Specification and Manual

Customer :

Description : HEAT EXCHANGER 310 W/K

Customer Part No. : Rev :

Delta Model No. : HEX310PA Rev : 01

Sample Date Code:

Sample Issue Date : Oct.30.2023

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 CITY 333, TAIWAN

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

Table of content

Description

This document is an installation and the characteristics of Delta HEX310PA 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

HEX is a precision instrument, it should be handled or transported with care, do not stand on the box, or place heavy objects on it. Please pay attention to the following icons on the package.

Safety Notes

Please read the safety notes carefully before installing HEX unit and be sure to install it correctly. After completing the installation, make sure that the unit operates properly during the start-up operation.

Meaning of WARNING and CAUTION notices:

⚠ Warning:

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

⚠ Caution:

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

⚠ Warming:

1. Installation work and electrical wiring must be done by qualified person(s) 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 HEX in accordance with the instructions in this installation manual. Improper installation may result in water leakage, electric shocks or fire.
4. Make sure that all wiring is secured, the specified wires are used, and 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 for installation work.
9. This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons".

⚠ Caution :

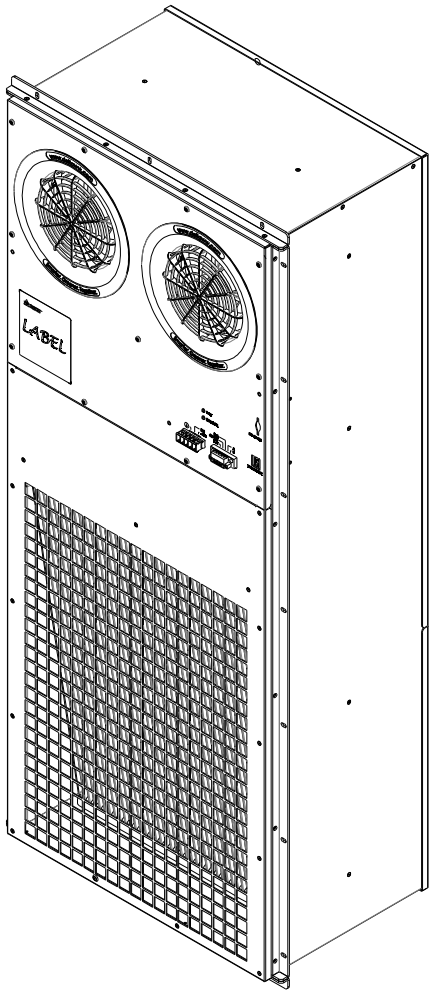
1. Install the HEX on a wall/ door strong enough to withstand the weight of the unit.
2. Do not allow a child to mount on the outdoor unit or avoid placing any object on it.
3. Do not block air inlets or exits.
4. Do not install the HEX at any place where there is a danger or flammable gas leakage.
5. To avoid injury, do not touch the air inlet or aluminum fins of unit.
6. Watch your steps at the time of fin cleaning or HEX inspection.
7. Do not topple the HEX while moving or storage.
8. The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
9. Children being supervised not to play with the appliance.

Part no. :

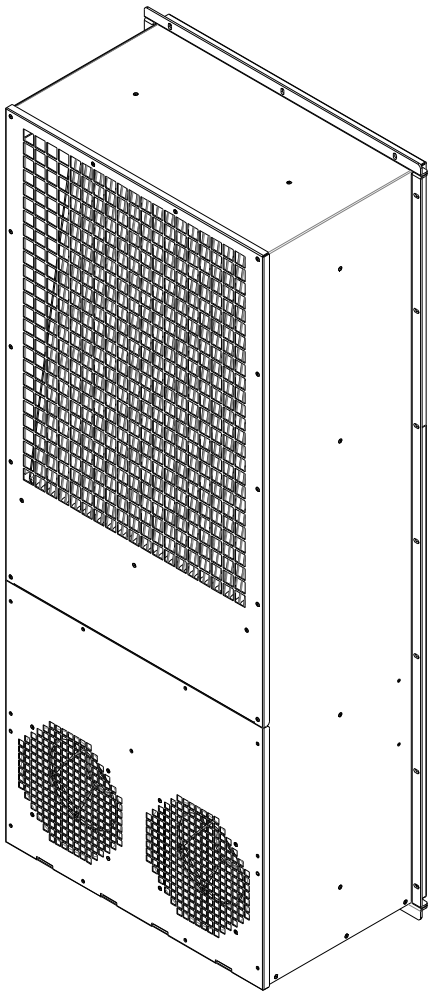
Delta model no. : HEX310PA

Specification for Approval

Customer :	
Description : HEAT EXCHANGER 310 W/K	
Customer P/N :	Rev. :
Delta model no. : HEX310PA	Rev. : 01
Sample revision. :	Date Code :
Sample issue date :	Quantity :



INTERNAL



EXTERNAL

1. Product Instruction

1-1. General Description

The Heat Exchanger (HEX) is designed for direct air to air heat exchange to remove the heat from the cabinet, and there is designed for IP55 sealed outdoor telecom cabinet to provide stable and optimum internal conditions for equipment and avoid hotspot inside the cabinet. It is easy to be installed in the cabinet with the nuts.

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

Dimensions, Weight & Mounting Method		
Dimension (H x W x D)	mm (inch)	1280 x 540 x 320 (50.4 x 21.2 x 12.6)
Application	N/A	Outdoor
Weight	Kg (lbs)	43 (94.8)
Mounting Method	N/A	Door / Side
Color		RAL7035
Environmental Protection & Performance		
Operating Temperature Range	°C (°F)	-25 to +70 (-13 to +158)
Operating Humidity		External: 0~100% RH Internal: 0~90% RH
Storage Temperature	°C (°F)	-40 to +70 (-40 to +158)
Storage Relative Humidity	RH	5~95%
Refrigerant	N/A	R134a
Protection for Dust, Wind and Water (External)	IEC 60529 / GR487	IP55 / GR487
Noise (1.5m)	dB-A	73dB-A
Operating Status	N/A	LED Indicator / Display Board
Cooling Capacity & Operational Data		
Operating Cooling Capacity	W/K	310
Operating Cooling Current	A	9.6
Operating Internal Airflow	ft^3/min (CFM)	1020
Operating External Airflow	ft^3/min (CFM)	980
Power & Range		
Input Voltage	VDC	48

Part no. :

Delta model no. : HEX310PA

Input Voltage Range	VDC	40 - 60
Rated DC Current	A	12
Alarm	N/A	Dry Contact Output
Key Components		
Controller	N/A	Built-in Smart Controller
Communication port	N/A	RS485
Fans	N/A	Delta High Efficiency Blower

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

Q: Heat dissipation (W) from inside of cabinet

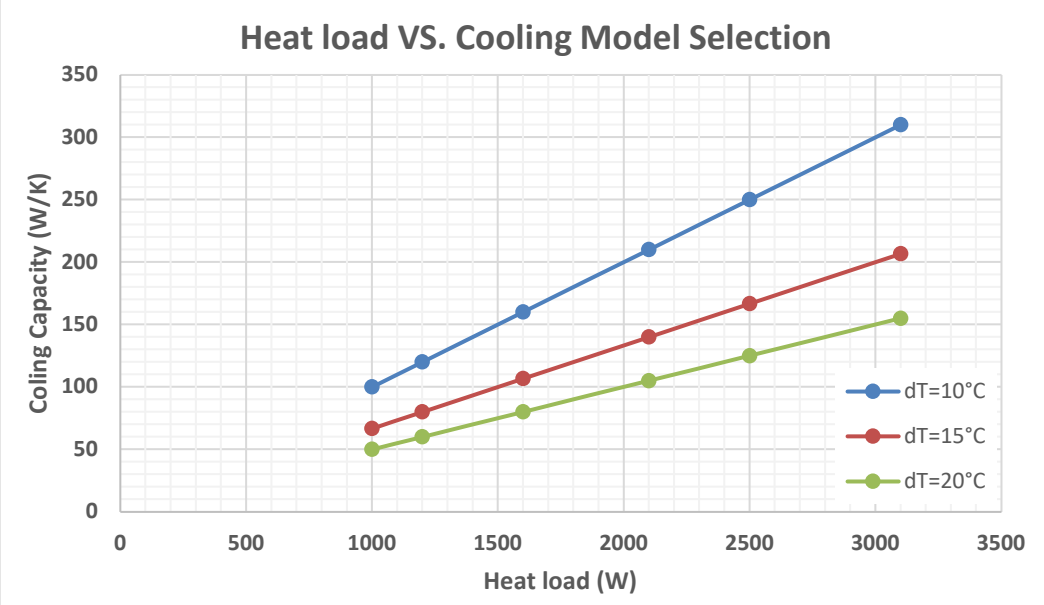
TI: Return temperature of internal air circuit (K OR °C)

TA: Ambient temperature of external air circuit (K OR °C)

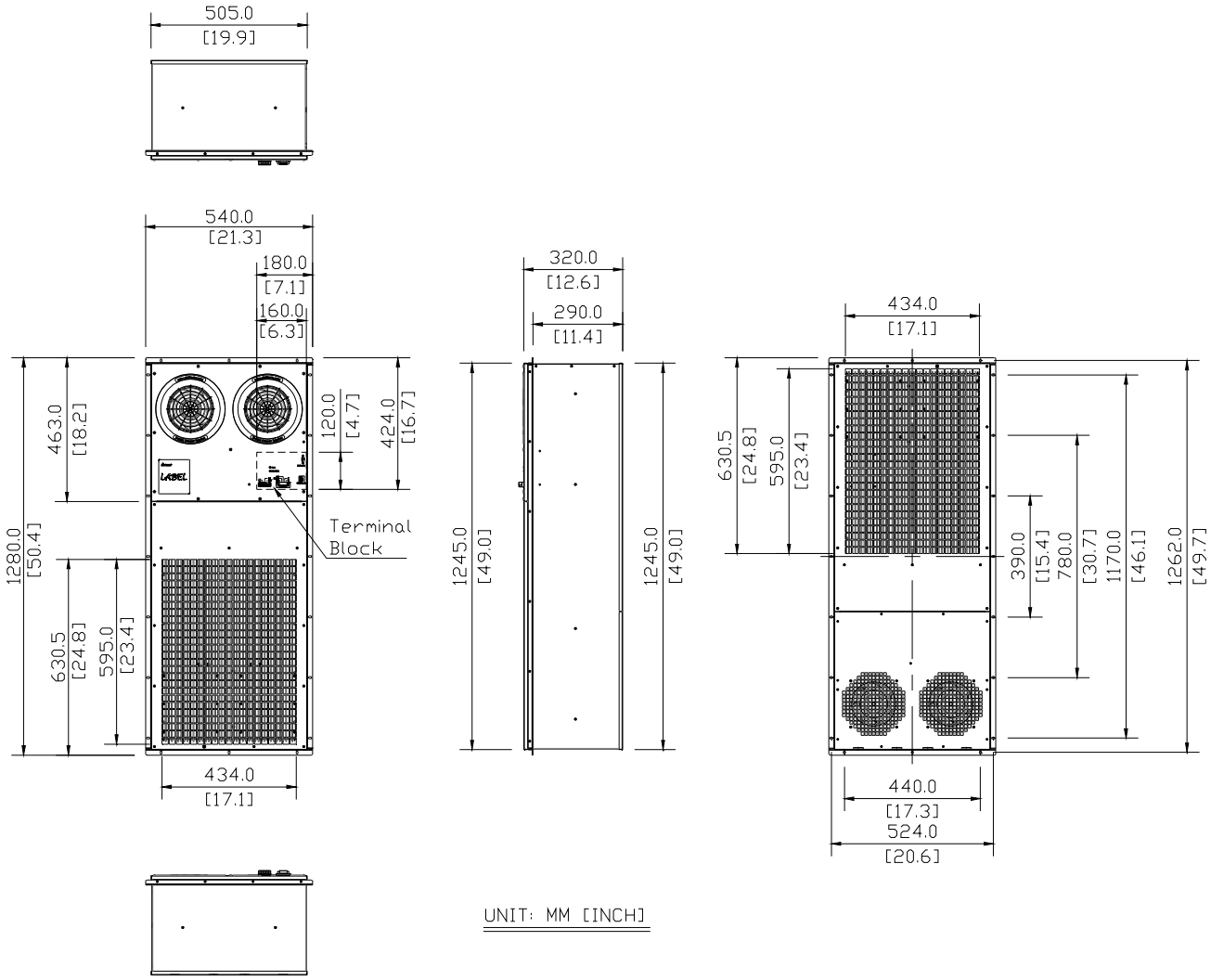
Note2: Default temperature difference, denoted as dT, is defined as dT=10°C / 15°C / 20°C, with reference to TI-TA as defined in Note 1.

X-axis: Heat load inside the cabinet in watts (W)

Y-axis: Recommended cooling capacity of the selected heat exchanger models in watts per kelvin (W/K)



1-3. Dimension

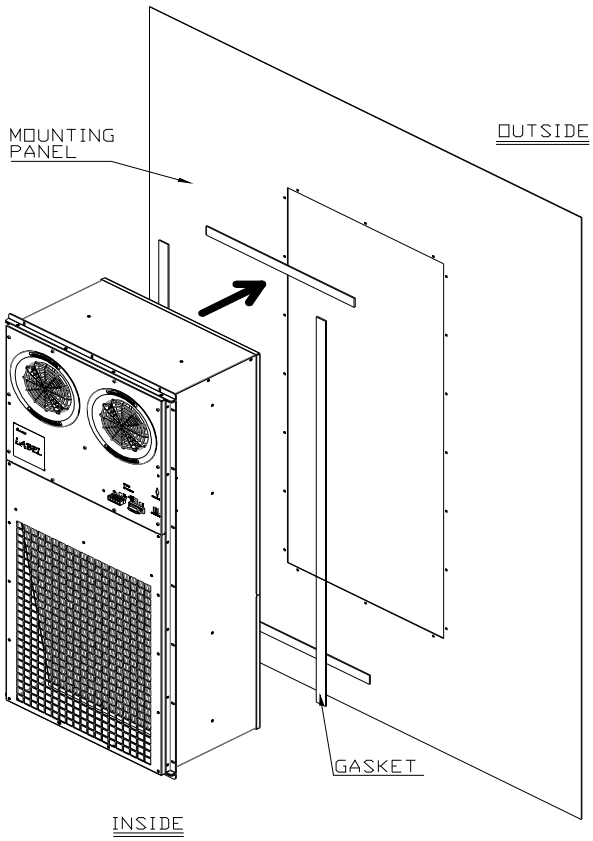


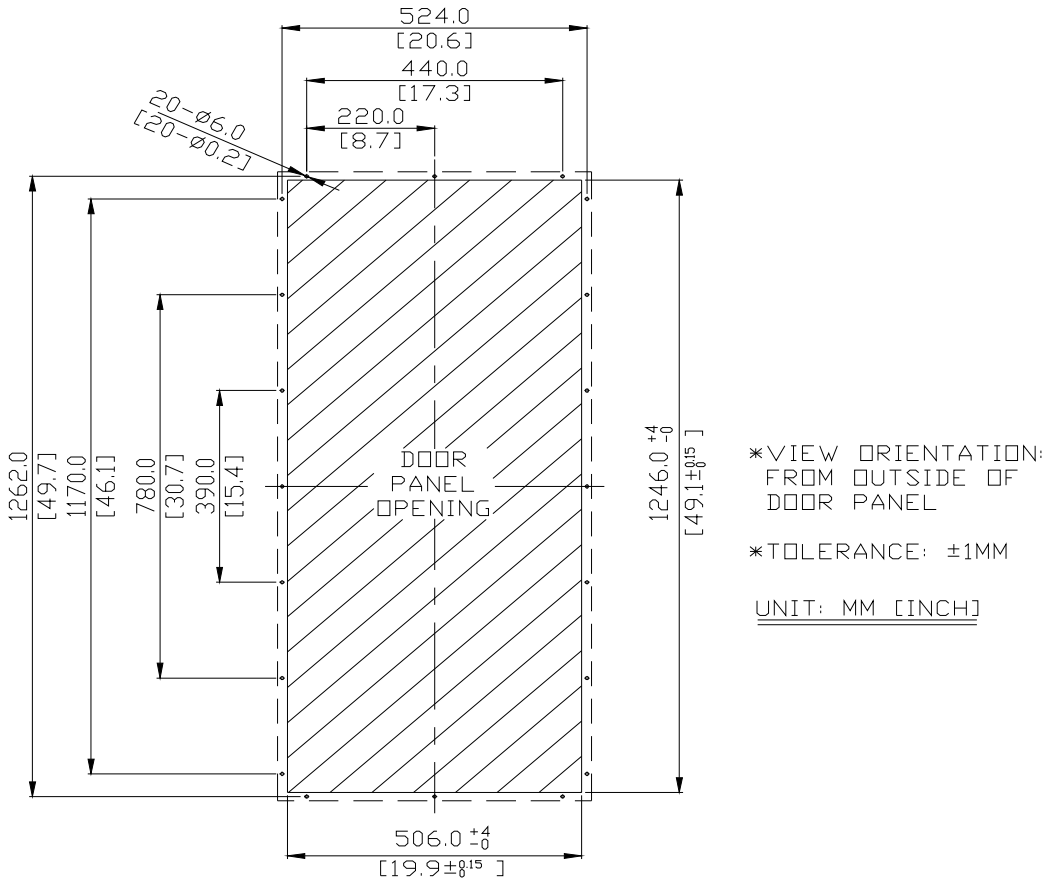
(1) Material: Case AL sheet t=1.5mm.

(2) Finish: Powder coating 75um min, Color: RAL7035

(3) Dimensional Tolerance: ± 1.0mm [0.04”]

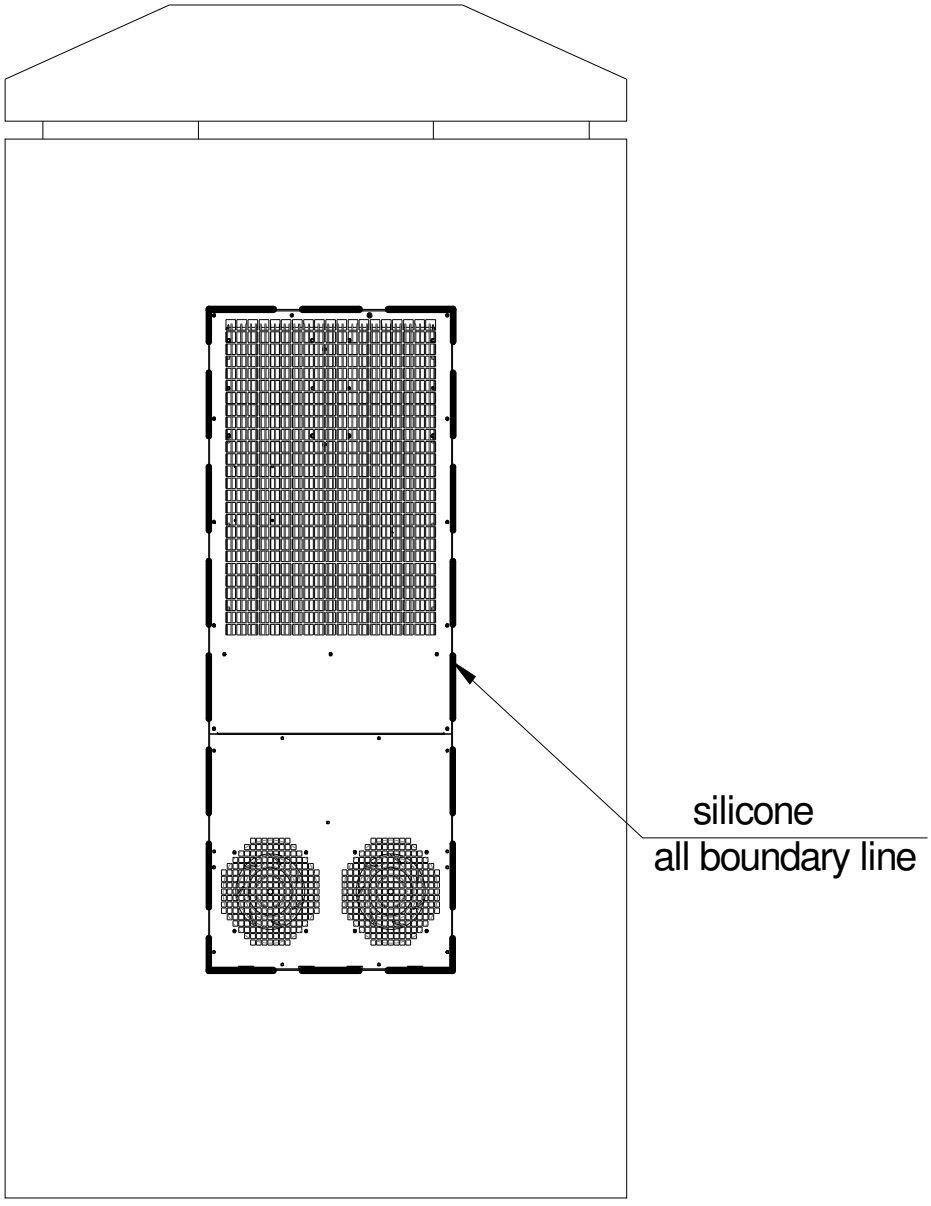
1-4. Mounting Panel Cutout





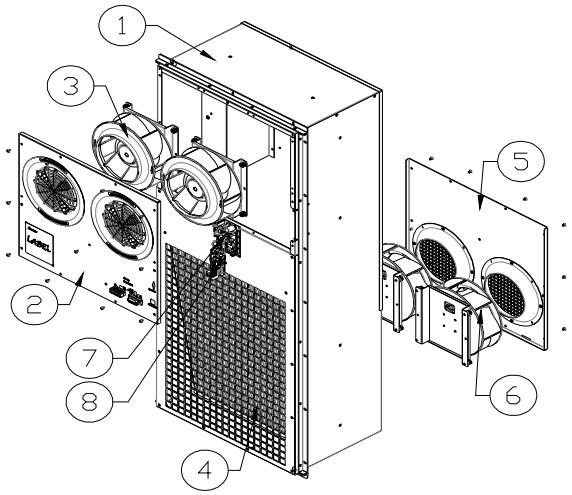
1-5. Smear waterproof layer

Take silicone to seal the gap at all boundary line of heat exchanger.



1-6. Configuration & Maintenance

Make sure the HEX 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.



NO.	Q'TY	DESCRIPTION
1	1	Case Chassis
2	1	Internal Case Cover
3	2	Internal Fans
4	1	Heat Exchange unit
5	1	External Case Cover
6	2	External Fans
7	1	Controller-1
8	1	Controller-2

In order to assure the HEX 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.

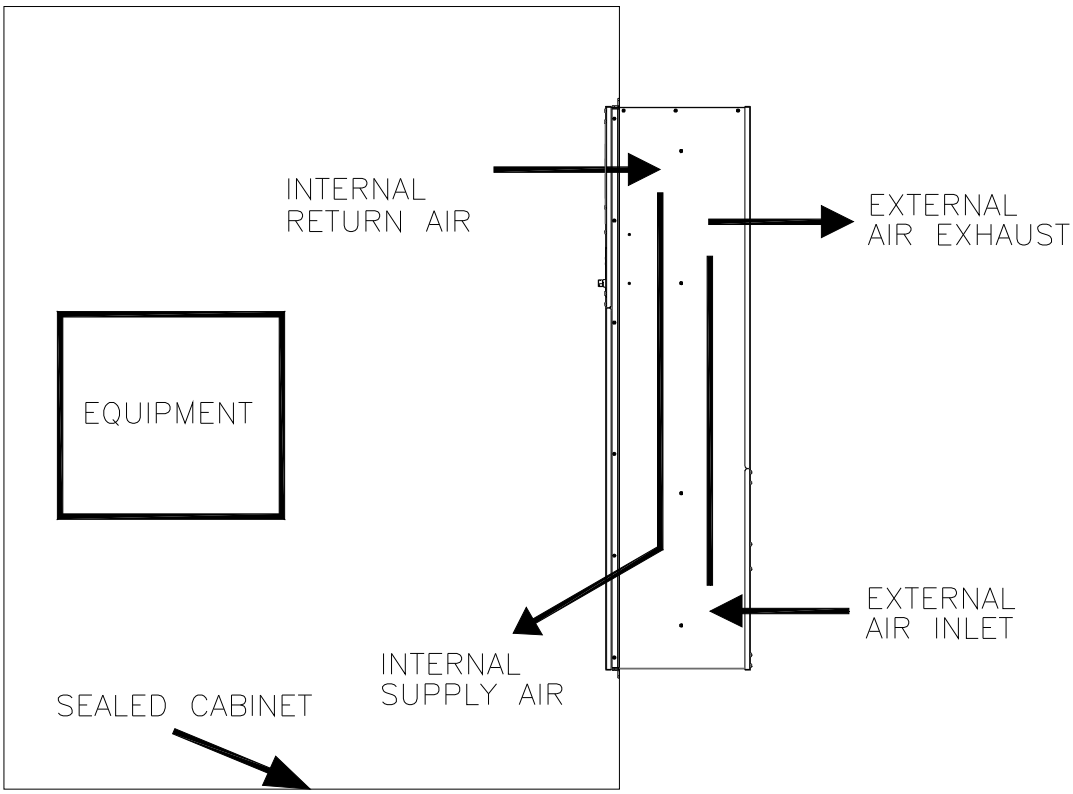
The bottom hole of the heat exchangers is used for drainage, please clear drain holes when the maintenance. Please also notice that following:

1. Check wires are connected correctly, and the insulation is not cracking or broken.
2. Do not wipe the product with organic solvent, volatile substances like toluene or gasoline, it will destroy the powder-coated surface.
3. Turn off the power before maintaining.
4. Please turn off power and remove dry contact connector while non-operating for a long time.
5. If any abnormal acoustic noise from HEX happened, please turn off the product and contact with customer services.
6. 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.

1-7. Thermal and Airflow

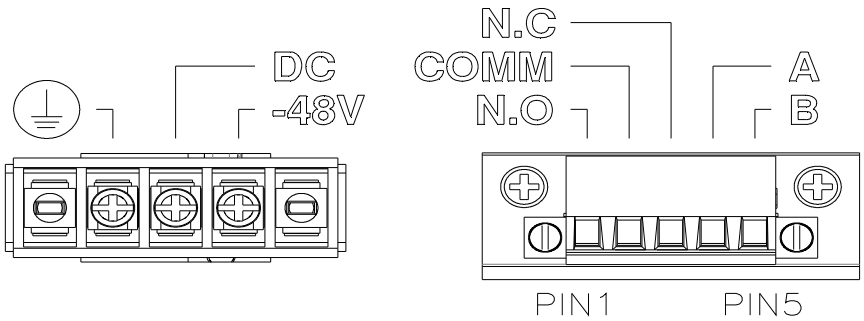
The internal and external air flow circulation is shown as the figure. Through separated mechanism design, internal and external air flow won't be mixed since the waste heat can be dissipated from the cabinet to the ambience. Internal temperature sensor is placed at return air stream to provide reliable temperature measurement and safety of operation.

The waste heat generated from the internal equipment will be absorbed by the refrigerant through the evaporator and dissipate to the ambience by the condenser of external side.



2. Electrical specification

2-1. Indicator & Connector (HEX panel side)



- The power and signal connector should be connected correctly to avoid product damage.
- Dry contact : (contact max. rating : 30VDC/1A)

	Normal open	Normal close
Connection	Pin 1 & Pin 2	Pin 2 & Pin 3
Control board, NTC and fan are in normal status	OPEN	CLOSE
Power-off or control board is disabled	CLOSE	OPEN
NTC resistance is over range such as “open circuit” or “short circuit” or Inner temperature alarm (>65°C or <-11°C)	CLOSE	OPEN
Fan speed is lower than 50% of definition or fan locked	CLOSE	OPEN

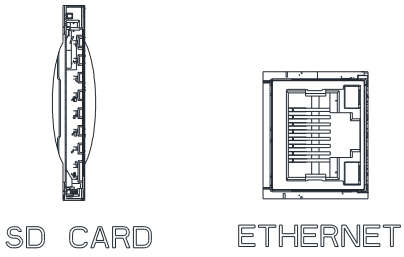
➢ **LED indicator:**

◎ FAN

◎ SENSOR

	FAN	TEMP
Fan normal, NTC normal and NTC sensor under 65°C	Green	Green
Fan fail	Red	Green
NTC fail or Inner temperature alarm (>65°C or <-11°C)	Green	Blanking Red
Fan fail and NTC fail or Inner temperature alarm (>65°C or <-11°C)	Red	Blanking Red

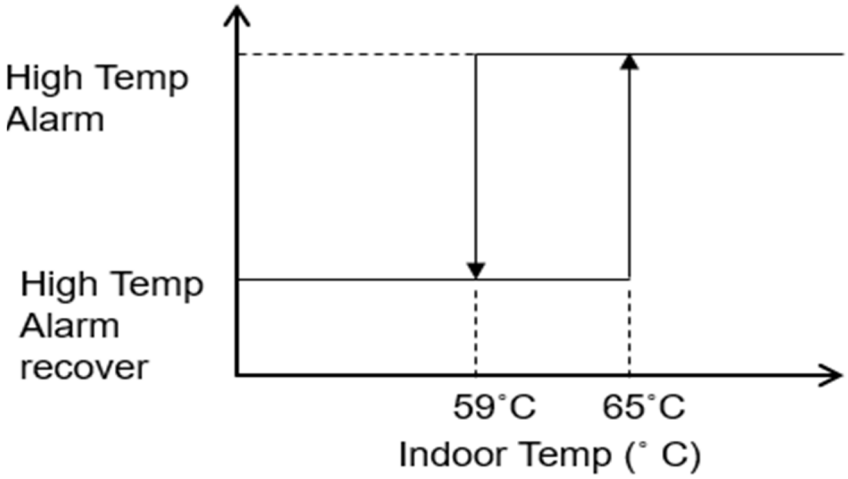
- **SD card & Ethernet:**



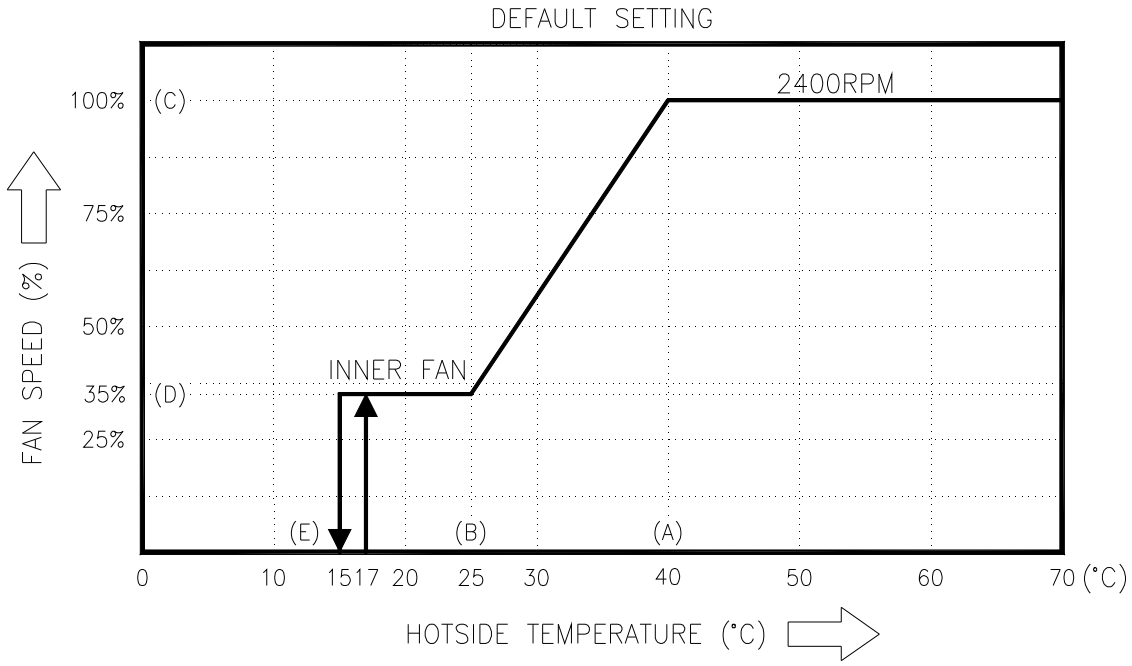
The controller used communication technology to remotely control, monitor, SD card 8 GB for logging data and alarm the cooling and heating functions of the HEX. This can be done using a RJ45 or RS485 connected to an industrial network or a personal computer (PC) connected to an Internal local area network.

2-2. Standalone control mode

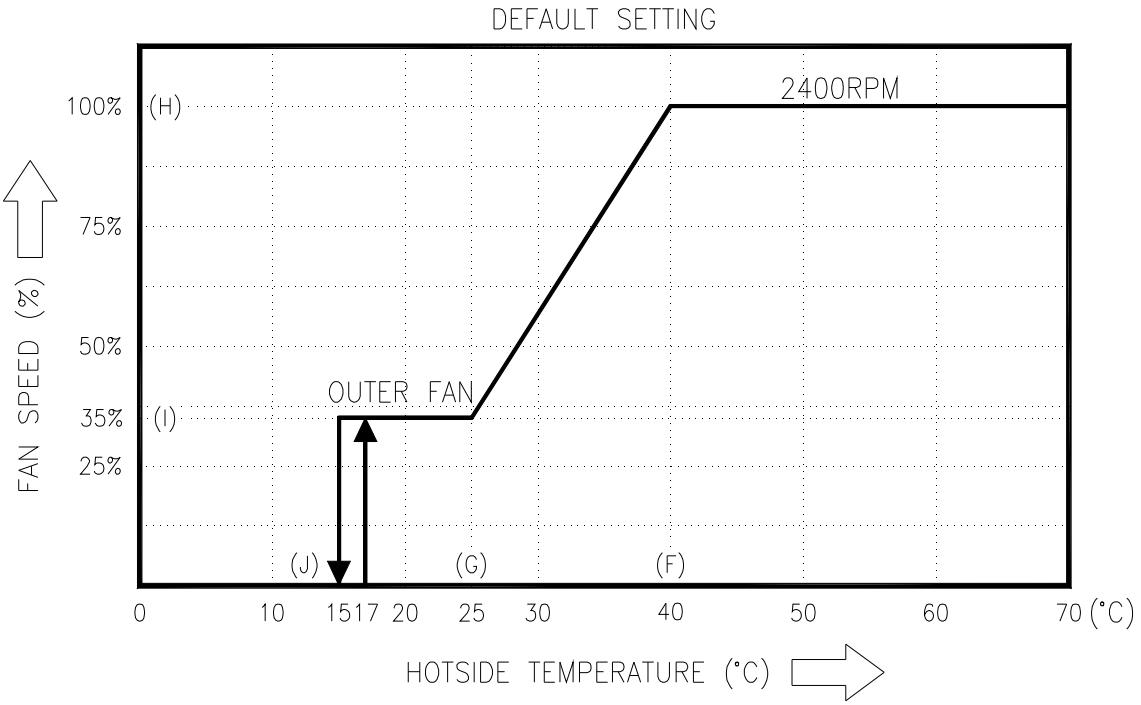
HEX can detect temperature inside of cabinet to control cooling



2-3. Fan speed V.S Temperature Curve



Inner fan speed V.S.Temperature



Outer fan speed V.S.Temperature

2-3. Parameters table

No.	System Parameter	Current Setting	Range
A.	Inner Fan High Speed Temp.	40°C	40°C ~ 60°C
B.	Inner Fan Low Speed Temp.	25°C	20°C ~ 30°C
C.	Inner Fan High Speed Duty	100%	60% ~ 100%
D.	Inner Fan Low Speed Duty	35%	20%~ 55 %
E.	Inner Fan OFF Temp.	15°C	10°C ~ 15°C
F.	Outer Fan High Speed Temp.	40°C	40°C ~ 60°C
G.	Outer Fan Low Speed Temp.	25°C	20°C ~ 30°C
H.	Outer Fan High Speed Duty	100%	60% ~ 100%
I.	Outer Fan Low Speed Duty	35%	20% ~ 55%
J.	Outer Fan OFF Temp.	15°C	10°C ~ 15°C
K.	Tin High Temp. (Alarm)	65°C	40°C ~ 70°C
L.	Tin Low Temp. (Alarm)	-11°C	-20°C ~ 0°C
M.	SD Card Logging Interval	5 Min.	1 ~ 20 Min.
N.	Recover Default Value	N/A	N/A

3. Environmental condition

3-1. Operating temperature

-25°C ~ +70°C (-13°F ~ +158°F)

3-2. Storage temperature

-40°C ~ +70°C (-40°F ~ 158°F)

3-3. Operation Humidity

External air loop: 0 ~ 100% RH

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

3-4. Ingress Protection rating

IEC60529 IP55 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

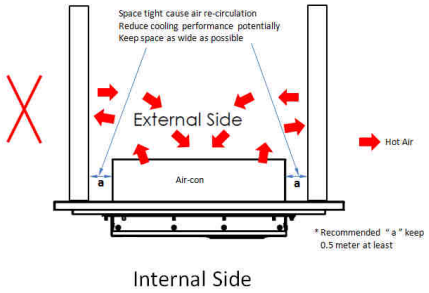
Test item	CONDITION
High temperature	IEC 60068-2-2
Low temperature	IEC 60068-2-1
High temp. / High humidity	IEC 60068-2-14 TEST Nb
Temperature cycle	IEC 60068-2-3
Vibration	ETSI 300 019-1-4 CLASS 4.1
Ingress protection (External side)	IEC60529 IP55
Package bump	IEC 60068-2-29

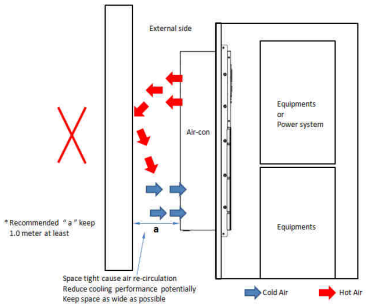
5. Safety Certification

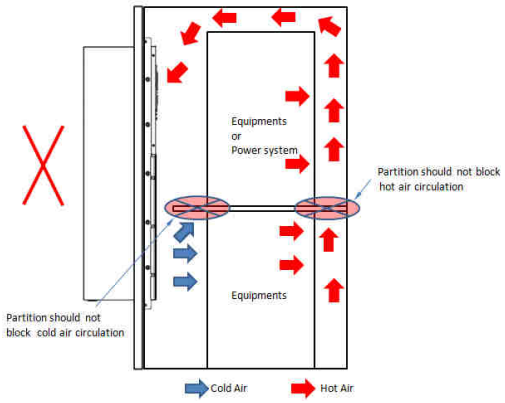
NA

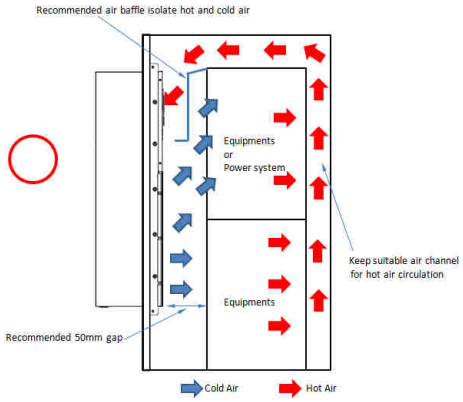
6. Installation Notice

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









7. 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.

8. Versions

REV.	DESCRIPTION	DRAWN	CHECKED			APPROVED	ISSUE DATE
			ME	EE	CE		
00	ISSUE SPEC	Nick Wang	Nick Wang	Allen Hung	---	Gavin Chen	05/22/20
01	Update the air volume value	Nick Wang	Nick Wang	Allen Hung	---	Gavin Chen	10/30/23