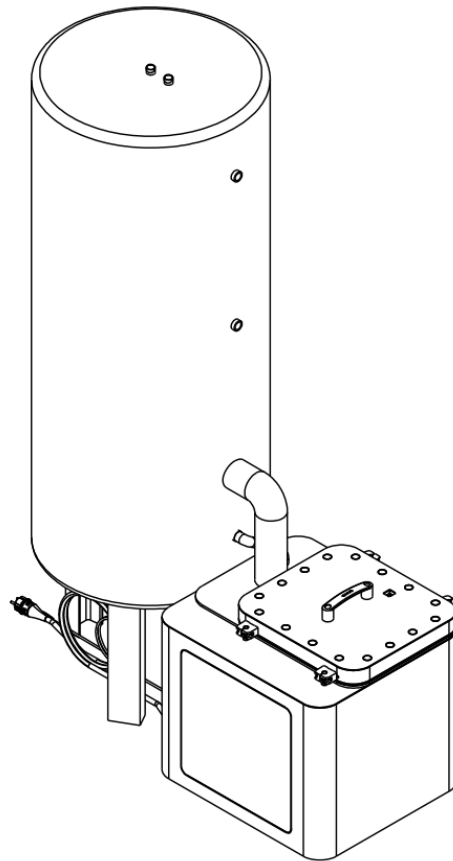


Sato

Mining Boiler

Installation & Technical Manual



A WisElement Trademark

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1. Content

- 1 Sato
- 5 Cartridges
- 2 x 3m ethernet cable
- 2 x 5L Heat Transfer Liquid (3M Novec 7200)
- 1 T&P Relief valve
- 2 Solenoid Valve
- 1 Drain Valve
- 3 inspection door joints (for maintenance)
- Optional :
 - ASIC Hashboards
 - ASIC Controlboards
 - 2 x PLC Socket

2. Introduction

Thank you for specifying the Sato Assistant Boiler (hereafter referred to as Sato) from WiseMining.

Sato is an electrically heated direct acting self modulating boiler assistant that is designed for domestic heating purposes,

Sato consists of an electric heating evaporator and an indirect hot water cylinder with the necessary safety devices.

Sato also has an inbuilt programmer that allows you to set your heating and hot water temperature.

This appliance is not intended for use 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 concerning use of the appliance by the person responsible for their safety.

Children should be supervised to ensure they do not play with the appliance.

The product may only be used for the heating of boiler water and for DHW heating. Any other use is considered inappropriate. We assume no liability for damage occurring due to non permitted use.

- WiseMining reserves the right to make changes to the specifications or design when necessary. This document will then be updated. Make sure you are in possession of the more recent one.
- All boiler's assistants come with a 20 years warranty that covers all defects originating from faulty materials and workmanship in the manufacture of Sato, except concerning mining materials and electronical parts.
- The warranty covers the replacement of any faulty parts and labour costs.
- The warranty will not cover any damage to Sato from poor or incorrect installation work.
- The warranty will not cover any call out charges that have not been authorised by WiseMining.
- The warranty will not cover water leaks into Sato. All plumbing joints must be checked.
- A magnesium anode is fitted to Sato and must be replaced at least annually.
- Failure to replace the magnesium anode may result in appliance damage, this will not be covered under warranty.
- Take care when handling Sato not to cause any damage to the unit.
- Sato must be stored in a dry place.
- Care must be taken when installing Sato to make sure the floor area will take the appliance's full weight when full.
- Minimum clearances must be adhered to.

3. Safety

Please read and understand these instructions before installing Sato. Failure to comply with instructions may result in material damage and personal injury, including possible loss of life. System functioning should be explained to the customer and all instructions left with them for future reference.

- Sato must be installed in accordance with the manufacturer's instructions and all relevant regulations in force at the time of installation.
- Sato must be installed into a sealed (pressurised) primary system.
- Sato's hot water cylinder is indirectly heated by the evaporator through a heat exchanger located within the unit.
- Please note a load check should be taken into consideration when installing high output electrical appliances.
- The use of an Off-Peak tariff is not recommended since it will reduce mining/heating time. Sato is designed to run 24/24h
- When manipulating electrical connections, the electric supply should be turned off.
- *Sato's Domestic Hot Water Cylinder is of the UNVENTED type. Its installation is subject to Building Regulation G3 (England and Wales), Technical Standards for (Scotland) or Building Regulation (Northern Ireland). The Installation must be carried out by a competent person qualified to do so.*

This appliance must be fitted in accordance with the following instructions:

- The Local Building Regulations
- The Building Regulations
- The Building Standards, (Scotland-consolidated) Regulations.
- Local water bylaws.

Manipulating the thermic liquid :

- The thermic liquid used in Sato is a product made by 3M, the Novec 7200.
- This product is harmless for humans and has zero ozone depletion potential and other favorable environmental properties.
- Meanwhile, this product is considered Hazardous to the Aquatic Environment. It should therefore not be disposed of in the environment.

Extract from 3M Safety Data Sheet

Inhalation: No need for first aid is anticipated.

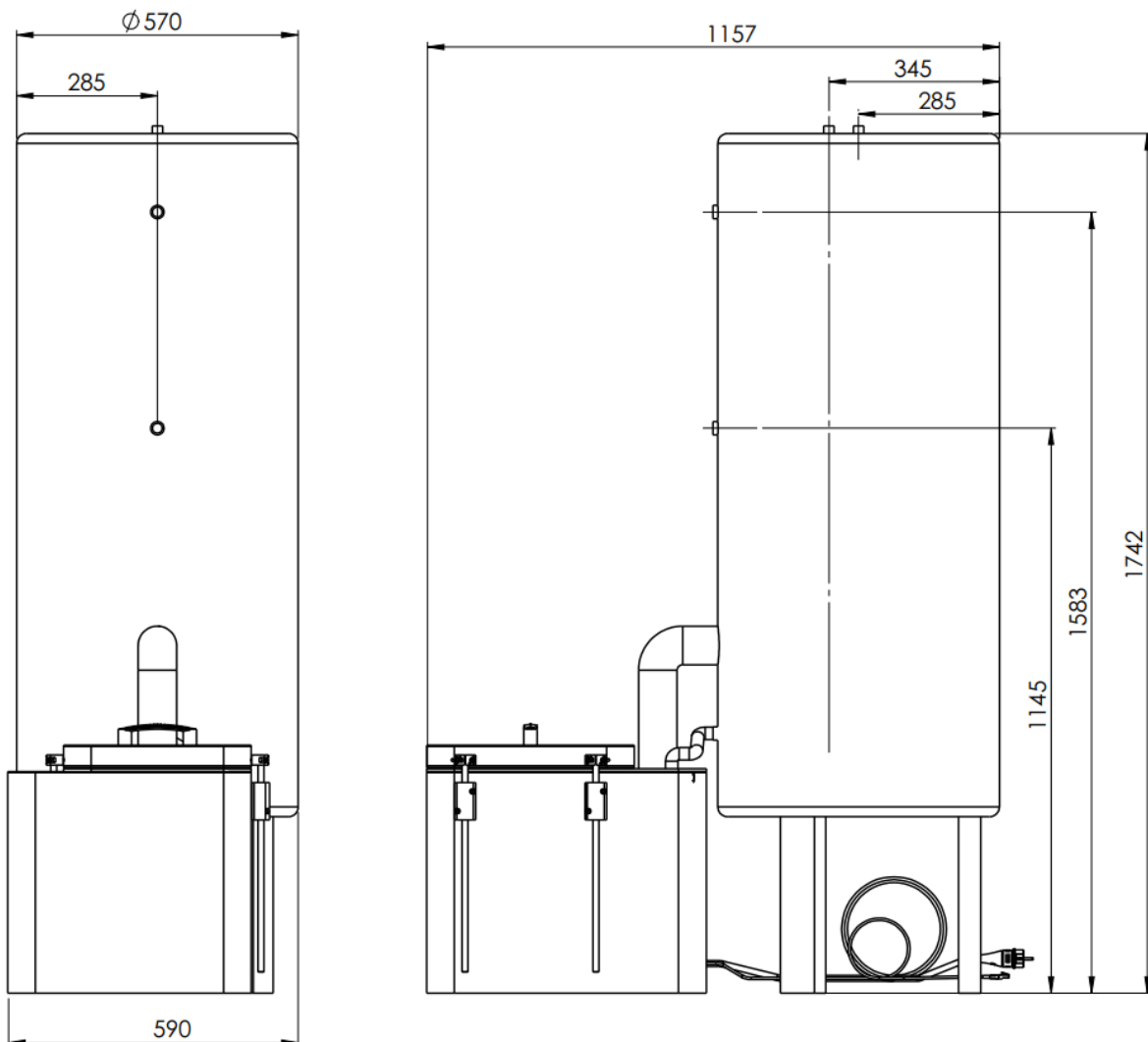
Skin contact: Wash with soap and water. If you feel unwell, get medical attention.

Eye contact: No need for first aid is anticipated.

If swallowed: Rinse mouth. If you feel unwell, get medical attention.

Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Avoid contact with oxidising agents (eg. chlorine, chromic acid etc.) No smoking: Smoking while using this product can result in contamination of the tobacco and/or smoke and lead to the formation of hazardous decomposition products. Keep away from sparks/flames/extreme heat

4. Installation: Dimensions



All dimensions are displayed in millimeters.

WiseMining reserves the right to change those dimensions. Be sure to always have the latest version of this manual.

Note: Please take care to leave enough space at the front and on the left side of the boiler for routine maintenance!

- Remove the boiler packaging checking the contents are correct.
- Take care when lifting the boiler not to cause damage to the outer casing.
- Due to the weight of the product the use of a handling device will be required.
- The boiler should be handled by a minimum of two persons with a handling device.
- Lift the boiler by the internal frame only, do not lift by pipes.
- Stooping should be avoided and protective clothing worn.
- Packaging is recyclable and should be disposed of appropriately.

5. Installation: General

1. General:

The boiler must be installed by a professional plumber or heating engineer and must be connected to the public low voltage network by a competent person. WiseMining will not be held responsible for faulty installations which are performed by unqualified tradespeople.

2. Pipe Connections:

Every Sato has 22mm Compression pipe connections that are clearly marked. Please note that the boilers are supplied with blank plugs for transit purposes that must be removed before fitting. Mains Inlet, Hot Outlet, Flow & Return connections are clearly marked on the external case, under no circumstances should these connections be reversed. If hot capillary joints are to be used, these joints must be made before connections to the boiler are done.

3. Isolation Valves:

We recommend that full bore isolation valves are fitted on the Flow, Return & Main Water Supply Pipework. Such valves must be full bore and not "ball valves". The installation of ball valves in the flow and return pipework will reduce the flow rate through the boiler.

4. Boiler sizing:

Calculate the optimum mining power using the forecasting tool on wisemining website. Check with the wisemining team if doubts arise.

5. Insulation

Where practical, and if at all possible, we recommend that all pipework be insulated.. This is to reduce heat loss and reduce high cupboard temperatures from exposed pipework.

6. Water Quality

In the presence of softener, the TH should never be below 100ppm, preferably maintain a value between 120 and 150ppm.

Maintain a PH greater than or equal to 7.

Limit the chloride level to 30mg/l.

6. Water Connections

Provisions must be made for the replacement of water lost from the heating system (sealed systems). There must be no direct connection between the heating loop and the main water supply. When mains water is required to fill the system directly, all local water bylaws must be observed, and any connection made must be disconnected after use.

7. System pressures

All water tanks are tested to 6.0 bar. The normal working pressure of the water tank should be set to approx 2 / 2.5 bar. The heat exchanger connected to the heating circuit is designed to support 4 bars. Normal working pressure inside should be set to approx 1 / 1.5 bar. All sealed systems should comply with the relevant building regulations and standards, including BS EN 13831 – Specification for Expansion Vessels.

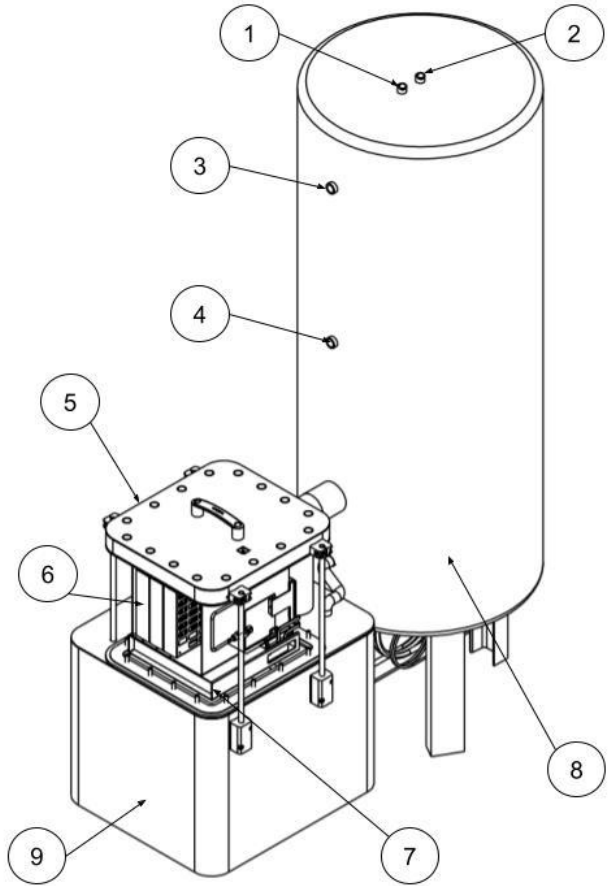
Please note: In order to protect the boiler, it is imperative that the pre-installed magnesium anode is removed and replaced at least annually. Failure to carry out this action will reduce tank lifespan.

8. System types

Sato can be used in various system designs. Please refer to WiseMining for more details.

Note :

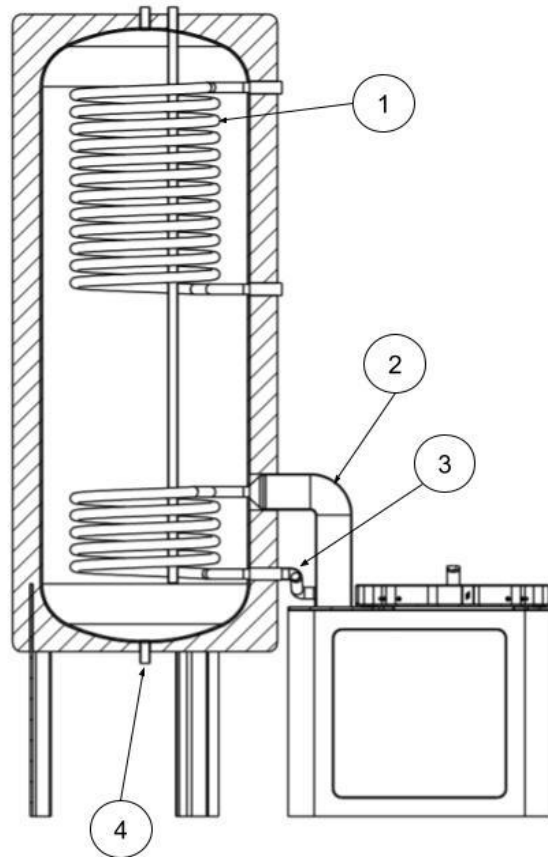
The current setup should be fully drained (water tank and heating circuit) before starting Sato's installation.



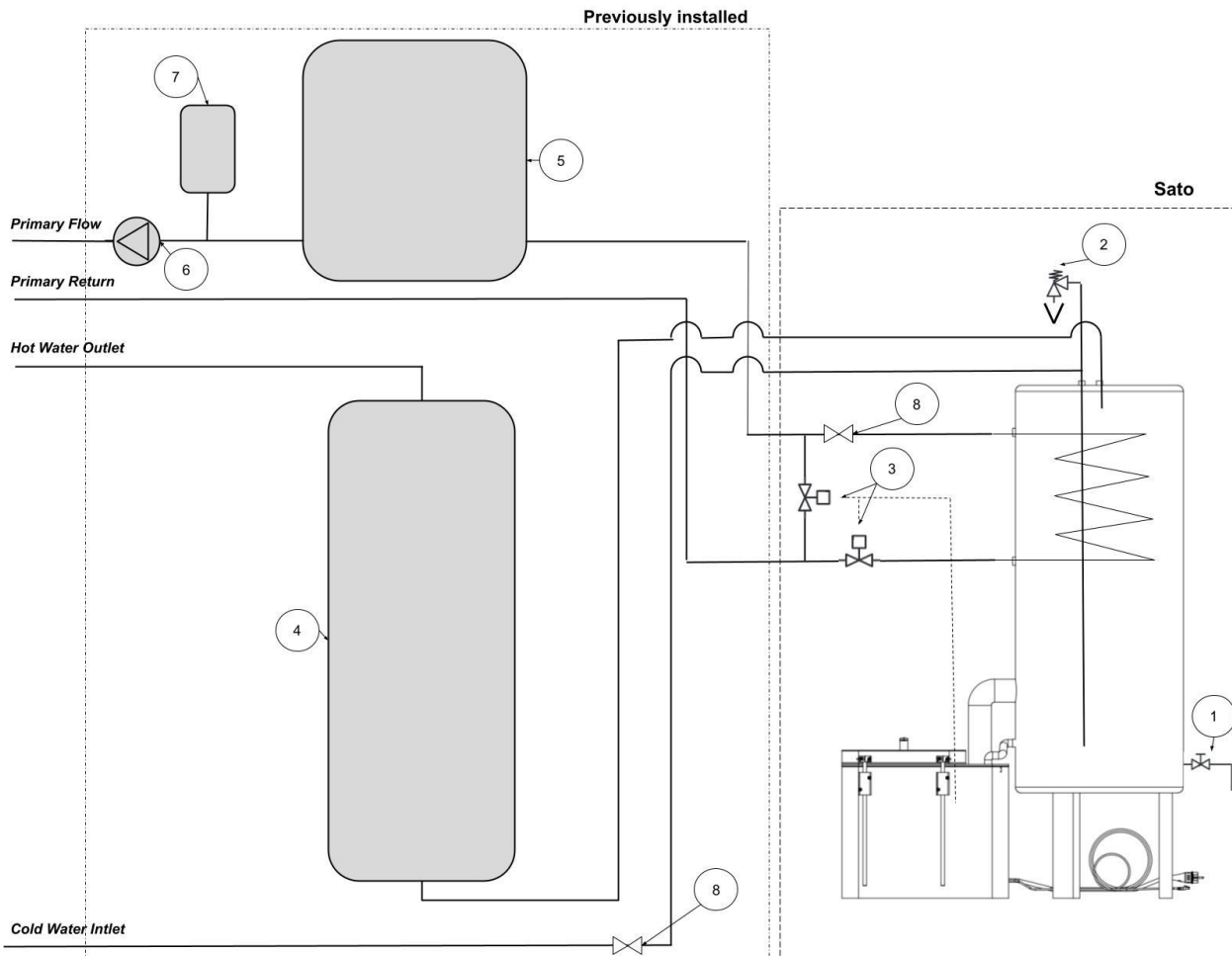
- 1 - Hot Water Outlet ($\frac{3}{4}$ "
- 2 - Cold Water Inlet ($\frac{3}{4}$ "
- 3 - Heating Circuit Outlet ($\frac{3}{4}$ "
- 4 - Heating Circuit Inlet ($\frac{3}{4}$ "
- 5 - Mining Drawer
- 6 - ASIC Cartridge
- 7 - ASIC Power Unit
- 8 - Hot Water Cylinder
- 9 - Evaporator

- 1 - Heat Circuit Exchanger
- 2 - Evaporator Chimney
- 3 - Condensate Return
- 4 - Drain Outlet

All plumbing connectors are BSP-3/4".



6. Hydraulic Schematic



- 1 - Drain Valve
- 2 - T&P Relief valve + Tundish
- 3 - Solenoid Valve
- 4 - Previously Installed Water Tank (Not Included)
- 5 - Previously Installed Boiler (Not Included)
- 6 - Previously Installed Pump (Not Included)
- 7 - Previously Installed Expansion Vessel (Not Included)
- 8 - Isolating valves (1 included)

Note : Primary return water temperature should not be more than 50°C. In fact, it should be as low as possible. If it is higher than the temperature in Sato’s water tank, solenoid valves will be used to divert the heating circuit and bypass Sato’s heat exchanger. This will then reduce mining time.

7. Installation Plumbing

Before any maintenance, make sure that the evaporator is fully closed. No water must ever get into the evaporator tank which would cause damage to the mining equipment.

Water supply requirements:

Sato's hot water cylinder operates at 2 / 2.5 bar (controlled by the inlet set) and is capable of delivering over 50 litres per minute. The maximum possible water demand should be assessed by taking into consideration that both hot and cold services are supplied simultaneously from the mains.

In order to meet the most common heating setup's flow rate in domestic houses, Sato's inlet and outlet are BSP- $\frac{3}{4}$ ".

Cold mains pipework:

1. Run the cold water mains pipework to the location of the Sato. Take care not to run cold pipes close to hot pipework as this will cause thermal transfer.
2. Install an isolating valve (not supplied) before the cylinder inlet and the T&P Relief valve. This will allow you to stop the main water flow when draining Sato's tank for maintenance.
3. Allow space for a 22mm x 22mm x 15mm tee and a valve between the solenoid valve and the heating circuit inlet connection for the heating system filling/draining loop. The valve must be closed after the system has been commissioned. It should only be opened when a draining of the heating loop is required.

8. Electrical Connection

ALL ELECTRICAL CONNECTIONS MUST BE MADE BY A QUALIFIED ELECTRICIAN.

Load check must be taken into consideration when installing high power boilers. This will be carried out by a qualified electrician. There may be an additional requirement to upgrade the incoming main fuse supplying the property if other high power devices are used within the property. All boilers must be protected at the meter position with a 30mA double pole RCD with a minimum of 3mm contact separation accompanied by a suitably rated MCB. If the boiler is not fitted local to the meter position then an additional isolation switch must be fitted local to the boiler for each supply. If the property is prone to lightning strikes or power cuts it is recommended to install a suitable surge protection device to the boiler supply. This will reduce the risk of damage to the boiler electronics during these events.

THIS APPLIANCE MUST BE EARTHED.

After completion of all electrical works, an electrical safety check should be carried out i.e. short circuit, earth continuity, resistance to earth and polarity check, and all relevant Test Certificates completed and issued to the customer.

Never open the side cover of the boiler until all power supplies to the boiler have been disconnected.

ELECTRICAL CONNECTIONS:

The electrical supply cables can be routed into the boiler from the evaporator's back side. Cable grommets are supplied and fitted to the boiler's cable entry point. All cables should be secured to meet current regulations.

The boiler connections are clearly marked inside the boiler L- Live, N - Neutral, E - Earth.
 The supply is a permanent Feed connection to the boiler from the mains supply and should never be isolated unless for maintenance purposes.

The Boiler circuit RCD should be independent of all other domestic circuits. It should not be disconnected during any part of the day for better results. Since Sato's power can be upgraded to 5000+W, the unit must be supplied with 4 mm² (11 AWG) cables.

BOILER PROTECTION:

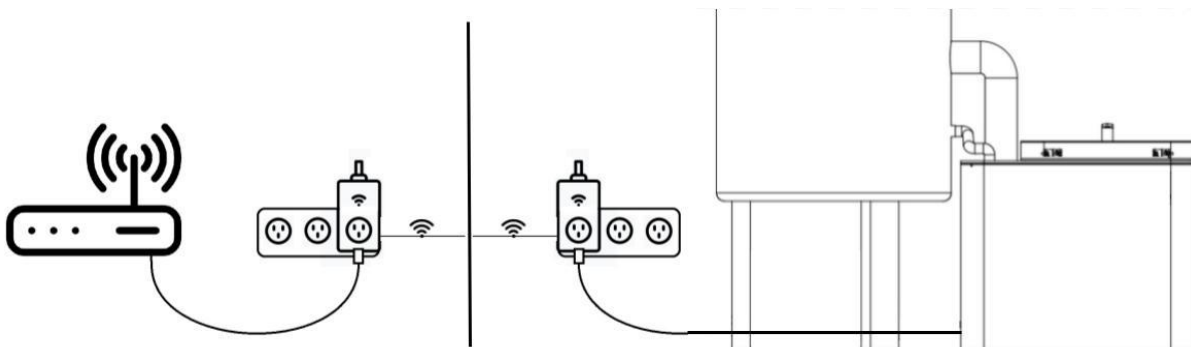
The recommended protection for hard wired boilers are as follows:

Mining/Heating Power	Protection
0 - 1500 W	7 A
1500 W - 2500 W	12 A
2500 W - 3500 W	16 A
3500 W - 4500 W	21 A
4500 W - 5500 W	25 A

9. Internet Connection

Internet connection type : RJ45 Ethernet 10/100M

Sato Must be connected to the internet. It should be connected to your internet router 24/24h 7/7d.
 Since wireless networks are not always available in the boiler room, we recommend the use of Power Line Carrier sockets to easily bring ethernet cable to the boiler room.



PLC Sockets and Ethernet cables are provided.

No high speed internet connection is required. It should only be continuous. Your router should not be turned off.

10. Commissioning

Before any maintenance, make sure that the evaporator is fully closed. No water must ever get into the evaporator tank which would cause damage to the mining equipment.

IMPORTANT:

TURN ON THE ELECTRICAL POWER SUPPLY TO SATO. MAKE SURE THAT THE PROGRAMMER IS NOT CALLING FOR HEAT AT THIS STAGE!
TO PREVENT MINING/HEATING FROM STARTING, SIMPLY UNPLUG THE ETHERNET CABLE.

FILLING THE HOT WATER CIRCUIT:

1. Check the pressure in the potable vessel is set to 2 Bar
2. Check that all plumbing connections are tight
3. Open the furthest away tap outlet
Note: Make sure that the filling loop is closed at this stage!
4. Turn on the mains water supply to the unit
5. It will take a few minutes to fill the cylinder, once the water comes through the tap outlet let it run
6. Open the other hot water outlets and purge all air out of the system
7. Once fully purged close all the outlets and further check for leaks

FILLING THE PRIMARY HEATING CIRCUIT:

This section should be made in accordance with your current boiler's filling procedure. Sato should be considered as a simple tube. Make sure that the circuit pressure does not exceed 3 bars.

System protection:

Failure to protect the system will invalidate the manufacturer's warranty.

Sato's heat circuit is compatible with most cleansing agents. Follow your boiler's cleaning procedure to clean your heating circuit, including Sato's coil.

FILLING THE EVAPORATOR TANK:

This process should be done once all plumbing is done, and no leaks are detected. Water must not ever get into the evaporator tank.

1. Remove the evaporator's lid bolts
2. Pull the mining drawer upward and block it on the "UP" position.
3. Locate the filling hole and insert the funnel.
4. Pour the thermic fluid inside. You should deliver about 5 liters then check for the fluid level indicator.
5. Top up if needed until it reaches the designed required level.
6. If needed, insert/replace/remove mining cartridges. Make sure they are inserted correctly.
7. Unlock the mining drawer and plunge it back into the evaporator tank.
8. Tighten every bolt on the lid following a star pattern.

11. Upgrading Mining Equipment

1. Remove the evaporator's lid bolts
2. Pull the mining drawer upward and block it on the "UP" position.
3. Insert/replace/remove mining cartridges. Make sure they are inserted correctly.
4. Unlock the mining drawer and plunge it back into the evaporator tank.
5. Tighten every bolt on the lid following a star pattern.

12. Annual Servicing

Before any maintenance, make sure that the evaporator is fully closed. No water must ever get into the evaporator tank which would cause damage to the mining equipment.

A competent installer should carry out the following checks on an annual basis, ideally at the same time as the annual boiler service.

1. The expansion relief valve on the inlet control set should be eased open allowing water to flow for 5 seconds. The valve should then be closed making sure it resets correctly. Always ensure that the discharge pipework is allowing the water to drain away adequately. If not check for blockages etc. and clear.
2. Ensure that the cylinder thermostat is working correctly and that it is controlling the water at a temperature of between 60°C and 75°C
3. Check the pressure in all expansion vessels. Turn off the water supply to the unit and open a hot tap first. Air or CO2 can usually be used to pressurise the expansion vessel.
4. Remove the head on the inlet control set by unscrewing, and clean the mesh filter within.
5. Replace the magnesium anode placed on the top of the water cylinder.
8. Ensure the central heating circuit is filled to 1.5 bar.



SERVICING MUST BE CARRIED OUT ANNUALLY & SHOULD ONLY BE CARRIED OUT BY COMPETENT INSTALLERS AND ANY SPARE PARTS USED MUST BE PURCHASED FROM WISEMINING, EXCEPT FOR REGULAR PLUMBING SERVICE. NEVER BYPASS ANY SAFETY DEVICES OR OPERATE THE UNIT WITHOUT THEM FULLY OPERATIONAL.

YOUR GUARANTEE MAY BE VOID WITHOUT PROOF OF ANNUAL SERVICING. THE COMMISSIONING CERTIFICATE SUPPLIED AT THE REAR OF THIS MANUAL SHOULD ALSO BE COMPLETED BY THE INSTALLER.

13. Other Servicing

The Water Tank should be drained at least every 5 years to remove scale and check the vessel and the heat exchangers' surface.

Before any maintenance, turn off the electric supply to Sato. Make sure that the evaporator is fully closed.

- 1 - Turn off the mains water supply before Sato
- 2 - Open a tap
- 3 - Connect the drain valve to any discharge pipe
- 4 - Open the drain valve
- 5 - Wait for the the tank to empty
- 6 - Remove the bolts from the inspection door and open it
- 7 - Remove the scale
- 8 - Inspect the cylinder's inside surface and the heat exchangers. There should not be very corroded parts. - In case of doubts, please contact WiseMining Support Center.
- 9 - Replace the inspection door joint with a new one
- 10 - Close the inspection door, and tighten the bolts one by one, following a star pattern.
- 11 - Turn on the mains water supply and check the absence of leaks
- 12 - Wait for water to come out of the opened tap then close the tap.

14. Guarantee

The Comet Combi boiler comes with a 2 year parts & labour warranty and the stainless steel parts (including vessel, evaporator tank, coils, chimney) and steel frame carry a 20 years guarantee against faulty materials or manufacture provided that:

- It has been correctly installed as per this document and all the relevant standards, regulations and codes of practice in force at the time.
- It has not been modified in any way, other than by WiseMining.
- It has not been misused, tampered with or subjected to neglect.
- It has only been used for the storage of potable water and space heating.
- It has not been subjected to frost damage.
- The unit has been serviced annually.
- The benchmark service record has been filled in after each annual service.
- The guarantee period starts from the date of purchase which should be registered with WiseMining.
- The extended guarantee is not transferable, and rests with the original householder.
- The system is fed from a public mains water supply.
- Store temperatures do not exceed 70deg C.
- Installations are made only in Europe and North America.
- The water supply does not have a Chloride content greater than 250ppm.
- Units are not installed with uncontrollable heat sources (E.g. Wood Burning Stoves).
- The annual servicing has been performed as stated in this document.

Warranty Exclusions:

- Damage to the boiler from poor or incorrect installation work.
- Water leaks into the boiler. All plumbing connections must be checked at installation and commissioning.
- Damage caused to parts & equipment by scale build up or system debris / contamination is not covered by this warranty.

15. Troubleshooting

If you smell something unusual during the heating process, there may be a leak in your Sato. In this case, turn off Sato and contact WiseMining Support.

In case your Sato stops working :

- Ensure that it is connected to the internet
- Try to reboot it
- If you have installed wisemining's application on your smartphone, connect it to your Sato and look for error messages.
- In case the error displays a lack of thermic fluid, top up the evaporator tank with the supplied spare liquid (following the filling guide). Immediately inform WiseMining that a top up was needed so that we can appreciate whether there may be an issue or not.
- In case the error displays a mining issue, it may be necessary to replace some of your mining equipment. Contact WiseMining support.

If you cannot find the origin to the fault, please contact WiseMining Support

16. Technical Data

Domestic hot water cylinder		Units		Units	
Nominal Storage capacity		L	200	gal US	52
Recommended available installation space	Height	cm	190	ft.	6,2
	Length	cm	150	ft.	4,9
	Width	cm	150	ft.	4,9
Max. operating pressure	Tank	MPa	0,6	PSI	87
	Coil	MPa	0,6	PSI	87
Surface area of upper coil		m ²	2	yd. ²	
Upper coil capacity		L	~17.5L		
Power of upper coil		W	6.75 kW (heat. inlet = 50°C ; inn. tank = 55°C ; 40L/min)		
Efficiency of upper coil		-	-		
Weight (without water)		kg	-	lb.	
Max. operating temp	Return Heating circuit	°C	50	°F	122
	Pre-heated hot water	°C	70	°F	158
Heating Power		W	100 - 5000W		
Input voltage		V	220 - 240 V		
Maximum Input current		A	25 A		
Networking connection mode		-	RJ45 Ethernet 10/100M		
Ambient operating temperature		°C	5°C - 50°C	°F	41°F-122°F
Storage temperature		°C	0°C - 60°C	°F	32°F-140°F
Operating humidity		%	Relative humidity 35 - 85 %, non-condensing		
Storage humidity		%	Relative humidity 35 - 85 %, non-condensing		
Water tank material		-	Stainless steel		

WARNING TO THE USER

1. Do not remove or adjust any component part of this unvented water heater. Contact a fully qualified engineer.
2. If the unvented water heater develops a fault, such as a flow of water from the discharge pipe, turn the heater off and contact a fully qualified engineer.

17. Environmental Protection and Disposal

WiseMining uses the best possible technology and materials to reduce its impact on the environment. This is why we try to provide products with long lifespan, and after sale support to prevent from disposing of a working product.

If at some point the user wants to get rid of its Sato, special attention should be given to the disposing.

First, check on WiseMining Website the latest news about trade-in offers. Depending on the conditions of your product, WiseMining may offer to recover your Sato to reuse and recycle its parts.

In case of local waste disposal please consider this :

- Most of the components are recyclable. The vessel, the evaporator's tank, and the heat exchanger are made of stainless steel.
- The frame and the outside walls are made of steel.
- The mining grid frame and the cartridges are made of aluminium
- All the electronic equipment should be disposed of as a WEEE.
- The heat transfer liquid must not be disposed of in the environment! It should be poured in an empty bottle and disposed of in your local waste disposal as a chemical. Please also consider sending it back to wisemining for reuse/recycling. Check wisemining.io for more information.

18. Energy Savings

Mining following heating demand:

Sato is designed to provide heating energy only if the user is needing it. No mining will be made throwing away heat.

It is also designed to avoid heat sink and loss.

Central heating system:

With modern heating systems set around 20°C heat loss, the optimum temperature setting to apply to your own boiler should be around 70°C or lower. This will allow a heating circuit return temperature around 50°C which will make Sato more efficient.

Pipe insulation:

Every pipe should be insulated to prevent heat loss, especially if Sato is placed in a non living room. This will also prevent the water from freezing which would damage the system.



If you require any further assistance:

Telephone: (+33) 9 72 56 69 11

E-mail: help@wisemining.io

or visit our website www.wisemining.io