YANO BOILER

400-920-8955

User Manual – Fuel Oil (Gas) Steam Boiler

(Suitable for steam capacity range from 35-200kg/hr)

TEL:+86-21-59972289
E-MAIL:sh-yano@163.com
HTTP://www.sh-yano.com

扬 | 诺 | 锅 | 炉

上海扬诺锅炉制造有限公司

Shanghai YANO Boiler

CARRY BREWTECH

Safety Illustration

1.Carefully read this manual before starting and maintenance boiler
2.Boiler operation should be with qualified worker
3.Cut off power before checking or maintenance boiler
4.It will cause very dangerous accident with not professional boiler operating

Boiler using conditions

1.Using suitable voltage (According to your local situation) and boiler should be safety ground connection
2.Boiler should be equipped with water softener to decrease water hardness and length boiler life span
3.Boiler suitable using temperature is 5 ℃ to 45℃, boiler can’ t be used in an open, moisture, too high or too low temperature condition
4.Before starting boiler, guarantee safety value should in validity period, and checking whether it's flexible and qualified. Besides, safety value should bring to inspection every year one time
5.According to national laws and regulation, boilers which need to apply an using certificate from government, kindly apply for it before using according to local situation

Below situations is not in product maintain range

1.Artificial damage
2.Damage due to voltage is not in the suitable range or power wire wrong connection
3.Due to use of substandard diesel or unstable insufficient gas supply
4.Circuits and electrical components damage due to water-in, moisture or high temperature.
5.Pipe and boiler spares freeze damage due to boiler used in extreme cold temperature condition
6.Damage due to heating tube scale is over 1mm since water hardness is too high

Catalogue

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Main technical parameters

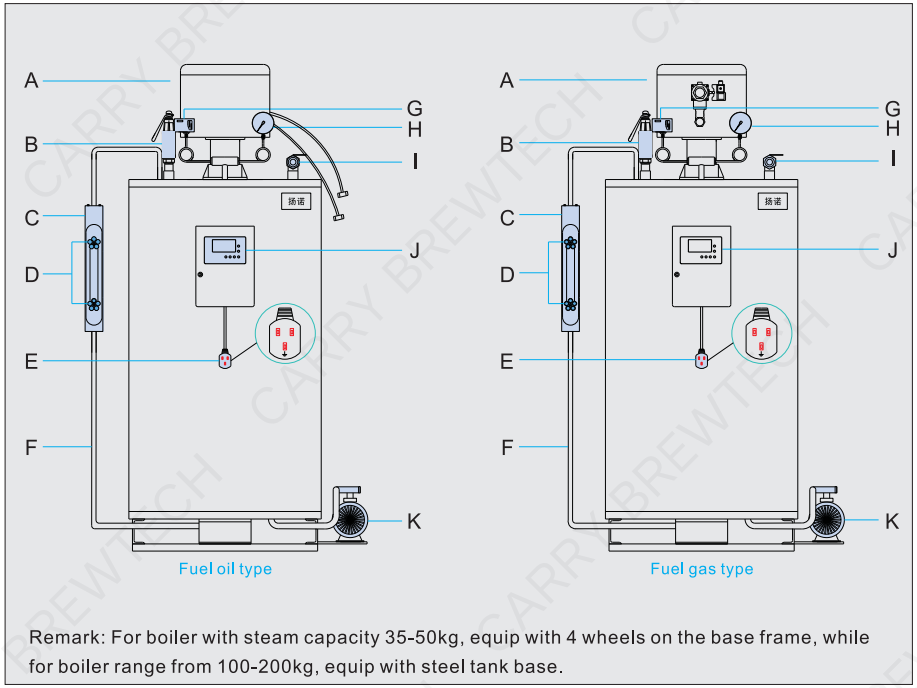
Spec \ Type		LSS0.035-0.7-Y/Q	LSS0.05-0.7-Y/Q	LSS0.1-0.8-Y/Q	LSS0.2-0.8-Y/Q
Rated evaporation(kg/h)		35	50	100	200
Rated pressure(Mpa)		0.7/1.0	0.7/1.0	0.8/1.0	0.8/1.0
Steam temperature(℃)		170/185	170/185	175/185	175/185
Fuel	Diesel(kg/h)	2.2	3.2	6.1	12.2
	Coal gas(Nm^3/h)	6.2	8.9	17.0	34.0
	Natural gas(Nm^3/h)	2.8	4.0	7.6	15.2
	Liquefied gas(kg/h)	2.25	3.3	5.7	11.4
Dimension (mm)	(L)	800	800	900	1000
	(W)	800	800	900	1000
	(H)	1350	1400	1800	2320
Steam caliber		DN15	DN15	DN25	DN25
Drain outlet caliber		DN15	DN15	DN25	DN25
Water inlet caliber		DN15	DN15	DN15	DN15

Remark:

1. The above parameters is for our common boilers, the specific parameter of each boiler refer to product rating plate. If custom-made boiler, the boiler's parameter refer to the custom-made parameter.
2. The calorific value of diesel fuel is calculated as 10600 kcal/kg; Natural gas calorific value 8500 kcal/m^3; City coal gas calorific value by 3800kcal/m^3; Liquefied gas calorific value by 11000 kcal/kg.
3. Energy consumption is different due to adjust of equipment or different fuel calorific value.

Boiler general view

Front part outer photo



Remark: For boiler with steam capacity 35-50kg, equip with 4 wheels on the base frame, while for boiler range from 100-200kg, equip with steel tank base.

Photo 1 General view of boiler front photo

A. Burner: Run automatically according to start and stop pressure we set on the pressure control.
B. Safety value: When the pressure exceeds the safety valve's off pressure, safety value will turn on automatically for relief pressure, safety value is with overpressure protection.
C. Water level electrode tube: For placing water level sensor.
D. Glass water level gauge valves: Normally open to show the water level in the drum.
E. Boiler power plug: After reliable power connection, boiler can function properly. Pay attention that the power plug, the left is zero line and right is live line, and can't be reversed.
F. Pressure switch: Used to control the burner stop/start, to ensure regular supply of steam.
G. Pressure gauge: Display the actual pressure of boiler.
H. Steam valve: Connect to the user's device.
I. Program controller: Display boiler's operation and operating status, see page 11-14 for detailed instruction.
J. Boiler feed water pipe: After starting the pump, softened water flow into boiler.
K. Boiler feed water pump: For boiler feeding water, water automatically into boiler according to water level signal control.

Right part outer photo

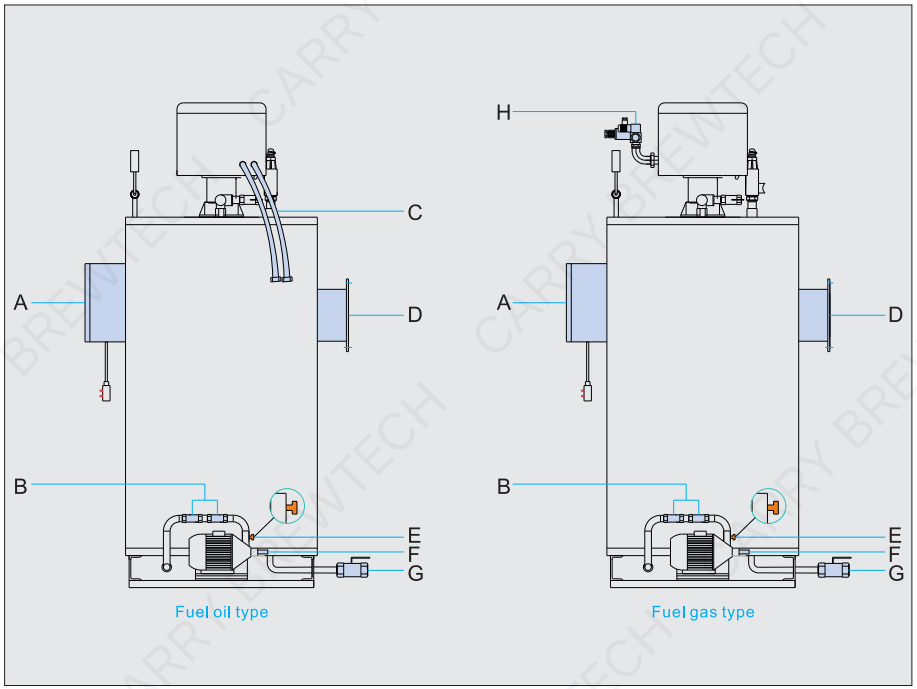


Photo 2 General view of boiler right part out photo

A.Boiler electric control box: Control the boiler pump and burner operating.
B.Check value: Prevent water inside of boiler back to water tank.
C.Diesel connection hose: Diesel from here into burner (inlet pipe and return pipe, each one)
D.Chimney: Connect to outdoor, chimney height is according to local environmental protection department data.
E.Pump vent: If water pumps have evacuated situation, after boiler shutdown, unscrew the screw exhaust, when air totally exhaust, pls tighten.
F.Pump water Inlet: Softened water into pump from here.
G.Drain valve: For drain out the water and scale in boiler .
H.Gas intake: Gas pipeline interfaces.

Top part photo

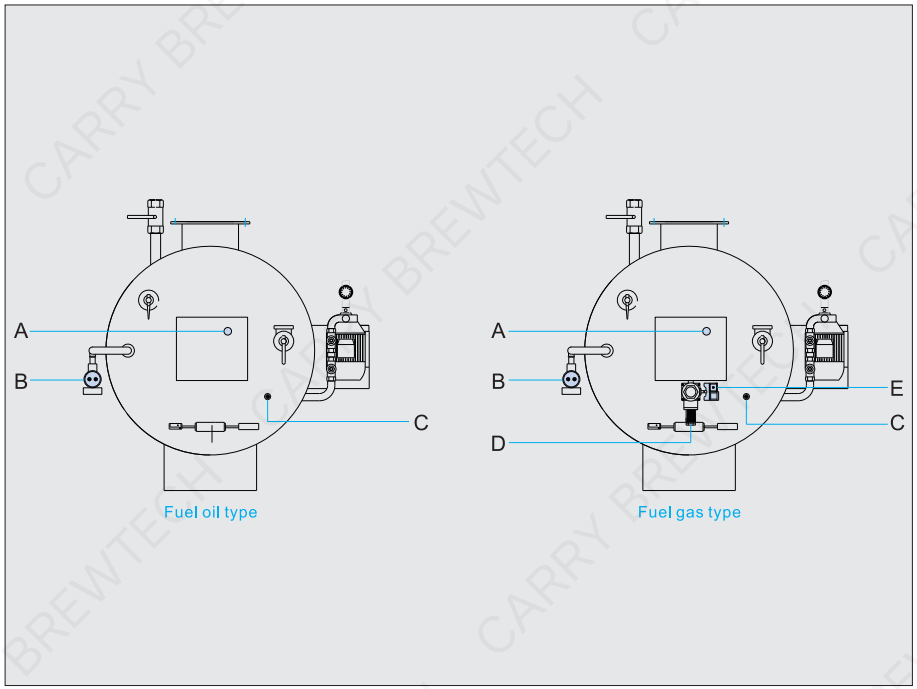
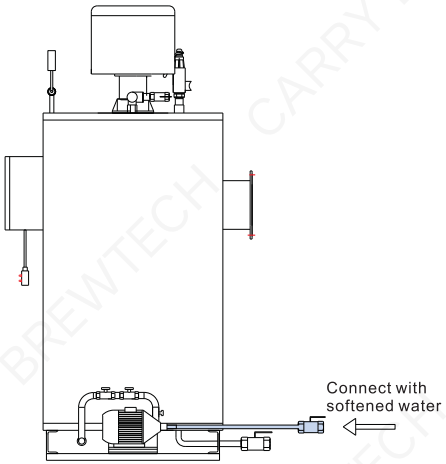


Photo 3 general view of top part photo

A.Burner operation instruction and reset button: Display burner status and fault alarm, it reset, When starts the burner, yellow light shines, after a period of time purging, the yellow light becomes flashing, pls make fire. After fire successful ignition, it becomes to green light, If the ignition is not successful then it becomes red light, then need to know the reasons and then press this button to reset.
B.High and low water level sensor: Boiler water level reaches the high level sensor, the pump stops, if water level is lower than the low sensor, water pump start to working; High sensor probe is short, low-sensor probe is long, usually red line indicated to high water level sensor, green line indicate to low water level sensor.
C.Extreme-low water level sensor: If water level is below this level, boiler burner forced to stop, this extreme-low water level sensor serve an function to prevent boiler from fire without water.
D.Gas flow control valve: Adjust the intake flow
E.Gas supply Low-voltage switch: Only the gas pressure exceeds this set value, the burner will start to working.



First Step

Install water pipes.
Connect the softened water tank outlet to the water pump inlet, before water in, please install water inlet valve.

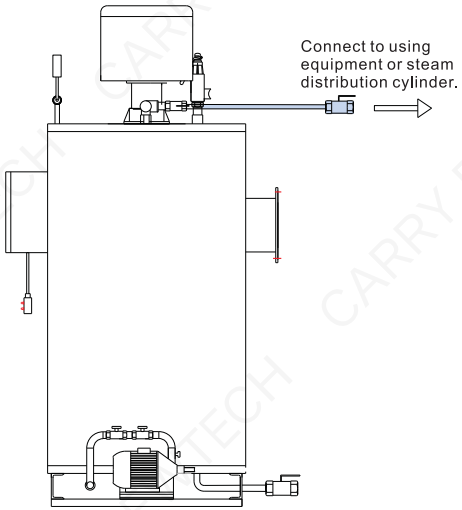
⚠ Warning:

Boiler should be equipped with water softener equipment, unsoft water is easily lead boiler , water level sensors and other components scaling, thus lead to boiler tube leaks or reducing the thermal efficiency of the boiler.

Water temperature requires less than 50 ℃, otherwise boiler requires to equip high temperature water feed pump.

ⓘ Notice:

System installation drawing, please refer to page20.
Water tank outlet should be 50mm higher than water pump inlet.

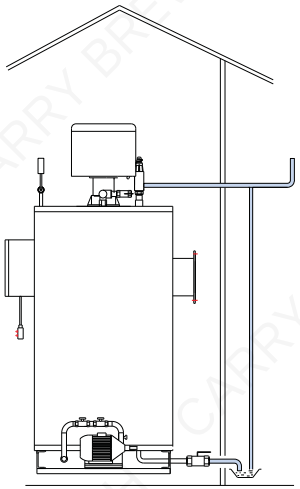


Second Step

Steam valve connect to using equipment or steam distribution cylinder.

ⓘ Notice:

It needs to equip with standard steel steam pipe, outside of the steam pipe need to do heat insulation to prevent thermal loss and being burned. If heating liquid by using the steam pipe touch the liquid directly, user needs to install an Check Value on steam pipe to avoid liquid flowing back to boiler thus make an damage to boiler.

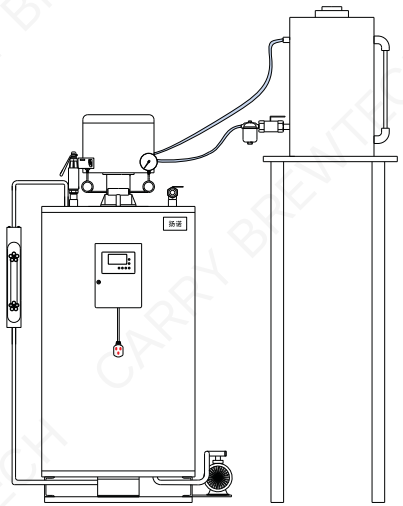


Third Step

Install the drain outlet pipe and safety value outlet pipe.
Drain pipe to sewer, steam value mouth should be installed stretch outdoor to avoid when safety value is opened, it will burns people.

ⓘ Notice:

It needs to equip with thermostability and voltage resistance standard steel drain outlet pipe. And caution being burned.
There is condensate water on safety value outlet pipe, user need to installed condensate water pipe to sewer. Otherwise, if in winter, the condensate water will freeze, thus safety value is not protective.



Forth Step

Install oil pipeline or gas pipeline.
If it's oil fired steam boiler, pls install oil pipeline

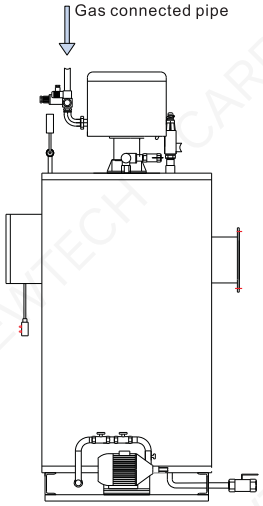
ⓘ Notice:

The mouth of daily oil tank was on the bottom side of tank, oil mouth access into the oil pipeline, oil inlet connected with valve first then connected with oil filter. The oil return back mouth was on the top side of the oil tank, oil return mouth connected with oil return pipe.

⚠ Warning:

The oil tank oil inlet should be 10cm higher than the burner mouth inlet.

It’s forbidden to use low-grade diesel, bio-oil or waste oil, which will cause the burner pump and nozzle damaged.



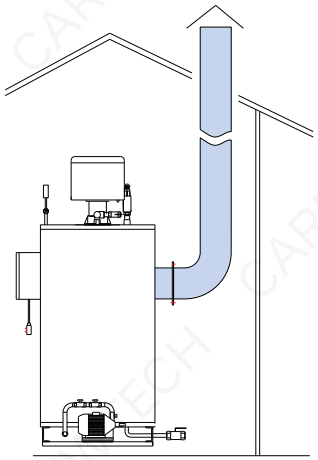
If it's gas fired steam boiler, pls install gas pipeline

Notice:

Gas pipe diameter must be greater than a standard pipe mouth diameter on the burner valve.
Please install a pressure gauge (unit in Kpa) for easy access to detect gas pressure before the gas onnected to boiler.

Warning:

Supply gas pressure: Dynamic pressure must be 2.5 ~ 4Kpa. Gasification devices and pressure reducing devices should be used when using LPG gas.



Fifth Step

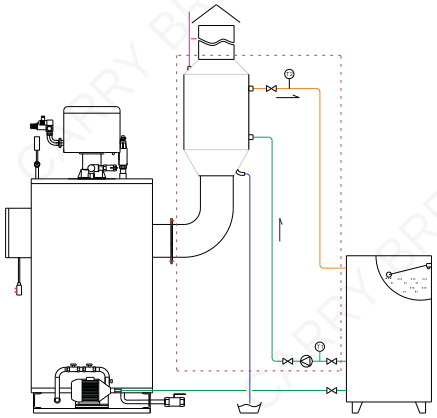
Install the chimney.

Notice:

Chimney up installation, chimney smoke vents height should be at least two meters above the highest point of boiler; A waterproof cap should be installed at the chimney outlet.

Warning:

In order to reduce the resistance of smokes require the use of a curved elbow corner, prohibited the use of right-angle bend.
It's forbidden to install chimney at down direction, otherwise it will increase the resistance on the smokes and effect boiler's normal combustion, resulting in damage to the burner



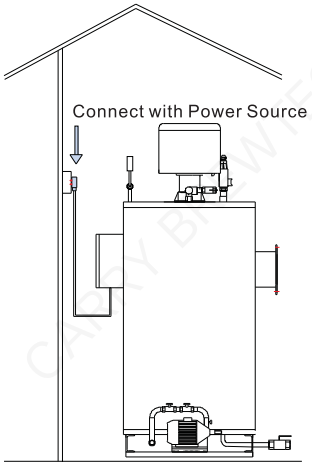
Sixth Step

Install the energy-saving system of boiler (That's smoke recovery system).

System Process: By using the circulating pump to give the softened water into the economizer, after economizer generate sufficient heat energy , the softened cold water becomes hot, then return back into water tank, thus play a role in energy saving.

Notice:

The economizer system (dotted line) does not belong to the product standard configuration, pls additional configuration according to the order.
Using insulation type water tank is more energy -saving.



Seventh Step

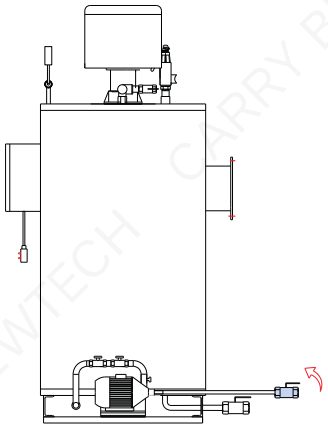
Connect the power supply.

Notice:

Plug into the power plug socket, positive direction must be left zero line, the right line of fire.

Warning:

Boilers must be grounded connected, neutral and ground is not allowed to share.
Suitable cable is required, too small cable easy to burn electric appliances.

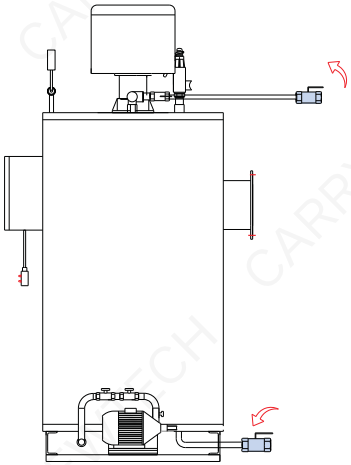


First Step

Open the water inlet valve, softened water can naturally flow into boiler inlet.

Notice:

Ensure there is enough softened water in the storing water tank, the softened water level should be more than 50mm above the boiler pump, so that when we open the inlet valve opens, softened water can flow directly to the pump inlet.
Pls ensure the water tank is clean, if there is debris inside, it will stuck the pump and check valve.
When water is spilling, please check whether the float ball is stuck, if the float ball is stuck, pls open the water tank, shake the float ball up and down to make the ball is lift flexibility and automatically.



Second Step

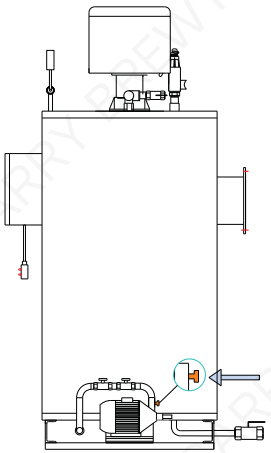
Open the steam valve, close the drain valve.

Warning:

When water flowing into boiler, if we close the Steam Value, the boiler gall is in closed condition, the gall inner space will produce pressure, this time the pressure on pressure gage is the air pressure not steam pressure. If there is air pressure in boiler gall, this will have an effect on the water flowing speed. If the air pressure exceed the safety value rated pressure, this will result in safety value being open automatically.

Notice:

When boiler is in operating condition, Drain Outlet Value required being in closed condition.
If the Value handle and Steam pipe is in vertical condition, the Drain outlet value is closed. Otherwise, it is open



Third step

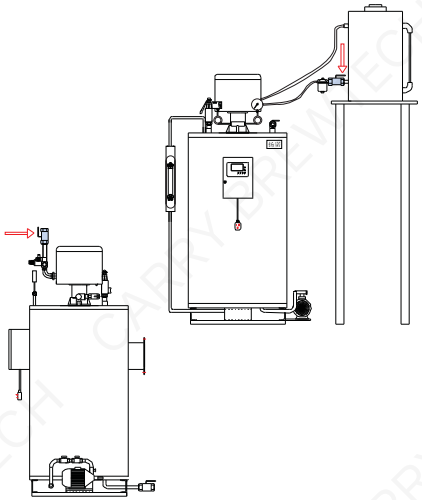
Screw off the bleed screw at the water pump inlet part. If there is water ran out, it means the air is fully exhausted, then tighten the screw.

Notice:

After boiler starting and water pump start, pls check whether water level in water tank is falling. If this, it means water pump is in good working condition, and water flowing into the boiler gall.

Warning

If water level is still not falling, kindly check whether water pump is rotating or not. If water pump works smoothly but water level is not falling, probably reason is there is still air inside of the pump, so pls re-operate Third step 3 until air is fully exhausted out.



Fouth Step

If fuel oil steam boiler, open the oil pipe value, and make sure there is no oil leakage.

Notice:

Before the boiler starting, pls full filled with standard 0# diesel, if at extremely low temperature, considering reheat diesel or do the heat insulation of diesel.

If gas-fired steam boiler, open gas supply valve, and make sure there is no gas leakage.

Notice:

Make sure the gas pressure meet the requirements before opening the gas valve.
For the first time boiler use, pls make the air evacuation of the gas pipeline.

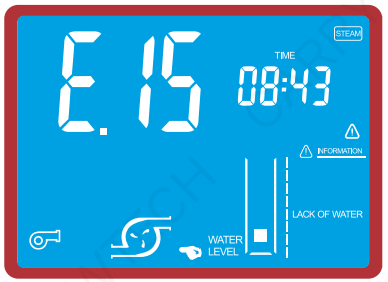


Photo A

Fifth Step

Press the controller at the "Power" button, the display shows the status of each job, this time, boiler is in "Extreme-low water level alarm " state. (See Photo A)

Notice:

The program controller is applied to a plurality of control modes, in this boiler series, no need to use "Set" button.

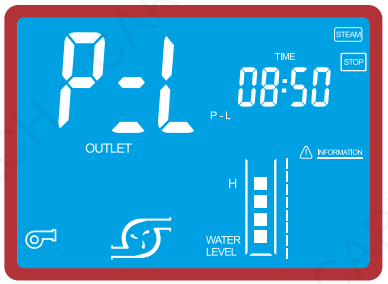


Photo B

Sixth Step

Press “on/off” button on boiler, this time the water pump will adding water automatically. When water level is in high water level line, warning voice disappear, water pump will stop working and the figure: disappear. This time boiler is in “off” condition. This means everything of the boiler is ok only waiting for starting. (See photo B)

Notice:

If the water pump didn’ t rotate and in an locked condition, pls press “+” for more than 5 seconds until water pump rotate; When water pump rotate, it present an regular voice, this time pls check whether the water level in water tank is falling , if water level is falling, it means water is flowing into the boiler. If water level is not falling, please kindly check whether water pump is jammed. If water pump is working smoothly but water level is water tank is not falling, it means there is still air in water pump, pls turn off the boiler and repeat operating Third step 3.

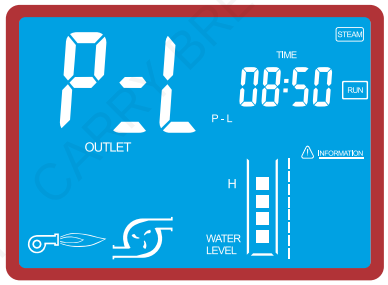


Photo C

Seventh Step

Press the “on/off” button on boiler, this time boiler is in “working” condition, pls turn on the burner. (See photo C)

Notice:

After burner operation, it will automatically working, then burner come into the ignition process, If ignition is sucess, burner will make the pressure control automatically. If the ignition fails, please make the burner restart by Burner Operation Instruction and Reset Button in page 4.
If the boiler second time use, burner can't be fired, check whether the oil-fired boiler inlet and return lines reversed. Gas boiler check the gas supply adequacy or regulate gas flow to be reignited. The inspection and repair of burner, please check burner user manual for details.

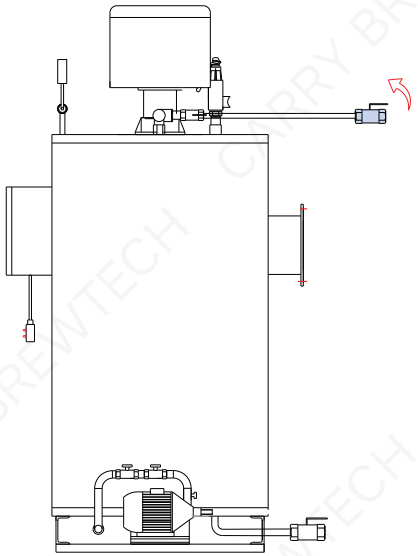


Photo D

Notice:

When the steam pressure reaches the "high", this means boiler pressure reaches the set pressure, this time, burner stops working (See photo D),

When the steam valve is open, and after using steam, the steam pressure drops, until the it reaches to "low-pressure" then burner re-start working.
If water level is between high level and low level, it shows “Mid-level” (see photo D).
When water level shows “low” , water pump will start add water. Water pump will stop until water level up to “high” level.



Eighth Step

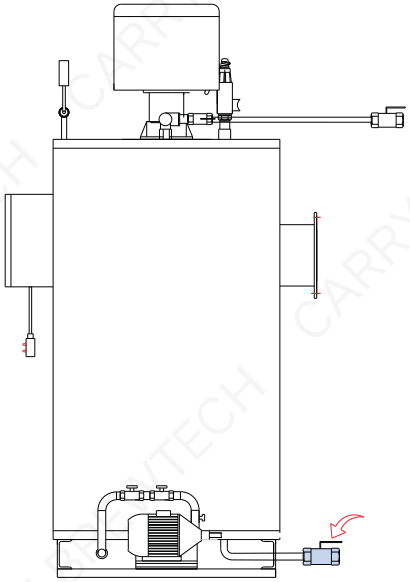
Open the steam value slowly

Warning:

Pls open the steam value slowly, if open too fast, the steam will produce an pressure that will bring boiler inner water out, this will lead to the output steam with large water.

Notice:

If required steam is bigger than boiler output steam, the pressure gauge directs 0 or very low pressure (the steam value is fully open). If needed an stable pressure for steam output, pls open the steam value slowly and kindly check the pressure gauge. When pressure up to the required value, user need to guarantee the steam value opening size. This is an coarse regulation method, if needed an accurate and stable pressure, extra stable pressure accessories should be installed.



Ninth Step

Stop using boiler

Press button "power", the controller displays disappear. Then turn off the main switch.

After boiler be turned off for 15 minutes and pressure falls to 0.1MPA, Pls open the drain outlet value to have drain outlet.

Warning:

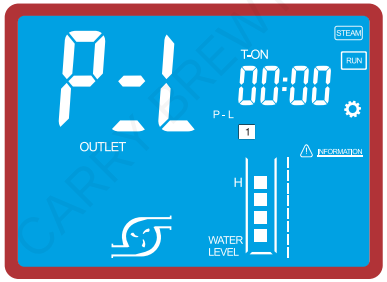
It is forbidden to have an drain outlet immediately after boiler stop work . Because this time boiler is still in high temperature and boiler inner gall will cooling very fast, this will damage the boiler.

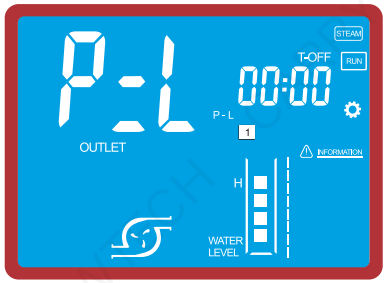
Besides, it is forbidden to have an drain outlet when boiler is still in high pressure, because waste water will backlash and burned people

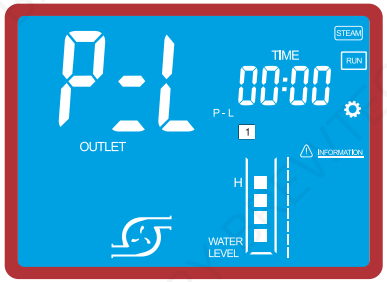
In cold temperature, after boiler turned off, pls open the water outlet value to have an water tank and pipes water outlet to avoid water freeze since this will damage the water pump, pipe and water tank.

Notice:

Drain can be better drained out with some pressure, at about 0.1Mpa.







Warning

Steam boiler should be operated by professional worker, "Timing setting" is an assistant function under condition of professional worker operating. If there is nobody operating the boiler, this is very dangerous to use "Timing setting" function.

Step 1

Press button "F" for 5 seconds or longer when boiler under the "STOP" condition, until "1" and "T-ON" shines, then we can set the time period and time.

Notice:

It is forbidden to have "timing setting" operation when boiler is in "working condition".

Time can be set from 0.00-23.59. total 4 periods time can be set. Time period setting should strictly follow the sequence 0.00-23.59, it is not allowed time overlapping and reversal. For example: If we set the 1st period time "starting time" as 8:00, then all the starting and closed time should be bigger than 8:00. Controller parameter should be checked and revised automatically according to this limits. The starting and closed time can be the same in one time period. So the time period is 0 and it is an invalid time. So in this way, we can set the starting and closed time the same to delete some unnecessary time period.

Step 2:

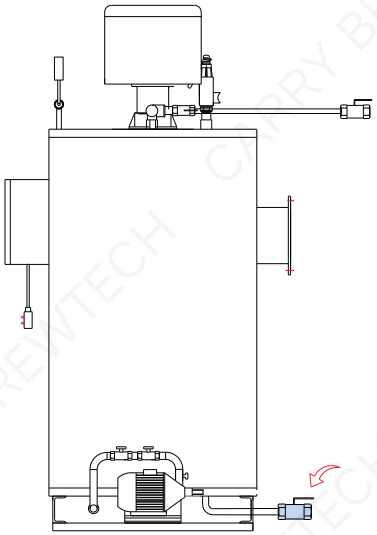
Time Period Setting and Timing Setting

At the upper left part of the clock, it display "timing open" and "1" display at down part. Then press "+" and "- " to set 1st period open time; Then Press button " F", this time it displays "timing close" at the upper right part, and "1" displays at the down part, Then press "+ " and "- " to set 2nd closed time. Continue press "setting" for next period time setting. Totally 4 period times can be set.

After the 4th period time is set, press button "F", the "time" is shine on the top of the o' clock. This time press " +" and "-" setting time, then press " F" button to save.

How to close "Timing control" ?

Set the 4 times "starting time" equal to "stop time", then Controller will present an non-timing condition, so the boiler is in "starting time" condition all day.

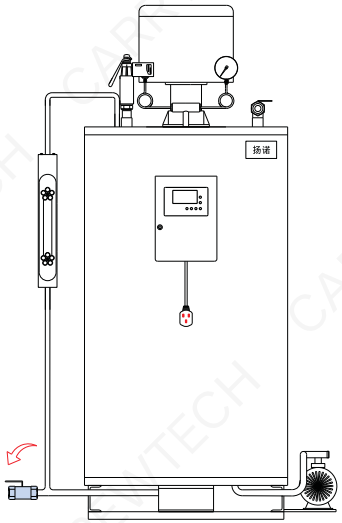


Regular drain outlet

Pls open the drain outlet Value to have an boiler drain outlet each time after boiler is stop working and closed about 15 minutes and steam pressure fall to 0.1Mpa.

⚠ Warning:

It is forbidden to have an drain outlet immediately after boiler stop working. Because this time boiler is still in high temperature and boiler inner gall will cooling very fast, this will damage the boiler. Besides, It is forbidden to have an drain outlet when boiler is still in high pressure, because waste water will backlash and burned people.

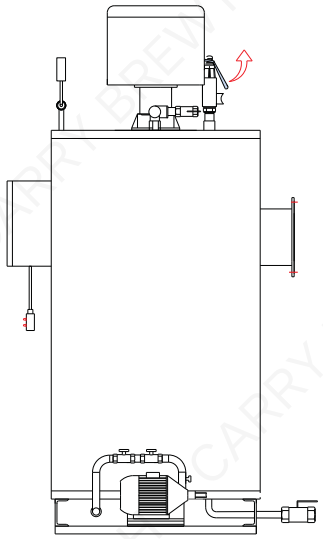


Regular flushing water level gauge

After starting the boiler every day, open the drain valve of water level gauge in full water level state, flushed five minutes for the water level gauge, to prevent clogging or fouling inside water level gauge, thus affecting the normal water level gauge measurement.

ℹ Notice:

If the water level gauge sewage is not smooth under, pls sewage when boiler is in 0.1Mpa Pressure. Remove the water level gauge and pipes clogged scale clean-up if the water level gauge blocked.

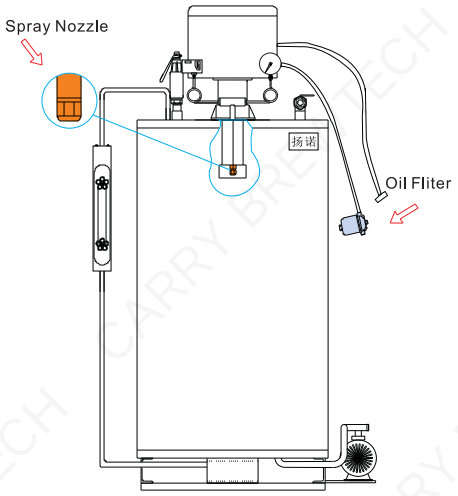


Safety value should be tested every month and be inspected every year.

Under the steam pressure condition, turn on quickly the safety value handle to check if there is steam blow out, if there is, it means the safety value is ok. Safety value should be bring to inspection every year, only the qualified Safety value can be used in boiler.

⚠ Warning:

If there is no steam blow out, stop using boiler. Then bring the safety value to have an inspection, after inspected, the steam value can be used. It is forbidden to use an non-inspected steam value.



Fuel oil boilers require regular clean filters and spray nozzle.

Every two months cleaning the oil filter and spray nozzle, (for details see burner user manual).

ℹ Notice:

When cleaning the oil filter, pls closed the oil tank oil-out valve, then unscrew the filter cup base with a soft brush to clean the filter.

When cleaning the spray, pls remove the screw which connected the burner and boiler and, and then pull out the entire burner. When twist nozzle, apply a wrench to the other end of the fixed nozzle and then pull out the spray nozzle by using another wrench.

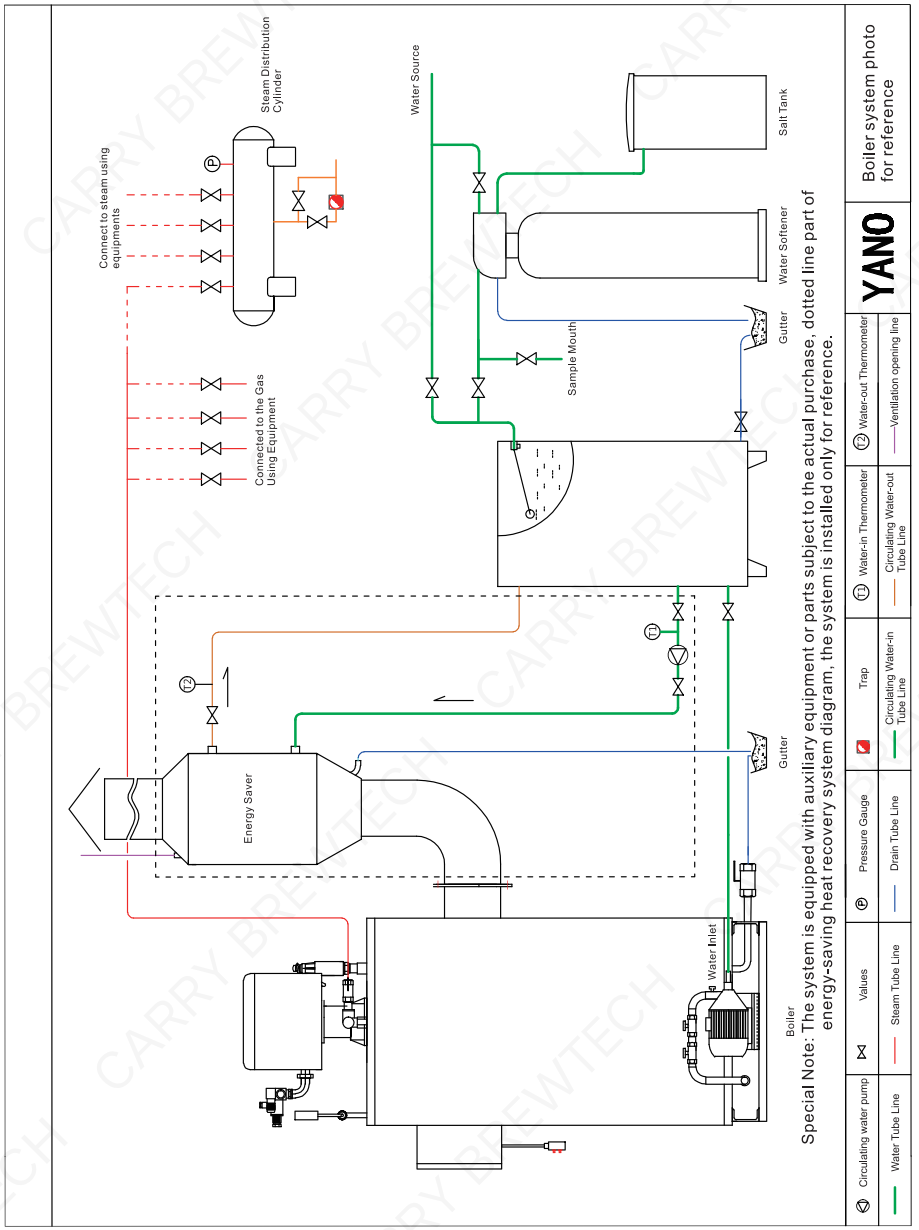
Situations	Possible reasons or others	Possible solving ways
LCD controller doesn't display	Fuse F1 burnout	Change another fuse
	Supply voltage is too low or too high	Check voltage
	Circuit is loosen or fall off	Check the circuit
	LCD panel is burnout	Change another LCD panel or return back for
LCD controller shines, but button is not working	Voltage is over-low or over-high	Check voltage
	Button is not flexible or damaged.	Change another LCD panel or return back for repairing
Water pump doesn't rotate under extre -low water level condition (Damage code E15)	The water pump is locked , so need to water replenishment by hand	Press "+" until water pump rotate
	LCD controller didn't send out the water pump single	Change with another one or return back for repair
	Fuse F2 burnout	Change with another fuse
	Water pump circuit is loosen or fall off	Check the circuit
	Water pump is burnout	Change with another water pump
Water pump doesn't otate in low water level state.	LCD controller didn't send out the water pump single	Change with another one or return back for repair
	Fuse F2 burnout	Change with another fuse
	Water pump circuit is loosen or fall off	Check the circuit
	Water pump is burnout	Change with another water pump
Water pump sound with rotate voice but didn't have water inlet	Air in the water pump	Exhaust the air
	Check value is jammed	Dismantle the check value have an clean or replacement
	Water pump is jammed	Turn off boiler, dismantle fan cover, and rotate the water pump blades
	Water pump wears and the head is not big enough	Change with another water pump
Water boiler is full but water pump is working to have an water inlet	Water level sensor is scaling	Clean Mid and high water level sensor
	High water level probe power wire is falling off	Check the high water level circuit
	Water level shell line is falling off	Check the water level shell line
High-pressure steam discharge but pressure gauge does not display pressure	Pressure gauge is damaged	Change with another pressure gauge
	Pressure gauge connected brass tube is blocked	Clean or change the connected brass tube

Situations	Possible reasons or others	Possible solving ways
Water level sensor breakdown (E18)	Water level sensor is scale	Clean or change another water level sensor
	Water level sensor power wire is loosen or falling off	Check the circuit
	Water level electrode container is scale and blocked up	Clean the water level electrode container
Water spill out from water tank	Float Ball Value is jammed	Open the water tank cover and wave the Float Ball Value up and down
	Float Ball Value is Broken	Change with another Float Ball Value
Water in water tank is very hot or with some steam	Check Value is jammed or broken, so steam return back	Clean or change with another Check Value
Boiler up to the set pressure but burner still heating	Pressure controller is not flexible or broken	Controller power wire is fall off or loosen
	Change with another pressure controller	Check the circuit
Safety value can't be open while pressure is higher than 0.03Mpa	Safety value is not flexible	Bring the safety value to have an inspection
	Safety value is broken	Change another qualified safety value
Safety value spray out much water	Water pump is still working and boiler is full of water	Drain out the boiler water, then restart the boiler
	Water level sensor lead to the water pump rotating all the time	Wash the water level sensor
Safety value dropping water or flowing out steam	Safety value is not flexible	Bring the safety value to have an inspection
	Safety value is broken	Change with an qualified safety value
Controller display the burner is working, but in fact burner is not working. (fuel oil boiler)	The plug between controller and burner is not firm.	Check the plug
	Damages of the burner	Check burner
Burner starts but didn't fire success (Fuel oil boiler)	Supply oil value of oil tank is not open	Check whether the value is open
	The location of Ignition electrode is wrong.	Check the location of Ignition electrode
	No spark appear with the ignition electrode	Check the transformer is working or not.
	Ambient temperature is below 5 degrees, oil curdling	Oil Preheating
After burner fired, it appears Interrupted fire stop. (fuel oil boiler)	Oil supply is not smooth	Check the oil supply tube is blocked
	Oil fliter is blocked	Clean the oil fliter
	Oil pump is blocked or jammed	Check the oil pump or change
	Oil quality problem	Check the diesel quality

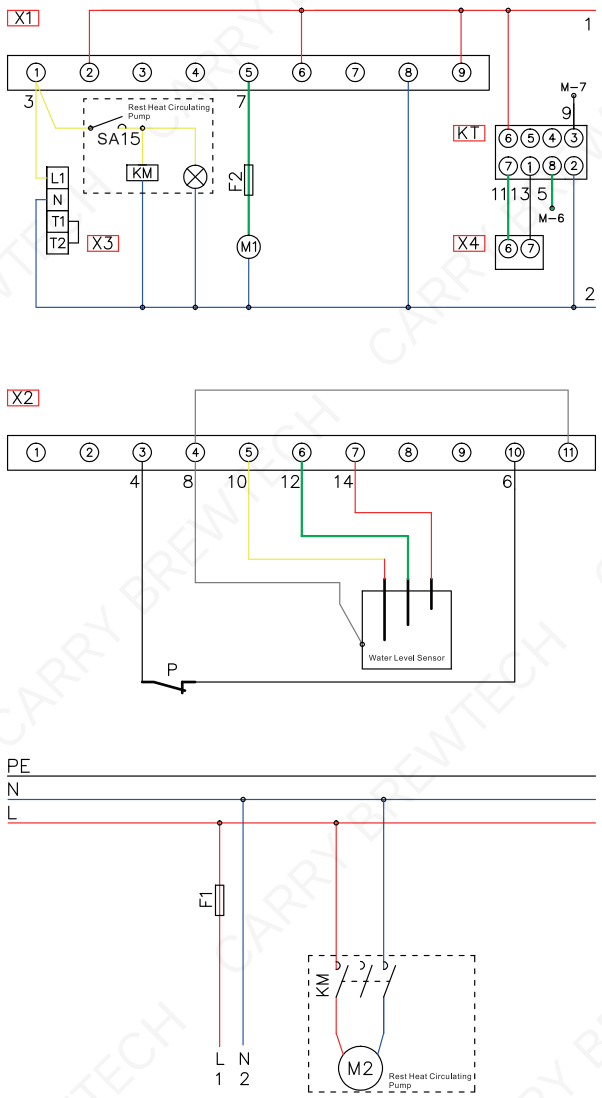
Boiler breakdown and repair

Situations	Possible reasons or others	Possible solving ways
When burner is fired, chimney give out black smokes (Oil fired steam boiler)	Air volume is too small	Adjust with large amount of wind supply
	Oil supply is too small	Adjusting the amount of oil
	Diesel quality problems	Check whether it' s regular diesel
Controller display the burner is working, but in fact burner is not working. (fuel gas steam boiler)	The location of Ignition electrode is wrong.	Check the location of Ignition electrode
	No spark appear with the ignition electrode	Check the transformer is working or not.
Lgnition burner start, but didn' t fired, boiler stops (Gas Fired Boiler)	No flame or flame is not sufficient	Check the Position and the electrode ionization current value
	Powered FireWire or zero line reversed	Check the power supply circuit
	Air flow and air supply ratio unreasonable	Adjusting the damper and the gas flow
Level gauge glass ends leak	Seals Aging or damaged	Replace the seals
	Both ends of the valve damage	Replace the gauge valve

System installation photo for reference



Control circuit diagram



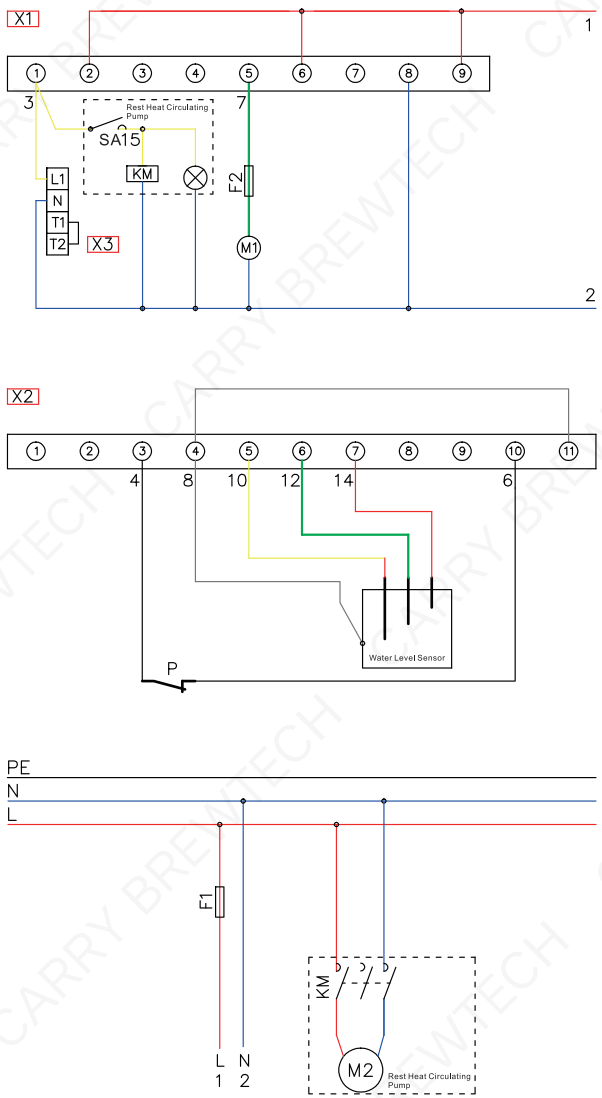
Type: 35–200KG
Voltage: 220V/50HZ
Fuel: Diesel Fired Steam Boiler

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Item	Spares
X1	Control input
X2	Signal input terminal
X3	Burner input device
X4	Oil burner control box
SA	Rotary Switches
KT	Time Relay
M-7	Burner Motor Line
M-6	Burner Motor Line
KM	AC contactor
P	Pressure Controller
F	Fuse
M2	Rest Heat circulating pump
M1	Boiler Water Pump

Note: The rest heat circulating pump is not part of the standard configuration, the configuration according to the order requirements.

Control circuit diagram



Type: 35–200KG
Voltage: 220V/50HZ
Fuel: Gas Fired Steam Boiler

YANO

Item	Spares
X1	Control input
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The final explanation right of this manual belongs to: Shanghai Yano Boiler Manufacturing Co,. Ltd.

Since products are still improved, please refer to real situation if different from the manual.

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