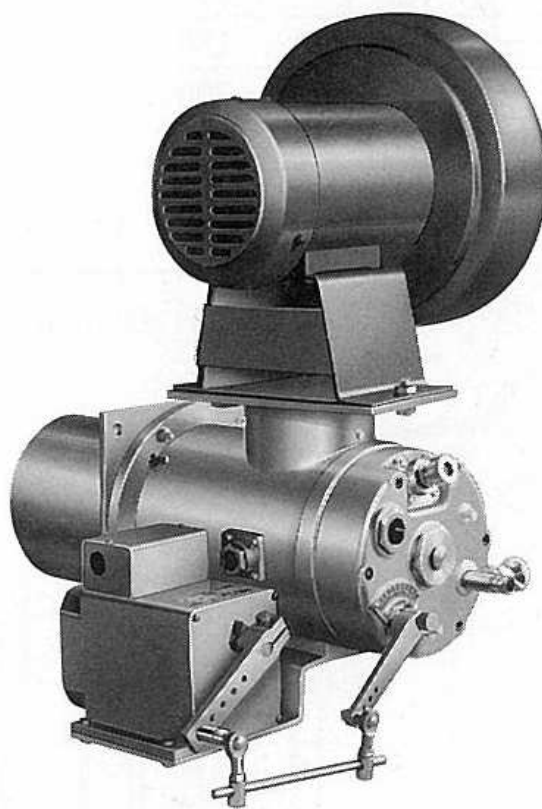


# HOPE

HG81061E

## HOPE WF WING FLOW BURENR HANDLING MANUALS



**YOKOI KIKAI KOSAKUSHO CO., LTD.**

Head Office:

2720-1, Oboraguchi, Nakashidami, Moriyama-ku  
Nagoya 463, Japan

Tel: +81-52-736-0773 Fax: +81-52-736-0

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# 1. Inspection of Product and Accessories, and Outline and Specifications of Product

Thank you for your selection of HOPE WING WFOV BURNER Type WF. Please carefully read this instruction manual in order for you to be fully satisfied with the performance of this burner and to secure the safety in operation, maintenance and inspection. Also, please be sure to deliver this instruction manual to the end user, as well as to the constructor.

## 1. Inspection of Product and Accessories, and Outline and Specifications of Product

### Inspection:

Check to confirm whether or not the product is exactly in accordance with your order by referring to the nameplate and the specification table given below. Also check for damage and other irregularities caused by and during transportation.

### Outline

This package burner can adjust both the gas flow rate and the air flow rate at the same time by only operating the handle. This burner can be used widely for air-heating furnaces, drying furnaces, heating furnaces, etc. This burner is featured as follows:

1. The turndown ratio is as large as 20:1.
2. It can be mounted directly on furnace bodies with no need of refractory.
3. As it is in the packaged mode, the equipment cost is economical.
4. As an ignition device is built in, ignition can be made easily.

### Specification

#### Burner

#### Blower

Type	Cap.kW	Mass.kg	Blower voltage	Motor power	Blower type
WF-3-4	47	32	200V three-phase	0.2kW	EP-75T
WF-3-7	81				
WF-3-10	116				
WF-4-12	140	42	200V three-phase	0.4kW	EC-100T
WF-4-20	233				
WF-4-30	350				
WF-5-40	465	76	200V three-phase	1.0kW	EC-125
WF-5-55	640				
WF-5-70	814				

## 2. Matters to be attended for safety

Before installing, trial- operating, maintaining or inspecting this burner, please learn the inside of this burner, information of safety and other matters to be attended by reading this instruction manual and all of attached documents.

The rank of the matters to be attended is classified to "Top danger", "Danger" and "Caution" in this instruction manual.



In case of wrong operating, it is predicted that a serious dangerous situation will happen and the operator or other people may die or may be seriously injured.



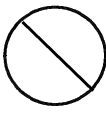





In case of wrong operating, it is predicted that a dangerous situation will happen and operator or other people may die or may be seriously injured.



In case of wrong operating, it is predicted that a dangerous situation will happen and the operator or other people will be injured or only material described.

NOTE, Even the matters classified to CAUTION have a possibility of causing serious results. Then, never fail to abide by matters described.

	Meaning of the mark	
 COMPULSION	This is to tell that there is indication to instruct compulsorily your action. Contents of the instruction must be described definitely nearby.	
 PROHIBITION	This is to tell the prohibited action. Specifically prohibited action are described.	 TOUCH PROHIBITED
 CAUTION	This is to tell that there is a thing to be attended. The specifically attended thing is described nearby.	 CAUTION HIGH TEMPERATURE

### 3.Read without fail



Never fail to exhaust the air in the furnace (pr-purge) before igniting. Repeated ignitions may cause explosion due to the gas stagnated in the furnace. Please install safety devices like a flame supper visor.



Never fail to cut the electricity of transformer when you take off the ignition plug in order to check the spark of it.



Never fail to take off the site hole when igniting or firinf the burner.  
※flame in the furnace may blow out.



**TOUCHING  
PROHIBITED**

Never touch the mounting plate of the burner and fitting parts of the pilot burner. These area are high temperature when the burner is burning.

1. Do not use the attached gasket for sering this burner.
2. Put the replaced old gaskets pouch and thrae'away therm according to the waste disposal regulation or the waste cleaning regulation.  
Never burn up them.
3. We do not use any packing containing asbestos.

## 4. Combustion Mechanism

The air is fed from the combustion blower. The air flow rate is controlled by the air damper that is operated through the operation of the control handle. The air is jetted into the frame corn from the clearance between the numerous ports and air body of the mixing corn.

The floe rate of the fuel gas is controlled by the movement of the control handle rod and gas rod connected to the link mechanism fittings and the engaged movement between the gas control core and the gas control curtain. The gas is jetted into the mixing corn from the gas nozzle ports through the manifold. The air and the gas are mixed with each other, and the air-gas mixture is ignited by the pilot combustion fire, and the combustion starts.

This combustion is generally called “nozzle mix combustion.” There is no possibility of backfire.

## 5. Mounting and Connection

### (1) Mounting of the burner

Place packing between the frame corn flange part and the furnace body steel plate. Put bolts in each of the 4 holes, and firmly fasten them.

### (2) Wire connection of the blower

Uncover the terminal box, and make wire connection. The power supplies are 200V 3-phase and 100V single-phase. Be sure to ground the connection with the machine screw on the terminal box. For the 100V specifications, the capacitor is located within the motor base. Do not remove the capacitor.

※ Carefully read the instruction manual for the blower.

### (3) Wire connection of the control motor

The control motor built in this burner on standard is Model CM-101TH/L made by Nissho Instrument Co., Ltd. Besides the standard control motor, a control motor with P (potentiometer) can also be built in. Therefore, carefully read the instruction manual for the control motor. When making wire connection, refer to the No. 8 connection diagram of the instruction manual for the control motors.

### (4) Gas piping

Lay pipes in such a manner that excessive force is not applied to the burner. It is advisable to use flexible tubes or the like. Also, use seal tape or the like for the screw fastened portions to prevent gas leak.

## 6. Preparation for Operation

- (1) Specifications and rotational direction of the blower
  - 1) Check on the motor nameplate
    - 100V 50/60Hz
    - 200V 50/60Hz
    - ※ Other voltages are also available.
  - 2) Rotational direction of the blower
    - Visually check the rotational direction by visually checking the motor spindle or the impeller.
    - The arrow direction on the blower body shows the forward rotational direction.
- (2) Supply of the fuel gas
  - Completely vent the air from the piping for replacement with the fuel gas.
- (3) Adjust the gas supply pressure.
  - Reference supply pressure according to the gas type
- (4) Adjust the interlocks of the Gas Pressure switch, the Air Pressure switch, etc. to the specification values.
  - Adjust the Gas Pressure switch to the lower limit -30 to -50% and to the upper limit + 30% or so against the reference supply pressure. For the Air Pressure switch, adjust it to the lower limit -40% or so.
- (5) Connect the control motor handle and the burner control handle to the rod through a universal joint. Fix the rod to somewhere between 10 and 2 of the scale.
  - At the scale 10, adjust the internal pressure of the air body with the blower suction damper. If the environment in which the burner is mounted is unfavorable and the suction net is clogged and has to always be cleaned, use the burner with the suction damper in the fully opened state. This burner can perform stable combustion even with the excess air, posing no particular problem.

### Air body Standard pressure

Type	Cap. kW	Air body pressure kPa
WF-3- 4	47	0.5
WF-3- 7	81	
WF-3-10	116	
WF-4-12	140	1.0
WF-4-20	233	
WF-4-30	350	
WF-5-40	465	1.0
WF-5-55	640	
WF-5-70	814	

- (6) Press ON the Combustion button, and visually check the ignition plug sparks from the sight hole.

## 7. Test Operation

- (1) Fully open all gas cocks excepting the pilot gas main cock and the main gas main cock.
- (2) Press ON the Start button of the blower.
- (3) After the completion of pre-purge, press ON the Combustion button.
- (4) Check the ignition plug sparks from the side sight hole.
- (5) Check to confirm that the pilot solenoid valve opens. Open the pilot gas main cock. Adjust the gas flow rate with the pilot needle valve. Stabilize the pilot combustion.

※ When the combustion gas is at the reference supply pressure, the target of the opening of the pilot needle valve for -adjusting the gas flow rate is as follows:

Fuel gases	Number of turns
High calorie gas (LPG) Gas Supply pressure . . . 2.8kPa	$\frac{1}{4} \sim \frac{1}{2}$ (WF-3) $\frac{1}{2} \sim \frac{3}{4}$ (WF-4) $\frac{3}{4} \sim 1$ (WF-5)
Middle calorie gas (Natural gas, Butane air gas) Natural gas Supply pressure . . . 2kPa Butane air gas Supply pressure . . . 5kPa	$\frac{1}{2} \sim \frac{3}{4}$ (WF-3) $\frac{3}{4} \sim 1$ (WF-4) $1 \sim 1\frac{1}{4}$ (WF-5)
Low calorie gas (COG etc) Gas Supply pressure . . . . . 10kPa	$\frac{3}{4} \sim 1$ (WF-3) $1 \sim 1\frac{1}{4}$ (WF-4) $1\frac{1}{4} \sim 1\frac{1}{2}$ (WF-5)

- (6) When the pilot combustion becomes stable, the flame is detected by the flame detector, and the main solenoid valve opens. Open the main gas main cock. Read the differential pressure of the MO type orifice meter or the gas flow meter from the opening of the gas adjusting handle, and adjust the gas flow rate.  
“As of this time, the control motor is open 100%. Otherwise, open it 100% by using the opening setting device. Then, adjust the gas flow rate to the rated gas flow rate at the time of high combustion.”
- (7) Repeat the ON/OFF of the Combustion button 2 to 3 times, and check to confirm no irregularity.
- (8) Now, the adjustment for test operation is completed. Check to confirm the stable flame current value at the time of the pilot combustion and the main combustion.



## 8. Daily Operation

- (1) Be sure to turn ON/OFF the power supply and open/close the main cock before and after operation.
- (2) If the burner is left at a stop for a long time, the fuel gas may be vented from the pilot gas line and ignition failure may occur during operation. This is nor abnormal. In this case, completely vent the air or repeat the ignition.

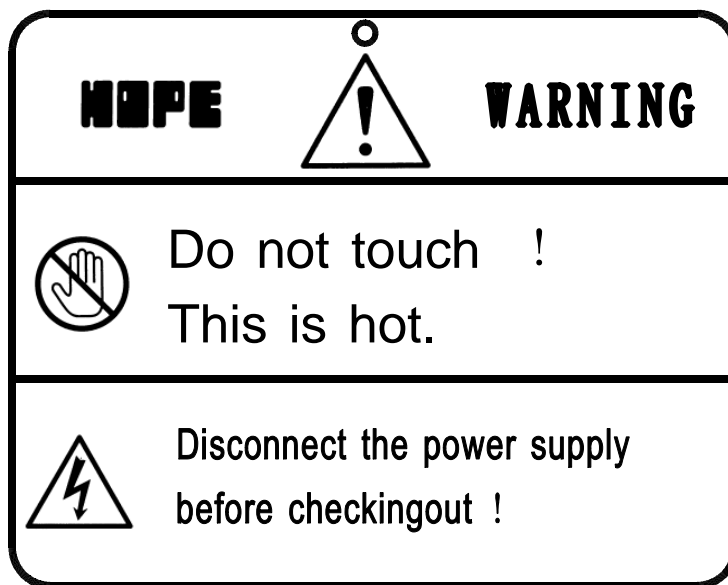
## 9. Inspection

※ Inspection must be made after the furnace has sufficiently been cooled.

- ①. Confirm that all power supplies, including one to the combustion blower, are OFF.
- ②. Confirm that all cocks are closed.
- ③. Loosen the union, etc, of the gas piping.
- ④. Remove the bolts and nuts fixing the fan ②⑤ body base, and pull out the fan ②⑤ upward.
- ⑤. Remove the motor base ②⑥.
- ⑥. Leave only the frame corn ②④, remove the nuts from the air body ①, and remove the whole burner.  
※ In this state, the frame corn ②④, the mixing corn ③ and the gas nozzle ④ can be checked.
- ⑦. Loosen the set bolt ⑤, and remove the bolts from the detection cap ②⑩ located on the right and left and front sides of the burner. Then, pull out the detection cap ②⑩ and the mounted components (e.g., detection pipe ①⑨) as a unit.
- ⑧. In this state, the mixing corn ③ can be pulled out to the front.
- ⑨. The gas link metal ①④, the link mechanism fittings ①⑤, the air connecting rod ①⑥ the universal joint ①⑦ and the air butterfly damper ①⑧ have been adjusted to the appropriate opening and positioned with the spring pin and the lock nut. Generally, do not disassemble them.
- ⑩. The components that may be damaged by heat are only the frame corn and the mixing corn ③. If they have to be replaced, also replace their packing ②③.
- ⑪. It is advisable to make ready the ignition plug and the flame detector as spare parts.
- ⑫. After no abnormality is confirmed in components, etc., reassemble them in the reverse order of the above procedures.
- ⑬. Center the air body ① and the mixing corn ③ with the set bolt ⑤. If they are not centered, the flame may be ill-balanced.

## 10. Warning Plate

When the installation construction has been completed, check to confirm that the warning plate shown below is firmly attached to the burner body. If the warning plate is lost, immediately contact our sales department for instructions.



# 11.Troubleshooting

## Troubleshooting (1)

Symptom	Possible cause	Remedy
The blower is turned ON but the fan does not run	1.The power is not being supplied	Check the switch and fuse on the distribution board.
	2. The protective device (thermal relay) of the motor is activated.	Check the set value. If no abnormality is confirmed, press the Reset button.
	3.Failure in some electric part.	Replace the electric part.
	4. The error buzzer sounds, and the error lamp flickers.	This phenomenon is caused by stopping the operation following abnormal stop. Find the cause, and press the Reset button.
	5.Failure in the electric circuit	Check the circuit.
The Combustion button is pressed but the ignition plug fails to spark.	1. Defect of the ignition plug	Replace the ignition plug
	2.Disconnection of the high-voltage cord.	Replace the high-voltage cord.
	3. Electrical disconnection	Check the circuit.
	4.Contamination or defect of the flame detector	Check and clean the detector.
	5.Defect of the protect relay	Replace the protect relay
The pilot fails to combust. (It sparks but fails to catch fire.)	1. The main gas cock is closed.	Open the cock.
	2. Air is in the gas piping.	Vent the air from the piping.
	3. The pilot solenoid valve cannot be opened.	Replace the solenoid valve
	4. Improper adjustment of the pilot needle valve	Readjust the valve.
	5. Failure in the electric circuit	Check the circuit.
The pilot is in combustion but goes out before it turns to main combustion.	1.The main gas cock is closed.	Open the cock.
	2.Defect of the flame detector	Check or replace the detector.
	3. Defect of the protect relay	Check or replace the protect relay
	4. Defect of the main solenoid valve	Check or replace the solenoid valve
	5. Improper adjustment of the main gas control handle	Readjust the main gas control handle.
	6. The pilot combustion is not stable.	Readjust the valve.
	7.Failure in the electric circuit	Check the circuit.

## Troubleshooting (2)

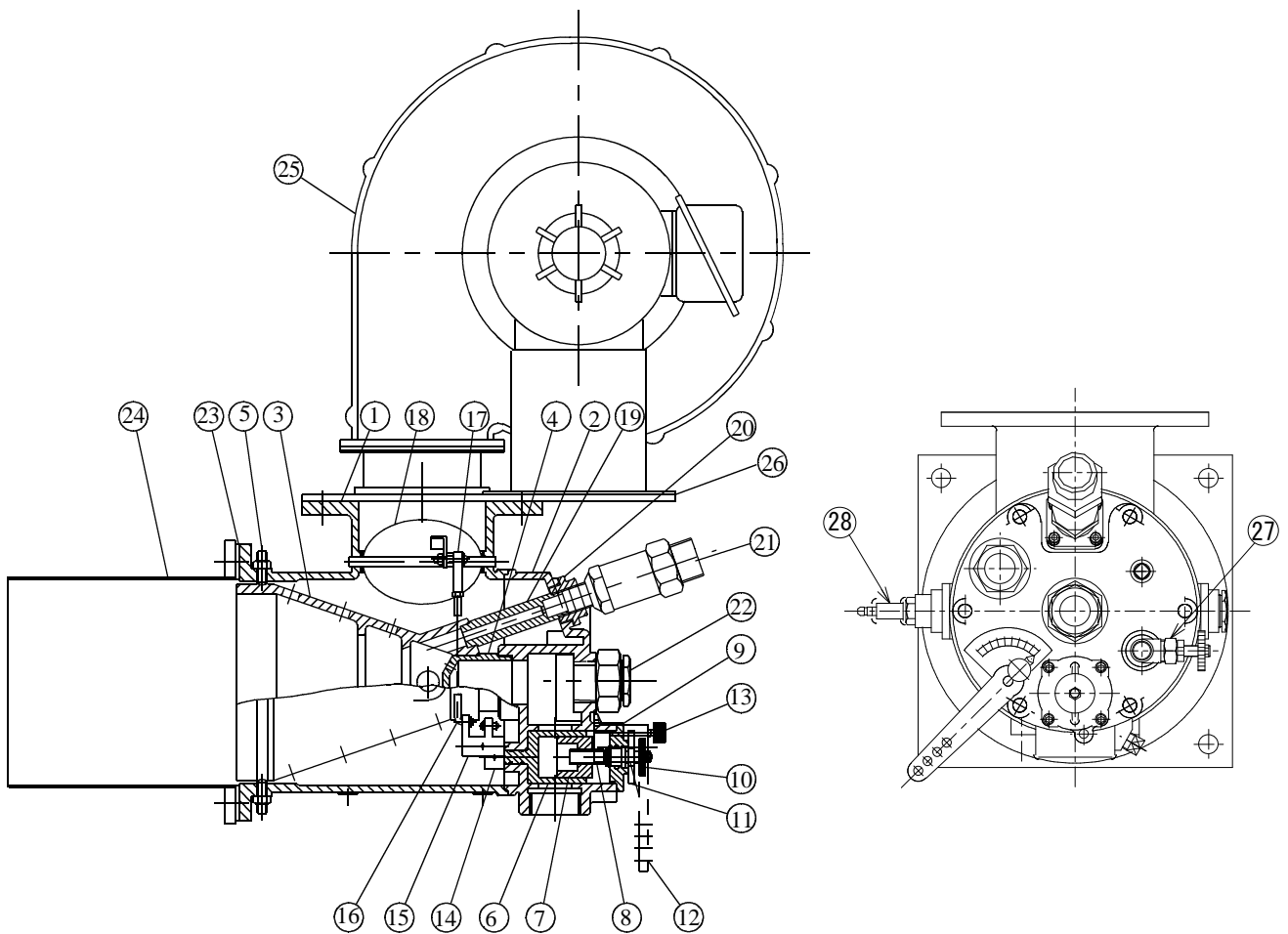
Symptom	Possible cause	Remedy
The main combustion goes out quickly.	1.The gas pressure switch (low) is activated.	Lower the set position.
	2.The air pressure switch (low) is activated.	Lower the set position or clean the suction net.
	3.Detachment of the universal joint	Adjust the joint.
	4.Defect of the protect relay	Check or replace the protect relay
	5.Defect of the main solenoid valve	Replace the solenoid valve
	6. Failure in the electric circuit	Check the circuit.
The combustion goes out occasionally and abnormally.	1.The pilot air is adjusted improperly.	Adjust the pilot air, and check the flame voltage.
	2 Defect of the air pressure switch	Check and replace.
	3. Defect of the gas pressure switch	Check and replace.
	4.Failure in the protect relay	Replace the protect relay
	5.Degradation of the flame detector	Replace the flame detector
	6.Breakage of the ignition plug insulator	Replace the ignition plug
	7.Failure in the pilot solenoid valve	Replace the pilot solenoid valve
	8. Failure in the main solenoid valve	Replace the main solenoid valve
	9.Defect of the ignition transformer and the high-voltage cord	Replace the ignition transformer and the high-voltage cord
	10..Detachment of the universal joint	Adjust the joint.

※ Before inspecting the burner and its peripheral units, carefully read the instruction manual attached to each equipment.

※ If there is any questions, contact our sale department.

TEL.052-736-0773  
FAX.052-736-0258

## 12.Structual drawing



NO.	Parts		NO.	Parts	
1	Air Body	1	15	Link Mechanism Fittings	1
2	Back Plate	1	16	Air Connecting Rod	1
3	Mixing Corn	1	17	UniversalJoint	1
4	Gas Nozzle	1	18	Air Butterfly Damper	1
5	Set Bolt	4	19	Detection Pipe	1
6	Gas Control Core	1	20	Detection Cap	1
7	Gas Contro Curtain	1	21	U V Adapter	1
8	Gas Contro Spindle	1	22	Sight Hole	1
9	Cap	1	23	Packing	1
10	Gas Contro Handle	1	24	Frame Corn	1
11	Lock Nut	1	25	Fan	1
12	Control Handle	1	26	Motor Base	1
13	Lock Thumb	1	27	Small Valve	1
14	Gas Link Metal		28	Ignition Plug (PW-3.4.5)	1