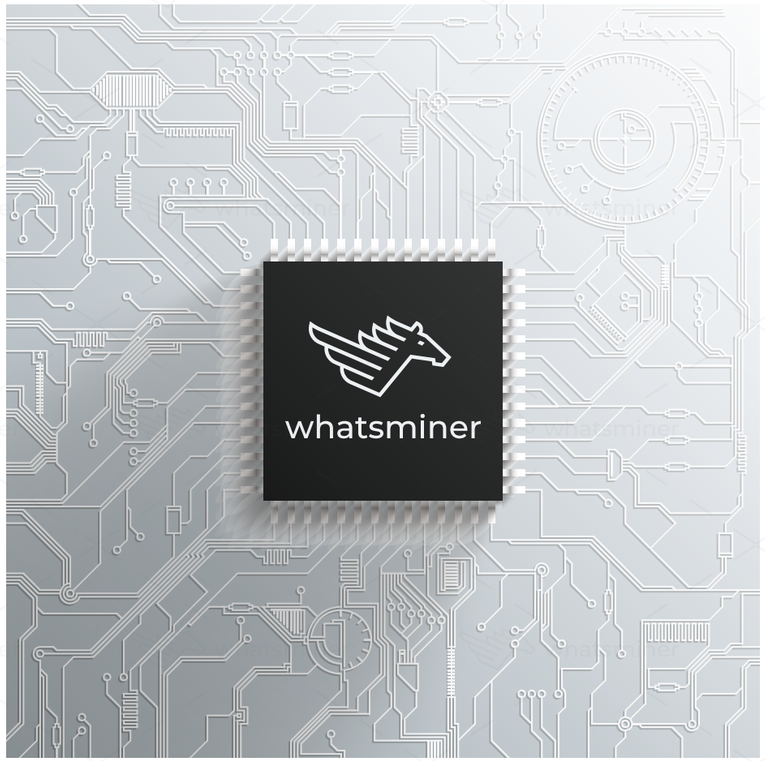
whatsminer

# WHATSMINER

## Product Manual




# CATALOG

## M30 SERIES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03 M30S ..... 05

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05 M31S ..... 09

06 M33S++ ..... 11

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08 M36S++ ..... 19

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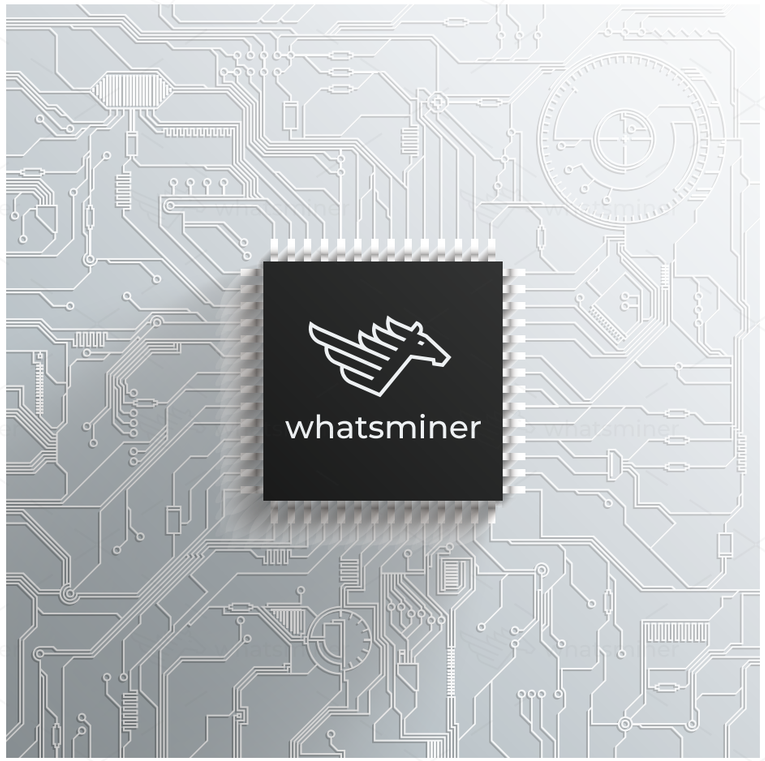


# CATALOG

## M50 SERIES


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# WHATSMINER M30S++

## Air Cooling


## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 100~112T ± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 31J/T ± 5% @25° C | Weight | 11.7KG |
| Power On Wall | 3100~3472W ± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |




| | |
|---|---|
| Components | Power Supply, Fan, Control Board,<br>Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light:<br>Working normally<br><br>Green and Red Lights Alternately Flashing:<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M30S+

## Air Cooling


## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 92~102T± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 34J/T ± 5% @25° C | Weight | 11.7KG |
| Power On Wall | 3128~3468W ± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |


| | |
|---|---|
| Components | Power Supply, Fan, Control Board,<br>Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light：<br>Working normally<br><br>Green and Red Lights Alternately Flashing：<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
| Warranty Period | One year after leaving the factory |
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# WHATSMINER M30S

## Air Cooling


## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 88T ± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 38J/T ± 5% @25° C | Weight | 11.7KG |
| Power On Wall | 3344W ± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |


| | |
|---|---|
| Components | Power Supply, Fan, Control Board,<br>Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light:<br>Working normally<br><br>Green and Red Lights Alternately Flashing:<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M31S+

## Air Cooling


## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 80T ± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 42J/T ± 5% @25° C | Weight | 11.7KG |
| Power On Wall | 3360W ± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |


| | |
|---|---|
| Components | Power Supply, Fan, Control Board, Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light：<br>Working normally<br><br>Green and Red Lights Alternately Flashing：<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M31S

## Air Cooling


## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 72T ± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 46J/T ± 5% @25° C | Weight | 11.7KG |
| Power On Wall | 3312W ± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |


| | |
|---|---|
| Components | Power Supply, Fan, Control Board, Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light:<br>Working normally<br><br>Green and Red Lights Alternately Flashing:<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
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# WHATSMINER M33S++

## Hydro Cooling

## SPECIFICATION

| | |
|---|---|
| Hashrate | 218~240T ±10% |
| Power Ratio | 31J/T ± 5% |
| PSU | AC380~480V, 3W+ ground, input 10kw |
| Size | 86mm*482.6mm*663mm with handle |
| Weight | Net weight: 27.5kg Weight with packaging materials: 30kg |
| Coolant demand per machine | About 1L |
| Power Cable Model | Custom made , ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~50℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Liquid flow | ☐ Limited Data：⩾10L/min<br>☐ Flow control accuracy ± 10%<br><br>Remarks: 10L/min corresponds to the temperature difference between inlet and outlet water close to 10℃@normal mode, 14℃@high performance mode |

| | |
|---|---|
| Liquid pressure | ⩽350kpa<br>Remarks: when the pressure is more than 350kpa, the water-cooled plate will be deformed and cause the risk of coolant |
| Liquid medium | First-level deionized water: meet the requirements of the national standard GB/T 6682-2008 first-level deionized water<br>Notice:<br>1) If the water conductivity is ⩾100us/cm, the medium must be replaced;<br>2) The water conductivity is less than 5us/cm when the system is running for the first time. |
| Liquid PH | Control range: 6~8 |
| Liquid medium circulation system(Machine side) | ☐ Anti-rust and anti-corrosion of pipeline;<br>☐ The particle diameter of the liquid medium is ⩽53 microns, that is, the circulation system is equipped with a 270 mesh filter;<br>☐ Before connecting the cabinet to the heat dissipation system, clean and filter the system pipeline with deionized water to remove dust, welding slag and other impurities;<br>☐ The temperature resistance of system components is above 85°C;<br>☐ The circulatory system is recommended to be equipped with a UV lamp sterilization device to prevent the liquid from breeding bacteria and attenuate the heat dissipation capacity of the system;<br>☐ The system is equipped with a 4bar safety relief valve;<br>☐ The system is equipped with a constant pressure expansion tank.<br>Note: when the temperature of the coolant rises after the miner is turned on the pressure will rise. |
| Humidity | ☐ Working humidity: 5%RH~85%RH (non-condensing)<br>☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |



Remarks: The above liquid temperature and flow parameters are based on deionized water as the liquid medium. If the liquid medium uses antifreeze, the liquid temperature and flow parameters need to be calculated separately. Table 2 shows an example of 30% glycol antifreeze temperature and flow parameters.

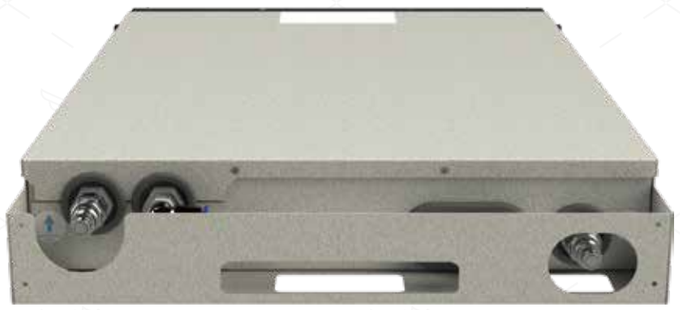
Table2 Example of temperature and flow parameters of 30% ethylene glycol antifreeze

| | |
|---|---|
| Temperature | ☐ Working temperature (inlet): 15℃~45℃@normal mode<br>15℃~35℃@high performance mode<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br>Note: please empty the liquid in the equipment during storage and transportation. |
| Flow | ☐ Limited Data：⩾11L/min<br>☐ Flow control accuracy± 10%<br>Remarks: The temperature difference between the inlet and outlet liquids at this flow rate is close to 10℃@normal mode, 14℃@high-performance mode) |

| | |
|---|---|
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M33S+

## Hydro Cooling



## SPECIFICATION

| | |
|---|---|
| Hashrate | 198~220T ± 10% |
| Power Ratio | 34J/T ± 5% |
| PSU | AC380~480V, 3W+ ground, input 10kw |
| Size | 86mm*482.6mm*663mm with handle |
| Weight | Net weight: 27.5kg Weight with packaging materials: 30kg |
| Coolant demand per machine | About 1L |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20°C~50°C@normal mode<br>20°C~40°C@high performance mode;<br>☐ Inlet temperature control accuracy ± 2°C<br>☐ Storage and transportation temperature: -40~70°C<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Liquid flow | ☐ Limited Data：⩾10L/min<br>☐ Flow control accuracy ± 10%<br>Remarks: 10L/min corresponds to the temperature difference between inlet and outlet water close to 10°C@normal mode, 14°C @high performance mode |

| | |
|---|---|
| Liquid pressure | ⩽350kpa<br>Remarks: when the pressure is more than 350kpa, the water-cooled plate will be deformed and cause the risk of coolant leakage. |
| Liquid medium | First-level deionized water: meet the requirements of the national standard GB/T 6682-2008 first-level deionized water<br><br>Notice:<br>1) If the water conductivity is ⩾100us/cm, the medium must be replaced;<br>2) The water conductivity is less than 5us/cm when the system is running for the first time. |
| Liquid PH | Control range: 6~8 |
| Liquid medium circulation system(Machine side) | ☐ Anti-rust and anti-corrosion of pipeline;<br>☐ The particle diameter of the liquid medium is ⩽53 microns, that is, the circulation system is equipped with a 270 mesh filter;<br>☐ Before connecting the cabinet to the heat dissipation system, clean and filter the system pipeline with deionized water to remove dust, welding slag and other impurities;<br>☐ The temperature resistance of system components is above 85℃;<br>☐ The circulatory system is recommended to be equipped with a UV lamp sterilization device to prevent the liquid from breeding bacteria and attenuate the heat dissipation capacity of the system;<br>☐ The system is equipped with a 4bar safety relief valve;<br>☐ The system is equipped with a constant pressure expansion tank.<br><br>Note: when the temperature of the coolant rises after the miner is turned on the pressure will rise. |
| Humidity | ☐ Working humidity: 5%RH~85%RH (non-condensing)<br>☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |



Remarks: The above liquid temperature and flow parameters are based on deionized water as the liquid medium. If the liquid medium uses antifreeze, the liquid temperature and flow parameters need to be calculated separately. Table 2 shows an example of 30% glycol antifreeze temperature and flow parameters.

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| | |
|---|---|
| Temperature | ☐ Working temperature (inlet): 15℃~45℃@normal mode<br>15℃~35℃@high performance mode<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Flow | ☐ Limited Data：⩾11L/min<br>☐ Flow control accuracy± 10%<br><br>Remarks: The temperature difference between the inlet and outlet liquids at this flow rate is close to 10℃@normal mode, 14℃@high-performance mode) |

| | |
|---|---|
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M36S++



## SPECIFICATION

| | |
|---|---|
| Hashrate | 150~174T ± 5% |
| Power Ratio | 31J/T ± 5% |
| PSU | AC380-480V |
| Size | 267.5mmX147mmX401mm |
| Weight | Net weight: 16kg Weight with packaging materials: 17kg |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~45℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2°C<br>☐ Storage and transportation temperature: -40~70℃ |
| Liquid flow | ☐ Limited Data：⩾24L/min<br>☐ Flow control accuracy ± 10%<br>Remarks: 24L/min corresponds to the temperature difference between inlet and outlet close to 7°C@normal mode, 10°C@high performance mode) |
| Liquid medium | Insulating liquid (S5X/S3X)<br>Remarks: See next page for details on liquid properties and safety requirements. |

| | |
|---|---|
| Humidity | ☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |

Remarks: The above liquid flow parameters are based on S5X/S3X as the liquid medium. If the liquid medium uses other types of coolant, the liquid flow parameters need to be calculated separately. Calculation method: When the mining machine has the same calorific value, the product of the liquid specific heat, density and flow rate is a fixed value, that is, the flow rate is inversely proportional to the product of density and specific heat.

## Coolant EC110 Flow Parameter Calculation Example

| Coolant type | Specific heat capacity (J/kg·℃) | Density (kg/m$^3$) | Flow (L/min) |
|---|---|---|---|
| S5X/S3X | 2274 | 806 | 24 |
| EC110 | 2231 | 778 | =(2274*806*24) /(2231*778)=25.35 |

## Insulating liquid performance and safety requirements

1) It has good thermodynamic properties (relatively high thermal conductivity, high liquid specific heat value, and low viscosity among similar substances);
2) It should have good chemical and thermal stability relative to the life cycle of the electronic system and the specified working temperature;
3) Appearance and smell, transparent and no odor;
4) Boiling point (°C), >120°C;
5) Flash point>150°C or no flash point;
6) pour point (°C), <-40;
7) Purity (Wt%) ⩾ 99.5%;
8) Non-volatile residues (Wt ppm) ⩽ 10ppm
9) Water content (Wt ppm) ⩽ 50ppm
10) Acidity (mg KOH/g) ⩽ 0.03
11) Withstand voltage breakdown (KV/2.5mm), initial ⩾ 20, saturated water state > 10;
12) Volume resistivity (Ω·cm) ⩾ 1X109; dielectric constant (100Hz-10MHz) < 8, dielectric loss factor < 0.7%;
13) The particle size limit in oil, after hot oil circulation, the number of particles larger than 5um in 100ml of oil is ⩽2000, and there are no particles larger than 50um.
14) Material compatibility, it should be compatible with most metals and hard inorganic substances, including stainless steel, copper, aluminum, silica, alumina, etc. commonly used in electronic systems, to ensure the appearance, volume and physical properties (mechanical properties). , electrical) impact <1%. For organic substances and elastomers, it should be confirmed by the Soxhlet extraction test, and it should be ensured that after extraction with organic substances in the system, the volume and weight change of organic substances is less than 3%, and the extracted products have no effect on liquid media and other devices that can reach the site through liquid transfer. . The liquid itself should not react chemically with any material it may come into contact with, resulting in the modification or decomposition of the liquid.
15) The physical reaction of the liquid with the contact materials, including dissolution, extraction, etc., should not affect the corresponding functions of the liquid and system materials. For example, the liquid extracts the plasticizer of the cable insulation layer, causing the cable to harden and crack. Or the substances in the system are dissolved in the contact liquid, resulting in an increase in the viscosity of the liquid or deterioration in performance.
16) Dissolved substances caused by liquid convection or driving flow should not affect other materials or devices in contact with the liquid. For example, the plasticizer precipitated from the cable will reduce the heat exchange efficiency on the surface of the heating device through accumulation.
17) The liquid chemical decomposition temperature should be much higher than the system working temperature and potential local overheating temperature.
18) It belongs to the non-toxic category. It is non-irritating to the eyes, non-irritating to the skin, and does not have mutagenic cell mutations or heart diseases.

# WHATSMINER M36S+



## SPECIFICATION

| | |
|---|---|
| Hashrate | 144~152T ± 10% |
| Power Ratio | 34J/T ± 5% |
| PSU | AC380-480V |
| Size | 267.5mmX147mmX401mm |
| Weight | Net weight: 16kg Weight with packaging materials: 17kg |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~45℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃ |
| Liquid flow | ☐ Limited Data：⩾24L/min<br>☐ Flow control accuracy ± 10%<br>Remarks: 24L/min corresponds to the temperature difference between inlet and outlet close to 7°C@normal mode, 10°C@high performance mode) |
| Liquid medium | Insulating liquid (S5X/S3X)<br>Remarks: See next page for details on liquid properties and safety requirements. |

| | |
|---|---|
| Humidity | ☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |

Remarks: The above liquid flow parameters are based on S5X/S3X as the liquid medium. If the liquid medium uses other types of coolant, the liquid flow parameters need to be calculated separately. Calculation method: When the mining machine has the same calorific value, the product of the liquid specific heat, density and flow rate is a fixed value, that is, the flow rate is inversely proportional to the product of density and specific heat.

## Coolant EC110 Flow Parameter Calculation Example

| Coolant type | Specific heat capacity (J/kg·℃) | Density (kg/m$^3$) | Flow (L/min) |
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| S5X/S3X | 2274 | 806 | 24 |
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## Insulating liquid performance and safety requirements

1) It has good thermodynamic properties (relatively high thermal conductivity, high liquid specific heat value, and low viscosity among similar substances);
2) It should have good chemical and thermal stability relative to the life cycle of the electronic system and the specified working temperature;
3) Appearance and smell, transparent and no odor;
4) Boiling point (℃), >120℃;
5) Flash point>150℃ or no flash point;
6) pour point (℃), <-40;
7) Purity (Wt%) ⩾ 99.5%;
8) Non-volatile residues (Wt ppm) ⩽ 10ppm
9) Water content (Wt ppm) ⩽ 50ppm
10) Acidity (mg KOH/g) ⩽ 0.03
11) Withstand voltage breakdown (KV/2.5mm), initial ⩾ 20, saturated water state > 10;
12) Volume resistivity (Ω·cm) ⩾ 1X109; dielectric constant (100Hz-10MHz) < 8, dielectric loss factor < 0.7%;
13) The particle size limit in oil, after hot oil circulation, the number of particles larger than 5um in 100ml of oil is ⩽2000, and there are no particles larger than 50um.
14) Material compatibility, it should be compatible with most metals and hard inorganic substances, including stainless steel, copper, aluminum, silica, alumina, etc. commonly used in electronic systems, to ensure the appearance, volume and physical properties (mechanical properties). , electrical) impact <1%. For organic substances and elastomers, it should be confirmed by the Soxhlet extraction test, and it should be ensured that after extraction with organic substances in the system, the volume and weight change of organic substances is less than 3%, and the extracted products have no effect on liquid media and other devices that can reach the site through liquid transfer. . The liquid itself should not react chemically with any material it may come into contact with, resulting in the modification or decomposition of the liquid.
15) The physical reaction of the liquid with the contact materials, including dissolution, extraction, etc., should not affect the corresponding functions of the liquid and system materials. For example, the liquid extracts the plasticizer of the cable insulation layer, causing the cable to harden and crack. Or the substances in the system are dissolved in the contact liquid, resulting in an increase in the viscosity of the liquid or deterioration in performance.
16) Dissolved substances caused by liquid convection or driving flow should not affect other materials or devices in contact with the liquid. For example, the plasticizer precipitated from the cable will reduce the heat exchange efficiency on the surface of the heating device through accumulation.
17) The liquid chemical decomposition temperature should be much higher than the system working temperature and potential local overheating temperature.
18) It belongs to the non-toxic category. It is non-irritating to the eyes, non-irritating to the skin, and does not have mutagenic cell mutations or heart diseases.

# WHATSMINER M50S++

## Air Cooling


## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 138~154T± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 22JT ± 5%@25° C | Weight | 11.7KG |
| Power On Wall | 3036~3388 W± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |


| | |
|---|---|
| Components | Power Supply, Fan, Control Board, Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light:<br>Working normally<br><br>Green and Red Lights Alternately Flashing:<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M50S+

## Air Cooling


## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 130~142T ± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 24J/T ± 5%@25° C | Weight | 11.7KG |
| Power On Wall | 3120~3408W ± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |


| | |
|---|---|
| Components | Power Supply, Fan, Control Board,<br>Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light:<br>Working normally<br><br>Green and Red Lights Alternately Flashing:<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M50S

## Air Cooling


## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 120~130T ± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 26J/T ± 5%@25° C | Weight | 11.7KG |
| Power On Wall | 3120~3380W ± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |

| | |
|---|---|
| Components | Power Supply, Fan, Control Board, Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light:<br>Working normally<br><br>Green and Red Lights Alternately Flashing:<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M50

## Air Cooling

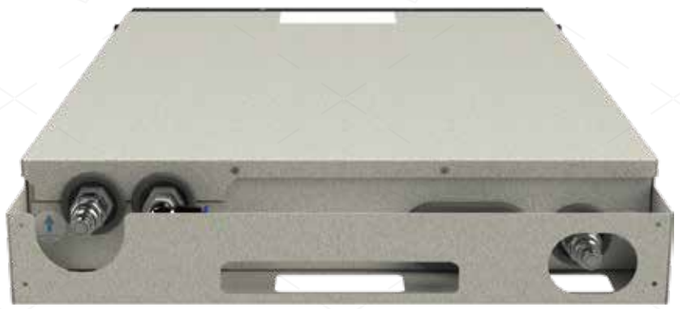

## SPECIFICATION

| | | | |
|---|---|---|---|
| Hashrate | 110~120T ± 5% | Size | 430mm*155mm*226mm |
| Power Ratio | 29J/T ± 5%@25° C | Weight | 11.7KG |
| Power On Wall | 3190~3480W ± 10% | Internet Connections | Ethernet |
| Working Temperature | -5° C ~ 35° C | Power Cable Model | IEC C19, ⩾16A |
| Air flow | 350CFM | PSU Model | P221B/P222B AC220V ~ 240V |


| | |
|---|---|
| Components | Power Supply, Fan, Control Board, Hash Board, Case |
| Flashing Light Introduction | Blinking Green Light:<br>Working normally<br><br>Green and Red Lights Alternately Flashing:<br>Alarm status and need to find the response error code |
| Safety Guidelines | 1. Please check if there is any obvious physical failure before power on, beware of electric shock<br>2. The product must be kept away from water sources and must not be operated in a humid environment<br>3. It requires professionals to carry out daily maintenance on the product<br>4. It is forbidden to directly touch the product by hand when power is on<br>5. Please use the stable voltage<br>6. The size of the air outlet: 143*218mm, refer to the relevant documents for the specific shape(website-support-download) |
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M53S++

## Hydro Cooling



## SPECIFICATION

| | |
|---|---|
| Hashrate | 310~328T± 10% |
| Power Ratio | 22J/T ± 5% |
| PSU | AC380~480V, 3W+ ground, input 10kw |
| Size | 86mm*482.6mm*663mm with handle |
| Weight | Net weight: 27.5kg Weight with packaging materials: 30kg |
| Coolant demand per machine | About 1L |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~50℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Liquid flow | ☐ Limited Data：⩾10L/min<br>☐ Flow control accuracy ± 10%<br><br>Remarks: 10L/min corresponds to the temperature difference between inlet and outlet water close to 10℃@normal mode, 14℃@high performance mode |

| | |
|---|---|
| Liquid pressure | ⩽350kpa<br><br>Remarks: when the pressure is more than 350kpa, the water-cooled plate will be deformed and cause the risk of coolant leakage. |
| Liquid medium | First-level deionized water: meet the requirements of the national standard GB/T 6682-2008 first-level deionized water<br><br>Notice:<br>1) If the water conductivity is ⩾100us/cm, the medium must be replaced;<br>2) The water conductivity is less than 5us/cm when the system is running for the first time. |
| Liquid PH | Control range: 6~8 |
| Liquid medium circulation system(Machine side) | ☐ Anti-rust and anti-corrosion of pipeline;<br>☐ The particle diameter of the liquid medium is ⩽53 microns, that is, the circulation system is equipped with a 270 mesh filter;<br>☐ Before connecting the cabinet to the heat dissipation system, clean and filter the system pipeline with deionized water to remove dust, welding slag and other impurities;<br>☐ The temperature resistance of system components is above 85℃;<br>☐ The circulatory system is recommended to be equipped with a UV lamp sterilization device to prevent the liquid from breeding bacteria and attenuate the heat dissipation capacity of the system;<br>☐ The system is equipped with a 4bar safety relief valve;<br>☐ The system is equipped with a constant pressure expansion tank.<br><br>Note: when the temperature of the coolant rises after the miner is turned on the pressure will rise. |
| Humidity | ☐ Working humidity: 5%RH~85%RH (non-condensing)<br>☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |



Remarks: The above liquid temperature and flow parameters are based on deionized water as the liquid medium. If the liquid medium uses antifreeze, the liquid temperature and flow parameters need to be calculated separately. Table 2 shows an example of 30% glycol antifreeze temperature and flow parameters.

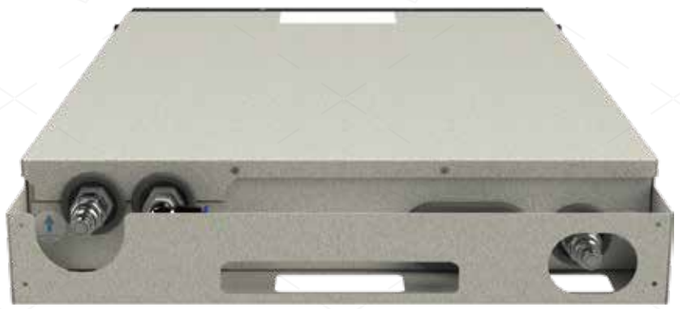
Table2 Example of temperature and flow parameters of 30% ethylene glycol antifreeze

| | |
|---|---|
| Temperature | ☐ Working temperature (inlet): 15℃~45℃@normal mode<br>15℃~35℃@high performance mode<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Flow | ☐ Limited Data：⩾11L/min<br>☐ Flow control accuracy± 10%<br><br>Remarks: The temperature difference between the inlet and outlet liquids at this flow rate is close to 10℃@normal mode, 14℃@high-performance mode) |

| | |
|---|---|
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M53S+

## Hydro Cooling



## SPECIFICATION

| | |
|---|---|
| Hashrate | 282~298T± 10% |
| Power Ratio | 24JT ± 5% |
| PSU | AC380~480V, 3W+ ground, input 10kw |
| Size | 86mm*482.6mm*663mm with handle |
| Weight | Net weight: 27.5kg Weight with packaging materials: 30kg |
| Coolant demand per machine | About 1L |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~50℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Liquid flow | ☐ Limited Data：⩾10L/min<br>☐ Flow control accuracy ± 10%<br><br>Remarks: 10L/min corresponds to the temperature difference between inlet and outlet water close to 10℃@normal mode, 14℃@high performance mode |

| | |
|---|---|
| Liquid pressure | ⩽350kpa<br><br>Remarks: when the pressure is more than 350kpa, the water-cooled plate will be deformed and cause the risk of coolant leakage. |
| Liquid medium | First-level deionized water: meet the requirements of the national standard GB/T 6682-2008 first-level deionized water<br><br>Notice:<br>1) If the water conductivity is ⩾100us/cm, the medium must be replaced;<br>2) The water conductivity is less than 5us/cm when the system is running for the first time. |
| Liquid PH | Control range: 6~8 |
| Liquid medium circulation system(Machine side) | ☐ Anti-rust and anti-corrosion of pipeline;<br>☐ The particle diameter of the liquid medium is ⩽53 microns, that is, the circulation system is equipped with a 270 mesh filter;<br>☐ Before connecting the cabinet to the heat dissipation system, clean and filter the system pipeline with deionized water to remove dust, welding slag and other impurities;<br>☐ The temperature resistance of system components is above 85℃;<br>☐ The circulatory system is recommended to be equipped with a UV lamp sterilization device to prevent the liquid from breeding bacteria and attenuate the heat dissipation capacity of the system;<br>☐ The system is equipped with a 4bar safety relief valve;<br>☐ The system is equipped with a constant pressure expansion tank.<br><br>Note: when the temperature of the coolant rises after the miner is turned on the pressure will rise. |
| Humidity | ☐ Working humidity: 5%RH~85%RH (non-condensing)<br>☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |



Remarks: The above liquid temperature and flow parameters are based on deionized water as the liquid medium. If the liquid medium uses antifreeze, the liquid temperature and flow parameters need to be calculated separately. Table 2 shows an example of 30% glycol antifreeze temperature and flow parameters.

Table2 Example of temperature and flow parameters of 30% ethylene glycol antifreeze

| | |
|---|---|
| Temperature | ☐ Working temperature (inlet): 15℃~45℃@normal mode<br>15℃~35℃@high performance mode<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Flow | ☐ Limited Data：⩾11L/min<br>☐ Flow control accuracy± 10%<br><br>Remarks: The temperature difference between the inlet and outlet liquids at this flow rate is close to 10℃@normal mode, 14℃@high-performance mode) |

| | |
|---|---|
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M53S

## Hydro Cooling

## SPECIFICATION

| | |
|---|---|
| Hashrate | 260~274T ± 10% |
| Power Ratio | 26J/T ± 5% |
| PSU | AC380~480V, 3W+ ground, input 10kw |
| Size | 86mm*482.6mm*663mm with handle |
| Weight | Net weight: 27.5kg Weight with packaging materials: 30kg |
| Coolant demand per machine | About 1L |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~50℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Liquid flow | ☐ Limited Data：⩾10L/min<br>☐ Flow control accuracy ± 10%<br><br>Remarks: 10L/min corresponds to the temperature difference between inlet and outlet water close to 10℃@normal mode, 14℃@high performance mode |

| | |
|---|---|
| Liquid pressure | ⩽350kpa<br><br>Remarks: when the pressure is more than 350kpa, the water-cooled plate will be deformed and cause the risk of coolant leakage. |
| Liquid medium | First-level deionized water: meet the requirements of the national standard GB/T 6682-2008 first-level deionized water<br><br>Notice:<br>1) If the water conductivity is ⩾100us/cm, the medium must be replaced;<br>2) The water conductivity is less than 5us/cm when the system is running for the first time. |
| Liquid PH | Control range: 6~8 |
| Liquid medium circulation system(Machine side) | ☐ Anti-rust and anti-corrosion of pipeline;<br>☐ The particle diameter of the liquid medium is ⩽53 microns, that is, the circulation system is equipped with a 270 mesh filter;<br>☐ Before connecting the cabinet to the heat dissipation system, clean and filter the system pipeline with deionized water to remove dust, welding slag and other impurities;<br>☐ The temperature resistance of system components is above 85℃;<br>☐ The circulatory system is recommended to be equipped with a UV lamp sterilization device to prevent the liquid from breeding bacteria and attenuate the heat dissipation capacity of the system;<br>☐ The system is equipped with a 4bar safety relief valve;<br>☐ The system is equipped with a constant pressure expansion tank.<br><br>Note: when the temperature of the coolant rises after the miner is turned on the pressure will rise. |
| Humidity | ☐ Working humidity: 5%RH~85%RH (non-condensing)<br>☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |



Remarks: The above liquid temperature and flow parameters are based on deionized water as the liquid medium. If the liquid medium uses antifreeze, the liquid temperature and flow parameters need to be calculated separately. Table 2 shows an example of 30% glycol antifreeze temperature and flow parameters.

Table2 Example of temperature and flow parameters of 30% ethylene glycol antifreeze

| | |
|---|---|
| Temperature | ☐ Working temperature (inlet): 15℃~45℃@normal mode<br>15℃~35℃@high performance mode<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Flow | ☐ Limited Data：⩾11L/min<br>☐ Flow control accuracy± 10%<br><br>Remarks: The temperature difference between the inlet and outlet liquids at this flow rate is close to 10℃@normal mode, 14℃@high-performance mode) |

| | |
|---|---|
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M53

## Hydro Cooling

## SPECIFICATION

| | |
|---|---|
| Hashrate | 226~250T ± 10% |
| Power Ratio | 29J/T ± 5% |
| PSU | AC380~480V, 3W+ ground, input 10kw |
| Size | 86mm*482.6mm*663mm with handle |
| Weight | Net weight: 27.5kg Weight with packaging materials: 30kg |
| Coolant demand per machine | About 1L |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

**Liquid temperature**

- ☐ Working temperature (inlet): 20℃~50℃@normal mode
  20℃~40℃@high performance mode;
- ☐ Inlet temperature control accuracy ± 2℃
- ☐ Storage and transportation temperature: -40~70℃

Note: please empty the liquid in the equipment during storage and transportation.

**Liquid flow**

- ☐ Limited Data：⩾10L/min
- ☐ Flow control accuracy ± 10%

Remarks: 10L/min corresponds to the temperature difference between inlet and outlet water close to 10℃@normal mode, 14℃@high performance mode

| | |
|---|---|
| Liquid pressure | ⩽350kpa<br><br>Remarks: when the pressure is more than 350kpa, the water-cooled plate will be deformed and cause the risk of coolant leakage. |
| Liquid medium | First-level deionized water: meet the requirements of the national standard GB/T 6682-2008 first-level deionized water<br><br>Notice:<br>1) If the water conductivity is ⩾100us/cm, the medium must be replaced;<br>2) The water conductivity is less than 5us/cm when the system is running for the first time. |
| Liquid PH | Control range: 6~8 |
| Liquid medium circulation system(Machine side) | ☐ Anti-rust and anti-corrosion of pipeline;<br>☐ The particle diameter of the liquid medium is ⩽53 microns, that is, the circulation system is equipped with a 270 mesh filter;<br>☐ Before connecting the cabinet to the heat dissipation system, clean and filter the system pipeline with deionized water to remove dust, welding slag and other impurities;<br>☐ The temperature resistance of system components is above 85℃;<br>☐ The circulatory system is recommended to be equipped with a UV lamp sterilization device to prevent the liquid from breeding bacteria and attenuate the heat dissipation capacity of the system;<br>☐ The system is equipped with a 4bar safety relief valve;<br>☐ The system is equipped with a constant pressure expansion tank.<br><br>Note: when the temperature of the coolant rises after the miner is turned on the pressure will rise. |
| Humidity | ☐ Working humidity: 5%RH~85%RH (non-condensing)<br>☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |



Remarks: The above liquid temperature and flow parameters are based on deionized water as the liquid medium. If the liquid medium uses antifreeze, the liquid temperature and flow parameters need to be calculated separately. Table 2 shows an example of 30% glycol antifreeze temperature and flow parameters.

Table2 Example of temperature and flow parameters of 30% ethylene glycol antifreeze

| | |
|---|---|
| Temperature | ☐ Working temperature (inlet): 15℃~45℃@normal mode<br>15℃~35℃@high performance mode<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃<br><br>Note: please empty the liquid in the equipment during storage and transportation. |
| Flow | ☐ Limited Data：⩾11L/min<br>☐ Flow control accuracy± 10%<br><br>Remarks: The temperature difference between the inlet and outlet liquids at this flow rate is close to 10℃@normal mode, 14℃@high-performance mode) |

| | |
|---|---|
| Warranty Period | One year after leaving the factory |
| After-sales Contact Information | 1. Email: Support@microbt.com<br>2. Telegram Group: @WhatsMiner Community |

# WHATSMINER M56S++



## SPECIFICATION

| | |
|---|---|
| Hashrate | 222~236T± 10% |
| Power Ratio | 22J/T ± 5% |
| PSU | AC380~480V |
| Size | 267.5mmX147mmX401mm with handle |
| Weight | Net weight: 16kg Weight with packaging materials: 17kg |
| Power Cable Model | Custom made，⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~45℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃ |
| Liquid flow | ☐ Limited Data：⩾24L/min<br>☐ Flow control accuracy ± 10%<br>Remarks: 24L/min corresponds to the temperature difference between inlet and outlet close to 7°C@normal mode, 10°C@high performance mode) |
| Liquid medium | Insulating liquid (S5X/S3X)<br>Remarks: See next page for details on liquid properties and safety requirements. |

| | |
|---|---|
| Humidity | ☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |

Remarks: The above liquid flow parameters are based on S5X/S3X as the liquid medium. If the liquid medium uses other types of coolant, the liquid flow parameters need to be calculated separately. Calculation method: When the mining machine has the same calorific value, the product of the liquid specific heat, density and flow rate is a fixed value, that is, the flow rate is inversely proportional to the product of density and specific heat.

## Coolant EC110 Flow Parameter Calculation Example

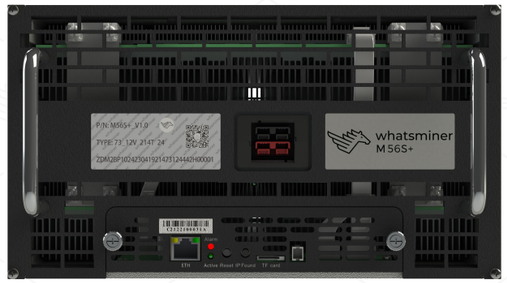
| Coolant type | Specific heat capacity (J/kg·℃) | Density (kg/m$^3$) | Flow (L/min) |
|---|---|---|---|
| S5X/S3X | 2274 | 806 | 24 |
| EC110 | 2231 | 778 | =(2274*806*24) /(2231*778)=25.35 |



## Insulating liquid performance and safety requirements

1) It has good thermodynamic properties (relatively high thermal conductivity, high liquid specific heat value, and low viscosity among similar substances);
2) It should have good chemical and thermal stability relative to the life cycle of the electronic system and the specified working temperature;
3) Appearance and smell, transparent and no odor;
4) Boiling point (℃), >120℃;
5) Flash point>150℃ or no flash point;
6) pour point (℃), <-40;
7) Purity (Wt%) ⩾ 99.5%;
8) Non-volatile residues (Wt ppm) ⩽ 10ppm
9) Water content (Wt ppm) ⩽ 50ppm
10) Acidity (mg KOH/g) ⩽ 0.03
11) Withstand voltage breakdown (KV/2.5mm), initial ⩾ 20, saturated water state > 10;
12) Volume resistivity (Ω·cm) ⩾ 1X109; dielectric constant (100Hz-10MHz) < 8, dielectric loss factor < 0.7%;
13) The particle size limit in oil, after hot oil circulation, the number of particles larger than 5um in 100ml of oil is ⩽2000, and there are no particles larger than 50um.
14) Material compatibility, it should be compatible with most metals and hard inorganic substances, including stainless steel, copper, aluminum, silica, alumina, etc. commonly used in electronic systems, to ensure the appearance, volume and physical properties (mechanical properties). , electrical) impact <1%. For organic substances and elastomers, it should be confirmed by the Soxhlet extraction test, and it should be ensured that after extraction with organic substances in the system, the volume and weight change of organic substances is less than 3%, and the extracted products have no effect on liquid media and other devices that can reach the site through liquid transfer. . The liquid itself should not react chemically with any material it may come into contact with, resulting in the modification or decomposition of the liquid.
15) The physical reaction of the liquid with the contact materials, including dissolution, extraction, etc., should not affect the corresponding functions of the liquid and system materials. For example, the liquid extracts the plasticizer of the cable insulation layer, causing the cable to harden and crack. Or the substances in the system are dissolved in the contact liquid, resulting in an increase in the viscosity of the liquid or deterioration in performance.
16) Dissolved substances caused by liquid convection or driving flow should not affect other materials or devices in contact with the liquid. For example, the plasticizer precipitated from the cable will reduce the heat exchange efficiency on the surface of the heating device through accumulation.
17) The liquid chemical decomposition temperature should be much higher than the system working temperature and potential local overheating temperature.
18) It belongs to the non-toxic category. It is non-irritating to the eyes, non-irritating to the skin, and does not have mutagenic cell mutations or heart diseases.

# WHATSMINER M56S+


## SPECIFICATION

| | |
|---|---|
| Hashrate | 206~224T ± 10% |
| Power Ratio | 24J/T ± 5% |
| PSU | AC380~480V |
| Size | 267.5mmX147mmX401mm with handle |
| Weight | Net weight: 16kg Weight with packaging materials: 17kg |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~45℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃ |
| Liquid flow | ☐ Limited Data：⩾24L/min<br>☐ Flow control accuracy ± 10%<br>Remarks: 24L/min corresponds to the temperature difference between inlet and outlet close to 7°C@normal mode, 10°C@high performance mode) |
| Liquid medium | Insulating liquid (S5X/S3X)<br>Remarks: See next page for details on liquid properties and safety requirements. |

| | |
|---|---|
| Humidity | ☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |

Remarks: The above liquid flow parameters are based on S5X/S3X as the liquid medium. If the liquid medium uses other types of coolant, the liquid flow parameters need to be calculated separately. Calculation method: When the mining machine has the same calorific value, the product of the liquid specific heat, density and flow rate is a fixed value, that is, the flow rate is inversely proportional to the product of density and specific heat.

## Coolant EC110 Flow Parameter Calculation Example

| Coolant type | Specific heat capacity (J/kg·℃) | Density (kg/m$^3$) | Flow (L/min) |
|---|---|---|---|
| S5X/S3X | 2274 | 806 | 24 |
| EC110 | 2231 | 778 | =(2274*806*24) /(2231*778)=25.35 |

## Insulating liquid performance and safety requirements

1) It has good thermodynamic properties (relatively high thermal conductivity, high liquid specific heat value, and low viscosity among similar substances);
2) It should have good chemical and thermal stability relative to the life cycle of the electronic system and the specified working temperature;
3) Appearance and smell, transparent and no odor;
4) Boiling point (°C), >120°C;
5) Flash point>150°C or no flash point;
6) pour point (°C), <-40;
7) Purity (Wt%) ⩾ 99.5%;
8) Non-volatile residues (Wt ppm) ⩽ 10ppm
9) Water content (Wt ppm) ⩽ 50ppm
10) Acidity (mg KOH/g) ⩽ 0.03
11) Withstand voltage breakdown (KV/2.5mm), initial ⩾ 20, saturated water state > 10;
12) Volume resistivity (Ω·cm) ⩾ 1X109; dielectric constant (100Hz-10MHz) < 8, dielectric loss factor < 0.7%;
13) The particle size limit in oil, after hot oil circulation, the number of particles larger than 5um in 100ml of oil is ⩽2000, and there are no particles larger than 50um.
14) Material compatibility, it should be compatible with most metals and hard inorganic substances, including stainless steel, copper, aluminum, silica, alumina, etc. commonly used in electronic systems, to ensure the appearance, volume and physical properties (mechanical properties). , electrical) impact <1%. For organic substances and elastomers, it should be confirmed by the Soxhlet extraction test, and it should be ensured that after extraction with organic substances in the system, the volume and weight change of organic substances is less than 3%, and the extracted products have no effect on liquid media and other devices that can reach the site through liquid transfer. . The liquid itself should not react chemically with any material it may come into contact with, resulting in the modification or decomposition of the liquid.
15) The physical reaction of the liquid with the contact materials, including dissolution, extraction, etc., should not affect the corresponding functions of the liquid and system materials. For example, the liquid extracts the plasticizer of the cable insulation layer, causing the cable to harden and crack. Or the substances in the system are dissolved in the contact liquid, resulting in an increase in the viscosity of the liquid or deterioration in performance.
16) Dissolved substances caused by liquid convection or driving flow should not affect other materials or devices in contact with the liquid. For example, the plasticizer precipitated from the cable will reduce the heat exchange efficiency on the surface of the heating device through accumulation.
17) The liquid chemical decomposition temperature should be much higher than the system working temperature and potential local overheating temperature.
18) It belongs to the non-toxic category. It is non-irritating to the eyes, non-irritating to the skin, and does not have mutagenic cell mutations or heart diseases.

# WHATSMINER M56S



## SPECIFICATION

| | |
|---|---|
| Hashrate | 194~220T ± 10% |
| Power Ratio | 26J/T ± 5% |
| PSU | AC380~480V |
| Size | 267.5mmX147mmX401mm with handle |
| Weight | Net weight: 16kg Weight with packaging materials: 17kg |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~45℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃ |
| Liquid flow | ☐ Limited Data：⩾24L/min<br>☐ Flow control accuracy ± 10%<br>Remarks: 24L/min corresponds to the temperature difference between inlet and outlet close to 7°C@normal mode, 10°C@high performance mode) |
| Liquid medium | Insulating liquid (S5X/S3X)<br>Remarks: See next page for details on liquid properties and safety requirements. |

| | |
|---|---|
| Humidity | ☐ Storage humidity: 5%RH~95%RH (non-condensing)<br>☐ Long-term storage humidity: 30%RH~69%RH (no condensation) |

Remarks: The above liquid flow parameters are based on S5X/S3X as the liquid medium. If the liquid medium uses other types of coolant, the liquid flow parameters need to be calculated separately. Calculation method: When the mining machine has the same calorific value, the product of the liquid specific heat, density and flow rate is a fixed value, that is, the flow rate is inversely proportional to the product of density and specific heat.

## Coolant EC110 Flow Parameter Calculation Example

| Coolant type | Specific heat capacity (J/kg·℃) | Density (kg/m$^3$) | Flow (L/min) |
|---|---|---|---|
| S5X/S3X | 2274 | 806 | 24 |
| EC110 | 2231 | 778 | =(2274*806*24) /(2231*778)=25.35 |



## Insulating liquid performance and safety requirements

1) It has good thermodynamic properties (relatively high thermal conductivity, high liquid specific heat value, and low viscosity among similar substances);
2) It should have good chemical and thermal stability relative to the life cycle of the electronic system and the specified working temperature;
3) Appearance and smell, transparent and no odor;
4) Boiling point (℃), >120℃;
5) Flash point>150℃ or no flash point;
6) pour point (℃), <-40;
7) Purity (Wt%) ⩾ 99.5%;
8) Non-volatile residues (Wt ppm) ⩽ 10ppm
9) Water content (Wt ppm) ⩽ 50ppm
10) Acidity (mg KOH/g) ⩽ 0.03
11) Withstand voltage breakdown (KV/2.5mm), initial ⩾ 20, saturated water state > 10;
12) Volume resistivity (Ω·cm) ⩾ 1X109; dielectric constant (100Hz-10MHz) < 8, dielectric loss factor < 0.7%;
13) The particle size limit in oil, after hot oil circulation, the number of particles larger than 5um in 100ml of oil is ⩽2000, and there are no particles larger than 50um.
14) Material compatibility, it should be compatible with most metals and hard inorganic substances, including stainless steel, copper, aluminum, silica, alumina, etc. commonly used in electronic systems, to ensure the appearance, volume and physical properties (mechanical properties). , electrical) impact <1%. For organic substances and elastomers, it should be confirmed by the Soxhlet extraction test, and it should be ensured that after extraction with organic substances in the system, the volume and weight change of organic substances is less than 3%, and the extracted products have no effect on liquid media and other devices that can reach the site through liquid transfer. . The liquid itself should not react chemically with any material it may come into contact with, resulting in the modification or decomposition of the liquid.
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# WHATSMINER M56



## SPECIFICATION

| | |
|---|---|
| Hashrate | 168~194T ± 10% |
| Power Ratio | 29J/T ± 5% |
| PSU | AC380~480V |
| Size | 267.5mmX147mmX401mm with handle |
| Weight | Net weight: 16kg Weight with packaging materials: 17kg |
| Power Cable Model | Custom made, ⩾16A |
| Internet Connections | Ethernet |

## ENVIRONMENTAL PARAMETERS

| | |
|---|---|
| Liquid temperature | ☐ Working temperature (inlet): 20℃~45℃@normal mode<br>20℃~40℃@high performance mode;<br>☐ Inlet temperature control accuracy ± 2℃<br>☐ Storage and transportation temperature: -40~70℃ |
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