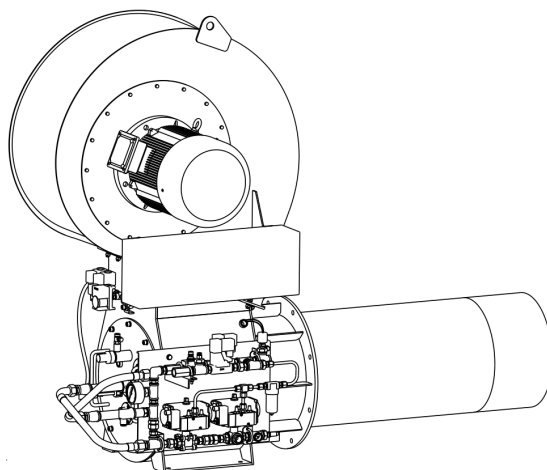

Operation Manual

LCL(Y)Series Burner

LC2022V2E-Y



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Important Information

Purpose

This manual is the important guidance about the oil burner installation and commissioning. Please do read it carefully before installation and commissioning. If there is any unclear place, please contact our company anytime to avoid any unnecessary equipment faults and danger

Important Safety Warnings

All participants involved in installation, dismantling, commissioning, operation and maintenance (including inspection, maintenance and repair) should complete related training and carefully read and understand this guidance manual

All of the other work out of oil burner related operations ONLY can be started AFTER the shutting off burner, cutting off of the power supply and fuel valve.



Warning: If violating the regulations, it may cause electric shock or fire disasters and result in serious personal injury or even death.

Safety Regulations

Importance of Safety Regulations

This chapter includes the required important information about safe operation on burner. For further safe operation guidelines, you can find in the following chapters. The operators are duty-bound to comply with all the safety rules.

Training

All participants involved in installation, dismantling, commissioning, operation and maintenance (including inspection, maintenance and repair) should complete related training and carefully read and understand this guidance manual

Transformation and Retrofit

Any unauthorized transformation and refit towards the burner is strictly prohibited. If necessary, please do contact the manufacturer. Unauthorized

transformation or refit may cause safety problems. please do not carry it. The manufacturer and seller will be not be liable for any damage caused by any unauthorized transformation and retrofit towards the burner.

Burner Operation and Maintenance

The burner will start to combust high efficiently once after installation and commissioning. the burner is designed for batch working type, for the safety, it should be stopped every 24 hours. All of the other work out of burner related operations ONLY can be started AFTER the shutting off of oil burner, cutting off the power supply and fuel valve. There will be possible dangers of electric shock or fire disasters caused by the violating of the regulations which can result in serious personal injury or even death.

Troubleshooting Process

If any breakdown, the operator should analyze the issues and resolve those according to the troubleshooting procedure. Then give feedback to the manufacturer or seller timely.

Stop-working Process

- ☐ Cut off the master switch
- ☐ If the equipment will not be used for a long time, Please do **turn off** the fuel valves



Important: The parameters of this machine have been set before leaving the factory. Please do not change it at will. If you change it, it may affect the performance or cause component damage.

Password for Changing Parameters: _____

Debugging Password:_____

A. Product Overview

LCL series burner is self-designed full-automatic burner based on thorough research on the asphalt plant drying drum. It's applicable to all kinds of layout of asphalt plant dryer drums with convenient moving, easier installation and maintenance

the main features as follows:

- centrifugal fan is used for air supply, and the air distribution volume is adjusted according to the speed of the fan;
- The fuel combustion power is adjusted by controlling the speed of the oil pump to control the fuel injection quantity
- The adjustment of air-fuel ratio is realized by the pre-set parameters of the controller
- The fuel nozzle is atomized by compressed air
- The operation sequence during startup and shutdown is controlled by automatic burner controller and flame monitoring device, which ensure the best safety performance under any operation state
- Automatic gas ignition device is adopted for ignition. The gas is ignited by high-voltage spark, and propane gas, liquefied petroleum gas or acetylene are used for ignition
- When the burner stops working, the main oil valve and circulating valve on the fuel pipeline are closed, and the oil pump stops rotating to prevent the fuel from flowing out of the nozzle
- There is an oil temperature and oil pressure detection device on the fuel pipeline;

B. Technical Parameters

Model	LCL1000Y	LCL1200Y	LCL1500Y	LCL2000Y	LCL2500Y	LCL3000Y
Max. Oil consumption (kg/h)	630	765	900	1200	1500	1800
Max. heating out (MW)	7	8.5	10	13.3	16.6	20
Fan Power (KW)	7.5	7.5	15	18.5	22	22
Oil Pump Power (KW)	1.5	1.5	1.5	2.2	2.2	3
Matched asphalt plant model	60-80	80-100	100-120	120-160	160-200	200-240
Air consumption (M ³ /min)	2.5	2.5	2.8	3.2	3.2	3.5
Regulation ratio	1:8					
Compressed air pressure	≥0.6MPa					
Oil supply pressure	≤0.03MPa					
Applicable fuel type	Diesel, Heavy Oil, Residual Oil					

Note: the above parameter is based on oil calorific value 40MJ/kg

C. Burner Structure Introduction

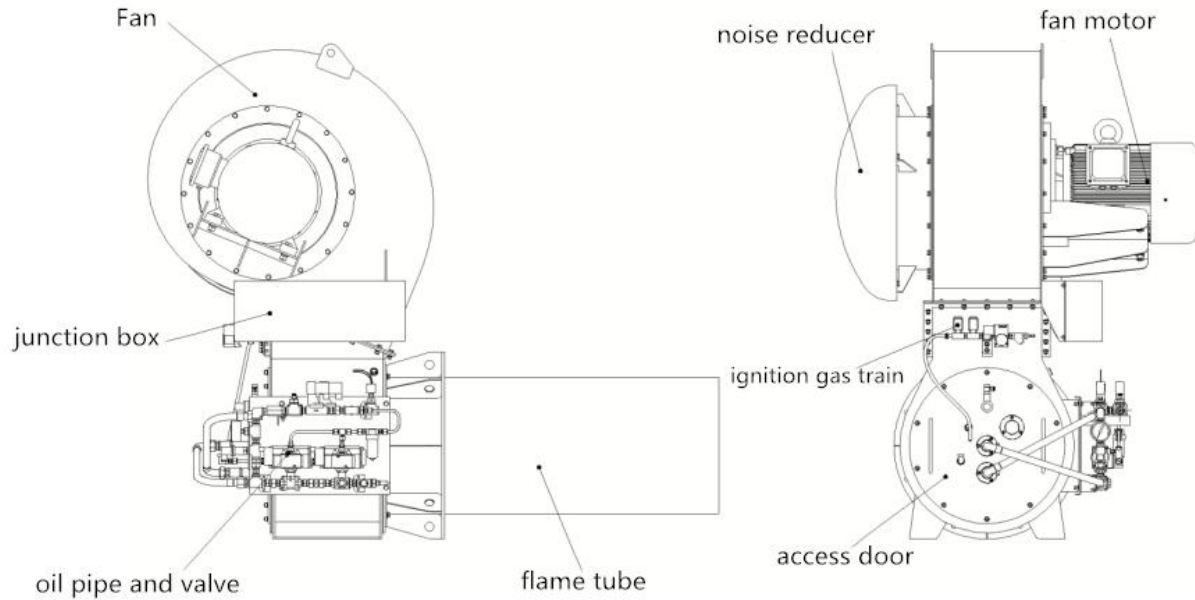


Diagram 1: burner main body outside view diagram

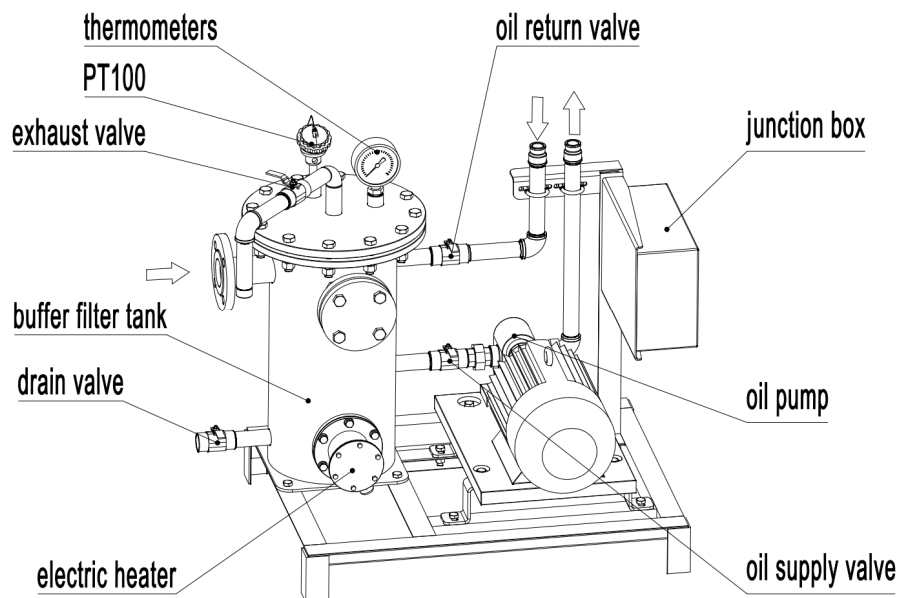


Diagram 2: oil pump unit composition

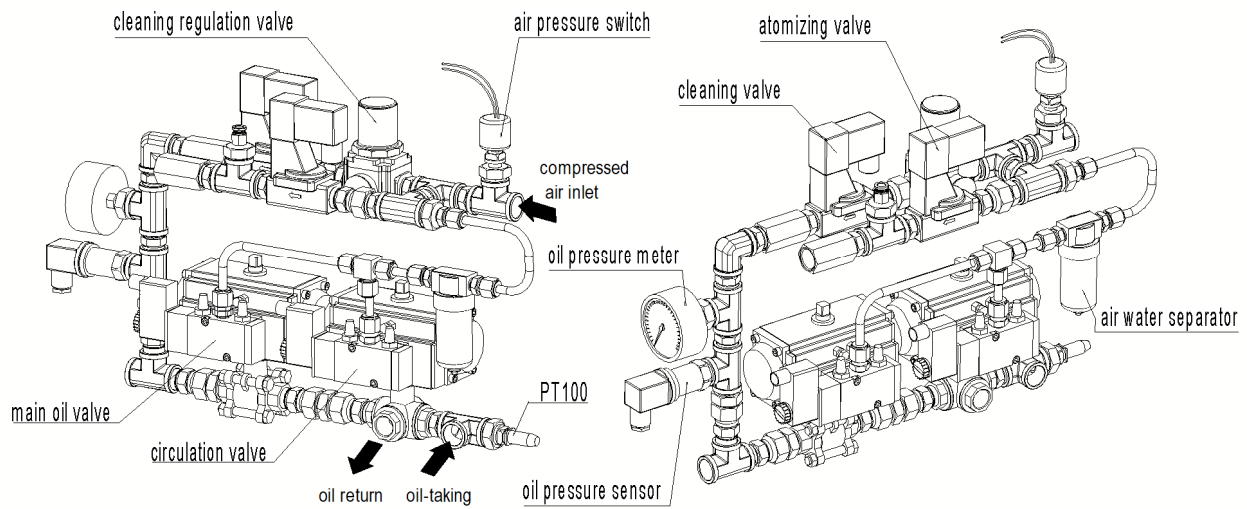


Diagram 3: composition of pipe and valve system

D. Burner Working Process Overview

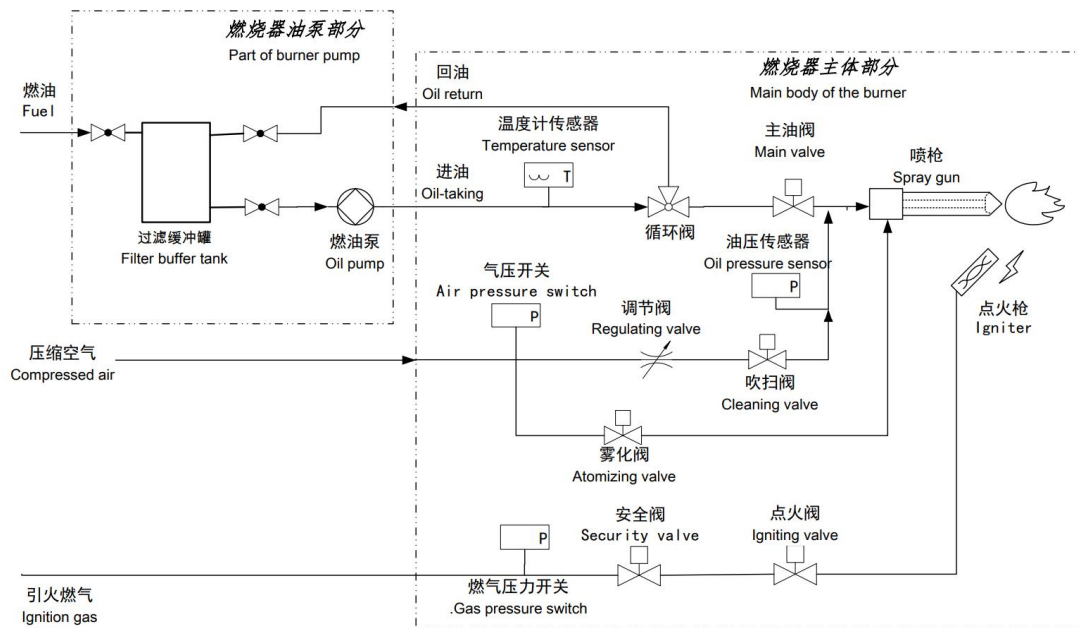


Diagram 4: Oil Pipes System Schematic Diagram

As shown in the burner pipes system, the filter buffer tank and the oil supply pipeline are heated by the heat conducting oil in advance. The burner can be started when the temperature of the oil in the buffer tank meets the operating

requirements. The fuel oil pump and the inlet and return pipeline connecting the main body of the burner are also heated by electric trace heating in advance to ensure that the pipeline temperature can make the oil flow. When starting the burner, the oil pump starts and the heated heavy oil in the filter buffer tank passes through the inlet valve →oil pump →oil intake pipe →circulation valve →oil return pipe →oil return valve →filter buffer tank to complete the heavy oil cycle. The oil pump and pipeline are preheated through the oil circulating to let the pressure of the oil pump is gradually going steadily during the circulation.

At the same time of oil pump circulating and preheating, the burner fan starts, the system carries on the self-inspection of security, After each inspection finished, the burner enters the ignition state. First, the oil pump and the fan run at the initial speed of ignition and the atomizing valve opens and the compressed air to be injected by the spray gun, so that the spray gun has the condition of atomizing oil. Then the high-voltage electrode is electrified to produce an electric spark, the gas ignition valve is opened, and the gas emitted from the ignition head is ignited. When the system confirms the normal combustion of the gas ignition head, the main oil valve and the circulating valve are opened, The oil is atomized with air by the spray gun and sprayed out from the nozzle, the flame of ignition head ignites the oil from the spray gun, Closes the high-voltage electrode and the gas valve after a few seconds, the system confirms that the flame is ignited, the combustion enters the preset load combustion state. The burner will increase or reduce the flame according to the control instruction. This process always carries out flame monitoring. Once the flame is extinguished, the system will immediately enter shutdown procedure.

When press the “Stop” button , the system enters the shutdown procedure. The main oil valve, circulating valve, and oil pump are closed immediately, at the same time, the cleaning valve are opened, Compressed air goes into the oil pipe of spray gun to clean out the remaining oil to burner completely and then valves will be closed, at that time, the flame will be out and the fan continues blowing for a period of time to clean out the remaining oil and gas, at the ending, the fan will stop and the system will enter reset -standby mode.

E. Burner Operation Interface Introduction

Note: The figures and numbers shown in the screenshot of the following interface are only examples and cannot represent the actual parameters of the specific products you purchase. With the technical update, the figures and parameters in the screenshot may be changed, but the meaning of use function and expression remains unchanged and will not be explained separately

1. Main Control Interface Introduction

Main interface as diagram 5, There are 5 menu buttons on the bottom of the screen: combustion Ctrl, Parameter Set, Alarm Record, Debug Mode, Fuel Selection.

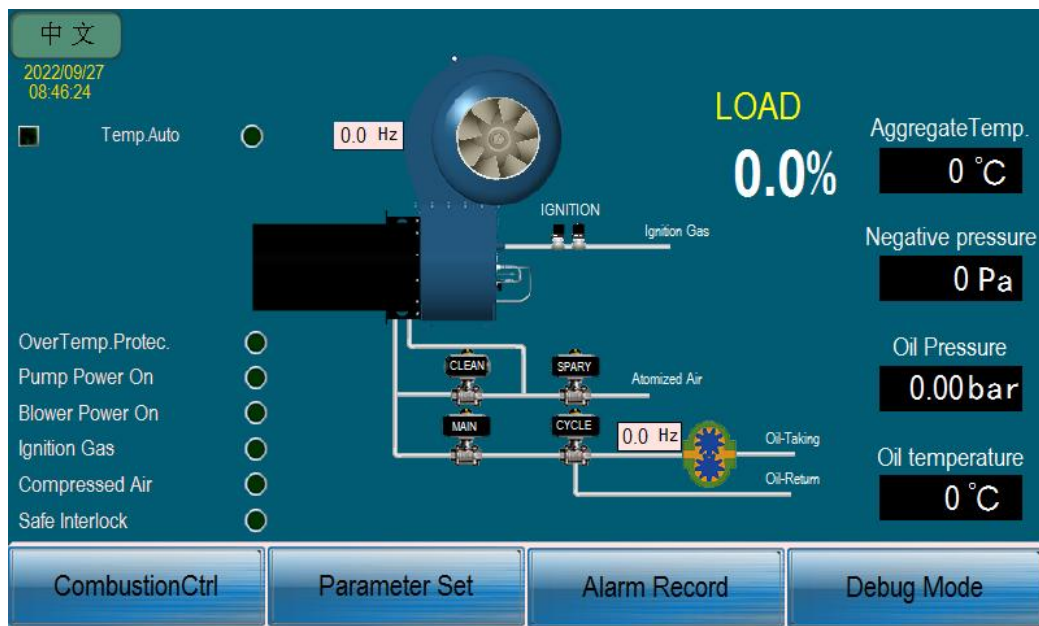


Diagram 5: Main Control Interface

On the switch signal display area, it will display “pump power on” ”fan power on” ”ignition gas” ”compressed air” ”safe interlock”

On the screen, it also shows the parameters of "oil pressure" "oil temperature" and "oil pump frequency" "fan frequency" and "load"

Information Reminding Area on the top of the screen is not displayed at

ordinary time., When the system makes a warning signal, the message will be scrolled in this area. The information in this area will not control the burner action, but will remind the operator to pay attention.

When the burner fails and affects the normal operation, the flashing alarm lamp pattern will be displayed in the flame area, and the relevant extinguishing action will be automatically performed. At that time, you can click the "alarm record" to see the cause of the failure and remove the trouble according to the prompt.

There is a Chinese-English switch button on the upper left of the interface. When the Chinese interface is displayed, click "English" (Chinese-English switch button) will switch to the English interface; when the English interface is displayed, click "Chinese" (Chinese-English switch button) will switch to the Chinese interface.

2. Combustion Control Interface Description

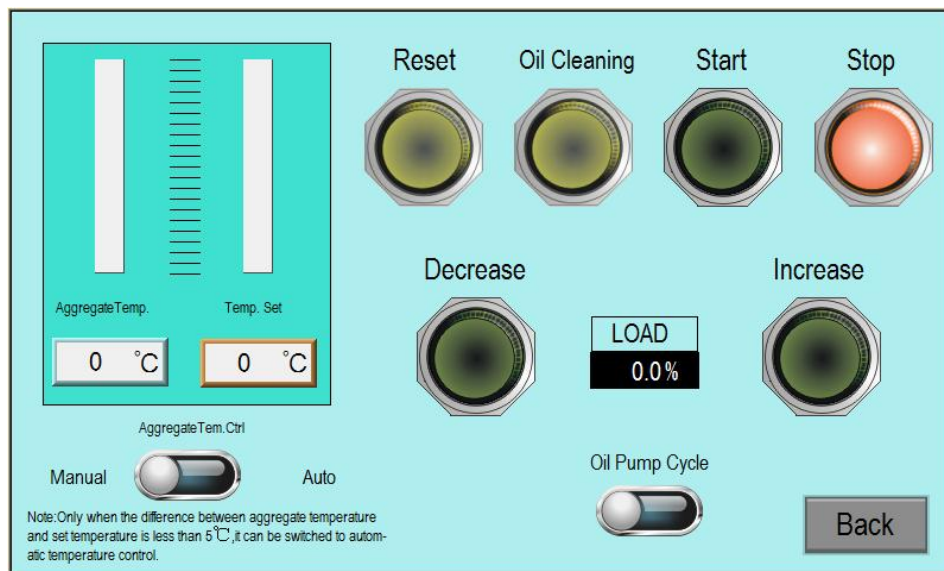


Diagram 6: Combustion Control Interface

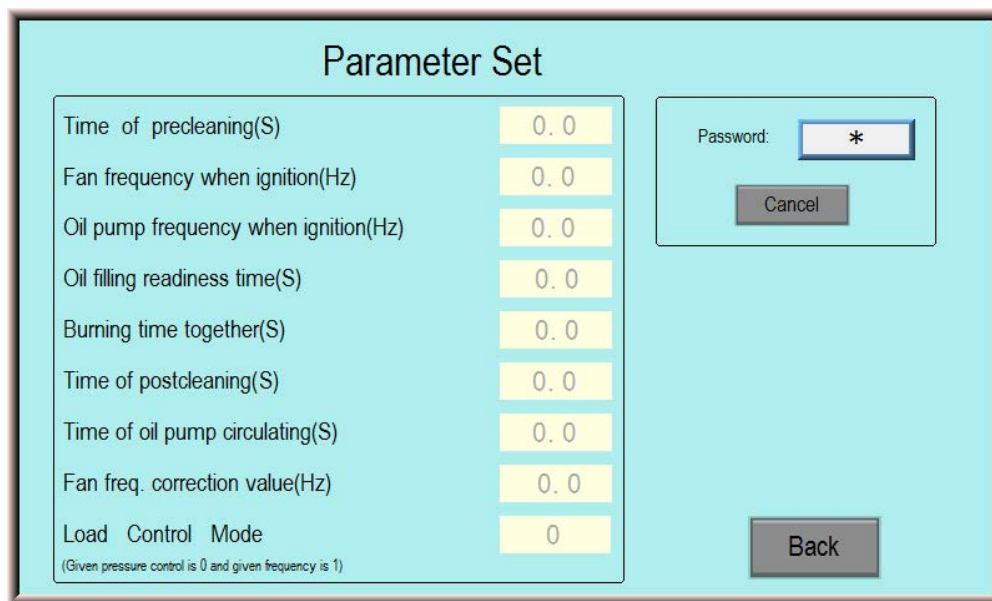
In the main interface, click the "combustion ctrl" button in the lower left corner of the interface that pops up the interface shown in diagram 6. In this interface you can complete the burner starting, stopping, increasing , reducing, reset, oil pipe

cleaning, oil pump cycle and other common combustion control action, but also can set aggregate automatic temperature control function, most of the buttons have physical objects

When the burner is shut down not properly, the heavy oil will stay in the spraying gun and oil pipe. you can press “oil cleaning” button. This function will open the atomizing valve and cleaning valve automatically for 10 seconds.at this time the compressed air will clean the oil in the pipe and spraying gun. When the working condition is very cold, it may cause the heating not evenly of the two heavy oil hoses between oil buffer filter tank and main body. If necessary, you can press the “oil pump cycle” button in advance, this will start the oil pump and let the heavy oil circulate through oil buffer filter tank, oil intake pipe and oil return pipe.

Note: ONLY you stop the burner first, “oil cleaning” button and “oil pump cycle”are needed to touch and keep the touch for over 0.5 seconds, then they can start.

3. Parameter Set Interface Description



The diagram shows a 'Parameter Set' interface with a light blue background. On the left, there is a list of parameters, each with a corresponding yellow input field. The parameters are: 'Time of precleaning(S)' (0.0), 'Fan frequency when ignition(Hz)' (0.0), 'Oil pump frequency when ignition(Hz)' (0.0), 'Oil filling readiness time(S)' (0.0), 'Burning time together(S)' (0.0), 'Time of postcleaning(S)' (0.0), 'Time of oil pump circulating(S)' (0.0), 'Fan freq. correction value(Hz)' (0.0), and 'Load Control Mode' (0). Below the last parameter, there is a small note: '(Given pressure control is 0 and given frequency is 1)'. On the right side, there is a 'Password:' label next to a yellow input field containing an asterisk (*). Below the password field is a 'Cancel' button. At the bottom right of the interface is a 'Back' button.

Parameter	Value
Time of precleaning(S)	0.0
Fan frequency when ignition(Hz)	0.0
Oil pump frequency when ignition(Hz)	0.0
Oil filling readiness time(S)	0.0
Burning time together(S)	0.0
Time of postcleaning(S)	0.0
Time of oil pump circulating(S)	0.0
Fan freq. correction value(Hz)	0.0
Load Control Mode	0

(Given pressure control is 0 and given frequency is 1)

Password: *

Cancel

Back

Diagram 7: Parameter Set Interface 1

Click the "parameter set" button in the lower part of the main interface to pop up the interface shown in diagram 7. In this interface, the control parameters of

the burner can be changed. In the initial state, the numbers in each parameter column are displayed in gray color. At this time, parameter change cannot be carried out. After entering the correct parameter setting password (three digits), these fonts turn black, and each parameter has a limited range, Only numbers in the input range are valid. Each time the password is entered, the system will automatically give 30 seconds to change the parameters. If it exceeds, the system will automatically save the new parameters and log off the password. At this time, if you continue to change, you need to re-enter the password.

When enter the debugging password (six digits), the interface will display "air-fuel ratio " and "advanced set", as shown in diagram 8. Click the button to enter the corresponding setting interface for more advanced parameter adjustment.

Parameter Set	
Time of precleaning(S)	0.0
Fan frequency when ignition(Hz)	0.0
Oil pump frequency when ignition(Hz)	0.0
Oil filling readiness time(S)	0.0
Burning time together(S)	0.0
Time of postcleaning(S)	0.0
Time of oil pump circulating(S)	0.0
Fan freq. correction value(Hz)	0.0
Load Control Mode	0

(Given pressure control is 0 and given frequency is 1)

Password:
 Cancel
 Air-fuel Ratio
 Advanced Set
 Back

Diagram 8: Parameter Set Interface 2

Note: The parameter adjustment of the corresponding interface of "air-fuel ratio " and "advanced set" can only be changed after professional training on the burner, mastering the control principle of the burner and understanding the role of relevant parameters. Changing parameters without authorization may cause burner failure or even injury.

Air-fuel Ratio			
LOAD (%)	Blower (Hz)	Oil-Freq (Hz)	Oil-Press (bar)
0.0	0.0	0.0	0.00
0.0	0.0	0.0	0.00
0.0	0.0	0.0	0.00
0.0	0.0	0.0	0.00
0.0	0.0	0.0	0.00
0.0	0.0	0.0	0.00

Pressure anomaly Set(bar)	
Up Limit	Down Limit
0.00	0.00

Frequency anomaly Set(Hz)	
Up Limit	Down Limit
0.0	0.0

Note: The air-fuel ratio parameters can be optimized during debugging. Once set, please do not change it at will. If you need to change, please contact the engineer.

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Diagram 9: air-fuel ratio set interface

Advanced Set	
Fan frequency of precleaning(Hz)	0.0
Oil pump frequency of circulating(Hz)	0.0
Fan frequency of postcleaning(Hz)	0.0
Allowable time of flame goes out(S)	0.0
Output low limit of temperature meter(°C)	0
Output up limit of temperature meter(°C)	0
Pressure fluctuation alarm(bar)	0.00
Temperature control zone(%)	0.0
Temp.Ctrl integration time(S)	0.0
Temp.Ctrl sampling period(S)	0.00

Next

Back

Diagram 10: advanced parameter set interface

Click "air fuel ratio " to enter the corresponding interface, as shown in diagram 9. The burner sets the corresponding fan motor speed and oil pump motor speed according to different load sections, and also sets the corresponding

oil pressure as a reference. These parameters are set according to the standard fuel before delivery, and generally you do not need to adjust it. If the actual difference on site is too large, it can be adjusted slightly. After adjustment, it is recommended that the user save the record.

In the advanced parameter interface (diagram 10), relevant parameters are used for factory setting and adjustment, which should not be changed easily.

4. Alarm Record Interface Description

Click the "alarm record" button at the bottom of the main interface, it will pop up the interface of diagram 11. The operator can find out the time and reason of the fault by inquiring the interface to guide the users to make troubleshooting.



S/N	Date	Time	Fault information, reason and solution
4	18/09/01	14:05:25	Exhaust gas temperature too high, stops automatically.
3	18/09/01	14:05:14	Oil flame failed to catch fire, some reasons: 1. Ignition Oil pump frequency set too low or main flame stable burning time too short 2. Oil Mixed with too much water or bubble 3. Oil supply line is blocked
2	18/09/01	14:05:00	Can not work because of compressed air pressure low. please check 1. Air compressor working or not 2. Compressed air pipe valve opened or not 3. Compressed air pipe broken or not 4. Compressed air pressure switch fault
1	18/09/01	14:04:47	The fan inverter is not power on

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Diagram 11: Alarm Record interface

5. Debug Mode Interface Introduction

To enter the manual debug mode, you first need click the debug mode button in the lower right corner of the main interface, pop up the security question and password input dialog box, enter the correct debug password and it will enter the debug interface (diagram 12)

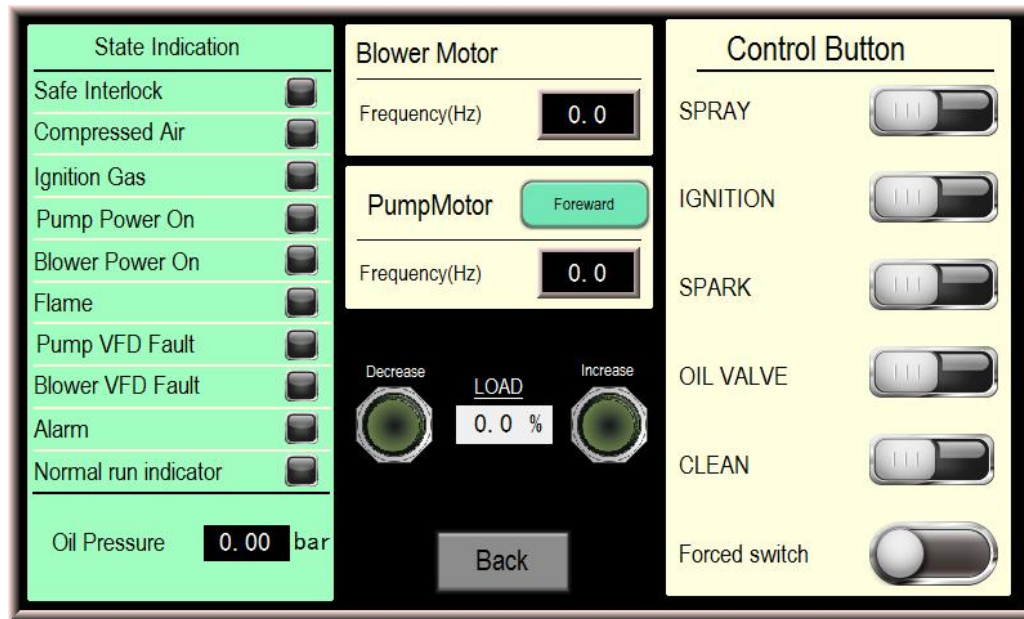


Diagram 12: Debug Interface

On the debug interface, the left area is the display of status indicator and pressure switch, which displays the on-off status of each part at that time. The right area of the interface is the control button, which can manually control the on-off action of each executive device. The upper middle area is used to set the operating frequency of fan and oil pump. Click the frequency display box to give and input their respective operating frequency.

F. Burner Adjustment

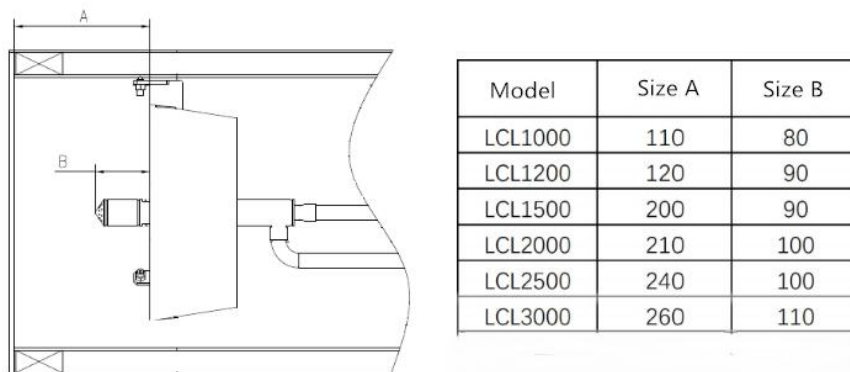


Diagram 13: Flame Stabilizing Disc Adjustment

1. Flame Stabilizing Disc Adjustment

The initial adjustment of the flame stabilizing disc can be pre installed according to size A (diagram 13 showing).flame stabilizing disc position adjustment can affect flame shape, if it is near fan position, the flame will be thin and long, on the contrary, the flame will become thick and short.

2. Adjustment of the Spray Gun

When the spray gun is installed, the initial adjustment position is the head of the spray gun exceeds the front of the flame stabilizing disc by 80-110 mm(size B). After confirming the position, the spray gun is fixed with the fixing screw.

3. Adjustment of Ignition Gun

There are two aspects to adjust the ignition gun. First check and adjust the electrode gap of the spark plug (see diagram. 14). The minimum distance between the electrodes of the front end of the spark plug is 3-5mm. After adjusting the gap between the electrodes, the position of the ignition gun should be adjusted. The position of the ignition gun nozzle should be directed towards the nuzzle. The distance between ignition gun front side and stabilizing disc is 60-120mm.After adjusting, the relevant screws should be locked to prevent loosening.

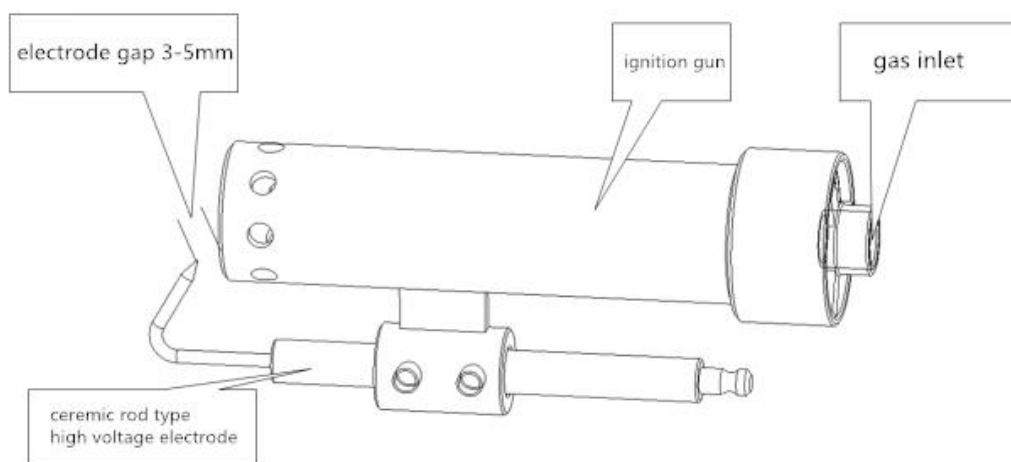


Diagram 14: Structure of Ignition Gun

G. Burner Installation

1. The burner is simple to install. Insert the combustion head directly into the installation position and fix it with the front flange. Because the burner is heavy , it is required that the flange on which the fixed burner is installed has sufficient strength and rigidity.
2. Place the oil pump unit in the corresponding position according to the design process, and connect the relevant fuel oil and heat transfer oil inlet and outlet pipelines in order. If heavy oil is used, the heat tracing of the delivery oil pipeline must be ensured
3. According to the cable configuration of the oil burner to lay the cable, the length of the cable depends on the site installation.
4. The fuel supply pressure in the fuel tank to the oil burner should range from 0 to 0.3kg /cm².If the fuel is heavy oil, the user needs to heat the oil and make the oil temperature to reach a certain level.
5. The metal hose is used to connect the main body of the burner with the oil pump unit. If the metal hose is not long enough, a steel pipe should be added on the oil system of the burner. After the connection, please confirm it is leak-free, then it can be used.
6. Compressed air is needed for combustion operation and system control of the burner. The pressure of air supply should be greater than 0.6 MPa and the air supply should meet the burner operating conditions. There is a pressure reducing valve at the end of the burner where the nozzle of the burner enters the burner, which needs to be adjusted to 0.5 MPa in advance.



Note: When adjusting the air pressure, behind the valve, it should be kept in a continuous air consuming state, otherwise it can cause the inaccuracy of pressure adjustment

7. The ignition gas of burner should be propane or acetylene, connect the ignition gas pipeline to the ignition gas inlet of burner body ,seal the interface and prevent leakage. The ignition gas and relevant connection pipelines are provided by the user. Pressure of acetylene should be 0.02 MPa -0.06 MPa (according to the type of gas and the size of flame, it is set when site debugging, the first debugging proposal pressure is set at 0.04MPa). Gas is used only at the initial stage of burner start-up. After the ignition and the burner running normally, close the gas main valve, and open again before the next start-up.
8. After all the parts of the burner are in place, all the parts are connected by the cables. When connecting, the types of cables should be distinguished. In principle, special cables should be used for sensor and the cable shield layer should be grounded reliably. The specific installation circuit diagram can be referred in the attached drawings.



Important: After the fuel oil pipelines are connected, the pipeline air pressure seal test should be carried out to ensure that there is no leakage.

H. Burner Debugging



Caution: The debugging of burner needs strong professional knowledge, which can only be done after burner debugging training. Otherwise, it will bring certain risks.

Before commissioning, it is necessary to check whether the burner components are damaged, whether the connecting parts are tightened, whether the pipeline is leaked by air pressure monitoring in advance, whether the connecting cable joints are connected correctly and reliably. Remove the

sundries(especially the sundries left in the fan housing)which affects the normal operation of the burner on site and equipment. After the checking ,if all is correct, the system can be powered on, the power of the control cabinet can be switched on to debug the burner

1. System is Powered on Operation

Turn on the main switch and air compressor

Turn on the power of burner fan

Turn on the power of oil pump

Turn on the power of electric tracing wire

Turn on the power of burner control



Note: turn on power and make pre-heating more than 20 minutes ahead of time to ensure that the valve and pipelines are fully heated.

2. Turn on the power and after the system completes self inspection,it enters the main interface

After entering the burner main interface, check whether the oil temperature, oil pressure, oil pump current, fan current analog signal are normal or not, if not normal, please check the circuit and sensor. *(Note: sometimes there are occasional "*" flashes in the signal window, which is a normal phenomenon.)*

Check the left switch signal lamps, under normal condition, the pump power on, fan power on, ignition gas , compressed air and safe interlock lamps should be on, indicating that it meets the ignition start-up requirements.

3. Initial Debugging

Firstly, open the valve on the compressed air pipeline to let the compressed air enter the burner, then open the control power on the burner control cabinet to check the opening and closing state of the valves on the pipeline; After turning

power on, the valves (main oil valve, circulating valve, cleaning valve, atomizing valve) should be in the initial closing state; If the opening and closing state of the valves do not conform to the above status after turning power on, the pipelines and system should be checked again to keep the initial state of the valve closed.

Turn on the ignition gas supply valve and adjust the gas supply pressure to 0.02-0.05MPa

Check whether the state indicators are consistent with the physical, for example: when compressed air pressure is normal, compressed air pressure indicator lights; when the flame signal is normal (can use lighter flame to test), the flame signal lights. If not, fix the breakdown in time. Before starting the manual operation, make sure that the five indicating lights are on: safe interlock, compressed air, ignition gas, pump power and fan power on

Start Entering Manual Debug Mode.

□ click on the SPARK button to see if the ignition relay in the control cabinet works and if the ignition device on the spot has an electric spark

□ Check whether ignition gas pressure is normal and whether the valve leaks. Confirm the ignition gas supplying condition and the sealing of the pipeline. .

□ Click on the cleaning valve to see if valve action is normal. Click on the atomizing valve to see whether the valve is working normally. Confirm the sealing property of the atomizing medium (compressed air) pipeline to see if there is any leakage. Shut down after examination. Click on the main valve and recycle (circulation) valve to observe whether the valve action is identical

4. Fan and Oil Pump Debugging

Click on the fan frequency and pump frequency display box, first input 10HZ frequency in the pop-up digital keyboard , then observe the operation of the motor, if it has faults, please check wiring, observe whether the real rotation direction and

demand rotation is consistent, if it reverses, please change the motor phase sequence and change the speed frequency value settings, then observe whether the frequency converter transmission is corresponding, at the same time observe the change of motor current on the main interface .

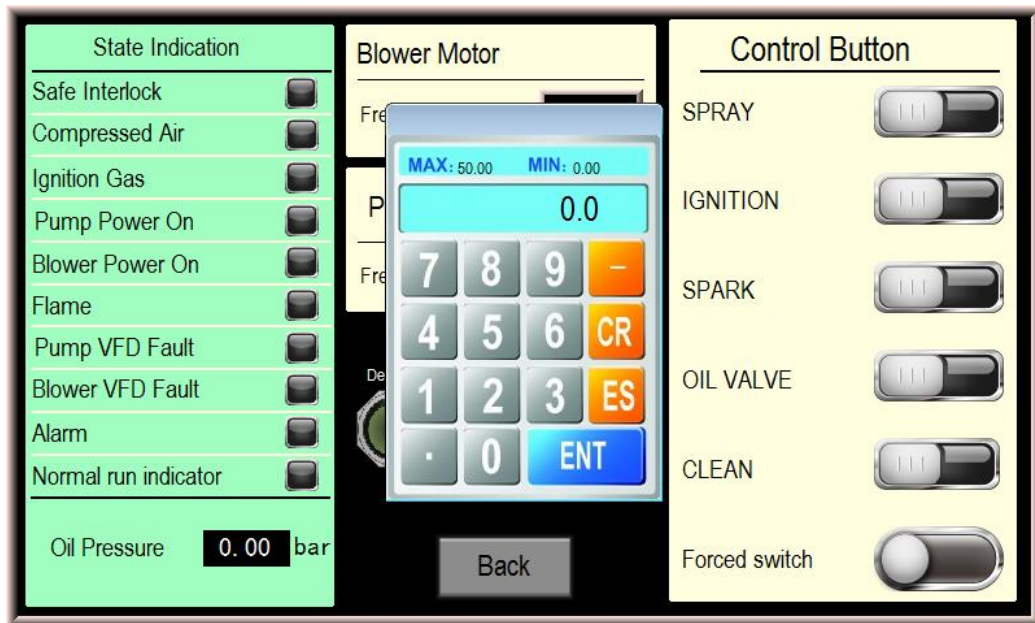


Diagram 15: Fan and Oil Pump Debugging

Note: When the frequency of the fan and the oil pump is greater than or equal to 2.5Hz, it will start automatically, On the contrary, it automatically stops.



Note: When do the oil pump debugging , it should be idle running for the first time, but not for long. If fuel oil available, ensure that the pipes and fuel are fully heated and the sealing condition of the fuel oil circulation must be checked first.

I. Burner Working Introduction

On the main interface, check the fuel oil temperature (generally about 80 °C), adjust induced draft fan to make the drum negative pressure at about 50-100 Pa.(click the button “Increase” and “Reduce” to adjust flame opening value between 25%-30%(default value is 25%) After confirming that the system is

fault-free, click the start button and start the automatic ignition program

During the ignition operation, the relevant parts of the burner will act in a set order and display on the main interface, such as: fan operation, oil pump operation, fuel or compressed air flow direction in the pipeline, high-voltage ignition, valve switch and so on. If the system fails, the operator will be alerted and the relevant fault information and solutions will be prompted in the fault Bar. The system alarm is divided into two situations, one is the serious fault which will affect the burner operation, the system will display the alarm signal in the flame area and at the same time ,buzzer sounds in control cabinet, you need to click the alarm record button under the main interface to see the specific problems and solutions, it can be eliminated by pressing the reset button. The second fault is slight and does not cause serious consequences. In this case, the system sends out a reminder sound and rolls the subtitle at the top of the main interface. After the troubleshooting, subtitle will disappear automatically. After the ignition is successful, the flame image will be displayed on the interface. When the upper space of the oil pump moving diagram appears, it shows that the system is now in normal working state, you can make flame increase and reduce operation. At this time, you can check whether the burner works according to the requirements

When you need to stop the fire, click the stop button, and the system will enter the automatic fire stop program. The system will control each component to perform related operations of flame out according to the set flame out program.

J. Troubleshooting

1. If a fault occurs, please first check the following contents

- (1) Check whether the compressed air pressure is normal, whether there is too much condensation water in the air tank, and whether the air inlet valve of the burner pipe has been opened.
- (2) Check whether the ignition gas is enough in the gas cylinder, whether the valve has been opened, whether the pipeline is not damaged and whether

the ignition gas pressure is normal.

- (3) Check whether the oil tank has oil, whether the oil valve is opened, whether the heavy oil temperature is heated enough, whether the heat tracing pipe and valve have been fully heated and whether the oil pump can run smoothly and normally.
- (4) Check whether all control devices are properly adjusted and whether the burner safe interlock channel is abnormal or not.
- (5) Check whether the electrical circuit is normal or not.

If it is confirmed that the fault is not caused by external causes, the functions of each part of the burner must be checked.

2. Abnormal Problems and Elimination

The Fault Phenomenon	Possible Reasons	Measures
The burner ignition gun has no spark	Wrong position of ignition electrode	The distance between the ignition electrode is 3-5mm
	The ignition electrode has carbon deposition	clean it
	Ignition electrode insulation leakage	Replace or clean and keep dry
	Ignition transformer is damaged	Replace
	The ignition transformer has no power	Check the wiring and control system
Burner ignition gun has electrical spark, but it can't ignite	The gas solenoid valve was not opened	Check the wiring and control system
	gas pressure is low	Adjust the pressure to the specified value or change the gas cylinder
	connecting gas hose is broken	Replace
	The air speed is too large	Reduce the fan opening

Connect the above-mention

Fault Phenomenon	Possible Reasons	Measures
The ignition gas is ignited but the oil can not be ignited under oil mode	oil pressure is low	Increase oil pump speed or change oil pump
	The oil temperature is low	Increase oil temperature
	the pressure of compressed air is low	Check the pipeline
	Solenoid valve fault	Repair or replace
	spray gun temperature is low or nozzle blocked	Preheat the spray gun or clean the nozzle
	Ignition flame is too small	Appropriately increase the gas pressure to increase the flame
	too much water in the oil	Change the oil
3 seconds later, the flame goes out after it is ignited	The flame photocell cannot detect the flame.	Check and clean flame photocell or readjust to make the photocell aligns to the flame.
	Flame amplifier fault	Check the flame amplifier and connection lines.
	Flame photocell is damaged.	Replace it
	The buffer filter tank has air or filter screen is blocked	Exhaust or clean the oil filter screen
When normal combustion occurs, the flame is extinguished or flame flicker	oil or air pressure not steady	Clean the oil filter or Replace the oil
	No fuel oil/gas	Replace fuel tanks or refuel
	Flame photocell dirty	Clean it
	Carbon accumulates on the flame stabilizing disc	Clean it
	The fuel contains too many impurities	Replace fuel or remove sundries
Discharge white smoke	excessive air volume	readjust to reduce air volume
	Oil pressure is low	Increase oil pressure & oil pump speed
	too much water in the oil	Replace oil or dehydrate it

Connect the above-mention

Fault Phenomenon	Possible Reasons	Measures
Discharge black smoke	The air is too small or the air inlet is blocked	Check and adjust to increase air volume
	nozzle worn	replace it
	oil pressure is too high	Reduce oil pressure and oil pump rotation speed
	compressed air pressure is low	Check the compressed air valve and air compressor
	oil viscosity is high	Increase oil temperature to reduce viscosity
Oil pressure abnormal	filter blocked	close valve, clean filter
	Oil pump worn	replace it

K. Maintenance and Overhaul



Warning: During maintenance and overhaul, must cut off the power supply of the burner and all control switches inside the control cabinet, Manually Shut off the compressed air pipeline valve, oil supply pipeline valve, ignition gas pipeline valve.

1. Maintenance

(1) Remove the cover plate of the filter on the oil system and remove the filter element. Clean the impurities on the filter screen to prevent the filter from blocking the oil road. Clean the filter daily when using dirty heavy oil.

(2) Check the working conditions of the packing seal of the oil pump on the fuel line system of the burner. In case of oil leakage, the pressure cover of the packing seal can be adjusted properly. But it is not allowed to press down too tightly, so as to avoid the heat at the packing and the rapid wear of the seal ring

(3) Regularly remove ash accumulation from flame detection tubes of the flame monitoring system.

(4) Regularly check the wear of the probe of aggregate temperature sensor. according to the wearing condition, turn around and push the probe deeper to ensure the probe 20mm into the aggregate.

(5) Check whether there is coking and blockage in the flame disc of the combustion head of the burner. If there is coking, clean out the coke and ash accumulation.

(6) Check the pollution on electrode of the ignition gun periodically and make sure that after cleaning, the gap between the electrodes is between 3 and 5 mm.

2. Overhaul

When inspecting the burner, if a small fault is found, the cause should be found out in time and the cause should be eliminated or handled. If the small fault can not be handled, the burner should be repaired immediately.

(1) Check the wear of the sealing filler at the oil pump seal; if the wear is serious, replace the sealing filler in time.

(2) Check the oil pipeline system. If there are no other abnormal conditions but the pressure of the oil system fails to meet the operating requirements, the pump head may need to be replaced .

(3) Check the nozzle wear of the oil spray gun in the combustion head. If it is seriously worn, it shall be replaced in time.

(4) Please use original parts. When ordering parts, please provide the burner's nameplate number and model number.

(5) When you need maintenance services, please contact the after-sales service engineer of the factory .

L. Appendix: Fuel Quality Requirements



Warning: We strongly recommends using fuel oil and gas that meet the national standard as fuel. Using non-standard fuel may cause the equipment not to work stably and well, and may cause abnormal wear and tear of some parts of the equipment. Please pay attention to it.

The company's fuel burners can use diesel, heavy oil and other fuel oil. In order to ensure that the burner is in continuous good operation, it is recommended to use standard fuel oil. If non-standard fuel oil is used, it is recommended to select and operate according to the following requirements

(1) The calorific value of the fuel should be $\geq 40\text{MJ/Kg}$, and the components in the fuel should be homogenized, without acid or alkaline substances, excessive sediment and moisture

(2) The viscosity of fuel oil flowing into the burner oil pump should be $\leq 40\text{mm}^2/\text{S}$ (or 5°E). If the viscosity is too high, the viscosity should be reduced by increasing the fuel temperature;

(3) The sulfur content in fuel oil should be less than or equal to 3%. Excessive sulfur content will cause serious environmental pollution and accelerate the wear of burner nozzle, oil pump and valve, and also aggravate the corrosion of flue, dust collector and induced draft fan of the asphalt mixing plant.

(4) Fuel flash point (closed) $\geq 38^\circ\text{C}$, low flash point will bring fire hazard

(5) The mechanical impurities in the fuel are less than or equal to 1%. Excessive mechanical impurities will block the filter screen, cause the wear of oil pump and the blockage of fuel injection nozzle, which will affect the normal combustion

(6) The water content in the fuel oil should be as small as possible. If the water content is too much and segregated and gathered at the bottom of the oil tank, the water should be drained completely. Otherwise, if the water enters the oil path, the burner will not be able to ignite, or the flame will flash violently or even flame out

(7) Before using the fuel oil, the fuel oil should be heated to a temperature that meets the viscosity of the burner. In principle, it is better to heat the oil at a slightly higher temperature. A higher oil temperature can reduce the fuel viscosity, which is conducive to improving the combustion efficiency

(8) Please note: The oil pipeline from the oil tank to the oil pump connecting end of the burner shall be equipped with heating sleeve, and the temperature of the pipe section shall be controllable, so long as the fuel oil can flow to the filter end well. In daily use, this section of pipeline is easy to be overheated, which causes a large number of bubbles in the fuel oil in the pipeline, which causes the ignition failure or flame out of the burner. This is also a frequent fault in the initial stage of ignition.

(9) The fuel oil connected to the inlet end of the burner oil pump does not need special pressure, just need to ensure that it can flow from the oil tank to the access end.

(10) The outlet pipe of the oil tank should be at a certain height from the lowest part of the oil tank, which can make impurities or precipitate water. The oil tank should have drain valves on the bottom. It is recommended to use two oil tanks, so as to prevent the impurities from being sucked into the burner and causing failure when the oil tank is being used.

(11) When two different fuels mixed for combustion, it is necessary to ensure that the two fuels are miscible and can not produce condensation reaction,

otherwise they can not be mixed. When changing the quality of oil or changing the supplier, the sample should be mixed in advance to ensure that the two kinds of oil can be mutually soluble or will not react

(12) When the fuel contains acidic or alkaline substances, it will cause the abnormal wear and tear of the oil pump, and then it will corrode all parts in the fuel pipeline, especially the spray gun and valve

Special reminder: the abnormal wear of burner oil pump and spray gun caused by the use of non-standard fuel oil is not within the scope of quality assurance.

Before using the burner, please read and be familiar with this manual carefully. If you have any unclear points, please contact the company to avoid the occurrence of faults and dangers. If you use non original accessories, serious dangerous accidents will occur. At the same time, you will give up the right of quality assurance and service.

