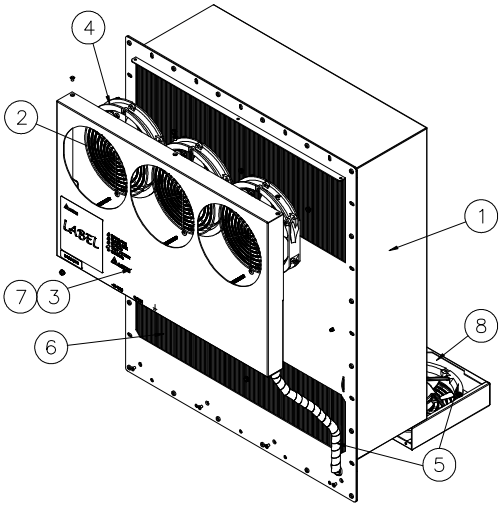
5. Mechanical feature

5-1. Thermal path and Airflow baffle

With forced convection using the axial fan, warm air generated by the equipment will be blown into the internal return opening and pass though the HEX, then flow out from internal supply opening. The air supply of the cold air will be used to cool down the system; On the opposite side, cooler air from the surrounding environment will be drawn in from the external air inlet side , and push the heat of the HEX out from the external air exhaust side. The thermal exchange path is shown in the figure below .



5-2. Configuration



Item	Q'ty	Description
1	1	Chassis assy
2	6	Fan guard
3	1	Controller
4	3	Internal fan
5	3	External fan
6	1	Heat exchange CORE
7	1	Internal plate assy
8	1	External plate assy

6. Maintenance and Replacement

Be sure to **SHUT DOWN** the power before proceeding with any maintenance or component replacement .

6-1. Maintenance

Monthly

Use brush and low pressure air to remove dust or any debris on both internal/external air inlet and air outlet opening .

Quarterly

Follow below maintenance sequence

Internal loop maintenance :

* The maintenance is from the **internal side** .
* Use screw driver to remove screw on upper portion of chassis assy (Item 1) .
* Disassemble the internal plate assy (Item 7) and disconnect fan from controller (Item 3) . Note the connection location .
* Use brush and low pressure air to remove dust on internal plate assy (Item 7) , internal fan (item 4) and heat exchange core opening .
* Hold internal plate assy (Item 7) and connect fan to controller (Item 3) .
* Re-attach internal plate assy (Item 7) and use screw driver to secure screw with chassis assy (Item 1) .

External loop maintenance :

* The maintenance is from the **external side** .
* Use screw driver to remove the screw on bottom portion of chassis assy (Item 1) .
* Disassemble and hold external plate assy (Item 8) , no need to disconnect external fan .
* Use brush and low pressure air to remove dust on external plate assy (Item 8) , external fan (Item 5) and heat exchange CORE opening .
* Re-attach external plate assy back (Item 8) and use screw driver to secure screw with chassis assy (Item 1) .

Test

Power on and depress “TEST” button on panel to proceed with auto test . Follow LED status to check that HEX has resumed to normal function after maintenance .

6-2. Replacement

Delta HEX is designed with dry contact alarm output and LED indicator on panel shown below to describe abnormal situation .

Refer to **Section 4-1** for checking abnormal part is **internal fan** , **external fan** or **controller** for abnormalities .

In cases of parts abnormality , Delta will follow the reading and submit spare part(s) below for replacement .

Internal fan P/N : AFB1548EH-BJ51
External fan P/N : AFB1548VH-CA18
Controller P/N : HEX150PC-000C

User can then refer to maintaince sequence on previous page , or request Delta authorized support for assistance .

7. MTBF and Reliability

7-1. MTBF

L10 Fan life is expected to be minimum 80,000 hours continuous operation at 40℃ with 15 ~ 65%RH .@ label rated vo ltage

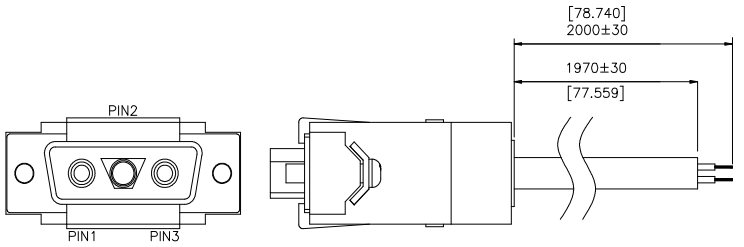
7-2. Relibability

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 (NEMA 3) GR-487 720hrs salt spray
Package bump	IEC 60068-2-29

8. Safety

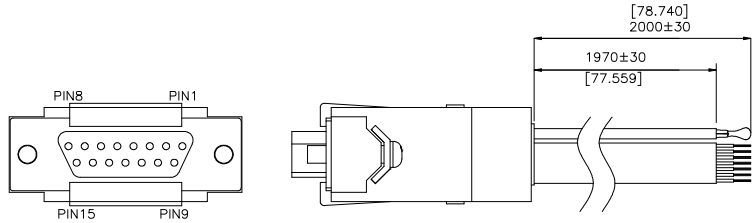
9. Accessory

9-1. Power cable



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

9-2. 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			

10. General Safety and Warnings

* Some electronic parts have a high operating temperature .
  Use caution at all times.
* Incorrect installation may cause damage and/or injury.
* Installation and maintenance should be performed only by qualified personnel . Use caution at all times.
* Ensure the grounding wire is connected before powering on the system.
* Ensure the cover and the mounting hardware are secure upon installation.
* All the cables connected to the unit must confirm to UL standards.