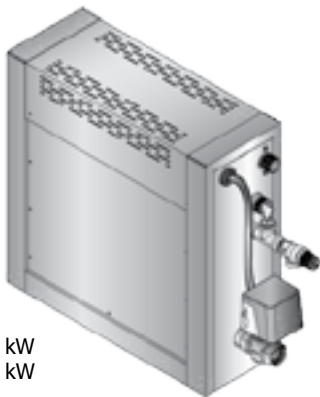


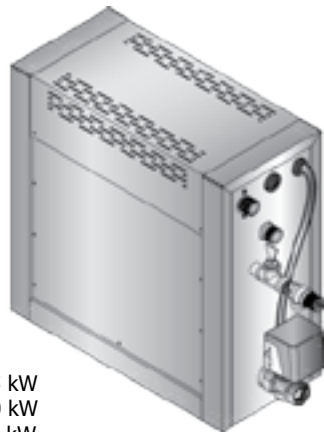
STN STEAM GENERATOR

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

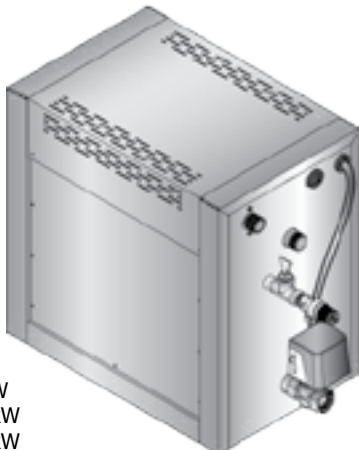
Congratulations on your purchase of a SAWO Steam Generator.
Please read the manual carefully before using the steam generator.



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



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



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

Not for use in the USA, Canada and Mexico.

TABLE OF CONTENTS

Before Installation	3
Steam Room Guidelines.....	3
Steam Generator Parts	4
Maintenance	5
Decalcification	5
Level probe cleaning	6
Tank cleaning	6
Assembly and Installation	7
Plumbing.....	8
Steam Generator	9
Water Supply.....	9
Water Pressure	9
Connecting Water Filter and Softener	9
Steam Outlet.....	10
Steam Guard Overflow	10
Steam Head	10
Drain	11
Attaching Autodrain	11
Power Wiring.....	11
Technical Data.....	12
Electrical Diagram	12
Installing the Temperature Sensor.....	15
Connection of SAWO Control to the PCB.....	16
Demand Button	17
Terminal Connection of Demand Button (optional).....	17
DIP Switches in the Steam Generator	18
Steam Generator Series Connection	19
Troubleshooting	19

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 steam room lighting. Use appropriate transformer to lower the light voltage. SAWO is not responsible for any damage caused by using high voltage lighting as stated.

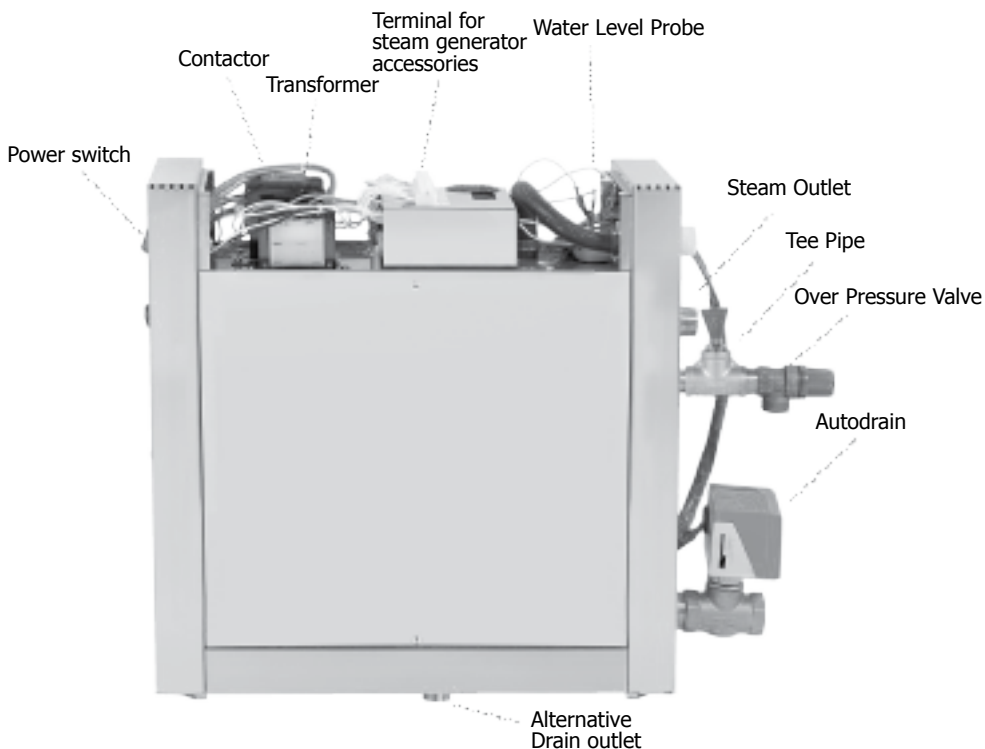
Use only incandescent bulb, halogen bulb or any resistive load bulbs. Do not use LED bulbs as it may destroy the board.

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.

Maintenance

1. Decalcification

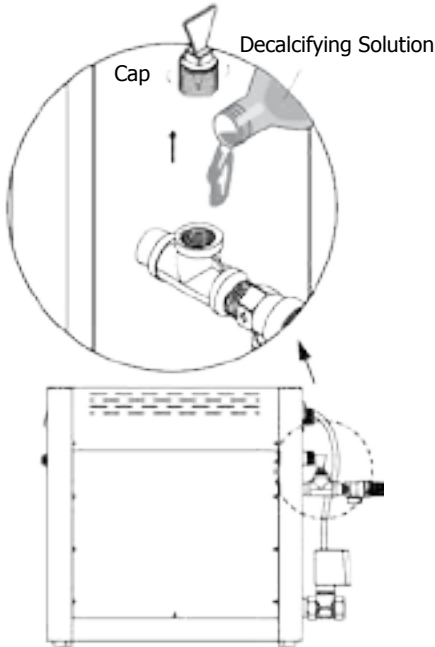
Tap water contains impurities, for example lime, that can cause calcium deposit and block the internal parts of the steam generator. To prevent this and prolong the lifetime of steam generator it is recommended to have a water filter and water softener. They are connected to the water source of the steam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



STP Classic Control:

1. Make sure that steam generator is OFF. Remove the cap of tee pipe in the over pressure valve piping. Pour the decalcifying solution into the tank. Return back the cap to its original position when done.
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 Standby button. Steam generator goes to standby mode and after time expires, water will be drained automatically. After draining screen goes to OFF state. If autodrain is not available then drain by pulling lever down.
- 3.2 If standby mode is not available:
Turn OFF the steam generator. Let the solution stay in the tank 30 minutes and then drain manually by pulling lever down.
4. Fill and drain the tank with water two times more by switching ON and draining the steam generator.

SST Touch Control:

1. Turn ON the steam generator.
2. Go to Settings menu by pressing three seconds the settings icon. Scroll to the "Decalcifying" menu and press "Start". Confirm by pressing "OK".
3. Next process shows that water is filled in the tank. After water is filled, add decalcifying solution: Remove the cap of tee pipe in the over pressure valve piping. Pour the decalcifying solution into the tank. Return back the cap to its original position when done.
4. After pouring the solution, press "OK" on the screen. Steam generator will automatically go through decalcifying process including draining. After process is done, screen will go to off state. Fill and drain the tank with water two times more by switching ON and draining the steam generator.

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.

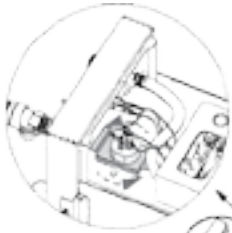
Frequency for decalcification:

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

- Turn switch OFF before opening the steam generator's cover.
- 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.



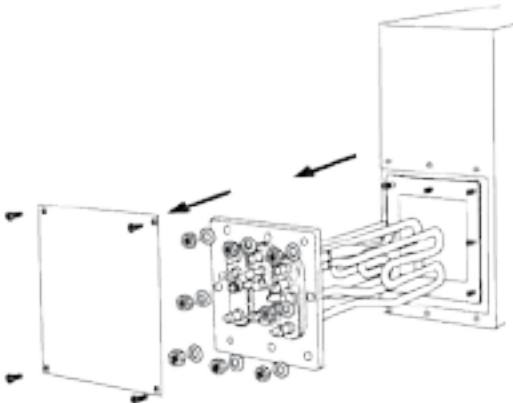
WARNING!

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

3. Tank cleaning

Easy way of cleaning the tank.

- Disconnect steam generator from main supply before opening generator's covers. Only licenced electrician or professional maintenance person can open covers and do cleaning.
- Clean level probe as stated in 2.a to 2.b.
- Remove temperature fuse and tank temperature sensor from terminal block.
- Remove the cassette where the heating elements are attached and clean deposits from the element.
- Remove deposits from bottom and sides of the tank. Open bottom plug to wash away deposits. Don't use autodrain valve since big particles can block autodrain valve.
- Attach bottom plug and use teflon pipe seal if needed.
- Attach heating elements. Make sure that temperature fuse and tank tempesensor are on the top of heating element. Inserting heating element upside down will prevent the temperature fuse from working.



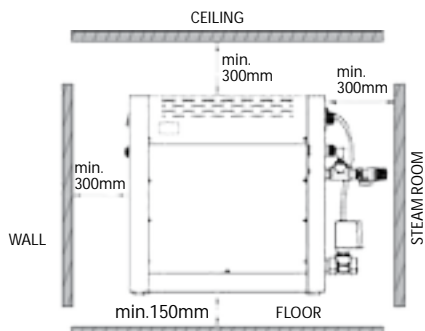
WARNING!

Do not overtighten the nuts that hold heating element cassette. Damaged nut can lead to leakage.

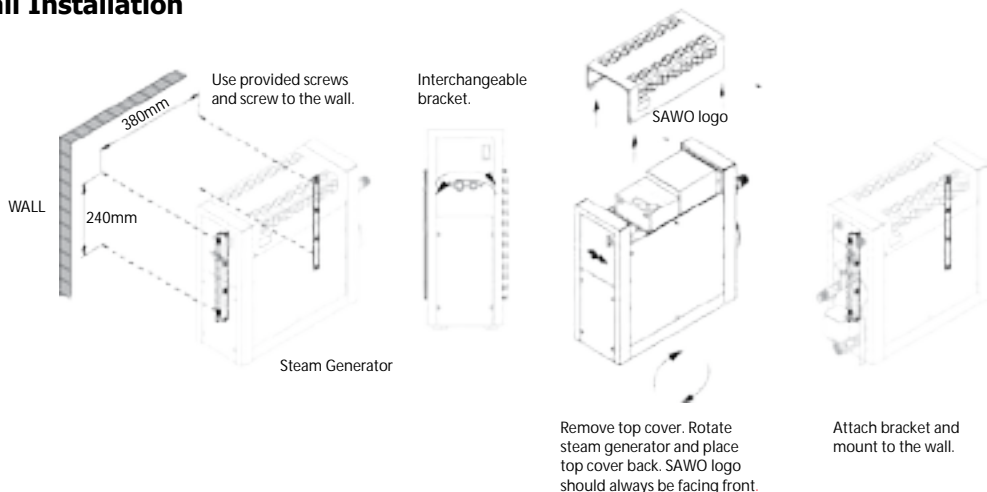
Assembly and Installation

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



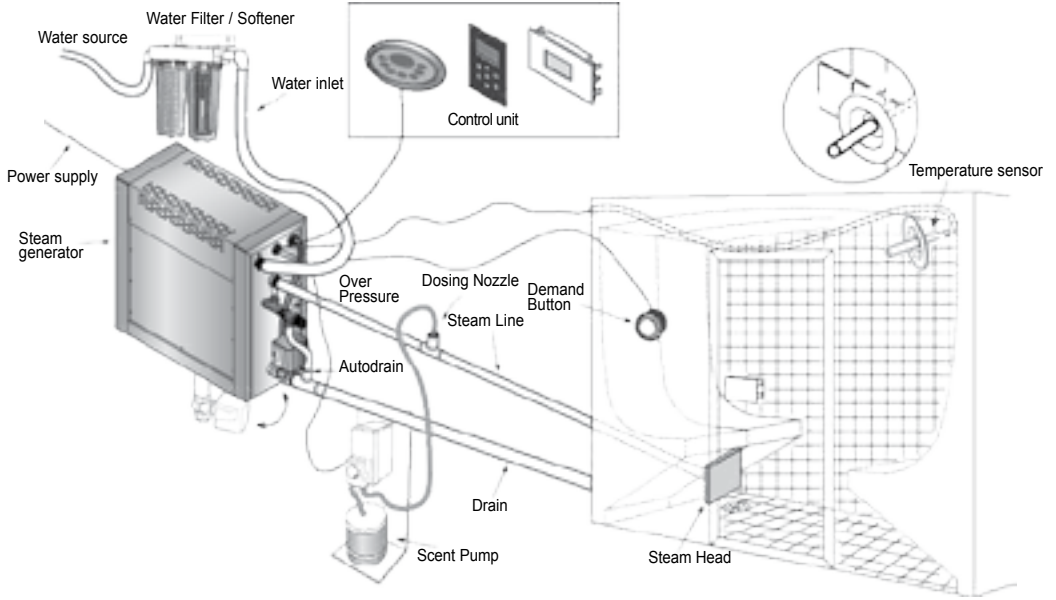
Wall Installation



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.

For illustrative purposes only.

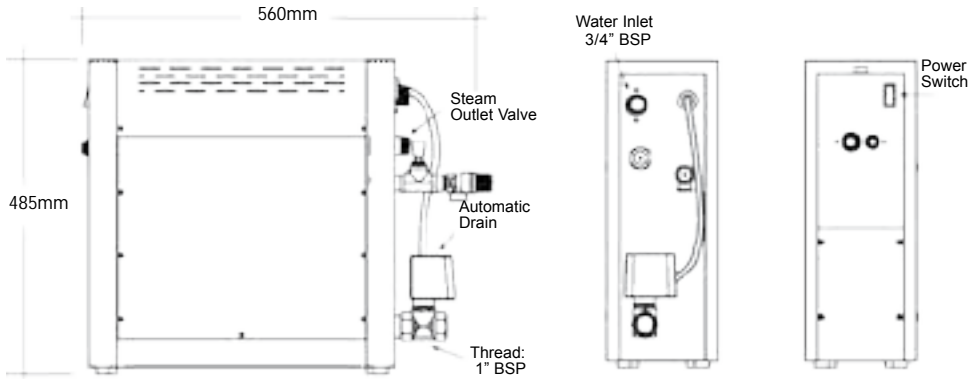


Steam Generator

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

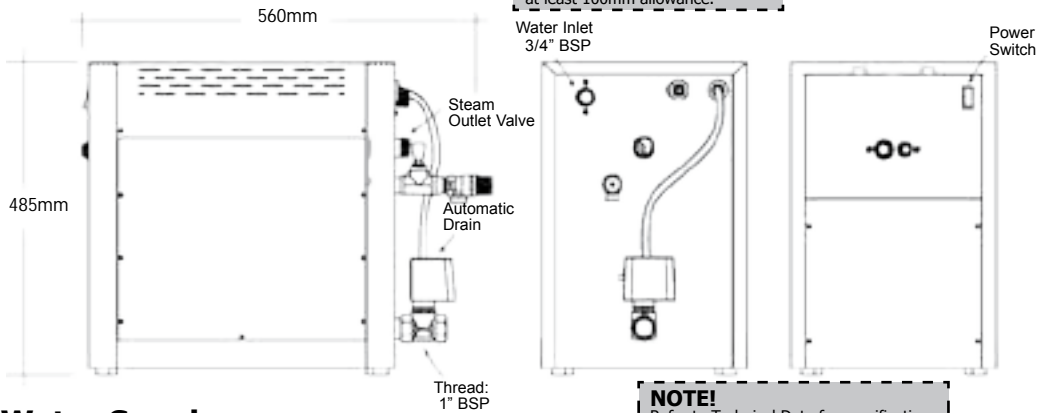
NOTE!
 If facing the wall there should be at least 100mm allowance.

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.



Water Supply

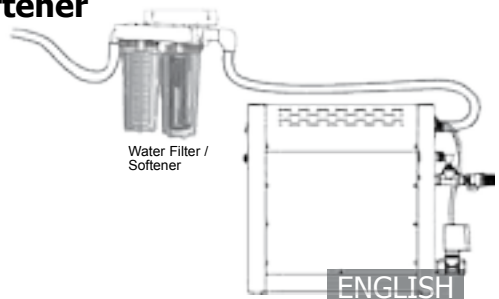
Provide a shut off valve on the water source for the steam generator. Turn off the inlet water line before installing the unit. Refer to the water filter's manual for the pressure requirement when installing. Maximum water pressure without water filter/softener is 8 bar. The water flow range must be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

Water Pressure

The water pressure required for the STP 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.

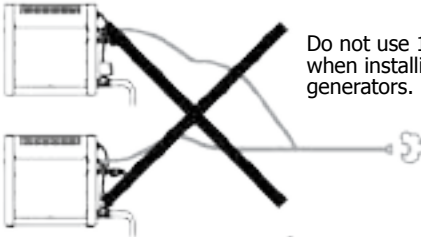
Steam Guard Overflow

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.

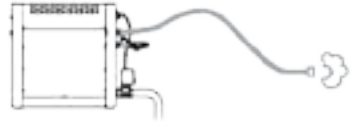
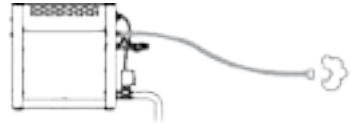
Steam Head

Place the steam head on a safe area where bathers cannot get in contact with it as it can get very hot. 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.

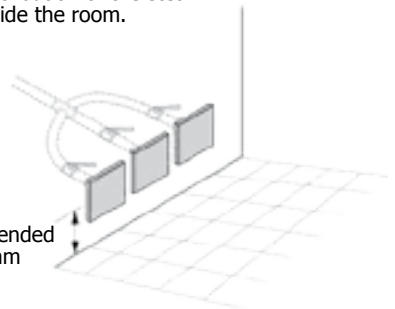


Steam Line Sizes

(kW)	Steam Line
3-7,5	1/2"-3/4"
9 and above	3/4"

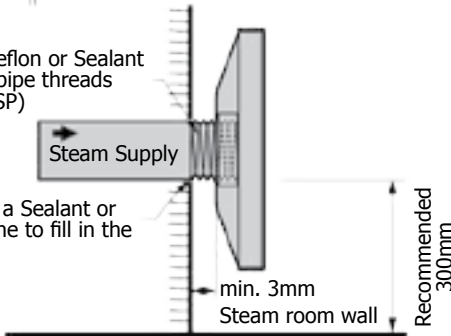
Installation with multiple steam head

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)

Place a Sealant or Silicone to fill in the gaps.



Recommended Steam Head Location



Recommended 300mm

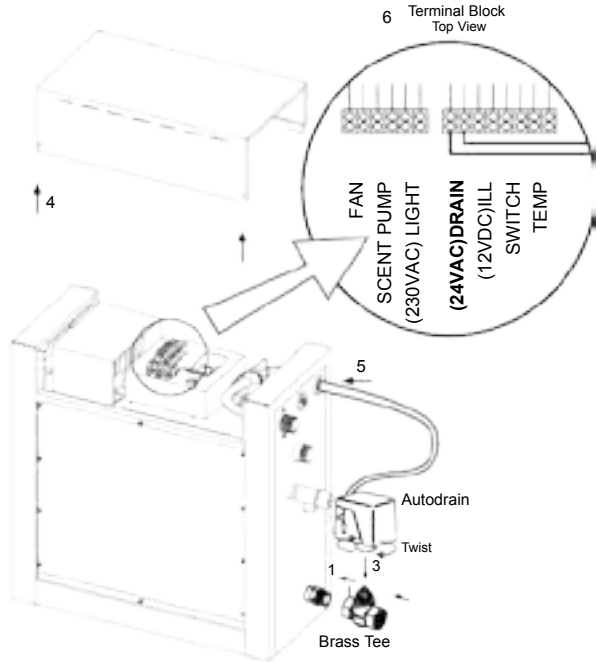
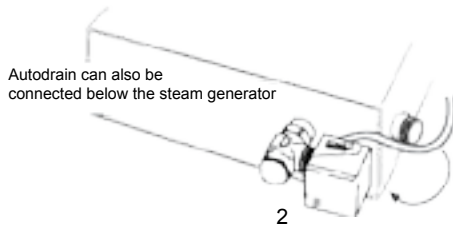
Drain

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.

Attaching the Autodrain

An extra outlet for the autodrain can be found under the steam generator.

1. Attach the Brass tee into the outlet that can be found on under and on the side of the steam generator.
2. An extra outlet for the autodrain can be found under the steam generator.
3. Attach the autodrain to the brass tee.
4. Open the cover of the steam generator.
5. Put the wire through the hole on the side of the steam generator.
6. Connect the wires in the terminal block to its label.
7. Cover back the steam generator.



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.

Technical Data

Model	kW	Steam Room Volume (m³)	Heating Element		Voltage (V)	Current (A)	Phase	Wire Size (mm²)	Size of Steam Generator			Weight (kg)	Steam Output Capacity (kg/hr)
			(kW)	Type Number					Width (mm)	Depth (mm)	Height (mm)		
STN-30-1/2	3,0	3 max	2 x 1,5 kW	STG-150	220 - 240 / 380 - 415	14 / 7	1N / 2N	2,5 / 2,5	560	185	485	18,5	3,9
STN-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	16 / 9	1N / 2N	2,5 / 2,5	560	185	485	18,5	4,6
STN-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	560	185	485	18,5	5,2
STN-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	21 / 11	1N / 2N	4,0 / 2,5	560	185	485	18,5	5,9
STN-50-1/2	5,0	2 - 6	2 x 2,5 kW	STG-250	220 - 240 / 380 - 415	23 / 11	1N / 2N	4,0 / 2,5	560	185	485	18,5	5,9
STN-45-3	4,5	2 - 5	3 x 1,5 kW	STG-150	380 - 415	7	3N	2,5	560	220	485	20,5	6,5
STN-45-C1/3	4,5	2 - 5	3 x 1,5 kW	STG-150	220 - 240 / 220 - 240 / 380 - 415	21 / 12 / 7	1N / 3 / 3N	4,0 / 2,5 / 2,5	560	220	485	20,5	5,9
STN-60-3	6,0	3 - 10	3 x 2,0 kW	STG-200	380 - 415	9	3N	2,5	560	220	485	20,5	7,8
STN-60-C1/3	6,0	3 - 10	3 x 2,0 kW	STG-200	220 - 240 / 220 - 240 / 380 - 415	27 / 16 / 9	1N / 3 / 3N	6,0 / 2,5 / 2,5	560	220	485	20,5	7,8
STN-75-3	7,5	4 - 15	3 x 2,5 kW	STG-250	380 - 415	11	3N	2,5	560	220	485	20,5	9,75
STN-75-C1/3	7,5	4 - 15	3 x 2,5 kW	STG-250	220 - 240 / 220 - 240 / 380 - 415	34 / 20 / 11	1N / 3 / 3N	8,0 / 4,0 / 2,5	560	220	485	20,5	9,75
STN-90-3	9,0	8 - 20	6 x 1,5 kW	STG-150	380 - 415	13	3N	2,5	560	310	485	25,5	11,7
STN-90-C1/3	9,0	8 - 20	6 x 1,5 kW	STG-150	220 - 240 / 220 - 240 / 380 - 415	41 / 24 / 13	1N / 3 / 3N	8,0 / 4,0 / 2,5	560	310	485	25,5	11,7
STN-120-3	12,0	15 - 28	6 x 2,0 kW	STG-200	380 - 415	18	3N	4,0	560	310	485	25,5	15,6
STN-150-3	15,0	22 - 40	6 x 2,5 kW	STG-250	380 - 415	22	3N	6,0	560	310	485	25,5	19,5

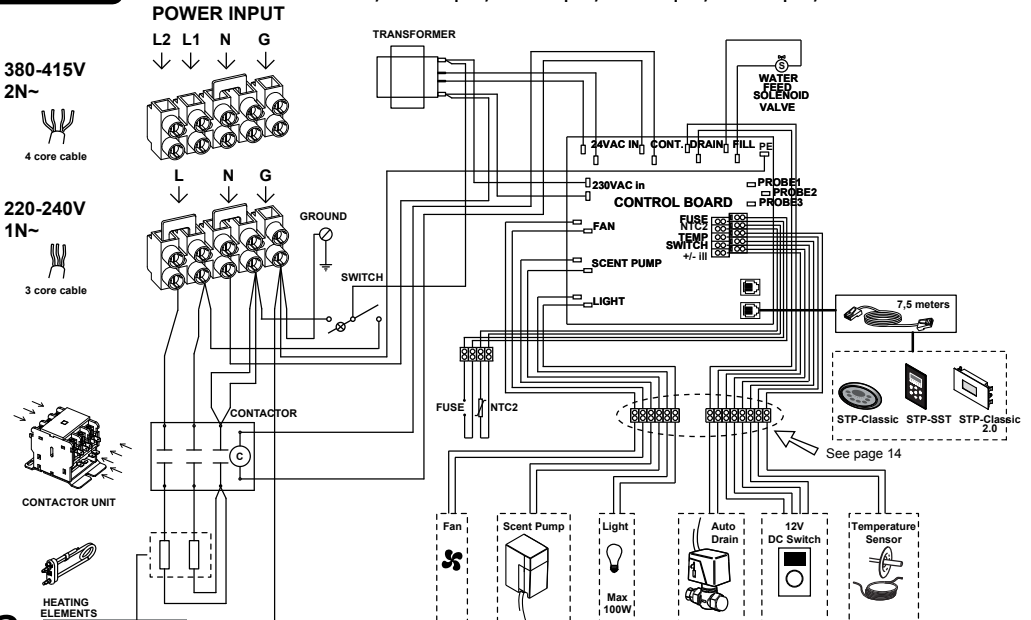
NOTE!

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

Electrical Diagrams

CONVERTIBLE

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



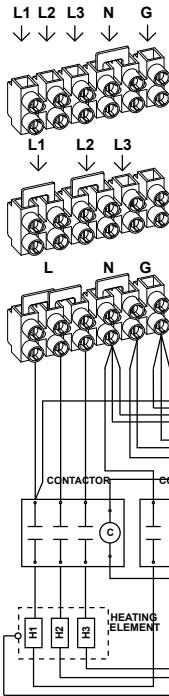
380-415V
3N~



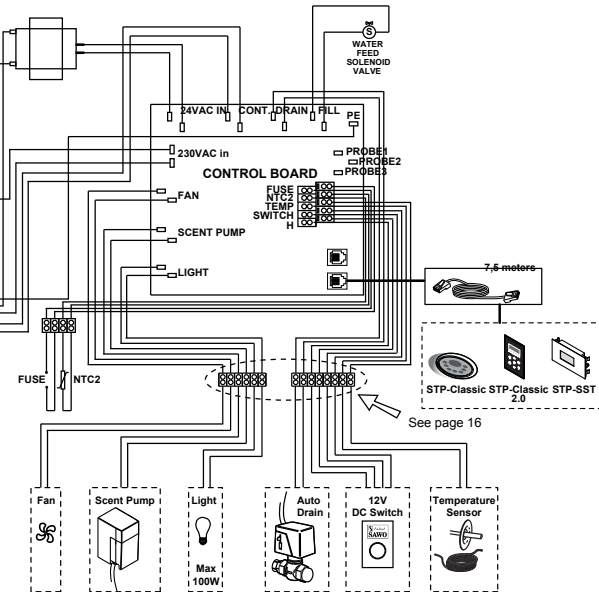
220-240V
3~



220-240V
1N~

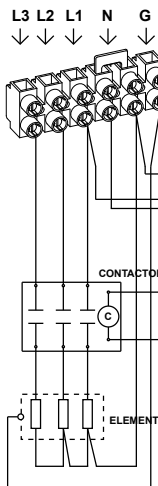


TRANSFORMER

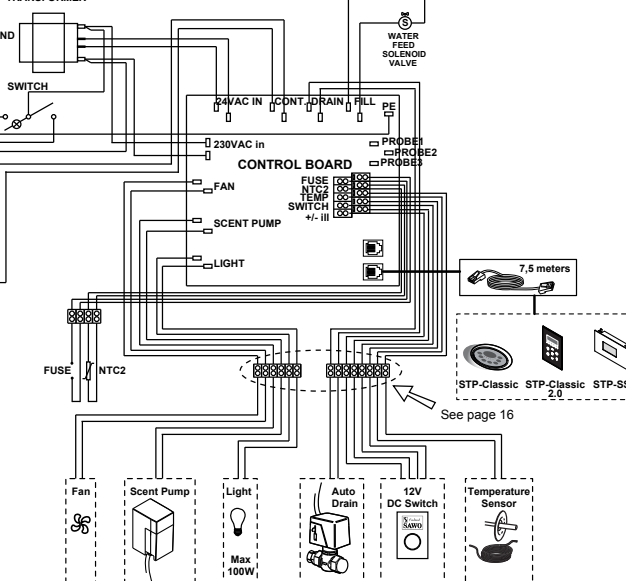


380-415V 3N~

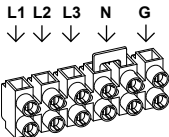
4,5 kW | 6,0 kW | 7,5 kW



TRANSFORMER

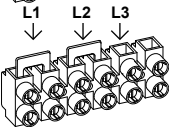


380-415V
3N~



5 core cable

220-240V
3~



4 core cable

220-240V
1N~



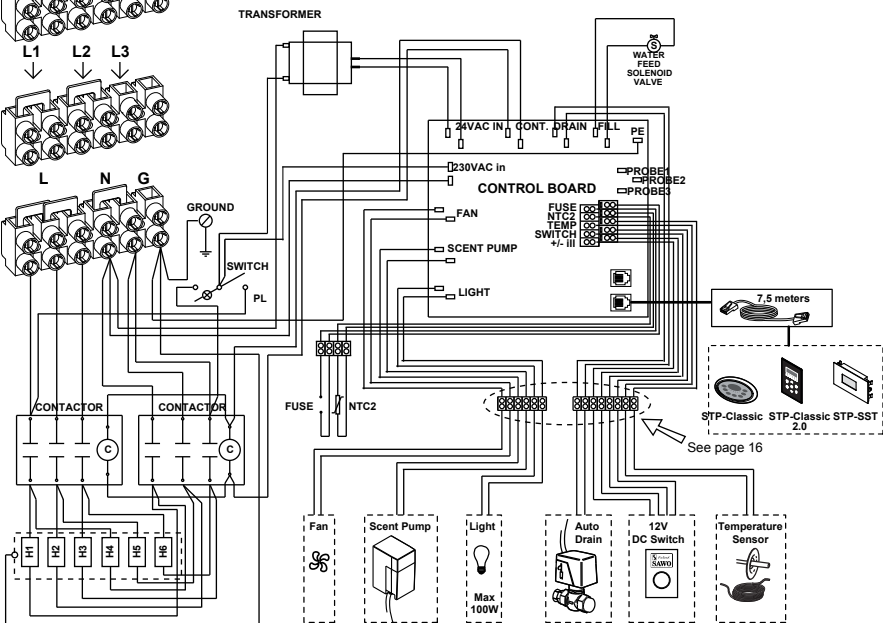
3 core cable



CONTACTOR UNIT

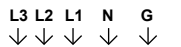


HEATING ELEMENTS



380-415V 3N~

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



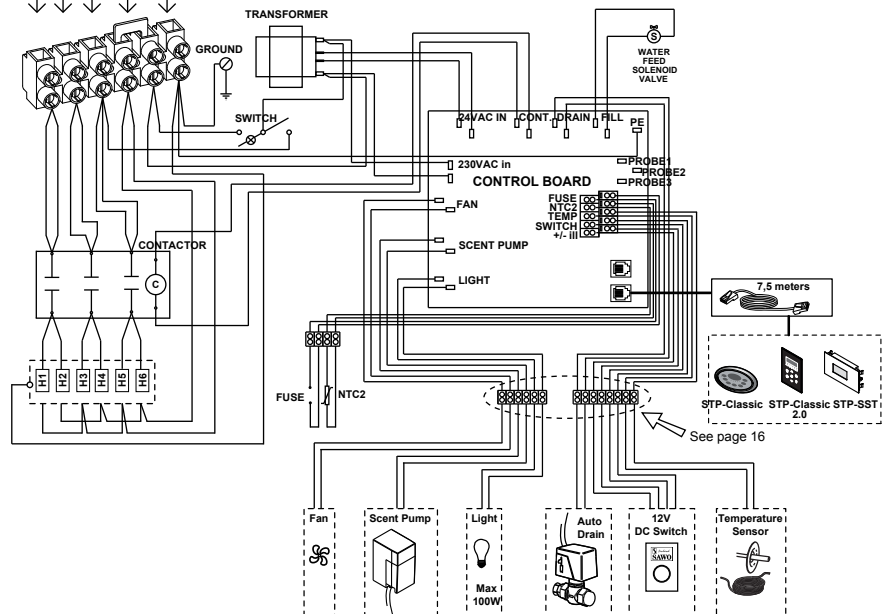
5 core cable



CONTACTOR UNIT



HEATING ELEMENTS



Installing the Temperature Sensor

Before installation main supply of the generator must be switched 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 "TEMP". See figure 2.

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

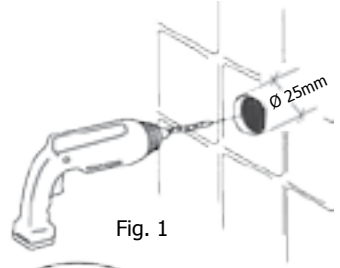
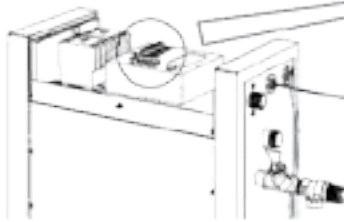


Fig. 1

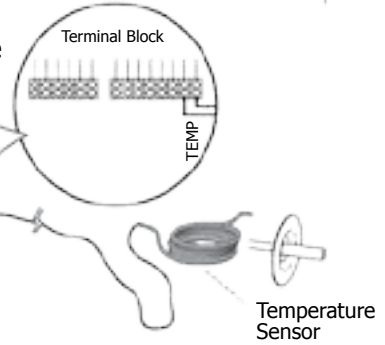
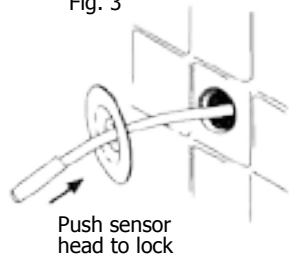


Fig. 3

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.

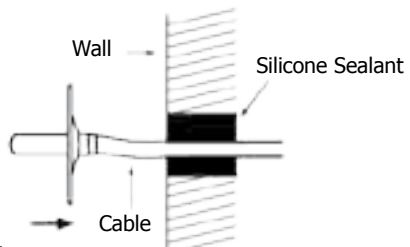


Push sensor head to lock

Fig. 4



Fig. 5

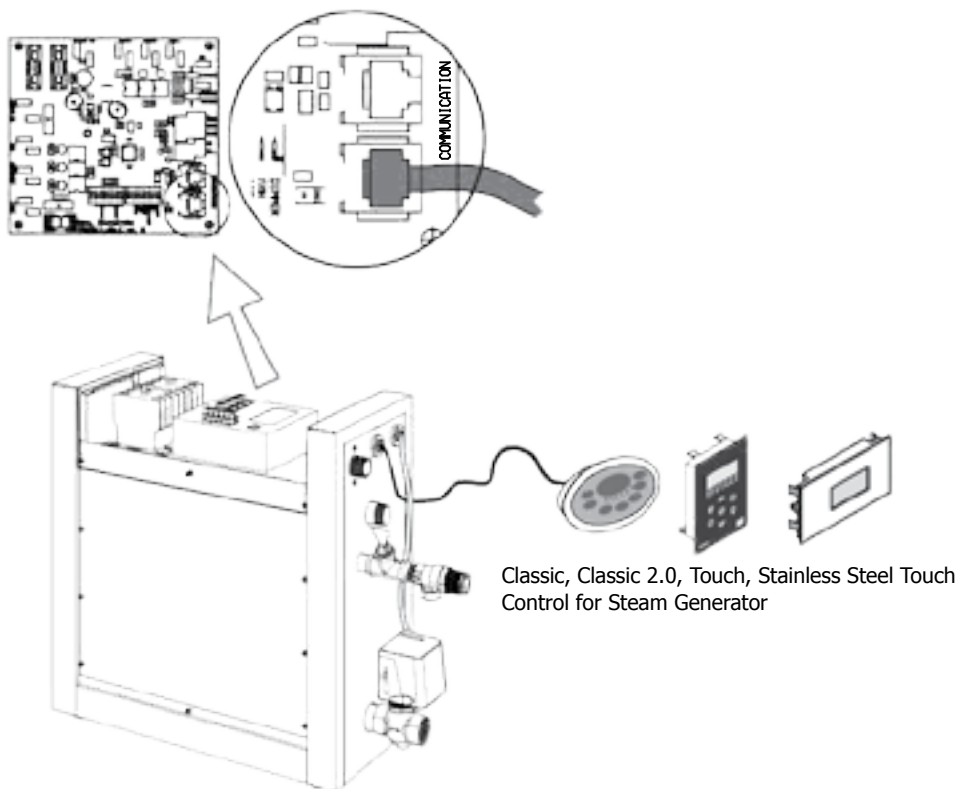


Push to the wall to stick

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 PCB cover on the side of the generator to get access on the PCB.
2. Guide the RJ12 control cable through the cable lead-in hole on the side of the generator and then behind the side panel as described in the drawing below to reach RJ jacks on the corner of PCB.
3. Note that there are two black RJ jacks on the board. One is for the control cable and the other one for the optional slave unit. The control cable and slave cable can be connected to either of these jacks, the order is insignificant.



4. Fasten the PCB cover and the top cover of the generator.
5. Turn the mains on and switch on the power switch in the back of the generator.
6. The software version should be displayed in the control unit.
7. Turn the control unit on "On" mode to check it works properly.

Demand Button



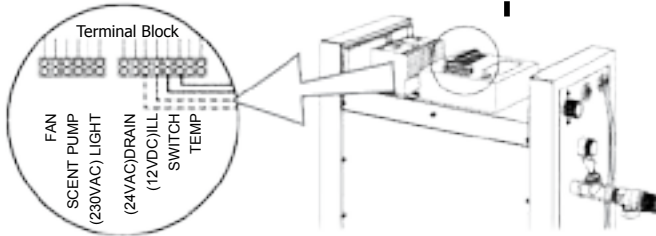
A separate demand button can be installed on any desired location including inside the steam room. Press of the demand button will immediately release extra steam for 30 seconds.

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

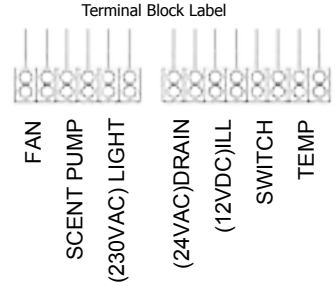
Demand Button (optional)

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.



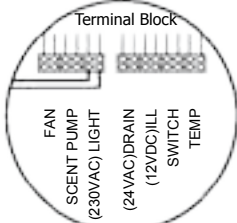
Terminal Connection



Make sure that polarity is right "ILL" output is +12VDC and 20mA. Refer to Demand Button manual for detailed instructions.

Light

Max. 100W
Power 230VAC

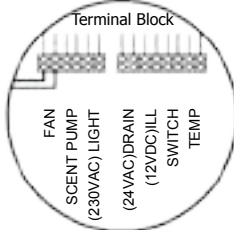


Use only incandescent bulb, halogen bulb or any resistive load bulbs. Do not use LED bulbs as it may destroy the board.

If you have optional dimmer in steam generator, make sure that the lights are dimmable before connecting. Steam generator uses phase control to regulate power for lighting.

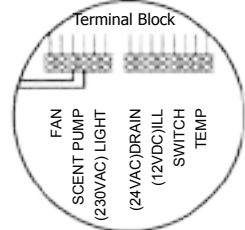
Fan (Optional)

Max. 100W
Power 230VAC

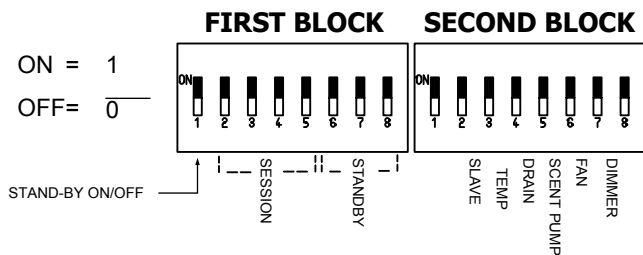


Scent Pump (Optional)

Max. 100W
Power 230VAC



DIP Switches in the Steam Generator



Standby time

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

Standby Duration Mode	Switch 6	Switch 7	Switch 8
4h	0	0	0
6h	0	0	1
12h	0	1	0
18h	0	1	1
Unlimited	1	0	0
4h	1	0	1
4h	1	1	0
4h	1	1	1

First Block of 8 Switches

DIP No.	Function
8	Standby mode duration
7	Standby mode duration
6	Standby mode duration
5	Maximum session time
4	Maximum session time
3	Maximum session time
2	Maximum session time
1	Disable standby mode / Enable standby mode

Dipswitches for other Functions

Dipswitch No.:	Function	On	Off
8	Cabin Light	Dimmer option enabled	Dimmer option disabled
7	Fan	Present	Not Present
6	Scent Pump	Present	Not Present
5	Auto Drain	Connected	Not Connected
4	Temperature range	30-55°C	30-50°C
3	Slave Unit	Yes	No
2	Slave Number		
1	Slave Number		

Session Time

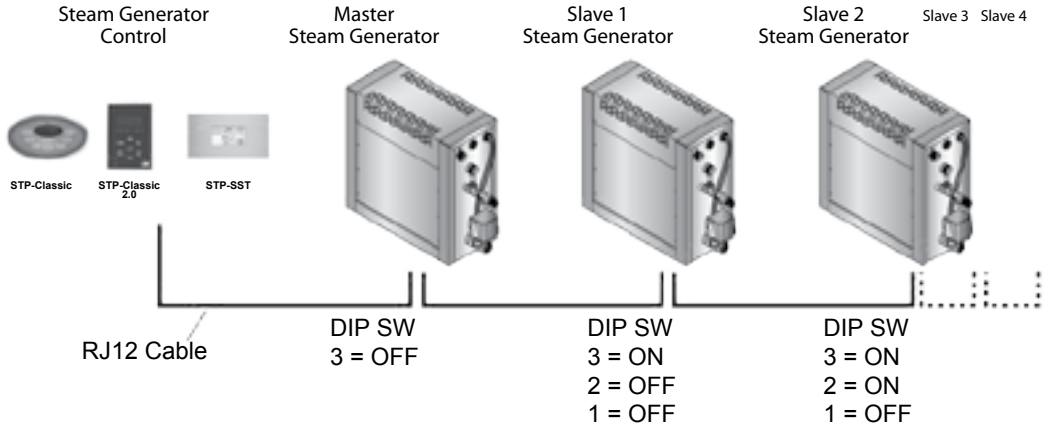
Session time can be set according to user preferences by session dip switches on the power controller board.

Session Time	Switch 2	Switch 3	Switch 4	Switch 5
10min	0	0	0	0
15min	0	0	0	1
20min	0	0	1	0
30min	0	0	1	1
45min	0	1	0	0
1h	0	1	0	1
2h	0	1	1	0
4h	0	1	1	1
6h	1	0	0	0
8h	1	0	0	1
12h	1	0	1	0
18h	1	0	1	1
Unlimited	1	1	0	0
10min	1	1	0	1
10min	1	1	1	0
10min	1	1	1	1

Dipswitches for Naming Slaves

Slave No.	1Switch	2Switch
1	0	0
2	0	1
3	1	0
4	1	1

Steam Generator Tandem 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 in the control panel, see the table below.

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

If an error occurs in one of the slave units, error message is followed by slave number. For example: E1 -> S2 -> E1 ->S2... Pressing ON/OFF button disables the slave and rest of the generators can operate normally.

Possible errors are:

Code	Problem	Solution
E1	Temperature sensor 1 not connected.	Check the wire between the sensor and the control unit.
E2	Temperature sensor 1 short circuit.	If there is no problem with the wires and they are correctly installed, check the sensor.
E3	Temperature sensor 2 not connected.	
E4	Temperature sensor 2 short circuit.	If no problem can be found, contact the retailer.
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.

Code	Problem	Solution
E6	Water level too high and operation not permitted.	Check that the drain valve is not blocked. Clean the level probes. If no problem can be found, contact the retailer.
E7	Water level too low and operation not permitted.	Check that water supply is open and there is enough pressure. Check solenoid valve. Clean level probes. If no problem can be found, contact the retailer.
E8	Illogical combination of water level measurements.	Clean level probes. If no problem can be found, contact the retailer.
E9	Fill failure.	Check that water supply is open and there is enough pressure. Check solenoid valve. Clean level probes. If no problem can be found, contact the retailer.
E10	Drain failure.	Check that the drain valve is connected and not blocked. Clean the level probes. If no problem can be found, contact the retailer.
E11	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.
E12	Temperature is greater than the maximum temperature.	Contact qualified electrician or maintenance personnel before using the steam generator again.
E13	No master steam generator connected.	Dip switch setting is incorrect. Check dip switch settings. Check RJ12 for loose contact. Replace RJ12. If no problem can be found, contact the retailer.



Subject to change without notice.



www.sawo.com | info@sawo.com

STN_ML_(En1020)