![auradine logo]

Teraflux™ Miner

Hardware Reference

Air-cooled: AT1500 | AT2870 | AT2880

Single-phase Immersion: AI2500 | AI3680

Contact Information

Corporate Headquarters

Auradine

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Table of Contents

1.   Overview

This Hardware Reference Manual provides the information necessary for users to effectively use the Auradine Teraflux™ Bitcoin miners.

The Teraflux portfolio of high performance, hardware-based Bitcoin miners feature:

- Rapid demand response—EnergyTune™ unique, patent pending technology

- Superior uptimes & total cost of ownership (TCO)—wider temperature operating range and higher quality

- FluxVision™ & APIs with Mining Pool Configuration—both on-device and cloud-based management interfaces, and APIs for managing and monitoring miners

- Fleet management ecosystem partnerships with Foreman and Awesome Miner

- US-based supplier to diversify the supply chain and mitigate geopolitical risk

- Air-cooled AT1500 | AT2870 | AT2880, Single-phase Immersion AI2500 | AI3680, each presenting distinct performance and cooling configurations for your deployment requirements.

2. Get Started

2.1 Shipment Contents

Unpack the contents of the box and verify that you received the following items:

Note: Power cords will ship separately from the miner, if ordered.

Number	Content
1	Teraflux Miner (AT1500, AT2870, AT2880, AI2500 or AI3680)

2.2 Front Panel Overview

1   Ethernet port (10/100/1000 Mbps) that enables communication with the miner.

2   SD Card slot. SD Card required for AT1500 and AI2500, optional on AT2870, AT2880, and AI3680.

3   Status LEDs.   Alarm (top, LED2 in API) and Status (bottom, LED1 in API)

4   Reset button (recessed). This is a factory reset.

5   IP Report button that broadcasts the IP address of the miner

6   Fan connectors (front, intake AT1500 | AT2870 | AT2880 only has fans installed)

Note: (AT1500 | AT2870 | AT2880 only) Fans 1 & 2 are intake (front), and fans 3 & 4 (rear) are exhaust.

Teraflux Air-Cooled Miners Front View

AT1500 | AT2870 | AT2880 front view
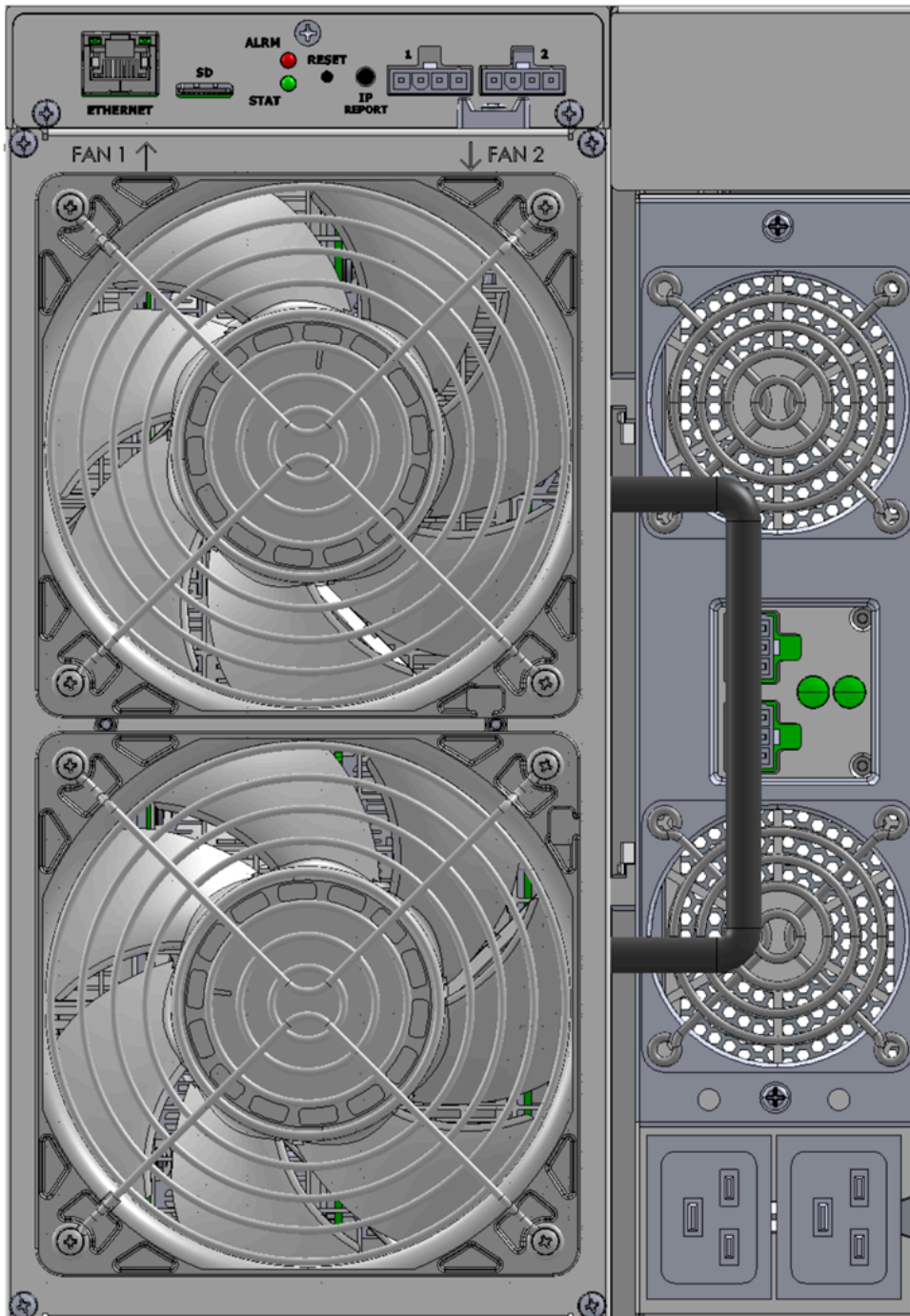
Teraflux Air-Cooled Miners Rear View

AT1500 | AT2870 |AT2880 rear view

Teraflux Single-Phase Immersion Front View

AI2500/AI3680 front view

Teraflux Single-Phase Immersion Rear View

AI2500/AI3680 rear view

2.3   Install

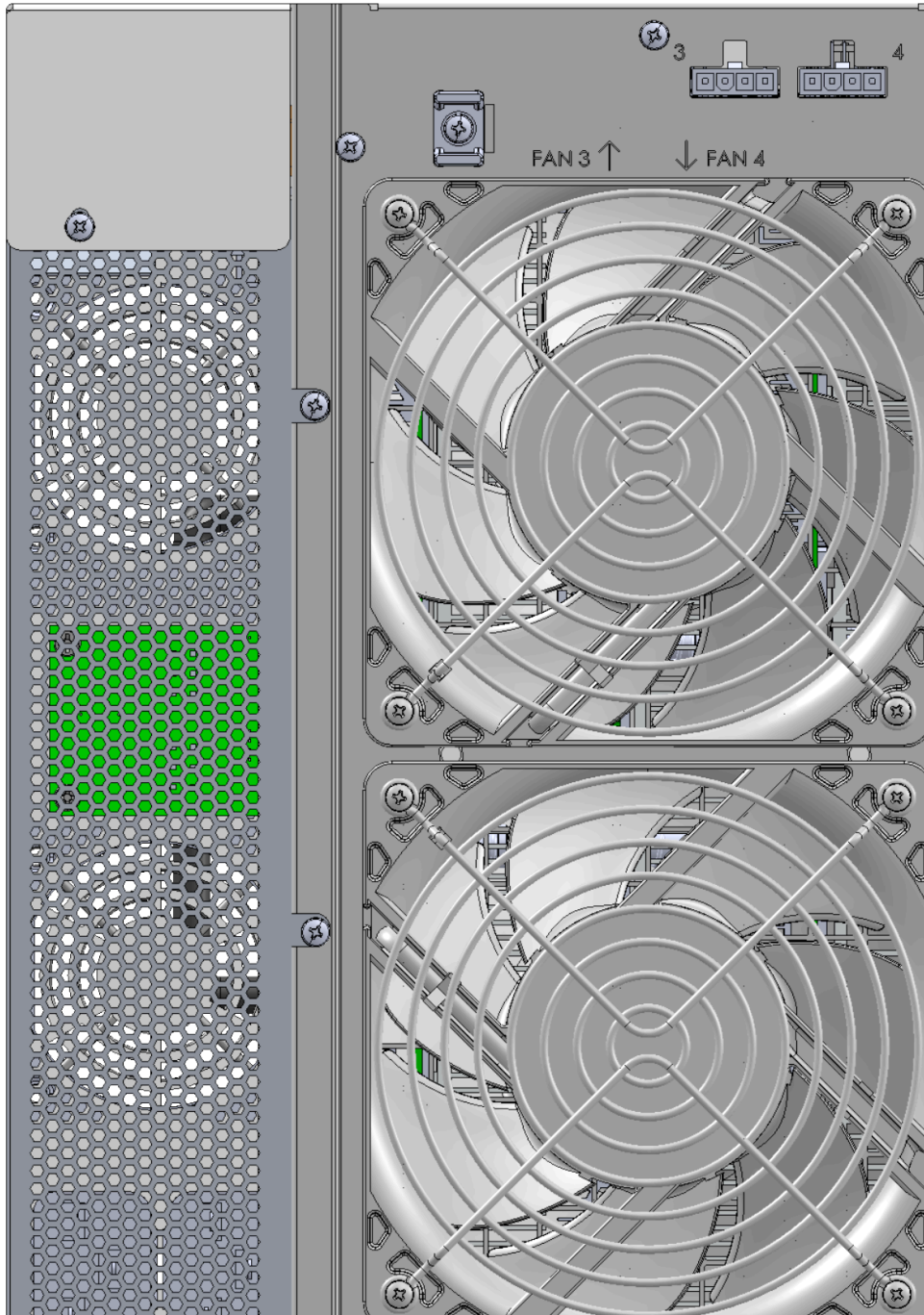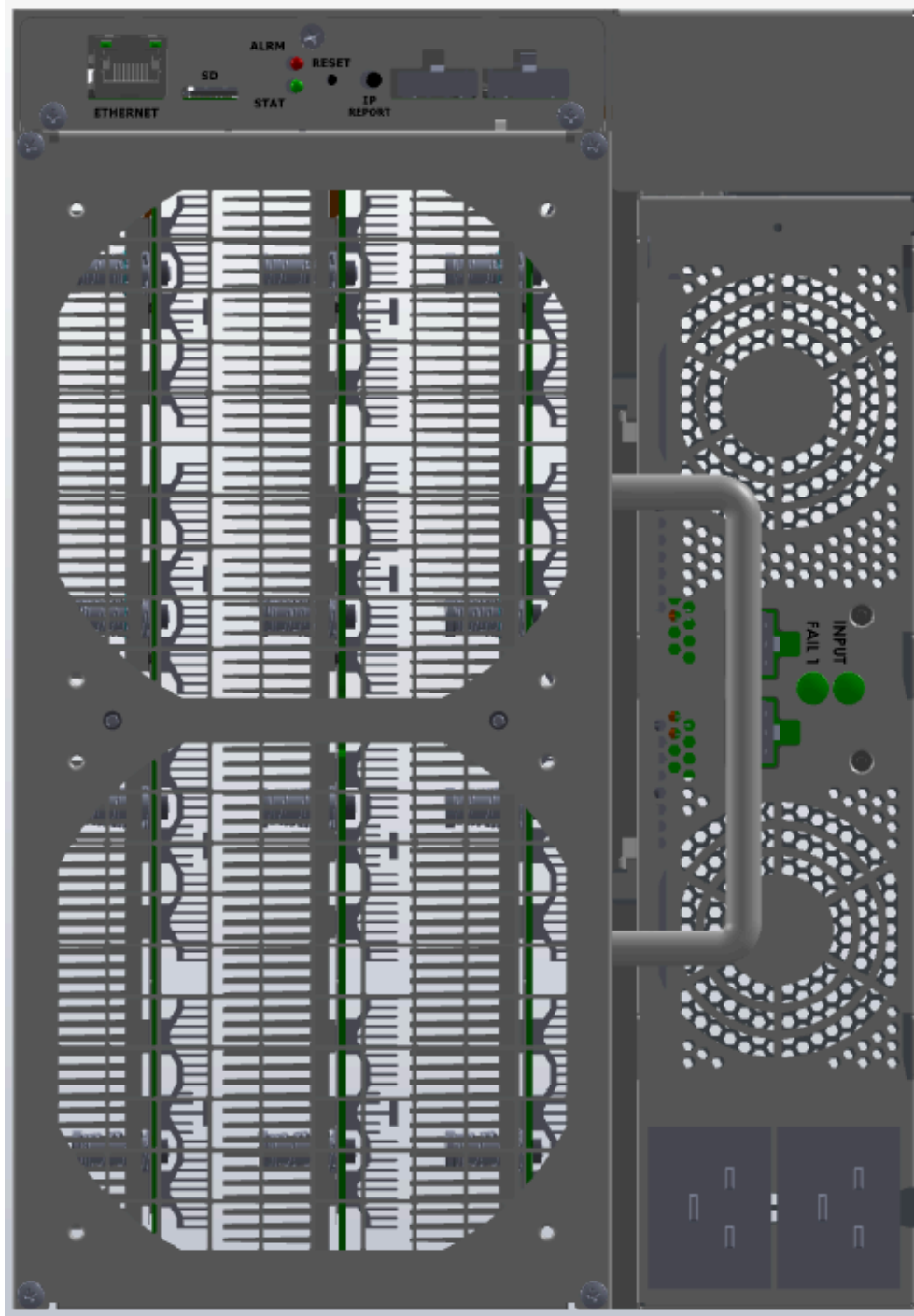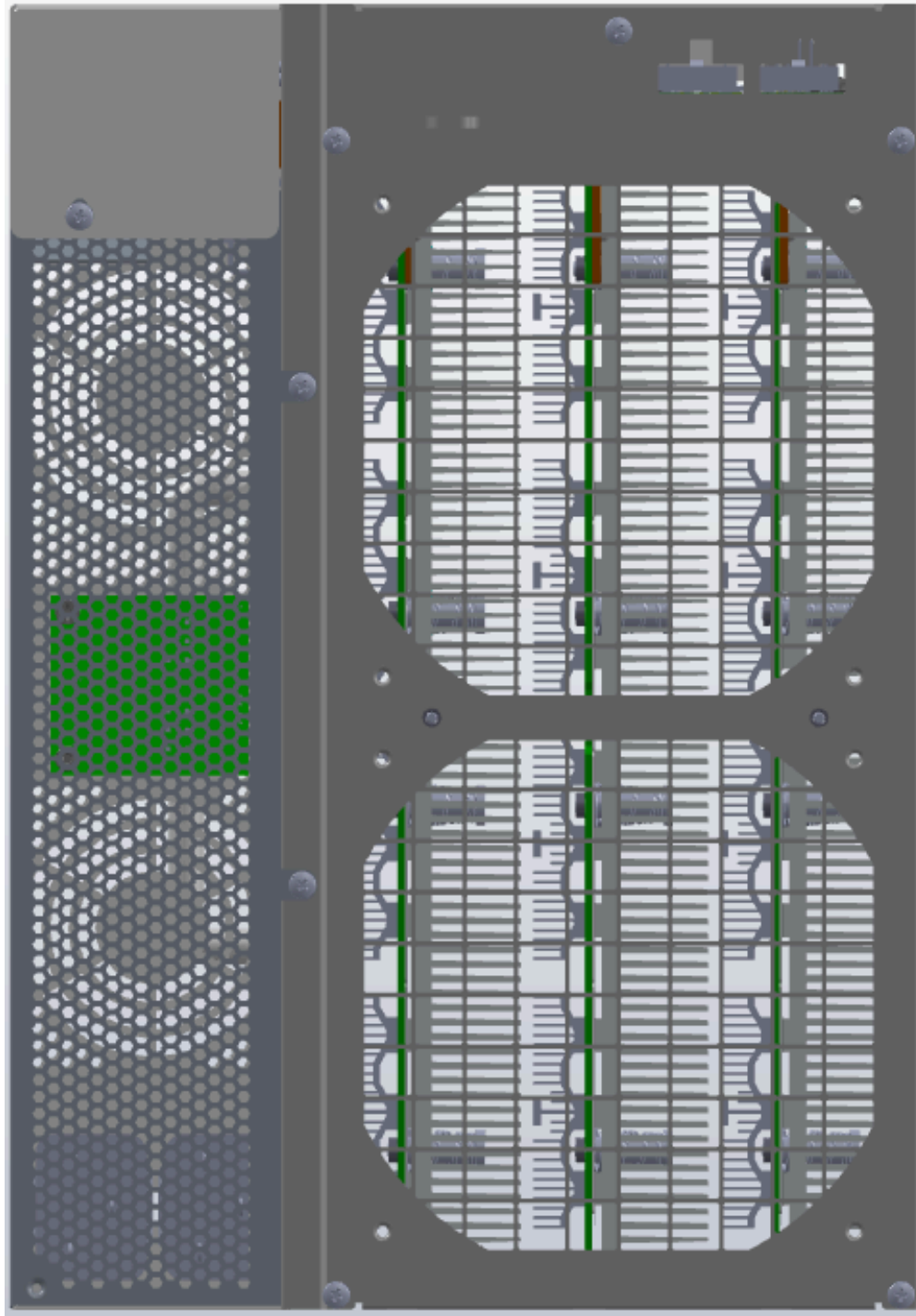The AT1500 | AT2870 | AT2880 miner is designed to be placed on a flat and sufficiently strong shelf in a datacenter or other suitable mining environment. In a mining farm, the AT1500 | AT2870 | AT2880 units can be arranged side by side without the need for any spacing between them.

Notes on deployment:

- The AT1500 | AT2870 | AT2880 weighs 38.6-42.5 lbs / 17.5-19.3 Kg
- Airflow is front to back, do not block either intake or exhaust (AT1500 | AT2870 | AT2880 only)
- "-240V" miners require 2 x 20 amp service to operate at full performance. "-277V" miners require a single 20 or 30 Amp service, depending on model.
- Miner should be installed in a suitable single-phase immersion tank with suitable fluid and cooling infrastructure in place. This infrastructure is the responsibility of the user (AI2500/AI3680 only)

2.4   Power On

The number of power inputs varies by model:

- AT1500/AI2500 Miner: 2
- AT2870/AT2880 Miner: 1 or 2 (optional)
- AI3680 Miner: 1 or 2 (optional)

Before you connect power, review the model Electrical Specifications to ensure that you have sufficient power and proper voltage for the miner.

Plug each power cord into the miner, then plug the power cords into the electrical outlets, again ensuring that the outlets can support the power requirements of the miner. The miner will power on and begin the boot process. There is no on/off power switch on the miner.

To turn off the miner, it's recommended to put the miner in the "standby" state before removing the power cords or turning off the power to the miner. After you place the miner in standby, you may then turn off the power or remove the power cords to power down the miner.

2.5 Connect to Network

Plug in a shielded RJ45 ethernet cable into the ethernet port on the front of the miner and connect it to the network; the miner uses DHCP by default to obtain and assign an IP address.

As an administrator, you can log onto the miner web interface directly using the IP address as needed (default password is admin).

Alternatively, log in to FluxVision to verify that your Teraflux miner is up and running on the "Miner Status" page and identify the IP address of the miner.

To enable network communication to your miner, the following protocols and ports need to be allowed by your network firewalls.

Inbound access	Allow access to the following TCP Ports: ● 80 HTTP web server ● 443 HTTPS web server ● 4028 TCP API ● 8443 REST API
Outbound access	Allow access to: ● TCP port 443 ● https://ws.customer.auradine.com ● https://customer.auradine.com ● https://update.auradine.com

2.6 Service the Miner

This section describes how to interpret the miner LEDs on the front of the miner and how to remove and replace the serviceable components.

2.6.1 Interpret the Ethernet Port LEDs

Input LED	Fault LED	Description
Link LED (right)	On	Link up (10/100/1000).
	Off	Link down.
Activity LED (left)	On	The port is connected and the link is up, but no data is being transferred.
	Off	The port is not connected or the link is down.
	Blinking	Data is being transferred.

2.6.2   Interpret the Status and Alarm LEDs

STAT (LED1)	ALRM (LED2)	Description
Off	Off	No power or the power supply is not functioning properly. This condition could also be due to a bad or corrupted SD card for AT1500/AI2500 models. To remedy such an issue, refer to the steps to replace the microSD card on page 17.
Green	Green	The miner is operating normally. In some cases, hash rate performance may be impacted due to environmental conditions. The miner will return to normal performance once conditions cool down.
Yellow Flashing	Green	The miner is in warm-up mode.
Green Flashing	Off	The miner is set to operate in standby mode.
Green Flashing	Green Flashing	There are three reasons for this case: 1. Miner is rebooting because a user either selected the Reset or Reboot button on the Upgrade/Reboot page on the miner web interface. 2. A software update is in progress. A reboot is required after a software update on the miner. 3. The Enable Flash LEDs' button was selected to visually locate the miner in a farm. To activate, select the 'Enable Flash LEDs' button in the upper right hand corner of the 'Miner Stats Dashboard'; Both LEDs continue to flash until you toggle the 'Disable Flash LEDs' button to turn off the flashing light.
Red Flashing	Off	Fan is not functioning properly (1 or more of the fans are not functioning properly). (Air-cooled miner models only)
Green	Red	Pool configuration is incorrect.
Yellow	Red Flashing	IP address or network connectivity issue.
Red	Off	Control board is not functioning properly and the issue is likely a MicroSD card corruption.
Red	Yellow	Hash board malfunction (One or more of the hash boards is not functioning properly).
Yellow	Yellow	The hash rate falls below 90% of the designated target hash rate.

Interpret the Power Supply Status LEDs

BOCO Power Supply LEDs

Input LED	Fault LED	Description
Off	Off	AC input fault
Green	Off	Power supply is functioning properly.
Green 1Hz Flashing	Off	Power supply output is disabled (miner is in standby mode)
Off	Yellow	Power supply may not be functioning properly because one or more inputs or outputs of the power supply are out of specification, such as low input voltage, or over current).
Green 2Hz Flashing	Off	Power supply is in bootloader mode or a firmware update is in progress.

AA Power Supply LEDs

Input LED	PWR.OK LED	Description
Off	Off	AC input fault
Green	Yellow	Power supply is functioning properly.
Green	Yellow 1Hz Flash	Power supply output is disabled (miner is in standby mode)
Green	Off	Power supply may not be functioning properly because one or more outputs of the power supply are out of specification, such as output over voltage or over current.

2.6.3   Replace the Miner Fan (AT1500 | AT2870 | AT2880 only)

The AT1500 | AT2870 | AT2880 miner has 4 fans on the front and rear of the miner. These units are field replaceable.

The process for replacing the front and rear fans are virtually identical, and you can follow these steps to replace either fan.

1. *Place the miner in the standby state.*
    Use the web interface or the API to place the miner in standby state.

2. *Remove power from the miner and move the miner to a location where you can work on it safely.*

3. *Unpack the replacement fan and have it ready for installation.*

4. *Disconnect the failed fan electrical connector located at the top of the miner.*

5. *Remove the four screws that secure the fan, and set them aside for use later.*

6. *Remove the fan out of the miner and set aside.*

7. *Align the new fan with the mounting holes on the miner.*

8. *Secure the new fan in place using the four screws that you removed earlier.*

9. *Connect the fan electrical connector back into the control board. It doesn't specifically matter which fan is plugged into which connector.*

10. *Move the miner back to its operational location, and connect the power cords to power it on.*

2.6.4   Replace the Power Supply Fan (AT1500 | AT2870 | AT2880 only)

1. *Place the miner in the standby state.*
    Use the web interface or the API to place the miner in standby state.

2. *Remove power from the miner and move the miner to a location where you can work on it safely.*

3. *Unpack the replacement power supply fan and have it ready for installation.*

4. *Disconnect the two fan electrical connectors located between the fans behind the power supply.*

5. *Remove the screws that secure the fan to the power supply, and set aside for use later. For miners with the BOCO power supply, remove the screws that secure the fan tray and four additional screws from inside the fan tray to release the fan.*

6. *Remove the fan out of the miner and set aside.*

7. *Align the new fan with the mounting holes on the power supply. For miners with BOCO power supply, first secure the new fan in the fan tray and then secure the fan tray on the power supply.*

8. *Secure the new fan in place using the screws you removed earlier.*

9. *Connect the fan electrical connectors back into the power supply.*

10. *Move the miner back to its operational location and connect the power cords to power it on.*

2.6.5   Replace the Power Supply

Replacing the power supply is for advanced users only. If you have any questions on the process below, contact Auradine.

1. *Place the miner in the standby state.*
   Use the web interface or the API to place the miner in standby state.

2. *Remove power from the miner and move the miner to a location where you can work on it safely.*

3. *Unpack the replacement power supply from the packaging and have it ready for installation.*

4. *Disconnect the electrical connectors from the control board for the rear fans.*

5. *Remove the rear fan tray by removing the screws that secure the fan tray and set them aside for use later.*

6. *Remove the top cover of the miner. You must remove the single screw on the top front side of the control board (above the reset switch).*

7. *Remove the two screws located at the rear of the power supply..*

8. *Remove the screw that secures the bus bar cover.*

9. *Remove the four screws located at the top of the power supply bus bars.*

10. *Disconnect the aux power and control cables from the power supply.*

11. *Slide the power supply toward the rear of the miner to remove it.*

12. *Slide the new power supply in.*

13. *Reconnect the aux power and control cables to the power supply.*

14. *Use the screws to secure the power supply bus bars.*

15. *Use the screws to secure the bus bar cover.*

16. *Use the two screws to secure the power supply to the chassis.*

17. *Use the screw to secure the top cover (screw is above the reset switch).*

18. *Secure the rear fan tray.*

19. *Plug fans into the control board.*

20. *Move the miner back to its operational location, and connect the power cords to power it on.*

2.6.6   Replace the MicroSD Drive AT1500/AI2500

MicroSD card failures occur on rare occasions.

1. *Locate a spare MicroSD card of at least 4GB. Note that the MicroSD card should be 'industrial temperature' rated (the standard cards shipped from Auradine are rated from -25-85C).*

2. *Use an appropriate adapter to connect the MicroSD card to your computer.*

3. *Launch a web browser on the computer and go to https://update.auradine.com.*

4. *Flash the card using one of the options.*

    a. *Drag entire .zip file into Balena/Etcher*

    b. *unzip file and use bmaptool: bmaptool copy --bmap image/.meta/[file].bmap image/[file].img /dev/[mmcblk0]*

5. *Replace the MicroSD card.*

    Eject the old MicroSD card, replace it with the new MicroSD card, and reboot the miner. To reboot the miner, you can use the web interface or the API.
    After reboot, the miner should be online and hashing in a few minutes. You can use the web interface on the miner or FluxVision to monitor miner status.

Note: AT2870, AT2880 and AI3680 use an internal EMMC drive to store the system image. If necessary/desired, the user can create an imaged SD Card and install it in the system, and the system will boot off the SD Card instead of the EMMC.

2.7   AT1500 Specifications

2.7.1   Physical

Specification	Value
Dimensions of Miner (Length/Width/Height)	15.5 x 8 x 11.5 inches / 395 x 202 x 290mm
Dimensions of package (Length/Width/Height)	20.3 x 12.5 x 17 inches / 516 x 318 x 432mm
Weight of Miner	38.6-42.5 lbs / 17.5-19.3 kg

2.7.2   Electrical

Specification	Value
Power supply AC input voltage, nominal	200-240 VAC
Power supply AC input voltage, min/max	180 - 264
Power supply AC input freq, Hz	48 – 62
Power supply AC input current, Amps	0-17.6 per input (2)
Power supply AC inrush current, Amps	50 per input (2)

2.7.3   Environmental

Specification	Value
Storage Temperature	-40F to 158F (-40 to 70C)
Operating Temperature	-4F to 122F (-20 to 50C)
Operation humidity, RH	20-80% RH non-condensing
Maximum operating altitude	10,000ft (3,048M)
Airflow	Front to back
Maximum BTU/hr	17,060
Electromagnetic Interference (EMI)	FCC Class A, CE Class A, VCCI Class A

2.8 AT2870/AT2880 Specifications

2.8.1 Physical

Specification	Value
Dimensions of Miner (Length/Width/Height)	15.5 x 8 x 11.5 inches / 395 x 202 x 290mm
Dimensions of package (Length/Width/Height)	20.3 x 12.5 x 17 inches / 516 x 318 x 432mm
Weight of Miner	38.6-42.5 lbs / 17.5-19.3 kg

2.8.2 Electrical

Specification	Value for Option A (2 Power Inputs)	Value for Option B (1 Power Input)
Power supply AC input voltage, nominal	200-240 VAC	208-277 VAC
Power supply AC input voltage, min/max	180 - 264	200 - 305
Power supply AC input freq, Hz	48 – 62	48-62
Power supply AC input current, Amps	0-17.6 per input	0-45
Power supply AC inrush current, Amps	50 per input	120

2.8.3 Environmental

Specification	Value
Storage Temperature	-40F to 158F (-40 to 70C)
Operating Temperature	-4F to 122F (-20 to 50C)
Operation humidity, RH	20-80% RH non-condensing
Maximum operating altitude	10,000ft (3,048M)
Maximum BTU/hr	17,060
Electromagnetic Interference (EMI)	FCC Class A, CE Class A, VCCI Class A

2.9   AI2500 Specifications

2.9.1   Physical

Specification	Value
Dimensions of Miner (Length/Width/Height)	12.2 x 8 x 11.5 inches / 310 x 202 x 290mm
Dimensions of package (Length/Width/Height)	20.3 x 12.5 x 17 inches / 516 x 318 x 432mm
Weight of Miner	38-40 lbs / 16.3-18.1kg

2.9.2   Electrical

Specification	Value
Power supply AC input voltage, nominal	200-240 VAC
Power supply AC input voltage, min/max	180 - 264
Power supply AC input freq, Hz	48 – 62
Power supply AC input current, Amps	0-17.6 per input (2)
Power supply AC inrush current, Amps	50 per input (2)

2.9.3   Environmental

Specification	Value
Storage Temperature	-40F to 158F (-40 to 70C)
Fluid Inlet Temperature	-4F to 122F (-20 to 50C)
Operation humidity, RH	20-80% RH non-condensing
Maximum operating altitude	10,000ft (3,048M)
Maximum BTU/hr	17,060
Electromagnetic Interference (EMI)	FCC Class A, CE Class A, VCCI Class A

2.10 AI3680 Specifications

2.10.1 Physical

Specification	Value
Dimensions of Miner (Length/Width/Height)	12.2 x 8 x 11.5 inches / 310 x 202 x 290mm
Dimensions of package (Length/Width/Height)	20.3 x 12.5 x 17 inches / 516 x 318 x 432mm
Weight of Miner	38-40 lbs / 16.3-18.1kg

2.10.2 Electrical

Specification	Value for Option A (2 Power Inputs)	Value for Option B (1 Power Input)
Power supply AC input voltage, nominal	200-240 VAC	208-277 VAC
Power supply AC input voltage, min/max	180 - 264	200 - 305
Power supply AC input freq, Hz	48 – 62	48-62
Power supply AC input current, Amps	0-17.6 per input	0-45
Power supply AC inrush current, Amps	50 per input	120

2.10.3 Environmental

Specification	Value
Storage Temperature	-40F to 158F (-40 to 70C)
Fluid Inlet Temperature	-4F to 122F (20 to 50C)
Operation humidity, RH	20-80% RH non-condensing
Maximum operating altitude	10,000ft (3,048M)
Maximum BTU/hr	17,060
Electromagnetic Interference (EMI)	FCC Class A, CE Class A, VCCI Class A

2.11   Compliance Statements

Federal Communications Commission (FCC) statement for a Class A digital device

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The above statement applies to the following models:

AT1500, AT2870, AT2880, AI2500, AI3680

Compliance contact information:

Auradine, Inc.

3200 Coronado Drive,

Santa Clara, CA 95054

Contact: info@auradine.com

2.12   Tamper Proof Statement

To ensure that products purchased from Auradine have not been tampered with during shipping, verify the following upon receipt:

- The tracking number on the box received matches the tracking number that was provided to you at time of order from Auradine.
- Ensure the integrity of the tamper-evident tape used to seal the miner has not been compromised.
- The "warranty is void if seal is broken" label on the side of the miner is intact and shows no sign of tampering.

- **Declaration of Conformity:**

Declaration of Conformity

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Auradine Inc. declares that under our sole responsibility the following products and all its options:

Models:
AT1500, AT2870, AT2880, AI2500, AI3680

are in conformity with the following harmonized standards and fulfill the essential requirements of the LVD Directive 2014/35/EU, EMC Directive 2014/30/EU, WEEE Directive 2012/19/EU, and RoHS Directives 2011/65/EU and 2015/863/EU.

Standards

EN 55032: 2015 +A11:2020
EN 55035: 2017 +A11:2020
EN 61000-3-3:2013/A2:2021, EN 61000-3-11:2017
EN 61000-3-2:2019, EN 61000-3-12:2011+A1:2021
EN62368-1:2018

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Date: February 19, 2025

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