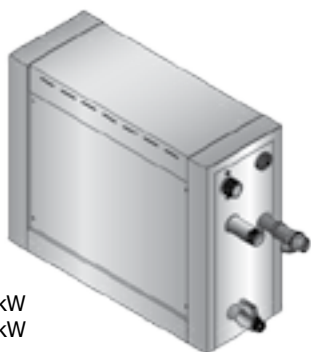


STEAM GENERATOR

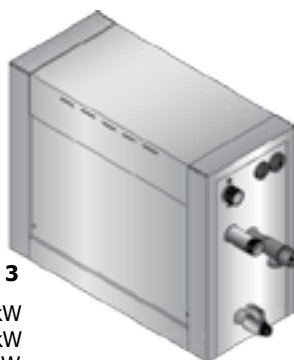
STE-30-1/2	STE-45-1/2	STE-45-C1/3	STE-90-C1/3
STE-35-1/2	STE-50-1/2	STE-60-C1/3	STE-120-3
STE-40-1/2		STE-75-C1/3	STE-150-3

Congratulations on your purchase of a SAWO Steam Generator.
Please read the manual carefully before using the steam generator.



STE 2

3,0 kW 4,5 kW
3,5 kW 5,0 kW
4,0 kW



STE 3

4,5 kW
6,0 kW
7,5 kW



STE 6

9,0 kW
12,0 kW
15,0 kW

Not for use in the USA, Canada and Mexico.

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Before Installing

Use the following information together with the consultation of your contractor, architect or designer in determining all factors necessary in providing a suitable and safe steam room.

Check that the supply voltage is suitable to your steam generator.

Ensure that the steam generator kilowatt corresponds to the volume of your steam room. Refer to Technical Data (See page 12).



WARNING!

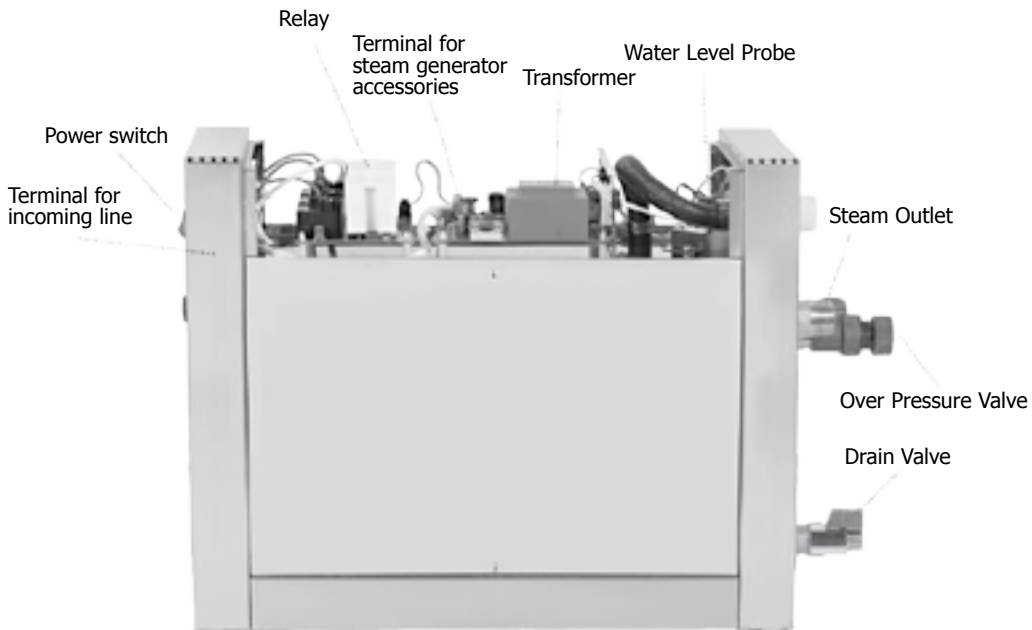
The voltage of the light output is 230VAC. Sawo recommends to use less than 50V for the steam room lightning. Use appropriate transformer for lower voltages. Sawo is not responsible of damages caused by using higher voltage inside the steam room.

Steam Room Guidelines

1. The Steam Room must be fully enclosed, complete with walls, door, flooring and ceiling.
2. Rubber linings (e.g. gaskets) are recommended for the door to effectively seal the heat and the steam inside the Steam Room.
3. If tiles are used for the flooring or some other smooth surface material, provide suitable anti-skid strips or rubberized mats to prevent slipping resulting to injury.
4. Materials used for the walls and ceiling should have water-resistant, non-corrosive surfaces such as tiles, marbles, molded acrylic, or other non-porous materials. The ceiling should be dome-shaped to prevent the dripping of condensate.
5. A drain must be provided in the flooring.
6. Heating, venting or air conditioning devices should not be installed inside the Steam Room.
7. Steam Room windows should be double paned.
8. Limit the Steam Room ceiling to a height of 2,5 meters. Exceeding 2,5m will require a higher-rated steam generator.
9. Floor drain for the steam generator must be available for maintenance.

Steam Generator Parts

For illustrative purposes only.



WARNING!

For illustrative purposes only.
Not for use for wiring. For
component identification only.

Instructions of Use

There are three different operation modes in the unit: Off, On and Standby. The user can easily switch between different modes, making the steam bathing more convenient with less energy consumption.

To use steam room the control unit needs to be in the On mode. In the On mode, the steamer is active, the temperature in the steam room will be kept in the preferred, set temperature, with occasional discharge of steam.

However, if the steam room is not used constantly, the generator can be set to Standby mode. The water in the tank is kept warm, with minimal energy usage. The generator is able to produce steam shortly after the unit is switch back to On mode for the convenience of the users or after Standby time expires. Room temperature is also kept warm during Standby-mode. Setting for room temperature is from 30 to 55°C.

On/Off Mode

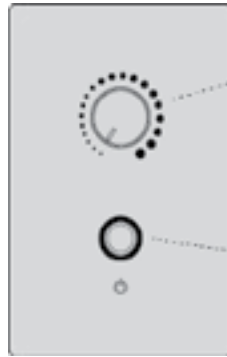
Press the On/Off button for ON / OFF / STANDBY

Short press the button to switch ON and long press to switch OFF.

When short press in ON mode, it goes to Standby.

Illumination

On/Off button light indicates the mode of the steam generator.



Thermo knob

Rotate to set minimum or maximum room temperature

On/Off button

Push button with LED light indicator

Status	LED Function
ON	steady light
OFF	slow blink
STANDBY	moderate blinking
ERROR	fast blinking

Standby Mode

During the Standby mode the water in the steam generator tank is kept hot. This minimizes the time to produce steam when generator goes to On mode after Standby time expires.

Standby-mode can be activated by any of the following methods when the unit is in On mode:

1. Short press "On/Off" button
2. When session time expires.

Extra setting is available if wanting to have less than 10deg.C temperature while in Standby mode. See jumper settings.

Standby mode can be disabled or enabled by a jumper setting on the STE board.

To activate On-mode again short press the "On/Off" button or turn latch remote On.

To go Off-mode:

1. Short press "On/Off" button
2. Wait until remaining standby time expires.
3. Latched off remote on, if disabled standby.

Session time

Session time can be set by jumpers on the STE board. See page 21 for further details.

Temperature

Room temperature can be set by turning thermo knob. Setting is from 30 - 55deg.C maximum.

Remote switch

Remote ON input can be latching switch or 230VAC input. Jumper 13 can disabled interface and room temperature dependence if placed. The main board will only follow commands from Remote ON switch, Remote ON AC, and demand button. And will follow default setting for room temperature. This setting is intended for WET sauna application or SAUNA heater and Steam Generator tandem.

If remote ON Switch is latched ON or Remote ON AC has HIGH input it will cause the following:

- Can't turn to state "OFF" using ON/OFF button.
- Unlimited Session time

Demand Button



A separate demand button can be installed on any desired location including inside the steam room. Press of the demand button will immediately release extra steam for 30 seconds when room is in Standby or On mode.

Pressing the "Demand" button when the steam generator is in "Off" or Standby" mode will switch the control unit to "On" mode.

Maintenance

1. Decalcification

Tap water contains impurities, for example lime, that can cause calcium deposit and block the internal parts of the steam generator. To prevent this and prolong the lifetime of steam generator it is recommended to have a water filter and water softener. They are connected to the water source of the steam generator's water inlet.

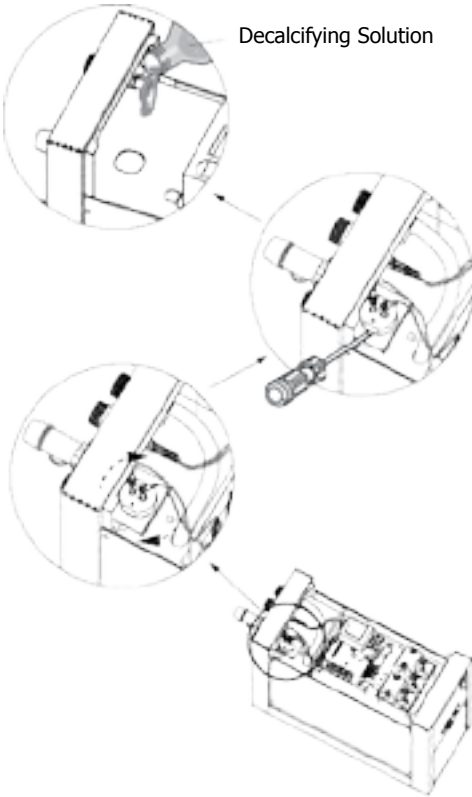
SAWO Decalcifying Solution can be used for decalcification. Follow these guidelines to perform preventative maintenance of the steam generator.



WARNING!

Never add the Decalcifying Solution when the generator is on, it can cause serious burns!

Decalcifying Solution



STE with ECO Control:

1. Remove top cover and level probe. Before opening, make sure that the generator is off. Use a flat head screw driver or similar to poke the level probe to dismount. Pour the solution into the water tank. Place level probe.
2. Turn ON the steam generator and wait until water inside the tank starts to boil. Let the solution boil for 5 minutes.
- 3.1 If standby mode is available:
Press shortly "On/Off" -button. Steam generator goes to standby mode. After standby time expires, steam generator goes to Off state. Drain tank manually.
- 3.2 If standby mode is not available:
Turn OFF the steam generator. Let the solution stay in the tank at least 1h and then drain manually.
4. Fill and drain the tank manually two times more.

Note: Default standby time is 1hr. If standby time is set more than that, turn off steam generator after 1hr and drain tank manually.

Use Decalcifying Solution as follows:

Steam Generator (kW)	Decalcifying Solution (ml)
3-7,5	250
9-15	500

For steam generators in commercial use (over 5 hours continuously daily) additional service plan is recommended twice a year. Please contact your service center for details.

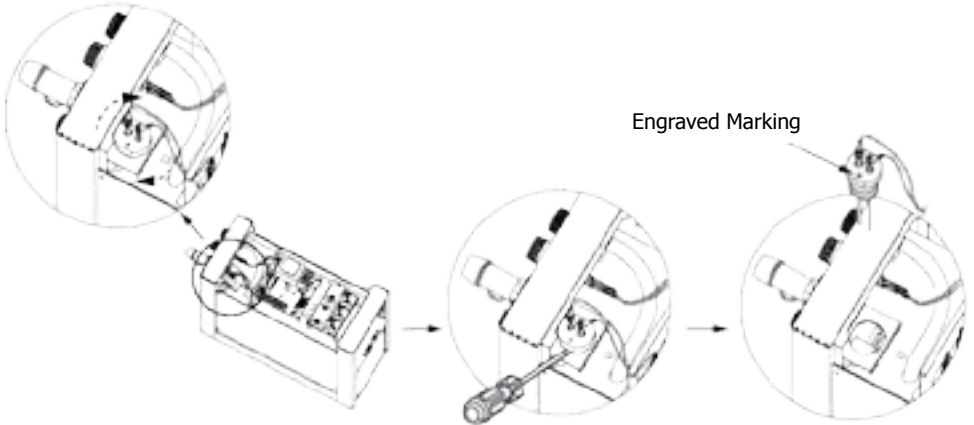
Frequency for decalcification:

Unit dH where 1 dH is 10 mg calcium in 1 liter of water

- < 3 °dH = very soft water, decalcification every 500 operation hours
- 3-6 °dH = soft water, decalcification every 100 operation hours
- 6-9 °dH = hard water, decalcification every 50 operation hours
- 9-18 °dH = very hard water, decalcification every 30 operation hours

2. Level probe cleaning

- a. Turn switch OFF before opening the steam generator's cover.
- b. Rotate the probe as shown in the illustration. Note that probe's engraved marking must point to "unlock" sign.
- c. Use a flat head screw driver or similar to poke the level probe to dismount. Clean tip of the pins from impurities using sandpaper. Don't damage plastic coating on pins. If coating is damaged, replace level probe. Return back the level probe to its original position when done.



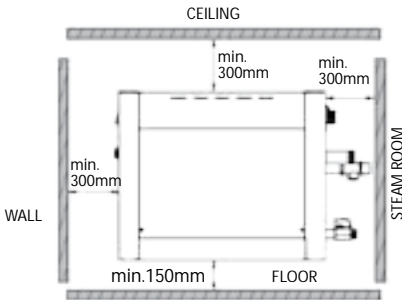
WARNING!

Make sure that wire terminals must not touch each other to avoid short circuit.

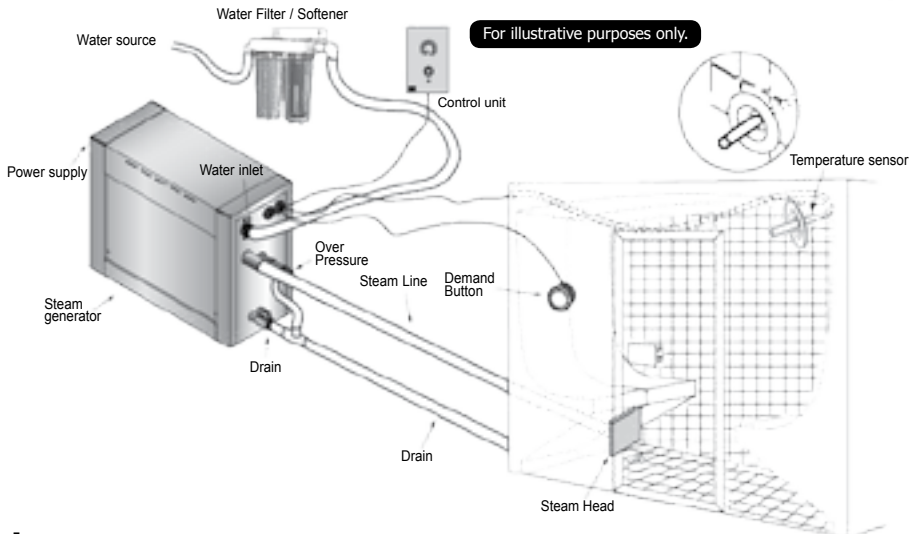
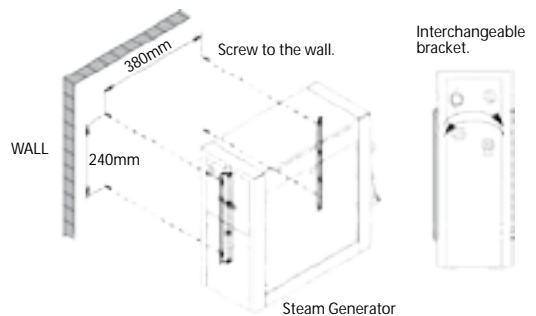
Assembly and Installation

1. Location of the steam generator has to be near the steam room. Place it within 7.5 meters to the steam room.
2. Steam generator has to be installed outside the steam room.
3. The steam generator must not be installed outdoors or areas that may damage the unit due to climate conditions.
4. Do not install the steam generator or plumbing lines in unheated attic or any locations where water could freeze.
5. The steam generator must not be installed in areas near flammable or corrosive materials or chemicals such as gasoline, paint thinners, chlorine or the like.
6. Provide a level surface to install steam generator. Side hole slots are provided for wall mounting. Make sure that the steam generator is secured and is level when mounted on the wall.
7. The steam generator has to be installed in an upright position only.
8. Install water filter and softener or alike when necessary.
9. Leave enough space for service and maintenance of the generator.

Minimum Space for Service and Maintenance



Wall Installation



Plumbing

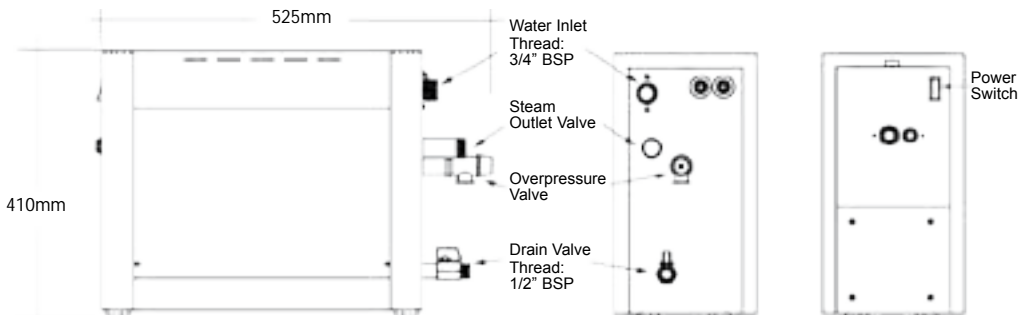
The plumbing has to be done by a qualified licensed plumber. Plumbing should be in accordance with national or local codes. Use unions for piping connections. Use only prescribed brass piping or copper tubing. Never use black or galvanized pipe for the plumbing as it can easily crack or damage.

Steam Generator

3,0 kW | 3,5 kW | 4,0 kW | 4,5 kW | 5,0 kW
4,5 kW | 5,0 kW | 6,0 kW | 7,5 kW

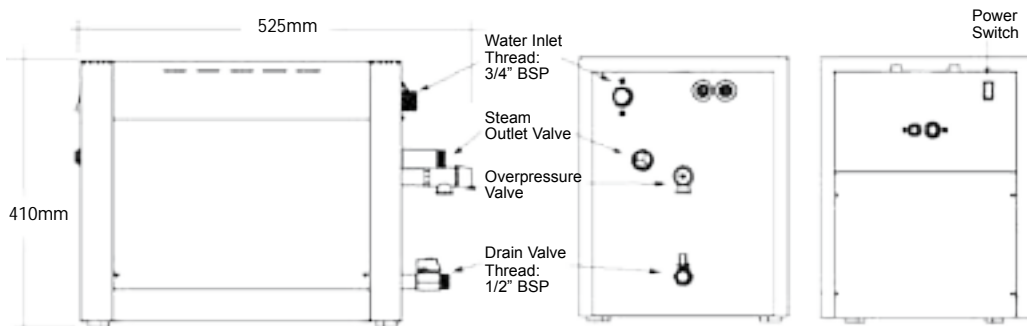
NOTE!
If facing the wall there should be at least 100mm allowance.

Side view showing element access panel



9,0 kW | 12,0 kW | 15,0 kW

NOTE!
If facing the wall there should be at least 100mm allowance.



NOTE!
Refer to Technical Data for specifications.

Water Supply

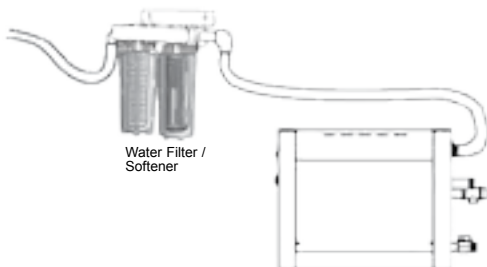
Provide a shut off valve on the water source for the steam generator. Turn off the inlet water line before installing the unit. Refer to the water filter's manual for the pressure requirement when installing. Maximum water pressure without water filter/softener is 8 bar. The water flow range must be at minimum of 4 liters per minute. Water softener is recommend to use.

Water Pressure

The water pressure required for the STE steam generators is 2-8 bar or 30-120psi. Below or above the pressure requirement may lead to damage or malfunction of the water inlet.

Connecting Water Filter and Softener

For illustrative purposes only.



Steam Outlet

The steam must move in a continuous flow to the steam room. Do not install valves on the steam line. Use insulated, rated 120°C or higher, brass pipe or copper tubing for steam line to connect to the steam head as permitted by codes (see table below). Slope the steam line height by 20mm per meter towards the steam head to avoid trapping of the condensate and eliminate steam trap that blocks the flow of the steam.

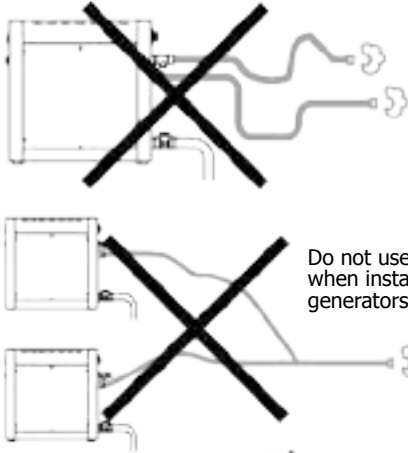
Steam Guard Overflow

The overflow safety guard activates when there is an overpressure in the steam line. It automatically opens and releases the pressured steam. When this happens, please check your steam line for servicing.

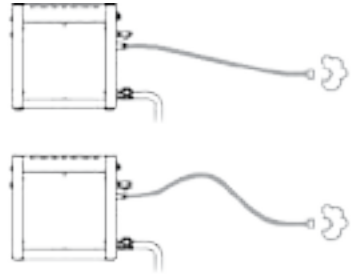
Steam Head

Place the steam head on a safe area where bathers cannot get in contact with it as it can get very hot. It is recommended that the steam head must be facing downwards. A teflon tape or equivalent needs to be used on the thread for tightening it. Avoid using a wrench to tighten the steam head as it might get scratched.

Running the steam line down and then up will create a "steam trap" blocking the flow of the steam.



Do not use 1 steam line when installing 2 steam generators.

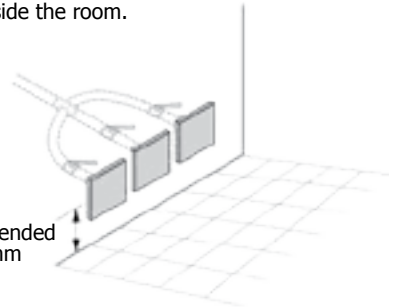


Steam Line Sizes

(kW)	Steam Line
3-7,5	3/4"
9 and above	3/4"

Installation with multiple steam head

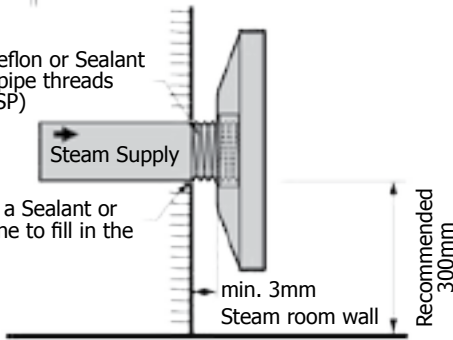
Add valve to each steam lines when installing multiple steam heads. This is to control the distribution of the steam inside the room.



Use a Teflon or Sealant for the pipe threads (3/4" BSP)

Steam Supply

Place a Sealant or Silicone to fill in the gaps.



Recommended Steam Head Location



Recommended 300mm

Drain

Drain valve is provided for maintenance. Set drain connection for your steam generator according to national or local plumbing requirements. Use only 1" pipe for drain to avoid water clogged up.

Technical Data

Model	kW	Steam Room Volume (m ³)	Heating Element		Voltage (V)	Current (A)	Phase	Wire Size mm ²	Size of Steam Generator			Weight (kg)
			(kW)	Type Number					Length	Width (mm)	Height	
STE-30-1/2	3,0	3 max	2 x 1,5 kW	STG-150	220 - 240 / 380 - 415	14 8	1N / 2N	2,5 2,5	525	175	410	9
STE-35-1/2	3,5	3,5 max	1 x 1,5 kW 1 x 2,0 kW	STG-150 STG-200	220 - 240 / 380 - 415	19 9	1N / 2N	2,5 2,5	525	175	410	9
STE-40-1/2	4,0	4 max	2 x 2,0 kW	STG-200	220 - 240 / 380 - 415	18 10	1N / 2N	4,0 2,5	525	175	410	9
STE-45-1/2	4,5	2 - 5	1 x 2,0 kW 1 x 2,5 kW	STG-200 STG-250	220 - 240 / 380 - 415	20 12	1N / 2N	4,0 2,5	525	175	410	9
STE-50-1/2	5,0	2 - 6	2 x 2,5 kW	STG-250	220 - 240 / 380 - 415	22 8	1N / 2N	4,0 2,5	525	175	410	9
STE-45-C1/3	4,5	2 - 5	3 x 1,5 kW	STG-150	220 - 240 / 220 - 240 / 380 - 415	20 12 7	1N 3N	4,0 2,5 2,5	525	200	410	10
STE-60-C1/3	6,0	3 - 10	3 x 2,0 kW	STG-200	220 - 240 / 220 - 240 / 380 - 415	26 16 9	1N 3 3N	6,0 2,5 2,5	525	200	410	10
STE-75-C1/3	7,5	4 - 15	3 x 2,5 kW	STG-250	220 - 240 / 220 - 240 / 380 - 415	13 20 11	1N 3 3N	8,0 4,0 2,5	525	200	410	10
STE-90-C1/3	9,0	8 - 20	6 x 1,5 kW	STG-150	220 - 240 / 220 - 240 / 380 - 415	40 23 13	1N 3 3N	8,0 4,0 2,5	525	290	410	13
STE-120-3	12,0	15 - 28	6 x 2,0 kW	STG-200	380 - 415	18	3N	4,0	525	290	410	13
STE-150-3	15,0	22 - 40	6 x 2,5 kW	STG-250	380 - 415	22	3N	6,0	525	290	410	13

NOTE!

This table is for steam rooms built with light walls (tempered glass or acrylic). Steam rooms with thick walls or ventilation, please use higher kilowatt steam generators.

Power Wiring

Only a qualified electrician should do the Electrical wiring connections.

Check the power supply before installing your unit. Single Phase connection, a 220-240V supplied is required. Use two-wire supply source and equipment grounding wire of single phase connection.

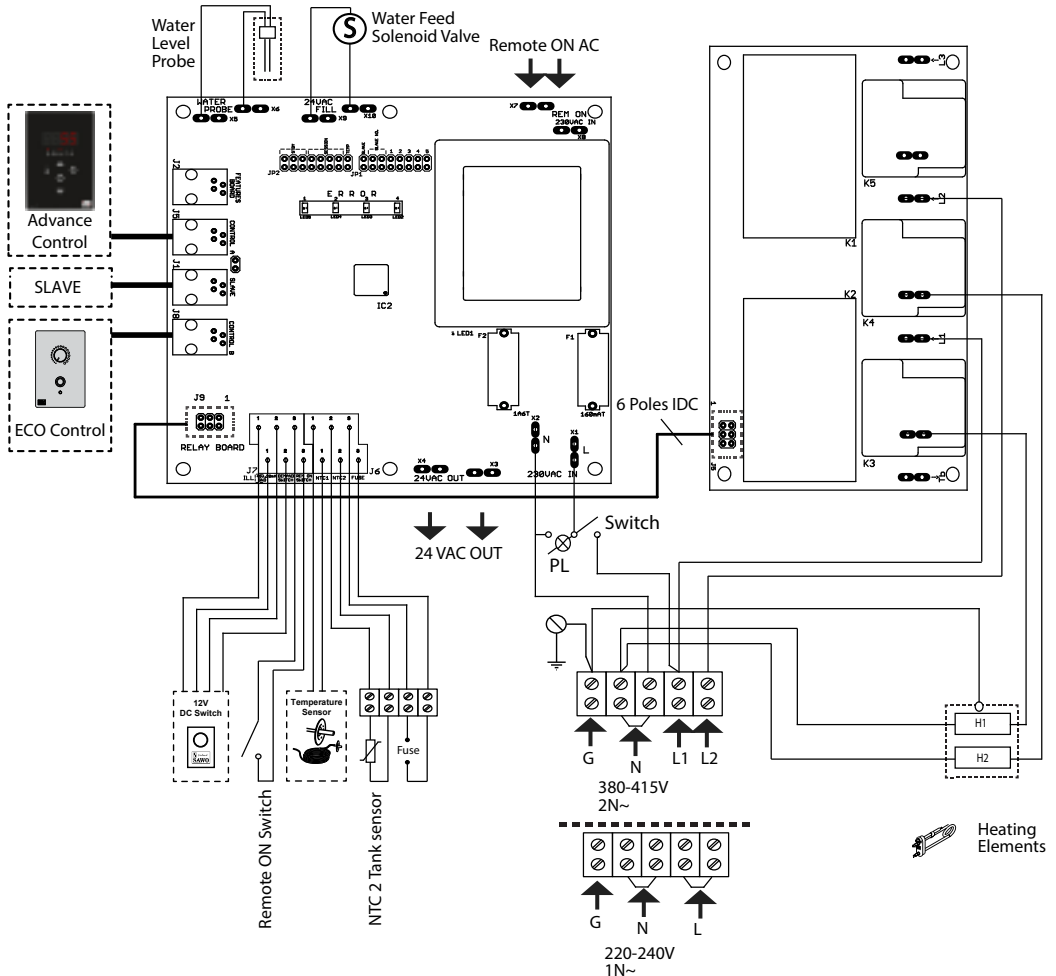
A 90°C / 600V (HO7RN-F) rated insulated copper wire is required for SAWO steam generators. Check size of wires in Ampere Chart in accordance with the National Electrical Code and local electrical code.

The installation must include switch for all pole disconnection. Circuit breaker with 3mm control gap is recommended.

Electrical Diagrams

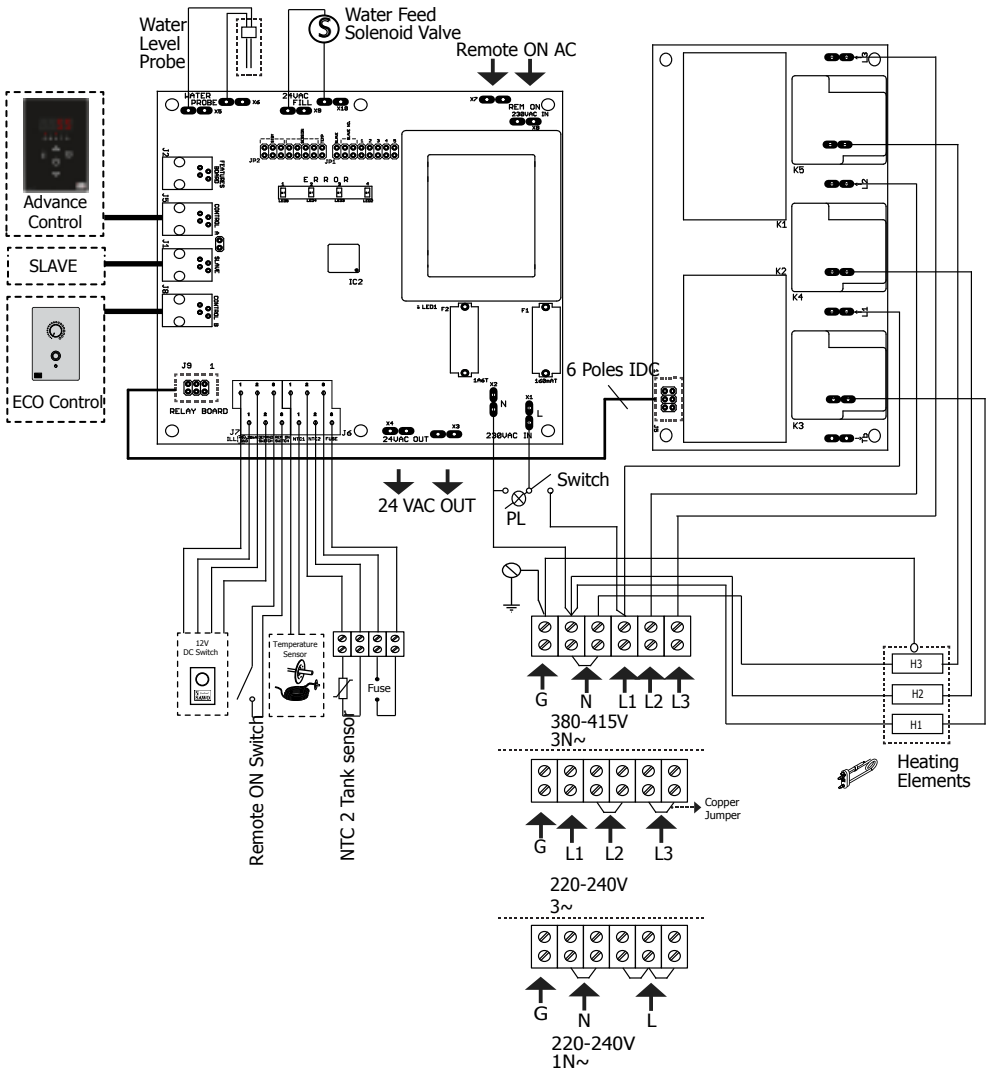
1 PHASE / 2 PHASE

3,0 kW | 3,5 kW | 4,0 kW | 4,5 kW | 5,0 kW

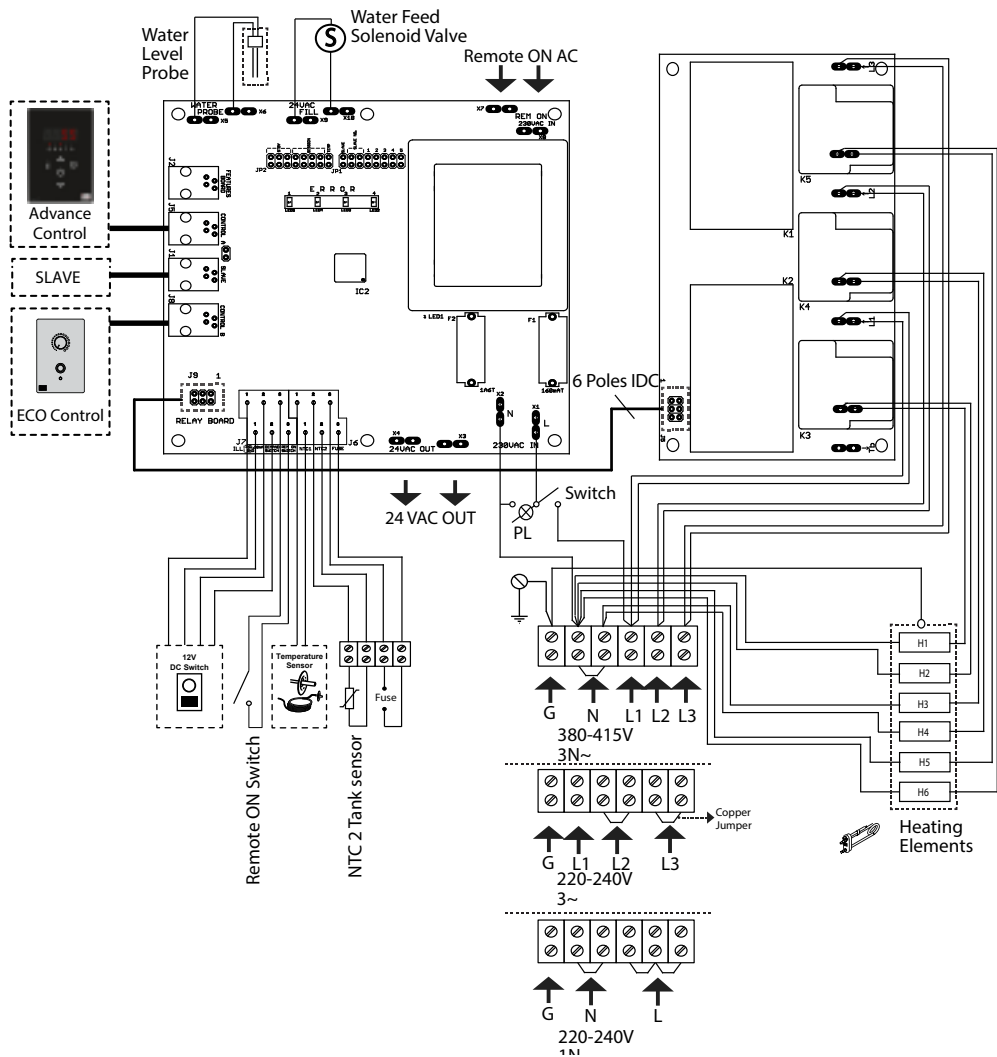


Heating Elements

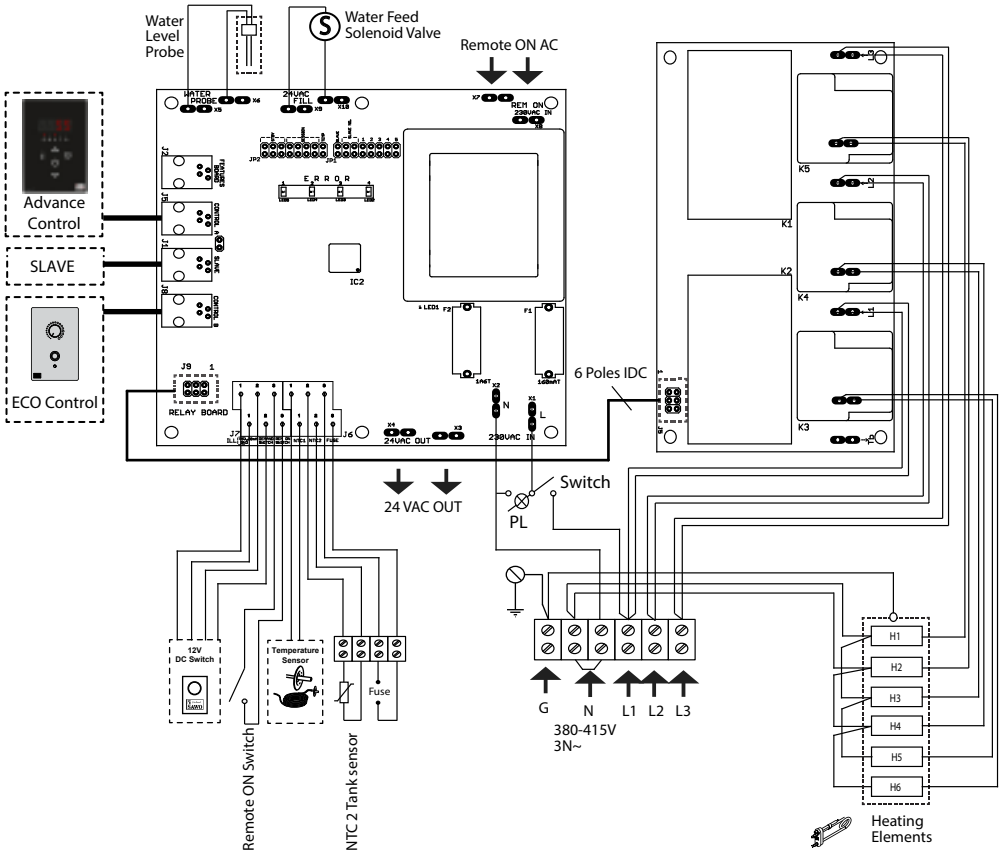
4,5 kW | 6,0 kW | 7,5 kW



9,0 kW



12,0 kW | 15,0 kW



Installing the Temperature Sensor

Before installation main supply of the generator must be switch off from the circuit breaker.

The temperature sensor comes along with the SAWO steam generator. It is recommended to use only Sawo temperature sensor with Sawo generator as it may otherwise not function correctly. Temperature sensor wiring should not be routed near power cables or hot areas as it may cause electronic interference or damage to the wires.

The sensor has an integrated 9-meter cable. If longer cable is needed use 2 x 0,5 mm² to 2 x 1,0 mm² cable for extension.

For illustrative purposes only.

1. The temperature sensor has to be installed:
Height 1,2-1,5 meters above the floor away from the steam head so that the steam will not hit the sensor directly.
2. A 25mm hole is required to insert the temperature sensor. Do not create bigger or smaller hole. Clean the hole before inserting the sensor.
3. Make a hole in the cable lead-in on the side of the generator to pull the cable through. Connect the cable in the terminal block marked as "NTC1". See figure 2.

SAWO Steam Generator
(shown with cover removed) Fig. 2

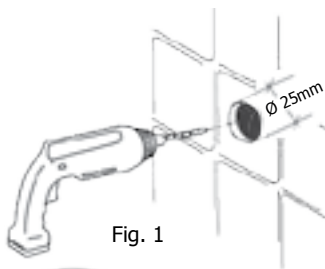
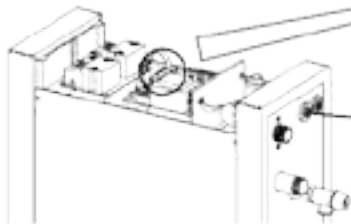


Fig. 1

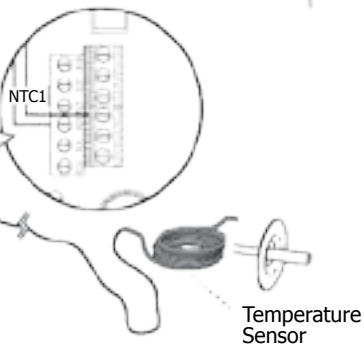
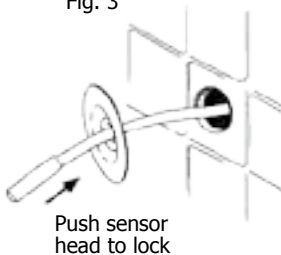


Fig. 3

4. Insert the temperature sensor through the steam room wall. Do not apply staples or other material that may damage the cable.
5. Apply silicone sealant on the hole in the wall to create a moisture seal (Fig. 4). Make sure that there is no trace of silicone on the sensor as it may interfere its reading.

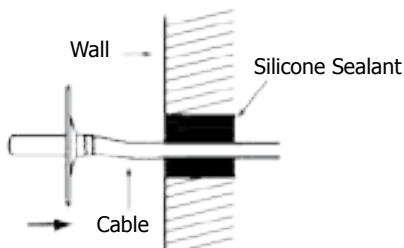


Push sensor head to lock

Fig. 4



Fig. 5



Push to the wall to stick

Installing Control Unit

SAWO Steam Control sets the temperature of your steam room. Mount the steam control unit on an accessible area outside the steam room. It is recommended not to place the steam control near to showers or similar wet places.

Never attempt to modify or to fix the steam control. Ask your licensed technician or your nearest service centre for repair.

Before installation, main supply of the generator must be switch off from the circuit breaker.

Installation Instructions

Check the most suitable area to place your steam generator control. The control and the steam generator should be accessible for the user and maintenance. Do not install the control unit inside the steam room! The cable of the control is 7,5 meters.

Mount the control in the wall, according to the specifications given below. Follow

NOTE!

If the control is attached to a concrete wall, provide a control holder or equivalent to mount the control into it.

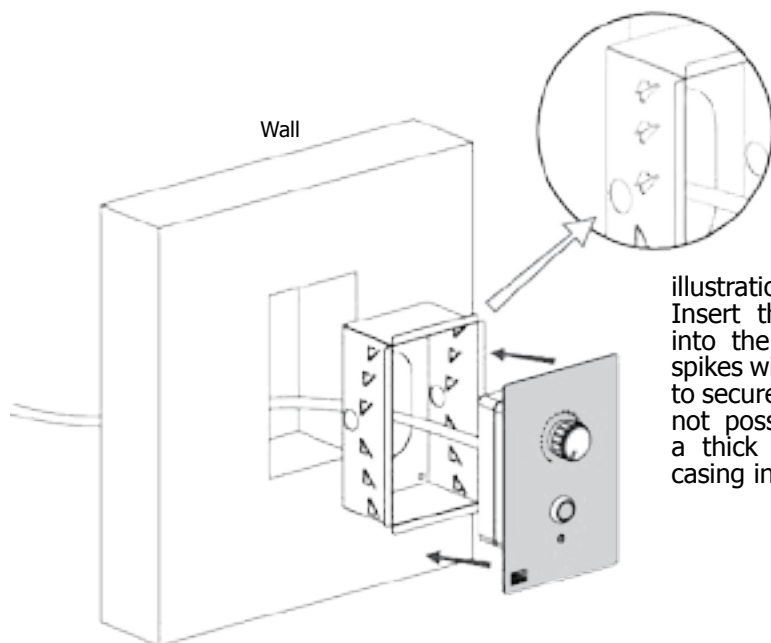
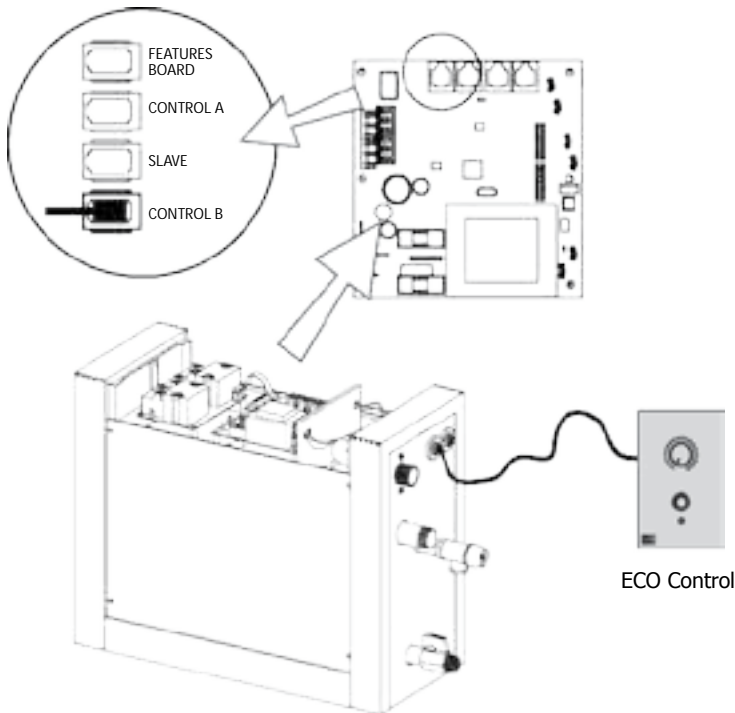


illustration.
Insert the metal casing into the hole. Poke the spikes with a screw driver to secure it to the hole. If not possible because of a thick wall, screw the casing into the wall.

Connection of SAWO Control to the PCB

Before installation make sure that the generator is disconnected from the mains by switching off the circuit breaker.

1. Unscrew top cover of the steam generator to get access on the PCB.
2. Guide the RJ11 control cable through the cable lead-in hole on the side of the generator as described in the drawing below to reach RJ jacks on the STE board.
3. Note that there are four black RJ jacks on the board. Make sure to connect the RJ cable to "**Control B**" jack. Connection cannot be interchanged. Other jacks are for Features, Classic 2.0 control and for Slave connection.



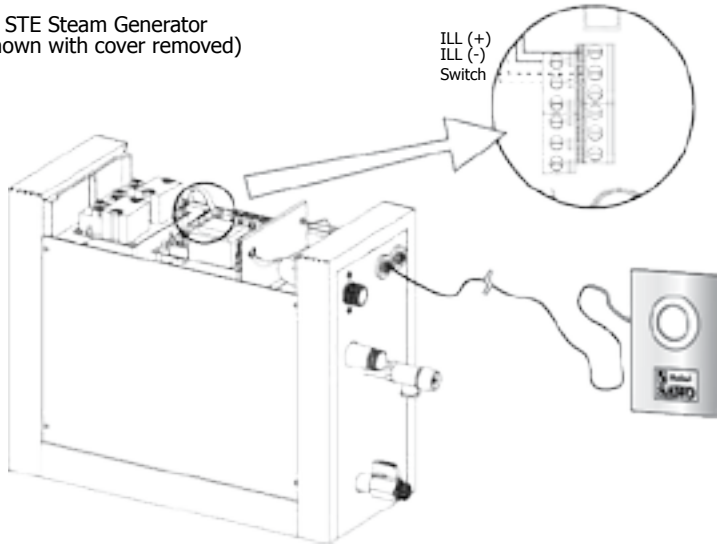
4. Fasten the top cover of the generator.
5. Turn the mains on and switch on the power switch in the back of the generator.
6. Turn the control unit on "On" mode to check it works properly.

Terminal Connection of Demand Button (optional)

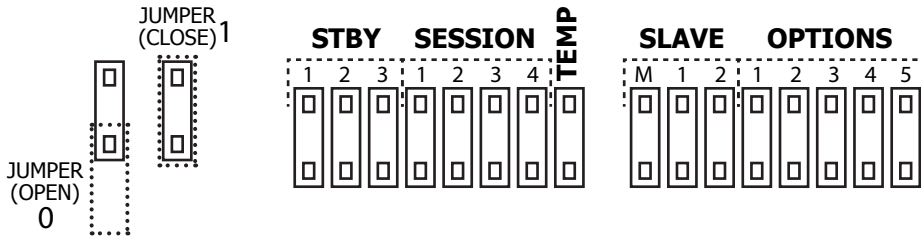
Before installation make sure that the mains is disconnected from the generator by turning off the circuit breaker.

1. Open the top cover of the generator.
2. Guide the cable through cable lead-in on the side of the generator.
3. Connect the wires to their designated places in the terminal block.
4. If the demand button has light connect the light wire on the "ILL" labeled terminal.

STE Steam Generator
(Shown with cover removed)



Jumper Connections in the Steam Generator PCB



Standby time

Standby time can be set according to user preferences by setting jumpers on the power controller board

Standby Duration Mode	STBY		
	1	2	3
1h	0	0	0
2h	1	0	0
4h	0	1	0
6h	1	1	0
12h	0	0	1
18h	1	0	1
Unlimited	0	1	1
Disable Standby	1	1	1

Naming Slaves

	M	1	2
STEAM GEN. MASTER	0	0	0
STEAM GEN. 1	1	0	0
STEAM GEN. 2	1	1	0
STEAM GEN. 3	1	0	1
STEAM GEN. 4	1	1	1

Maximum Temperature

TEMP	Max. Temperature
0	Max. 50 °C
1	Max. 55 °C

High Temperature in Standby Mode

At default (0), during the Standby Mode, the room temperature is stabilized by decreasing the setting at around 10deg.Celcius while the steam tank temperature maintains at 87deg.Celcius.

When High Temperature feature is ON (1), the steam tank temperature is maintained until 87deg. Celcius.

Session Time

Session time can be set according to user preferences by session jumpers on the power controller board.

Session Time	SESSION			
	1	2	3	4
30min	0	0	0	0
15min	1	0	0	0
20min	0	1	0	0
30min	1	1	0	0
45min	0	0	1	0
1h	1	0	1	0
2h	0	1	1	0
4h	1	1	1	0
6h	0	0	0	1
8h	1	0	0	1
12h	0	1	0	1
18h	1	1	0	1
Unlimited	0	0	1	1
10min	1	0	1	1
10min	0	1	1	1
10min	1	1	1	1

Options

Extra functions are available by setting your Options jumper.

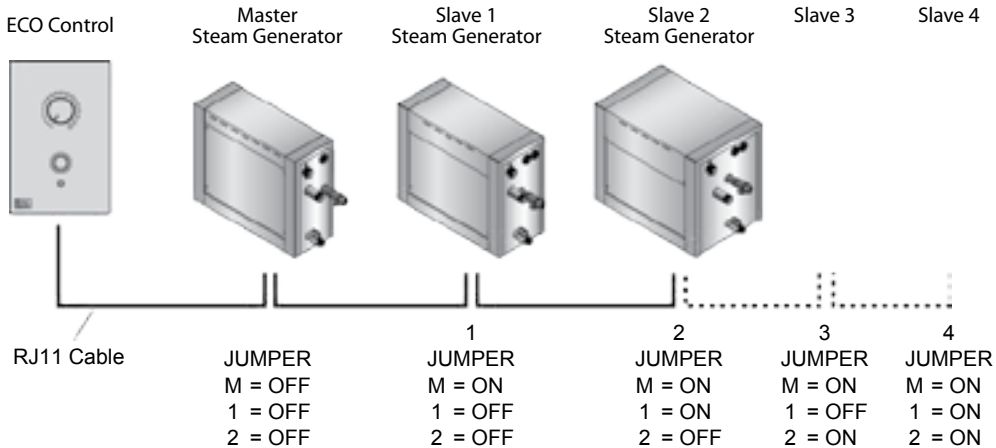
Extra Settings	OPTIONS				
	1	2	3	4	5
Standby High Temp	1	0	0	0	0
Dependence Controlling	0	1	0	0	0

Dependence Controlling

The dependence controlling needs to be switched ON when the steam generator acts as an accessory. It will make the steam generator dependent to the main controller system.

An example is that when the steam generator is used to increase the humidity of the sauna. The control of the sauna heater will be the primary host of the steam generator.

Steam Generator Series Connection



Troubleshooting

If an error occurs, the steam generator will be switched off. There will be a warning beep to alarm the user every 2 seconds. The code for the error will be displayed blinking on the STE board. See table below.

Please note, only a qualified electrician or maintenance personnel are allowed to make the service operations and repairs!

If error happens in slave, by pressing on/off this problem slave will deactivate. Rest of the steam generator will continue normal function.

If error occurred in any of the master or slaves, only the four LED indicators on the power controller board of damage board will blink, see table 15. The LED 1 of other board will blink to indicate state "OFF".

The activation and deactivation of master and slave can be set by the jumpers on the power controller board of basic steam generator.

Possible errors are:

Code	Problem	Solution	ERROR			
			1	2	3	4
E1	Temperature sensor 1 not connected.	Check the wire between the sensor and the control unit.	0	0	0	1
E2	Temperature sensor 1 short circuit.	If there is no problem with the wires and they are correctly installed, check the sensor.	0	0	1	0
E3	Temperature sensor 2 not connected.	If no problem can be found, contact the retailer.	0	0	1	1
E4	Temperature sensor 2 short circuit.		0	1	0	0
E5	Temperature fuse defect.	Check the wire between the fuse and the control unit. Fuse has probably overheated. The reason for it needs to be discovered before using the steam generator again. A new fuse is needed. If no problem can be found, contact the retailer.	0	1	0	1
E6	Fill failure.	Check that water supply is open and there is enough pressure. Check solenoid valve. Clean level probe. See to it that manual drain is always closed position. If no problem can be found, contact the retailer.	0	1	1	0
E7	Communication failure.	Check the RJ12 cable. If the area where cable is located has many other cables, it can cause EMC problems. If no problem can be found, contact the retailer.	0	1	1	1
E8	Temperature is greater than the maximum temperature.	Contact qualified electrician or maintenance personnel before using the steam generator again.	1	0	0	0



Subject to change without notice.



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STE_ML_(En1020)