AFAN-02
AFAN-04

1U Universal Cooling Fan

User Manual

Version 1.00

Warranty

All products manufactured by ICP DAS are under warranty regarding defective materials for a period of one year, beginning from the date of delivery to the original purchaser.

Warning!

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Contents

1. Introduction

AFAN-02 / AFAN-04 is a 1U general-purpose fan module developed by ICP DAS. It is designed with many advantages for the thermal management of computer room or industrial equipment. The main features are included as below.

[1] Fan Modules: AFAN-02 / AFAN04 equips with 2/4 fan modules separately and provides active air convection, which effectively reduces the operating temperature of the equipment and improves the stability and safety of the system.

[2] Power supply and protection: $24V_{DC}$ power supply with built-in 5A fuse overvoltage protection to ensure the safety of equipment operation.

[3] Monitoring and Alarm: Built-in fan fault indicator and DO Relay alarm output allow users to monitor the fan operation status through the remote monitoring center's DI connector, which helps to detect and handle fan faults in time to avoid system damage due to overheating.

[4] Hot-swappable support: Supports hot-swappable replacement of fan modules in case of failure without shutting down the system, which further improves system maintenance efficiency.

[5] Installation Compatibility: AFAN-04 is compatible with EIA RS-310-C standard, it can be installed in 19" racks, which is in line with the installation specification of general equipment in the server room.

In summary, the AFAN-02/04 is a high-performance, easy-to-maintain fan module with a variety of protection features, suitable for use in a wide range of equipment and systems that require stable heat dissipation.

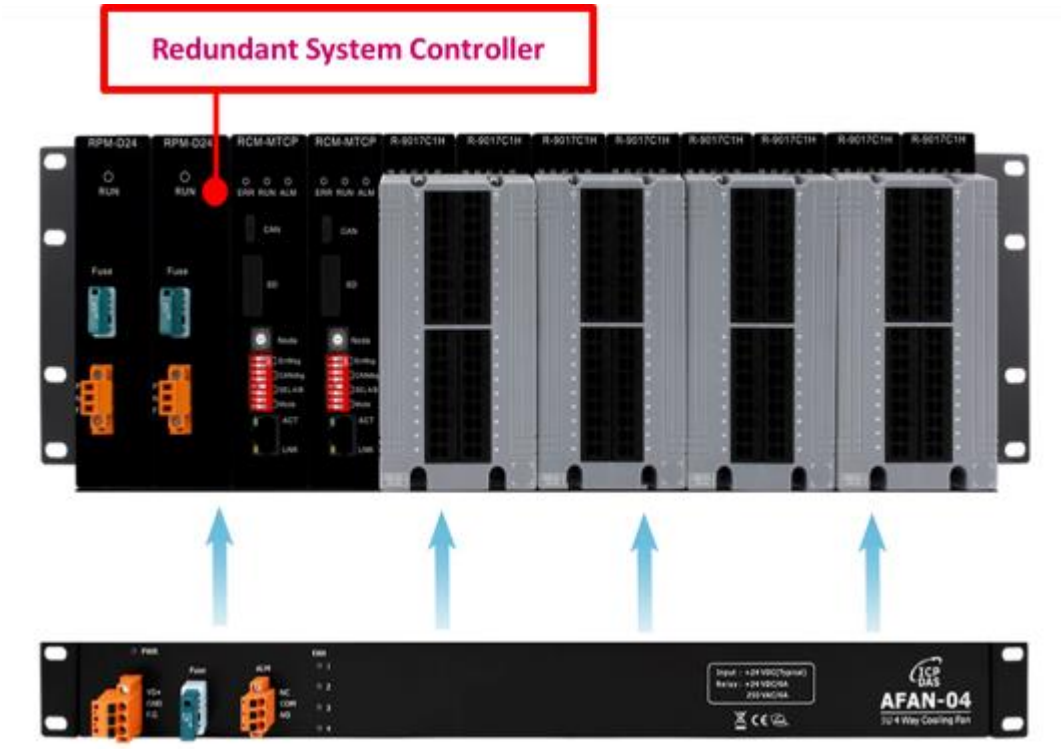


Fig 1-1：AFAN02/04 Application

1.1 Features

- Fan Module : AFAN-02/04 equips 2/4 fan modules respectively (hot-swap).
- Diagnostic Functions :
  - Individual fault LED for each fan.
  - DO Relay alarm output for any fan failure or power loss.
- Failure of any fan does not affect others.
- Overvoltage protection (5A fuse).
- Installation of AFAN-04 is compatible with EIA RS-310-C 19" rack mounting.

2. Specifications

2.1. System Specifications

Modules	AFAN-02	AFAN-04
LED Indicators		
Power Status (Normal : Light up)	1 power status LED	
Fan Status (Error : Light up)	2 fan status LED	4 fan status LED
Diagnosis		
Alarm Mechanism	Relay * 1 (6 A @ 30 V_{DC}) (alarm output when any fan failure or power loss)	
Relay Rating		
Contact material	$AgSnO_2$,AgNi	
Contact rating (Res. load)	6A 250 V_{AC} /30 V_{DC}	
Operate time (at nomi. volt.)	≦8ms	
Release time (at nomi. volt.)	≦4ms	
Electrical endurance	3 x 10^4 OPS (Test Conditions : Resistive load, 85℃, 1s on, 9s off)	
Mechanical endurance	1 x 10^7 OPS	
EMS Protection		
ESD (IEC 61000-4-2)	±4 kV Contact, ±8 kV On Air	
EFT (IEC 61000-4-4)	±1 kV for power line	
Surge (IEC 61000-4-5)	±1 kV for power line	
Power Requirements		
Rated Voltage	24 V_{DC}±10%	
Power Dissipation	5.76W (0.24A @ 24 V_{DC})	7.2W (0.3A @ 24 V_{DC})
Connector	3-pin screw terminal	
Protection		
Overvoltage Protection	5A Fuse ($6.3A^2 \cdot s$)	
Mechanical		
Dimensions (W x L x H)	299 x 144 x 45 mm	480 x 131 x 45 mm
Installation	Wall-mounted	
Environment		
Operating Temperature	-10℃ ~ +70℃	
Storage Temperature	-30℃ ~ +80℃	
Humidity	10 to 90% RH, Non-condensing	

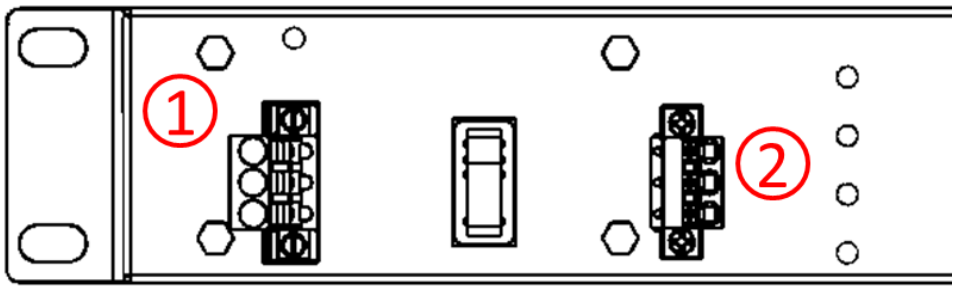
2.2. Fan Module Specifications

MECHANICAL CHARACTERISTIC	
MOTOR DESIGN	Brushless DC motor
BEARING	2 ball
MATERIALS OF FRAME	Thermoplastic PBT of UL 94V-0
MATERIALS OF FAN BLADE	Thermoplastic PBT of UL 94V-0
DIRECTION OF ROTATION	Counter-clockwise viewed from front of fan blade
MOUNTING HOLES	Diameter 4.3 mm in 8 holes
WEIGHT	75 g
ELECTRIC CHARACTERISTIC	
RATED VOLTAGE	+24 V_{DC}
RATED CURRENT	36 mA / Max. 45mA
RATED POWER CONSUMPTION	0.89 WATTS / Max. 1.08 WATTS
OPERATING VOLTAGE RANGE	8~27.6 V_{DC}
STARTING VOLTAGE	8 V_{DC} (25 °C Power On/Off)
OPERATING TEMPERATURE RANGE	-10~70°C
STORAGE TEMPERATURE RANGE	-40~80°C
RATED SPEED	2600 RPM ±15% at rated voltage
AIR FLOW	33 CFM
STATIC PRESSURE	0.11 Inch-H2O
ACOUSTIC NOISE	28 dB(A)
INSULATION CLASS	UL Class A
INSULAITON RESISTANCE (PLASTIC HOUSING)	10M ohm at 500 V_{DC} for one minute or AC 600V for 2 Seconds between housing and lead wire(+)
MTBF	70K (hours @ 40°C, 65% humidity, 90% CL.)
PROTECTION	Automatic Restart, Polarity Protection

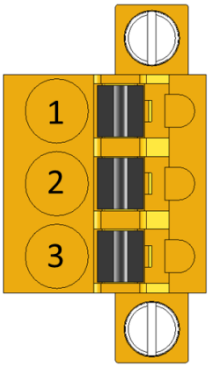
SAFETY				
Safety	UL	CUR	TUV	CE
No.	E77551	E77551	V	V

Note: This hardware specification is only for one fan module. AFAN-04 can support Max. 4 fan module.

2.3. Pin Assignments



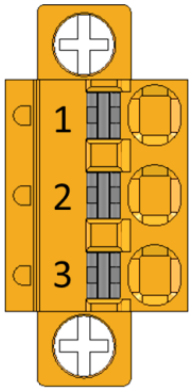
1. **Power Input :**



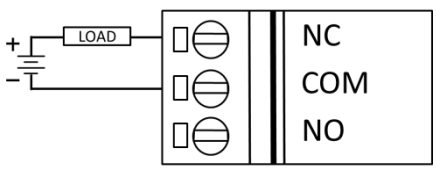
Pin	Description
1	24 V_{DC}±10%
2	24 V_GND
3	F.G

2. **DO Relay Output :**

[1] Relay COM and NC will turn on when any fan module fails.
[2] To remotely obtain the status of the fan module, please connect the COM and NC of the relay to the DI module channel (the circuit needs to be wired by users), when the DI channel lights up, it indicates that the fan module is abnormal.

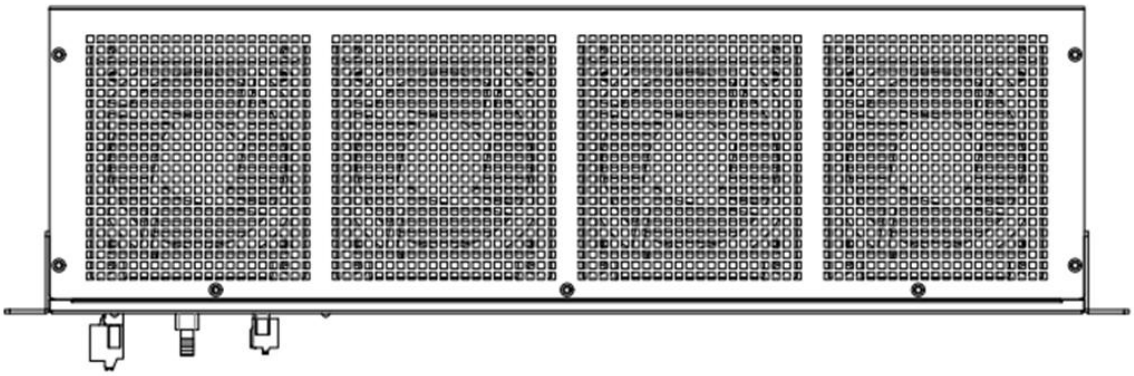


Pin	Description
1	Relay output : NC.
2	Relay output : COM
3	Relay output : NO.
Form C, 6A	

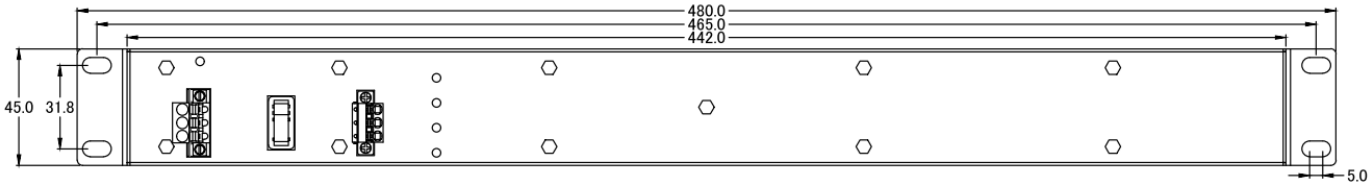
Output Type	DRY Contact
Resistance Load	

3. Dimensions

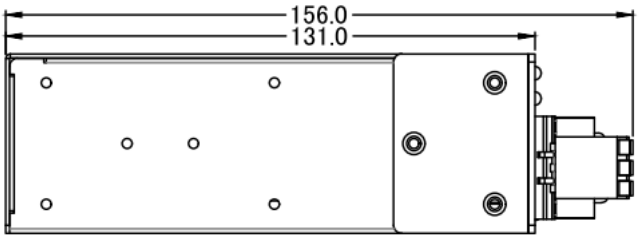
[AFAN-04] (Unit:mm)



Top View

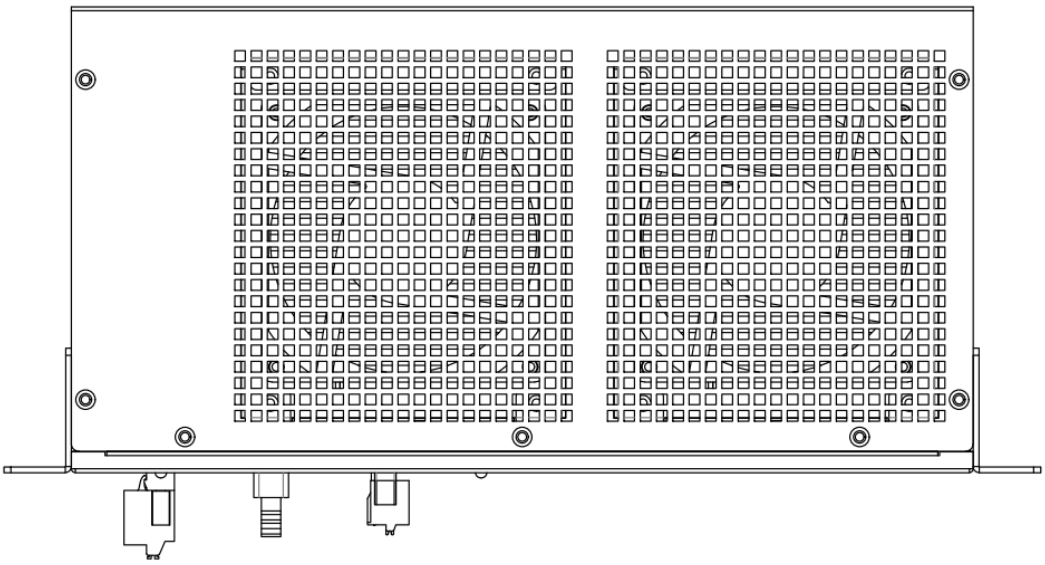


Front View

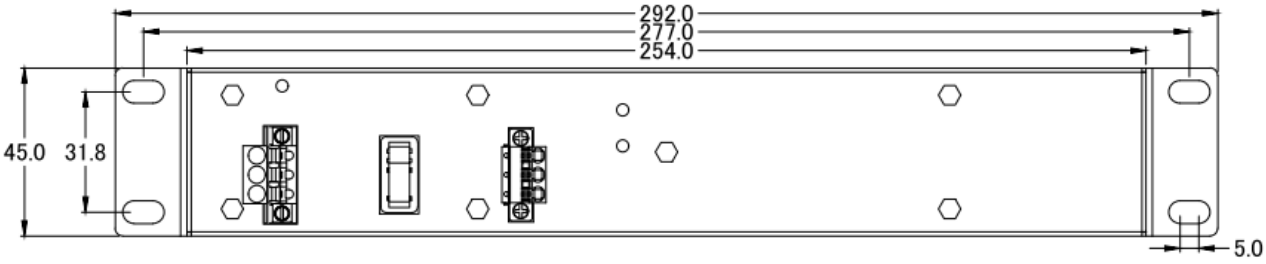


Left Side View

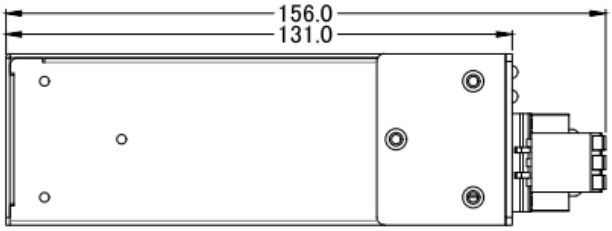
[AFAN-02] (Unit:mm)



Top View



Front View



Left Side View

4. Installation

[1] Use a screwdriver and M6 screws to install AFAN-02/04 on the cabinet

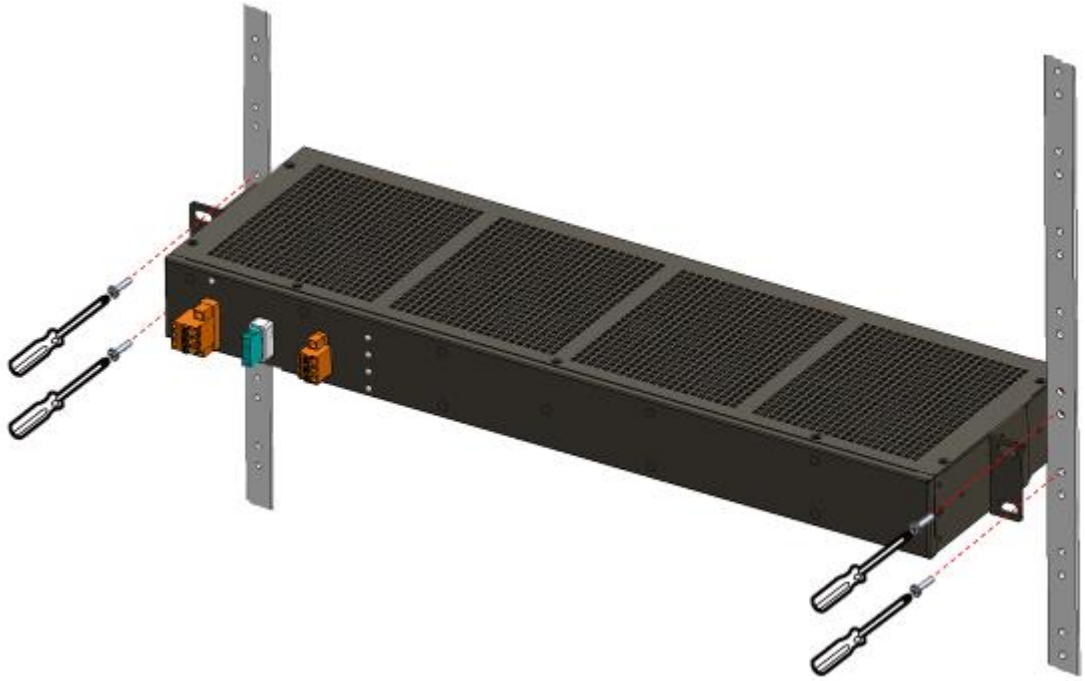


Fig. 4-1

[2] Installation Example.

Fig. 4-2

5. FAQ

Q01：How to replace the defective fan ?

A01：(2024/08/29)

1. **Confirm the defective fan number:**

   [1] Confirm the defective fan number by the LED of FAN on the panel (Fig. 5-1-1). (Red light on means the corresponding fan is broken.)。

   [2] The fan number is shown in Fig. 5-1-2.

Fig. 5-1-1

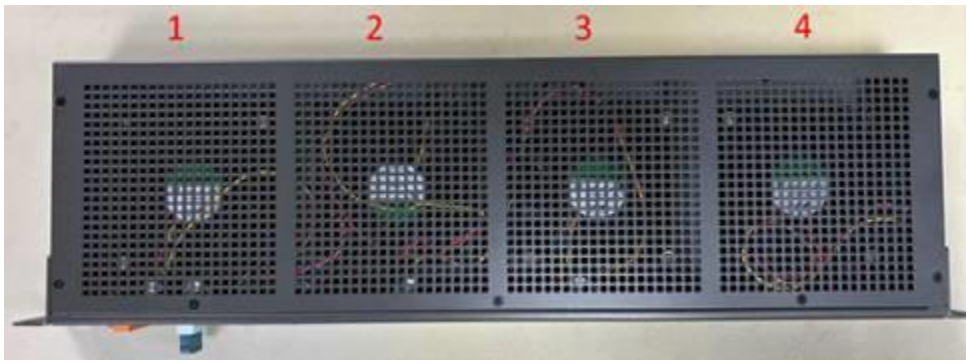


Fig. 5-1-2

2. Remove the defective fan**:**

[1] Switch off the fan and remove the 4 fan fixing screws (Fig. 5-1-3).

[2] Remove the defective fan (Fig. 5-1-4).

[3] Unplug the defective fan (Fig. 5-1-5).

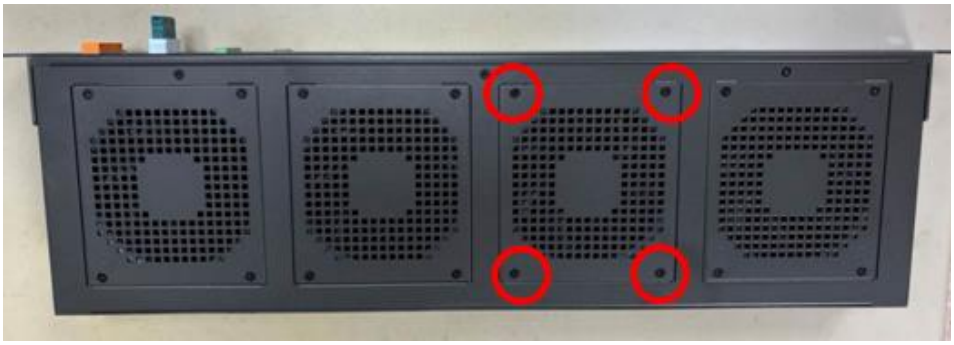


圖 5-1-3

Fig. 5-1-4

Fig. 5-1-5

3. Replace the normal fan**:**

[1] Remove the 4 metal plate screws and take out the defective fan (Fig. 5-1-6).

[2] Install the normal fan to the metal plate and lock the 4 screws (Fig. 5-1-7).

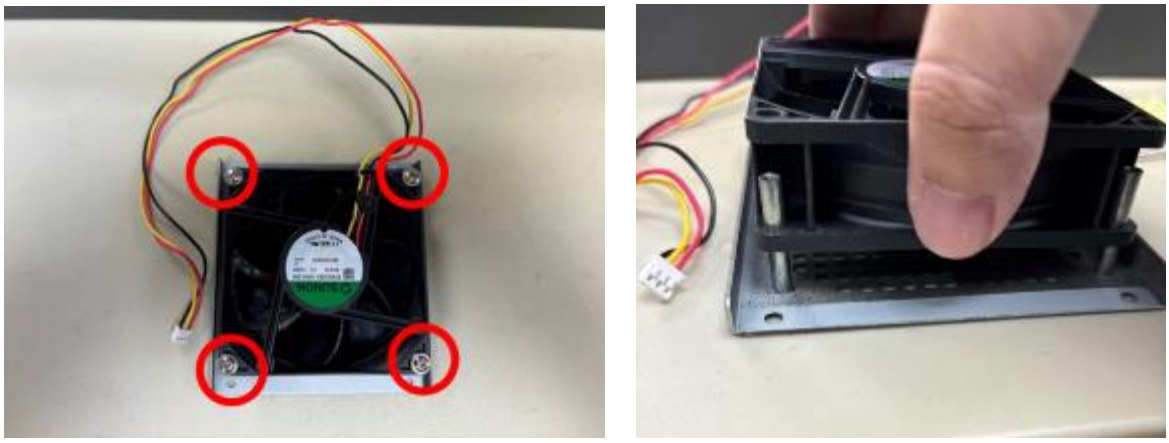


Fig. 5-1-6

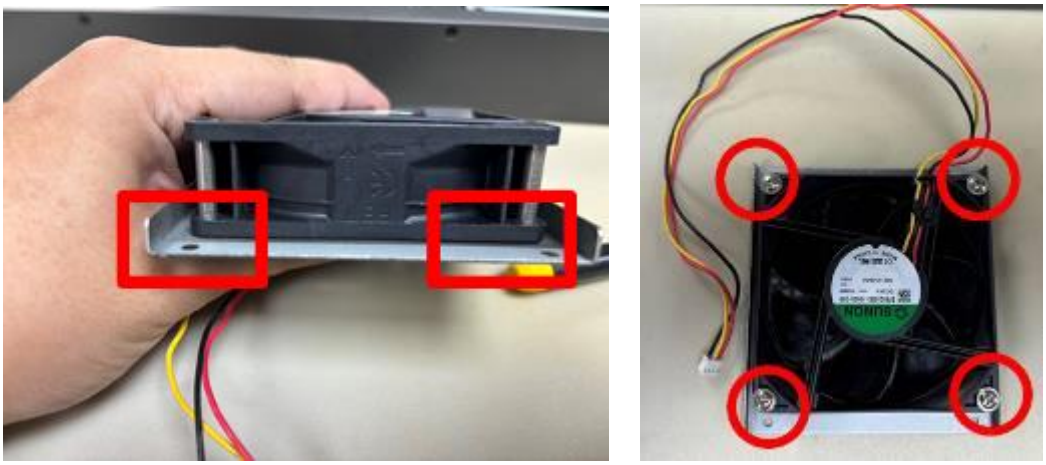


Fig. 5-1-7

4. Mount the fan to the AFAN**:**

[1] Plug in the fan's power plug (Fig. 5-1-8).

[2] Mount the fan to the AFAN and lock the 4 fan fixing screws (Fig. 5-1-9).

[3] Replacement is complete.

Fig. 5-1-8

Fig. 5-1-9

6. Revision History

Revision	Date	Description of Change
1.00	2024/08/29	Document release.