



Instruction for burner

MODEL: M-18、26、34、35 LF
M-26、34、35 LRF



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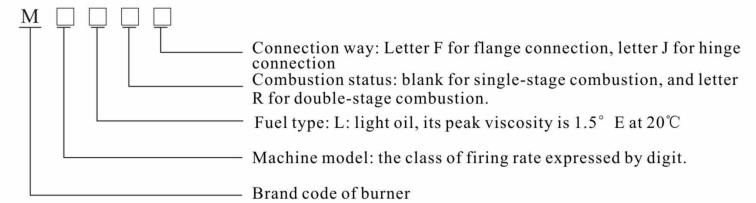
- Read carefully the instructions before starting the burner and service it.
- The works on the burner and on the system have to be carried out only by competent people.
- The system electric feeding must be disconnected before starting working on it.
- If the works are not carried out correctly it is possible to cause dangerous accidents.

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1. SUMMARIZE

1. Description of burner model

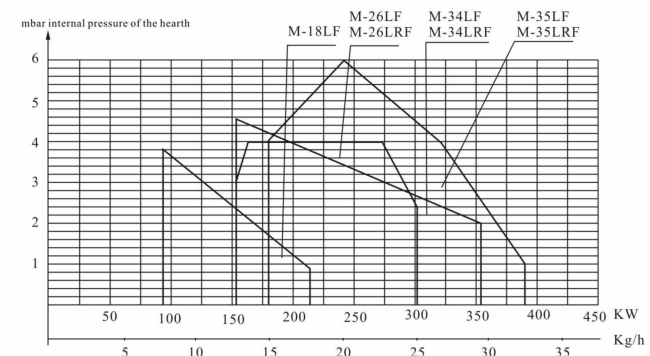


2. Technical parameters

Table 1 Technical parameters of burner

Model	Fuel oil quantity	Power of burner kw	Motor power kw	Motor speed r/min	Power supply
M-18LF	7.6 ~ 18	90 ~ 213	0.37	2800	230V 50Hz
M-26LF M-26LRF	13 ~ 26	154 ~ 308	0.37		
M-34LF M-34LRF	13 ~ 30	155 ~ 355	0.37		380V 50Hz
M-35LF M-35LRF	15 ~ 33	178 ~ 391	0.37		230V 50Hz

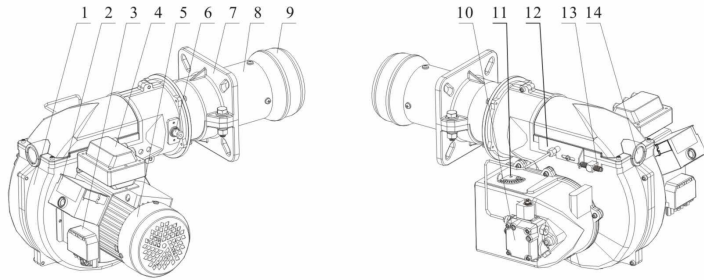
3. Operation curve



Drawing 1 Operation curve of burner



4.Assembly

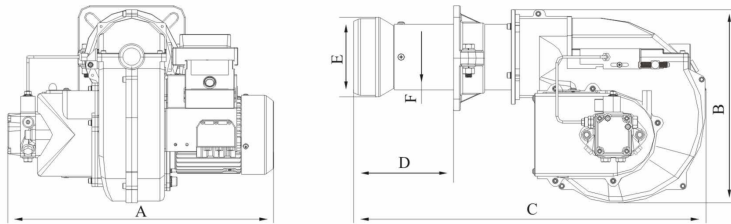


Drawing 2 Assembly of M-18.26.35 burner

- | | | | |
|--------------------|-----------------------------|---------------------|----------------------------|
| 1. Enclosure | 2. Program controller | 3. 7-jack socket | 4. Ignition transformer |
| 5. Motor | 6. Light sensitive resistor | 7. Mounting flange | 8. Fire tube |
| 9. Combustion head | 10. Oil pump | 11. Manual air door | 12. Dead plate of oil path |
| 13. Temper screw | 14. Peep sight | | |

II. Installation

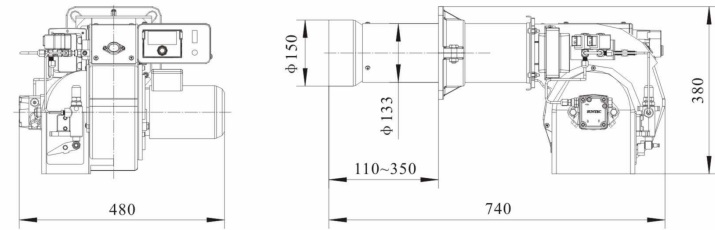
1. Outline size of burner



Drawing 3 Outline size of M-18.26.35 burner

Table 2 Outline size of M-18.26.35 burner

Model	A	B	C	D	E	F
M-18	360	355	610	105 - 200	118	114
M-26	450	355	610	105 - 200	138	114
M-35	450	372.5	780	105 - 350	150	133



Drawing 4 Outline size of M-34 burner

2. Mounting flange

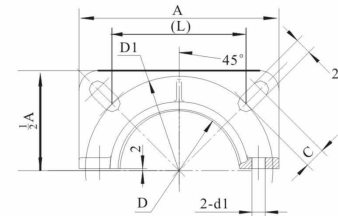


Table 5 Mounting flange

Table 3 Mounting flange of burner

Model	D	A	D ₁	L	C	d	d ₁
M-18	Φ114	186	166	118	20	14	14
M-26	Φ114	186	166	118	20	14	14
M-34	Φ133	216	205	145	22	18	14
M-35	Φ133	216	205	145	22	18	14

3. Installation, as shown in drawing 6

- 1) Open a hole a little larger than the outside diameter F of fire tube of the burner on the boiler mounting plate 6, and bore 4 threaded holes around according to the mounting flange slot position.
- 2) Open holes a little larger than combustion head in the boiler wall.
- 3) Disassemble the combustion head, put asbestos gasket 5 on the fire tube 1, pass through the boiler mounting plate 6, assemble the combustion head again.
- 4) Screw four studs 9 on the boiler mounting plate.
- 5) Put two mounting flanges on the fire tube, put asbestos rope 7 into groove, forelock with studs 9, and then fix by nut 8.
- 6) Connect or fix the boiler mounting plate to the boiler, adjust the depth of fire tube into the hearth, tighten the nut 2 and screw 3, enable the two mounting flanges to fix the fire tube, and the fire tube will not move any longer.

1.Fire tube

2.Nut

3.Screw

4.Mounting flange

5.Asbestos gasket

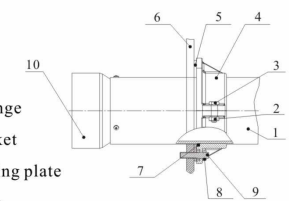
6.Boiler mounting plate

7.Asbestos rope

8.Nut

9.Stud

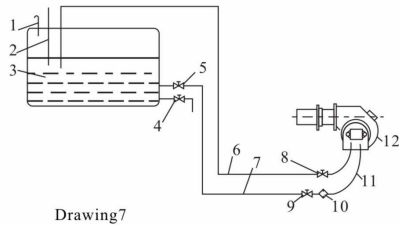
10.Combustion head



Drawing 6 burner Installation

4. Oil supply system

Oil supply system of light oil burner is very simple, usually made up of oil tank, stop valve, check valve, filter, oil pipe, elbow, etc., as shown in the drawing7.



Drawing7

- | | |
|-------------------------------|-----------------------------------|
| 1. Vent pipe | 17. Oil delivery pipe |
| 2. Oil filler pipe | 8. [] Valve of the scavenge pipe |
| 3. Oil tank | 9. Stop valve of the burner |
| 4. Blow off valve | 10. Oil filter |
| 5. Stop valve of the oil tank | 11. Metallic hose |
| 6. Scavenge pipe | 12. Burner |

It has bottom oil-out and top oil-out according to oil outlet of oil tank; is divided into single oil pipe connection and dual-oil-pipe connection two types according to the oil pipe connection, the later one not only has oil supply pipe, but also has scavenge pipe; it also can be divided into other two types according to the relative position of oil tank and burner, the position of oil tank may be higher or lower than the burner.

When designing and mounting the oil supply system, please pay attention to the following points:

When the position of oil tank is lower than the burner, please use dual-oil-pipe to connect the system. On the contrary, either the single oil pipe or dual-oil-pipe can be used for connection. In order to avoid the fuel oil in scavenge pipe flowing into the oil pump, please mount a check valve on the scavenge pipe, let the fuel oil flow to the oil tank from burner side only.

When adopting single oil pipe connection, please disassemble the circulating screw from the scavenge passage of oil pump, to make a scavenge passage of fuel oil in the oil pump, thus to avoid damaging the oil pump. Besides, please exhaust air first when starting the machine under initial mounting or cleaning the filter. When adopting dual-oil-pipe, it needn't to disassemble the circulating screw.

The oil outlet of the oil tank must be away from the bottom of oil tank, if too near the bottom, the oil pollution and water may enter into the oil pipe. Please clear the dirt and water in time, you can get rid of them by blow off valve in the bottom.

In the oil tank, oil return port of the scavenge pipe should be kept far away from the suction inlet of the oil supply pipe, thus to avoid dirt entering into the oil pipe due to air impacting with the return oil.

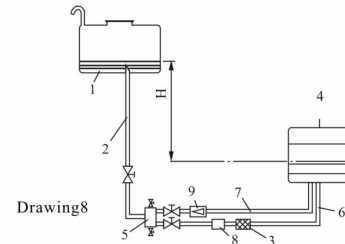
The oil delivery pipe, from the oil tank to filter, or the scavenge pipe, from check valve or stop valve to oil tank, should adopt copper pipe or steep pipe for mounting, and tighten them. From filter to oil pump, from oil pump to check valve, please adopt two metallic hoses provided along with the machine for connecting, please do not draw them extremely. The whole oil line should be sealed without any oil leakage or air leakage.

When multi burners are provided, each burner should have corresponding oil delivery pipeline. But the main pipe of scavenge returning to the oil tank can be commonly used, and the diameter and sectional area of the pipe should be large enough for matching the scavenge capacity.

The oil tank should not be set too far away from the burner, otherwise, the pipeline will be long, and the oil flow resistance will be high, as a result, it will be difficult for the oil pump to suck the oil. The allowable total length of oil delivery pipeline is relative to the inner diameter of oil pipe, number of valve, filter and elbow at the oil line, suction ability of the oil pump, fuel oil transporting capacity, relative distance of oil pump shaft line and oil level of the oil tank, etc.. When the pipe diameter is smaller, the transporting resistance will be higher, and the allowable total length of oil delivery pipe will be shorter. If the oil delivery pipe cannot be shorten due to position arrangement, please enlarge the inner diameter of oil pipe reasonably to reduce the resistance and supply oil smoothly.

The following recommended oil supply system wiring modes, inside diameter of oil tube and optional values of max length of oil pipe are for reference.

Oil out from the tank bottom

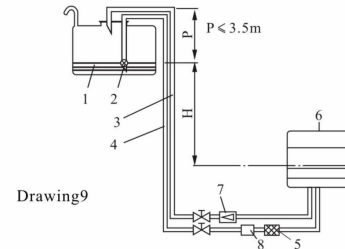


Drawing8

H	L.Overall length d=10
1	30
2	35
3	40
4	45

- | | | |
|--|--------------------|-----------|
| 1. Oil tank | 2. Oil supply pipe | 3. Filter |
| 4. Burner | 5. Exhauster | |
| 6. Oil suction pipe | 7. Oil return pipe | |
| 8. Cut off the device automatically when the burner does not run | | |
| 9. Check valve | | |

Oil out from the top of tank

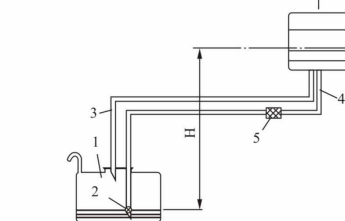


Drawing9

H	L.Overall length d=10
1	30
2	35
3	40
4	45

- | | | |
|--|----------------|--------------------|
| 1. Oil tank | 2. Inlet valve | 3. Oil return pipe |
| 4. Oil suction pipe | 5. Filter | |
| 6. Burner | 7. Check valve | |
| 8. Cut off the device automatically when the burner does not run | | |

The oil tank position is lower than the burner



Drawing 10

H: Distance between the oil level and oil pump shaft line m

L: Max length of the oil delivery pipe m d: Inside diameter of the oil pipe mm

H	L.Overall length	
	d=10*	d=12*
0.5	27	51
1	23	43
1.5	19	35
2	15	27
2.5	10	20
3	7	13
3.5		6

- | |
|---------------------|
| 1. Oil tank |
| 2. Inlet valve |
| 3. Oil return pipe |
| 4. Oil suction pipe |
| 5. Filter |
| 6. Burner |

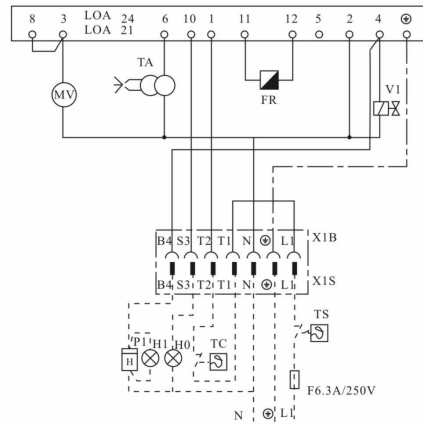
Note: 1. The vacuum negative pressure of suction port of the oil pump does not exceed 0.46bar, the max pressure of oil suction and oil return is 1.5bar.

2. Every added valve or elbow on the oil delivery pipe request the total allowable length of oil pipe to be reduced for 0.25m.

3. In order to supply oil successfully, we suggest that it is better not to use the third type of oil supply mode, and please keep the lowest oil level in the same level with the oil pump shaft line.

4. For the AS47 oil pump, when choosing AS67 oil pump, the inside diameter of oil pipe should be changed into $\phi 12$ and $\phi 14$ respectively.

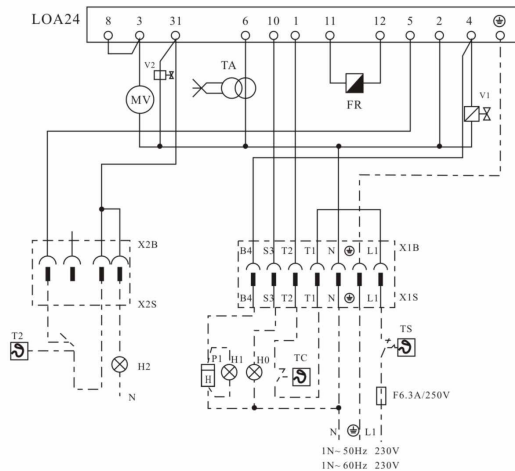
5. wiring diagram



- H0. Locking indicator lamp
- H1. Operation indicator lamp
- FR. Light sensitive resistor
- TA. Ignition transformer
- TSSafety thermostat
- TC. Boiler thermostat
- LOA21
- LOA24 Control box
- V1. Primary solenoid valve
- MV. Fan motor
- P1. Timer

L1-Phase wire
 ⊕ -rth wire
 N -Neutral wire
 1N ~ 50Hz 230V
 1N ~ 60Hz 230V

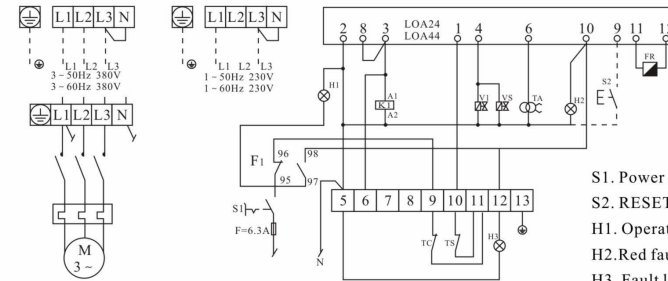
Drawing11 M-18.26.35LF wiring diagram



- H0. External fault indicator lamp
- H1. Primary fire indicator lamp
- FR. Light sensitive resistor
- TA. Ignition transformer
- TS. Safety thermostat
- TC. Boiler thermostat
- LOA. Control box
- V1. Primary fire solenoid valve
- MV. Fan motor
- P1. Timer
- H2. Secondary fire indicator lamp
- T2. Secondary fire thermostat
- V2. Secondary fire solenoid valve

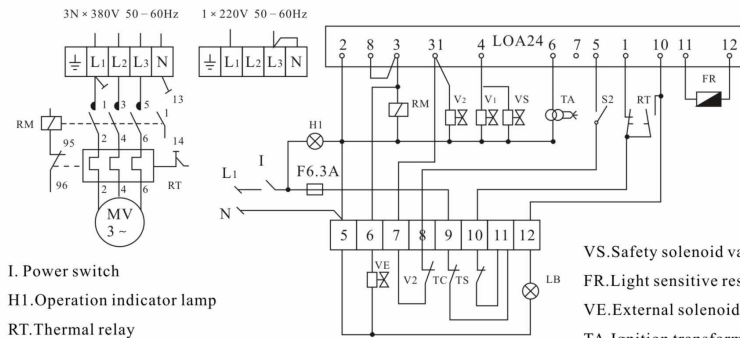
1N ~ 50Hz 230V
 1N ~ 60Hz 230V

Drawing12 M-26.35LRF wiring diagram



Drawing13 M-34LF wiring diagram

- S1. Power switch
- S2. RESET key
- H1. Operation indicator lamp
- H2. Red fault lamp
- H3. Fault lamp
- F1. Thermal relay
- F.6.3A Fuse 6.3A
- K1. AC contactor
- V1. Primary fire solenoid valve
- TA. Ignition transformer
- TS. Safety thermostat
- FR. Light sensitive resistor
- VS. Safety solenoid valve
- TC. Boiler thermostat



Drawing14 M-34LRF wiring diagram

- I. Power switch
- H1. Operation indicator lamp
- RT. Thermal relay
- RM. AC relay
- F. Fuse
- V1. Primary fire solenoid valve
- V2. Secondary fire solenoid valve
- S2. Secondary fire switch

- VS. Safety solenoid valve
- FR. Light sensitive resistor
- VE. External solenoid valve
- TA. Ignition transformer
- TS. Safety thermostat
- TC. Boiler thermostat
- T2. Secondary fire thermostat
- LB. External fault alarming lamp

Note: This drawing is only for reference, because the functions or optional parts are different, the actual connection will be various possibly, user shall take the real object or the drawing along with the machine as to allow.

III. Stating and running of the burner

1. Prepare for starting

- 1) Open the exhaust valve of boiler and chimney to outlet smoke.
- 2) Make sure that the boiler water level is in the right position, and keep the valve on the water supply pipeline open.
- 3) Make sure that the connection of oil feed pipeline and oil return pipeline are correct, the oil level of oil tank is in line with the requirements, open the valve, and no oil leakage on the oil line.
- 4) Make sure that the circuit wiring is correct, the voltage is in line with the requirements.
- 5) Check the rotation direction of the motor and oil pump, if they rotate in wrong direction, please exchange the two wires on the power inlet terminal.
- 6) Make sure that the depth of burner head into the hearth is suitable without danger of burning the hearth wall and so is in line with relative stipulations about boiler. The mounting flange section has fine sealing condition, the high temperature smoke will not spill out.
- 7) The combustion head should be concentric with the swirler, gaps around should be equal, thus the flame would not deflect and burn the burner. (Refer to the adjustment part for adjusting method, swirler's alignment adjustment)
- 8) The secondary air passage between combustion head and swirler should not be too small. Otherwise, the wind speed will be high and it will be difficult to ignite (refer to the adjustment part for adjusting method, adjustment of relative positions of combustion head and swirler).
- 9) Adjust the opening extent of air door to a suitable degree to make it easy for igniting, and also enable it to own right air capacity for primary combustion. (Refer to the adjustment part for details of air door adjusting)

2. Start and run

- 1) Disconnect the thermostat and close the main switch, switch on button of the program controller, motor rotates and feeds air, open the air door to pre-purge.
- 2) When finishing pre-purging, ignition transformer is powered on and begins to ignite.
- 3) The primary solenoid valve of the oil line is opened to supply oil. It will light a fire once the gas-oil mixture meets spark, then enters into primary combustion state.
- 4) Light sensitive resistor senses and monitors the flame, burning lasts. If the ignition is failure, and the light sensitive resistor can not sense the flame, then the primary solenoid valve will close automatically, oil supplying is stopped, enters into locking state.
- 5) Only the burner under primary combustion state is able to adjust the opening degree of air door by the air door adjusting mechanism. The burner under secondary combustion state will adjust the opening degree through adjusting the relative cam of servo motor or by temper screw in the hydraulic cylinder, make sure that the air capacity in the burner can satisfy the primary combustion request. When finishing adjusting, fix and lock it.
- 6) Stop burning, restart to verify if the igniting is stable.
- 7) Close the thermostat, switch on the program controller, and enter into secondary combustion state. Control the opening of air door through adjusting air conditioning cam of servo motor or air conditioning screw in the hydraulic cylinder that prepared for secondary combustion, make sure that the secondary air come into the burner assort with the secondary combustion oil. All of the flame, smoke component and blackness are reached to optimum condition.
- 8) Adjust the position of combustion head and swirler forwards or backwards to change the annular area of secondary air passage between them, thus to change the proportion of primary air and secondary air, finally to change the shape, length and stability of the flame.
- 9) When the pressure of steam boiler or temperature of hot water boiler has exceeded the set value of pressure switch or thermostat (temperature switch), pressure switch or thermostat will open, and the secondary combustion stops and return to the primary combustion state.
- 10) During starting, any symptom on any procedure will cause the burner to stop. Only when all the symptoms are remedied that you can manual restart the machine.

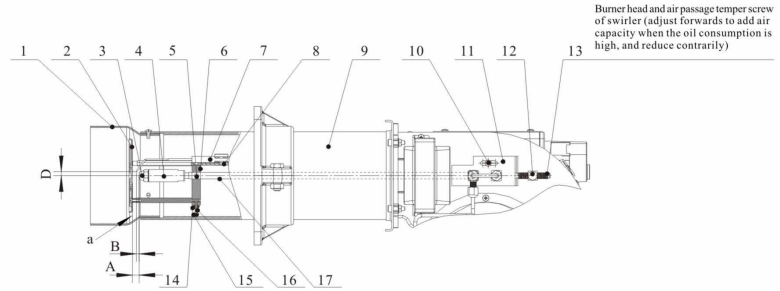
3. Verification of safety device

- 1) Light sensitive resistor
Under burning state, pull out the light sensitive resistor from the mounting position, cover it with a clean cloth, then the burner is flame out and stops.
Cover the light sensitive resistor with a cloth, and restart the burner, take off the cloth immediately when the burner torching, then the burner will combust normally.
- 2) Temperature switch, pressure switch
When the temperature of hot water in the boiler is higher than the set value of boiler temperature switch and limiting temperature switch separately, both of the two switches will cut off the electric circuit and stop burning.
When the steam pressure in the boiler is higher than the set value of boiler pressure switch and limiting pressure switch separately, both of the two switches will cut off the electric circuit and stop burning.

IV. Adjustment

1. Relative positions of ignition electrode, nozzle and swirler

Refer to drawing 15 and table 4 for the relative positions of ignition electrode, nozzle and swirler.



Drawing 15 Adjustment for part of burner

- | | | | |
|-----------------------|---------------------|-----------------------------------|----------------------|
| 1. Combustion head | 2. Swirler | 3. Oil nozzle | 4. Oil nozzle holder |
| 5. Fastening screw | 6. Oil gun bracket | 7. Electrode | 8. Electrode bracket |
| 9. Fire tube | 10. Fastening screw | 11. Mounting plate of the oil gun | |
| 12. Square head screw | 13. Temper screw | 14. Blocking nut | 15. Acorn nut |
| 16. Carrying screw | 17. Oil gun | a. Air passage | |

Table 4 Distance among electrode, oil nozzle and swirler

Model	A	B	Distance between two electrode tips	D
M-18 ~ 35LF	9 ~ 10	1	3 ~ 4	5 ~ 7
M-26 ~ 35LRF	9 ~ 10	1	2 ~ 4	6 ~ 7

2. Swirler's alignment adjustment

Refer to drawing 15, the combustion head 1 should be concentric with the swirler 2, passages around should be equal, otherwise, the secondary air capacity would be unequal, and the air speed would be quick or slow, meanwhile, flame would decline and make black smoke, even would burnt the combustion head.

When assembling, as the swirler has been concentric with the combustion head, need not to adjust and it cannot be adjusted any more during trial burning, this procedure can only be proceeded before mounting or when furnace shutdown. Turn down the carrying screw 16 into the oil gun bracket 6, mount acorn nut 15 on the head, and fix it on the fire tube or the inner wall of combustion head. Adjust the depth of carrying screw into oil gun bracket to keep the swirler concentric with the combustion head. After completing the adjusting, fix them with the blocking nut 14.

3. Adjustment of relative positions of swirler and combustion head

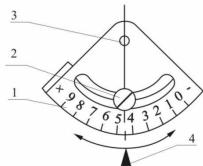
Loosen the fastening screw 10, rotate the temper screw 13 by flat head screwdriver to move the swirler forwards or backwards. Rotate the temper screw clockwise, mounting plate of the oil gun will move backwards with the oil gun, secondary air passage area of swirler and conical surface of combustion head will reduce, then the air capacity reduces and air speed is quickened.

When finishing adjusting, please fix it by fastening screw 10.

4. Adjusting mechanism of the air door

M-18~35 burner is a kind of on-off control burner, also named kick adjustment. M-18~35LF has two-position and primary level combustion, there is only one opening extent for the air door, and should be manual adjusted. M-26~35LRF type has three-position and secondary level combustion, with intense fire and small fire two burning states, and the air door has two opening extents, when it is small fire, requires less combustion-supporting air, the air door should be opened with small opening extents, when it is intense fire, the air door should be opened with large opening extents, this kind of burner has two methods for adjusting, that is to adjust the air door by hydraulic cylinder or servo motor.

1) Manual adjusting the air door for single-stage combustion Refer to drawing 16 and drawing 17



Drawing 16 Manual adjusting the air door of M-18, 26, 35LF

- | | |
|----------------------|------------------------|
| 1.1. Adjusting plate | 2. Screw |
| 3. Air door shaft | 4. Indication of scale |

Loosen the screw 2, rotate the adjusting plate 1, the air door shaft 3 will rotate with the air door plate. When the adjusting plate rotates clockwise, the air door of M-34LF type will be opened widely, and the combustion-supporting air capacity adds. However, the burners of M-18, 26 and 35 type work the opposite, the opening extent of air door as well as the air capacity will be reduced. When finishing adjusting, please tighten the screw 2 again to avoid shift.

2) Air door adjusting of double-stage burner

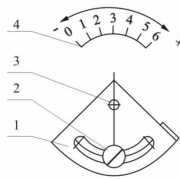
a. Air door opening adjusted by hydraulic cylinder

There are two types of hydraulic cylinder:

a) Air door opening adjusted by hydraulic cylinder A, refer to drawing 18

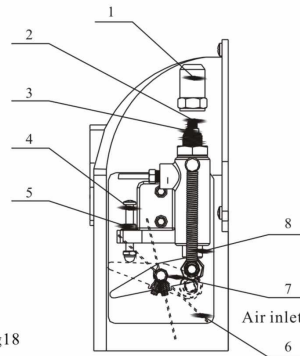
Air capacity adjusting for primary combustion

Screw out the top cap 1, screw down the temper screw 2 clockwise by flat head screwdriver, push down the piston 8 and compel the rocking beam 7 rotate anticlockwise around the door shaft, then the air door that is connected with the door shaft is opened. The downward distance of temper screw 2 determines the opening extent of the air door, also controls the air capacity for primary combustion. When finishing adjusting, lock it by the blocking nut 3, and cover it with top cap finally.



Drawing 17 Manual adjusting the air door of M-34LF burner

- | | |
|----------------------|------------------------|
| 1.1. Adjusting plate | 2. Screw |
| 3. Air door shaft | 4. Indication of scale |



Drawing 18 Schematic drawing of hydraulic cylinder A of the air door

- | | | | | | | | |
|------------|---|-----------------|---|-----------------|-------------|-----------------|-----------|
| 1. Top cap | 2. Air conditioning screw of primary fire | 3. Blocking nut | 4. Air conditioning screw of secondary fire | 5. Blocking nut | 6. Air door | 7. Rocking beam | 8. Piston |
|------------|---|-----------------|---|-----------------|-------------|-----------------|-----------|

Air capacity adjusting for secondary combustion

Unscrew the blocking nut 5, rotate the temper screw 4, move upwards for a certain distance. Open the solenoid valve, the fuel oil enters into the hydraulic cylinder, the piston goes on moving downwards under the oil pressure, to push the rocking beam continuously and rotate anticlockwise until the temper screw 4 stops it. Along with rocking beam rotating, air door is opened widely. The distance of temper screw 4 moving upwards locks the rotation angle of the rocking beam, also determines the opening extent of the air door. Adjust repeatedly for many times to get the optimal proportioning of air and oil quantity, lock it by blocking nut 5 to prevent from changing due to loosening during running.

B) Air door opening adjusted by hydraulic cylinder B, refer to drawing 19

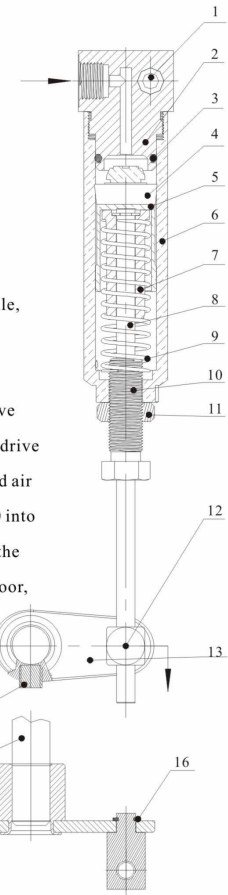
Air capacity for primary combustion can be got through adjusting the pull rod 8 and push rod 12. The push rod sways with the rocking beam 13, meanwhile, drives the air door shaft 15 to rotate for a certain angle to get the required air capacity for primary combustion.

When the burner enters into the secondary combustion state, solenoid valve is put through, the fuel oil flows to the base 2, and pushes down the piston 5 to drive the spring seat 7, pull rod 8 and push rod 12, to make the centering block 13 and air door shaft 15 rotate, finally open the door wider. The depth of temper screw 10 into the cylinder body 6 can limit the traveling distance of spring seat 7, also limit the traveling distance of pull rod 8. This finally determines the open angle of air door, and gets the required air capacity for secondary combustion.

When resuming to primary combustion, fuel oil is withdrawn, and oil pressure is disappeared. Under the action of spring 9, piston, spring seat and pull rod are resumed to the initial state, rocking beam, air door shaft and air door plate are reset to home position, and the air door stays at the primary combustion state.

Screw 1 is used to fix the hydraulic cylinder assembly to the air ear of burner.

- | | | | |
|------------------|------------------|--------------------|------------------|
| 1. Screw | 2. Base | 3. Sealing ring | 4. Sealing ring |
| 5. Piston | 6. Cylinder body | 7. Spring seat | 8. Pull out rod |
| 9. Spring | 10. Screw | 11. Nut | 12. Push rod |
| 13. Rocking beam | 14. Screw | 15. Air door shaft | 16. Clamp spring |



Drawing 19 Schematic drawing of hydraulic cylinder B of the air door

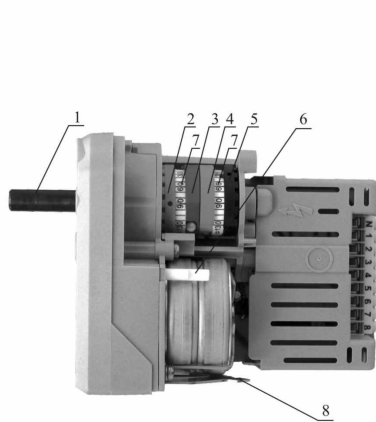
C) Adjust the opening of air door with the servo motor.

In general, the servo motor is used to adjust the opening of air door, it has two types, namely, type SQN70 and type SQN30. Refer to drawing 20 and drawing 21.

Press the clutch pin 6 of camshaft, to make the motor shaft separate from the cams shaft. Release the holding screw of each cam, and adjust the cam position with the special spanner. The scale pointed by angle scale in indication 7 and small triangle tip projection on the cam is the approximate opening of air door.

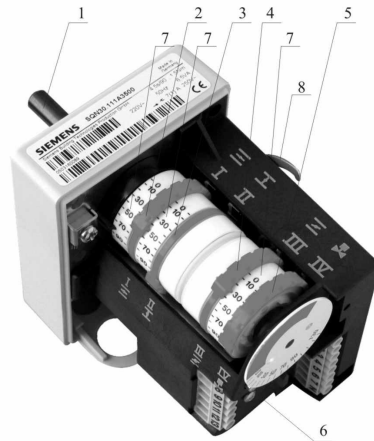
Release the clutch pin 6 of camshaft, to make the motor shaft mesh with the camshaft. When assembling, let the motor shaft be connected with air door shaft into one unit, when the servo motor rotates, four cams touch the sensitive switch one by one, connect to the circuit, and make kinds of orders. In the meantime, the plate of air door also can be stopped at different positions, to meet requirements of three statuses: shutdown, burning with small fire, burning with intense fire.

If the adjustment of cams is in line with the requirements, please fix it with the holding screw.



Drawing 20 SQN70 type servo motor

1. Motor shaft
2. Air conditioning cam for secondary fire (full load)
3. Adjusting cam in the air door closing position at stopping running
4. Air conditioning cam for primary fire (partial load)
5. Solenoid valve controls the cam, to control opening time of secondary combustion used oil (or gas) between 4 and 2.
6. Motor camshaft clutch pin
7. Angle scale indication
8. Special spanner



Drawing 21 SQN30 type servo motor

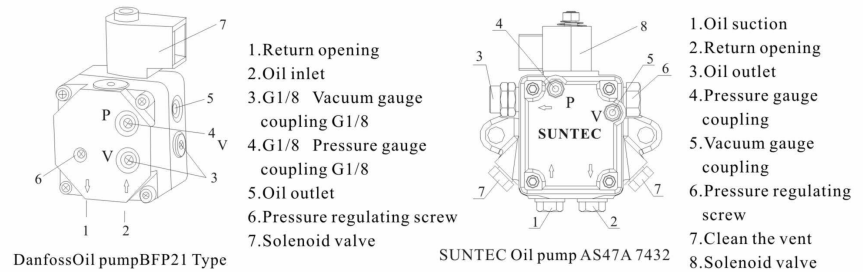
5. Oil pump pressure adjusting

The usual oil pump has two types: SUNTEC and Danfoss. Refer to drawing 22

In general, the oil pump pressure needn't be adjusted. Although other pressures have been used, the atomization quality of fuel oil is still poor, if that, the oil pressure of oil pump can be heightened to improve it. Furthermore, through pressure regulation, the quantity of oil injection can be changed within a certain range to meet the requirement of load.

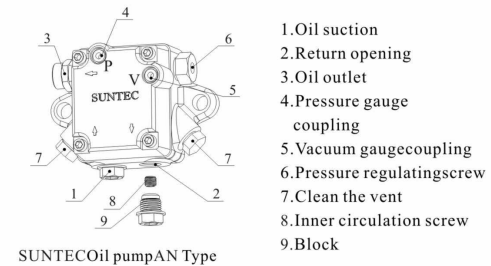
When adjusting, please mount the pressure gauge and vacuum meter on the corresponding couplings.

Notice: if only sucker is used, but no scavenge pipe (single oil pipe system), please must remove the inner cycle screw from the oil return path of the oil pump, thus to form an oil return path in the oil pump and prevent the oil pump being damaged.



Danfoss Oil pump BFP21 Type

SUNTEC Oil pump AS47A 7432



SUNTEC Oil pump AN Type

Drawing 22 Oil pump

5j. Maintenance and repair

1. Keep the light sensitive resistor clean, to prevent the burner extinguishing after it ignites.
2. Keep the head of ignition electrode and swirler clean, otherwise the ignition would be affected.
3. Check whether the locking screw of air door and the fastening screws of ignition electrode, nozzle and oil path are loose, to prevent the accident when the burner runs. (Notice: Must be careful to reassemble the device, to prevent locking of burner for the short circuit caused by earthing of electrode,
4. Check whether the nozzle is jammed seriously or damaged, please clean or change it if necessary (Notice: The enclosure must be cleaned with mixing liquid of water and detergent).
5. Clean the filter in time, and change the damaged filtering net immediately.
6. Keep the oil level of tank at a required height, the deposition in the tank shall be cleared immediately.
7. If necessary, please clean the flue of boiler and chimney.

Symptom and remedy

Symptom	Possible cause	Remedy
The burner refuses to start	<ol style="list-style-type: none"> 1.The wire has no voltage or only has low voltage. 2.The disconnecting switch isn't closed. 3.The thermostat is connected not according to the connection drawing. 4.The thermostat is open circuit. 5.The thermostat or pressure switch isn't closed. 6.The light sensitive resistor is short circuit. 7.There is something wrong with the controller. 	<ol style="list-style-type: none"> 1.Find out the reasons and give the correction. 2.Close 3.Correct the connection 4.Correct the thermostat 5.Increase the set value, or let the water temperature in the boiler fall down naturally until it closes again. 6.Change 7.Repair or change
When the burner sprays oil, it can't ignite, so it stops (The red fault lamp goes on).	<ol style="list-style-type: none"> 1. The ignition circuit is damaged. 2.The conductor of ignition transformer is out of use for aging. 3.The conductor of ignition transformer isn't connected well. 4.The ignition transformer is damaged. 5.The gap between tips of ignition electrode is not correct. 6.Because the electrode is dirty or its insulation is damaged, the electrode discharges to earth (enclosure). 7.The pressure of oil pump is abnormal. 8. There is water in the oil. 9.The burning air is too much. 10.The passage between the swirler and combustion head is too wide. 11. The oil nozzle is worn or dirty. 	<ol style="list-style-type: none"> 1.Examine the circuit and maintain 2.Change 3.Tighten 4.Change 5.Adjust it to the right position 6.Clean the electrode, or change it if necessary; check the binding post of the insulator 7.Readjust the oil pressure 8.Drain the water from the oil tank with the suitable pump (Never use the oil pump on burner). 9.Reduce the burning air (close the air door a little) 10.Adjust the combustion head to the right position 11.Clean or change
The nozzle can't make spray oil, so the burner stops (The red fault lamp goes on).	<ol style="list-style-type: none"> 1.One of power supply phases drops. 2.The motor is out of use. 3.The fuel oil hasn't arrived at oil pump. 4. There is no oil in the oil tank 5.The valve of oil suction pipe is closed. 6.The nozzle is jammed. 7.The three-phase motor rotates inversely. 8.The inlet valve leaks or is jammed. 9. There is something wrong with the oil pump. 10. The solenoid valve doesn't work (closing). 11. The voltage is too low. 12.The drive shaft always slips. 	<ol style="list-style-type: none"> 1.Examine the power supply and maintain 2.Repair or change 3.Check the oil feed pipeline 4.Feed the oil. 5.Open the valve 6.Disassemble it and clean 7.Change any phase position in the power switch. 8.Disassemble, and repair or clean it. 9.Change 10.Repair, or change if necessary. 11.Contact with power supply department. 12.Check the rotary shaft fixing screw, rubber shaft, rubber sheath, and change if necessary.

Symptom	Possible cause	Remedy
Stop under burning (The red fault lamp goes on), the flame controller occurs fault	<ol style="list-style-type: none"> 1. The light dispensable resistor is damaged or jammed by oil smoke. 2. Lack ventilation 3. The circuit of light sensitive resistor is damaged. 4. The swirler and combustion head are dirty. 	<ol style="list-style-type: none"> 1.Change or clean 2.Examine boiler and flue of chimney 3.Change 4.Clear away the dirtiness
There is noise from the oil pump	<ol style="list-style-type: none"> 1.The diameter of oil pipe is so small, and the oil flows too fast 2. The air gets into the oil pipe. 3.The distance from oil tank to the burner is too far, or the added partial resistance (from elbow, throttling unit) is too large. 4.The filter is dirty 5.The hose is damaged. 	<ol style="list-style-type: none"> 1.Change into a big oil pipe. 2.Find out the leak and let the air in the pipe get out. 3. Shorten the length of oil pipe. 4.Clean 5. Change.
The flame is not good, and there is some spark	<ol style="list-style-type: none"> 1.Low atomizing pressure 2. Too much burning air 3.The nozzle is out of use (worn or jammed) 4. There is water in the fuel oil 	<ol style="list-style-type: none"> 1.Improve oil pressure 2.Reduce the burning air 3. Clean or change 4.Drain the water in the oil tank with the suitable pump (Never use the oil pump on burner).
The shape of flame is not perfect, and there is smoke and carbon black.	<ol style="list-style-type: none"> 1.The burning air capacity is lack. 2.The nozzle is out of use (worn or jammed) 3.The combustion chamber is not reasonable in design or it is too small. 4.In relation to the size of combustion chamber, the oil sprayed by nozzle is too much. 5.Fireproof asbestos sealing ring is not applicable or is too small. 6.The boiler or flue of chimney is jammed. 7.The atomizing pressure is too low. 	<ol style="list-style-type: none"> 1.Increase combustion air capacity 2Clean or change 3.Reduce the oil spraying, to fit for the capacity of combustion chamber, or change the burner. 4. Change the nozzle, or let it make less force. 5. Correct the size of sealing ring. 6. Clear away the dust 7.Increase the oil pressure.
The flame is poor, pulsation or fire-off, fumes white smoke.	<ol style="list-style-type: none"> 1. The draught is too large (only when an induced draught fan is mounted on the flue) 2.The nozzle is out of use (worn or jammed) 3. There is water in the fuel oil. 4. There is dirt around the swirler. 5. The combustion air capacity is too much. 6.The passage from swirler to combustion head is too wide. 	<ol style="list-style-type: none"> 1.Adjust the speed of induced draught fan through changing the diameter of pulley 2. Clean or change the nozzle 3.Drain the water in the oil tank with the suitable pump (Never use the oil pump on burner). 4. Clean 5. Reduce combustion air capacity 6.Adjust the position of combustion chamber, to reduce the area of passage.