

Anderson Thermal Solutions (Suzhou) Co., LTD

FFO57 Burner Operation Manual

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This manual has been written for those who are already familiar with all aspects of nozzle mix burner and its add-on components. Main contents of the manual including safety rules, burner installation, commissioning, operation parameters, maintenance and troubleshooting, spare parts, etc.

1. Disclaimer Notice

Anderson Thermal Solutions (Suzhou) Co., Ltd. reserves the right to change the construction and/or configuration of our product at any time without informing customers.

If the product or its individual modules are used for purposes other than the designated purpose, their effectiveness and suitability must be confirmed.

Anderson warrants that the product itself will not infringe any patents. Every effort has been made to make this manual as accurate and complete as possible. If you find errors or omissions, please contact us so we can correct them.

2. Liability And Warranty

Due to negligence, breach of warranty or other reasons, Anderson's liability for its products is limited to the provision of such replacement parts and will not be liable for any other injury, loss or expense, whether direct or indirect, including but not limited to Loss of or damage to the use of materials that sell, install, use, fail to use or repair or replace Anderson related products.

The warranty is void if: any operation explicitly prohibited in this manual, any adjustment or assembly process not recommended or authorized.

3. Safety Guide

Only those who were trained and qualified person can follow the manual to operate or adjust the combustion system. The fire was prohibited within a radius of 5 meters of the combustion system. Flame, non-covered light sources or heat sources shall not be brought to the combustion area unless it is related to the process. Welding in combustion control area shall be approved to ensure the safety in the area and also preventive measures should be taken into consideration.



Before starting, the operator must confirm whether the burner and gas pipeline are in normal working condition, and there is no flammable substance around the burner. The burner must be operated with fuel and oxygen or air. The ignition and operation of the burner must be performed at the specified position. The burner has been correctly and safely installed before ignition. The ignition of the burner needs to be performed after the combustion chamber is purged. If it is ignited at a low temperature, it needs to be replaced with 5 times the volume of the combustion chamber to avoid explosion.

However, it is not necessary to purge when the temperature is higher than 750°C. Air pipe or gas pipe connected with burner should be tight enough with no leakage, also the periodically check air or fuel nozzles of the burners to prevent to be blocked by dust, slag or other materials.

ATTENTION: DANGER OF BEEN BURNT



When burner in operation, combustion is severe, so the burner must be fixed. Hoses or cables in area of the combustion system must be suitable for high temperature, to prevent high temperature failure or cause safety accidents. Burners should be periodically inspected and cleaned. Copper wire brush may be used, if necessary, to clean burner head. The burner system should be checked twice a year for safety operation.

Burner commissioning shall take care of ignition position, minimum and maximum output position. Following interlocks will cause emergency stop, including gas low pressure, high pressure or low combustion air pressure, as well as emergency stop is triggered, the main power is out, UV signal failure or kiln safety conditions (such as high temperature limit, flue system opening, etc.) will cause the burner lockout. Users need to know the maintenance interval recommended by the manufacturer and the interval specified by national laws, whichever is shorter.

4. Fuel Information

The following table shows that the combustion involves common gas properties, and the operators should strictly abide by the safety regulations. Information is provided by the fuel supplier.

Fuel	Natural gas
Lower Calorific value	$H_U=35,900 \text{ [kJ/m}^3\text{]}$
O ₂ -requirement	$2.03 \text{ O}_2 \text{ m}^3/\text{ NG m}^3$
Composition	$>98\% \text{ CH}_4$
Reference conditions	$1, 013.25 \text{ mbar, } 0^\circ\text{C}$

5. Brief introduction

FFO57 series oxygen-natural gas burner is a product developed by Anderson Thermal Solutions (Suzhou) Co., Ltd. for reflective furnace copper smelting, suitable for pure oxygen-natural gas copper combustion control system.

The FFO57 series oxygen-natural gas burner is rated at 2,000 KW. The burner adopts a highly integrated design, the ignition burner, spark plug, UV design into one, reducing the installation work. The oxygen of the FFO57 series of oxygen-natural gas burner adopts a graded design to achieve the best performance of the burner through professional adjustment.

The FFO57 Series oxygen-gas burner is equipped with heat resistant stainless steel and quick disassembly joints with a typical length of 800mm. To extend the service life of the sleeve and burner, Anderson strongly recommends cooling air with a flow rate of 30 to 60 Nm³/h.

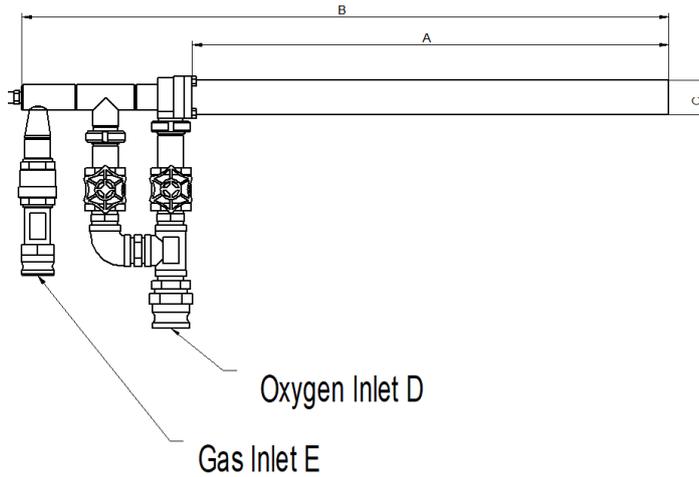


Figure 1: FFO57 Series Oxygen-Gas Burner

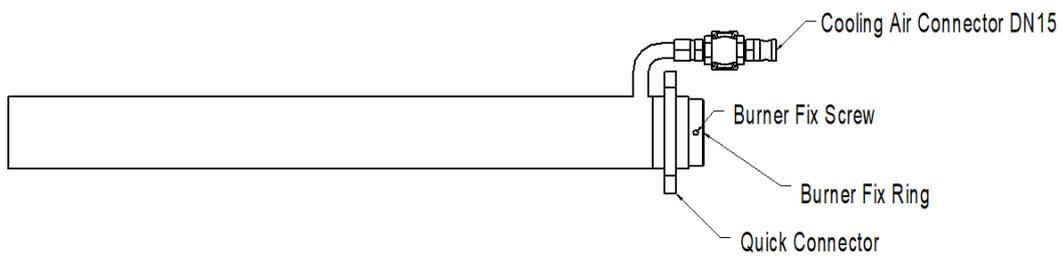


Figure 2: FFO57 Series Oxygen-Natural Gas Burner mounting sleeve

Attention
<ol style="list-style-type: none"> 1. If the burner is stopped, if the installation casing is not cooled, remove the burner to prevent damage to the burner, spark plug and flame detector. 2. When the gas is not completely closed, it is forbidden to remove the gas metal hose or the locking device

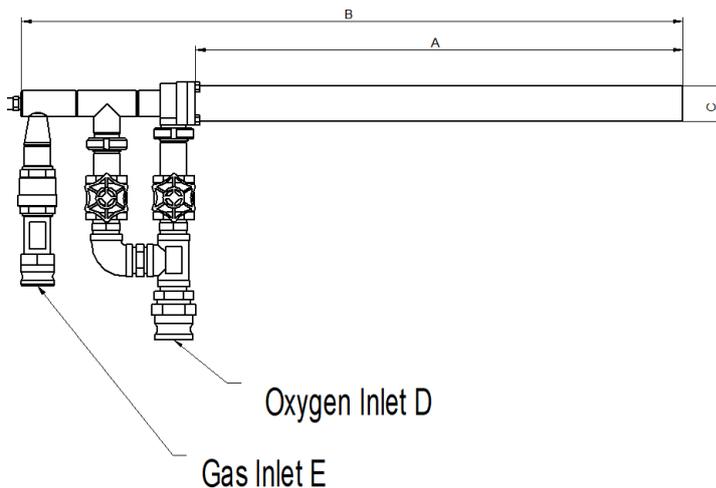
5.1 Burner Datasheet Burner Parameters

Table 1 Burner data

Burner Type	Input kW	Gas Flow (Nm ³ /h)		Gas Pressure (mbar)		Combustion Air Pressure (mbar)	
		Min	Max	Min	Max	Min	Max
57G1000	250-1000	25	100	50	200	100	500
57G1500	250-1000	50	150	50	200	100	500
57G2000	500-2000	50	200	50	200	100	500

Burner dimension and inlet interface:

Burner Model	Input kW	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
57G1000	1MW	1000	1323	57	DN50	DN32
57G1500	1.5MW	895	1215	65	DN50	DN40
57G2000	2MW	805	1267	73	DN50	DN40



5.2 Burner adjustment

On the non-combustion side, open the quick disassembly connector before installation and secure the front sleeve part to the furnace wall. Position the burner retaining ring to the burner and firmly with fastening screws. Then secure the burner and casing together using the quick removal connector. Lock the burner to ensure the front of the burner does not extend the casing and retreat for 1-5cm. Connect the burner main gas hose, main oxygen hose, ignition gas hose, ignition oxygen hose, install the flame detector and wiring, connect the spark plug. Open all hand regulating valves, adjust the cooling air flow, and check to ensure that all hoses are properly connected.

6. Burner Maintenance

Burners require routine inspection. Examination after the first or long absence are particularly important.

For the first use, check that the seal of each interface is intact and not loose. After the burner is first used normally, the burner needs to be checked. In the first month, the burner, the spark plugs, the flame detectors are checked on the week, and the inspection frequency can be extended to once two weeks in the second month. Anderson suggested that the burner check out at least once a month. Each inspection requires the inspection when the system is down and has cooled to room temperature.

7. Spare Parts

For normal use and regular maintenance of the burner, we recommend preparing the following parts:

- Flame Detector
- Spark Rod
- Burner Spare Sleeve

8. Appendix

8.1 Training Record

Each trained person must verify that he has read and understood the contents of the operating manual and know how to operate and maintain this series of burners correctly.

Manual Number and Revision	Date	Who (Name)	Signature

8.2 Bi-annual Audit Record

Routine audit must be made every 6 months. Please sign the following table.

Function Audit	Date	Inspector	Problem description	Next Audit Time
Flame sensor state				
air and gas pressure				
Alarm signals				
igniter electrode				
Control motors				
Ventilate equipment				
Interlock Function				
Shut off cock function				
Combustion air blower				

8.3 Annual Audit Record

Yearly audit list as follow but not only included

Function Audit	Date	Inspector	Problem description	Next Audit Time
Leak test				
Pressure switch test				
Cable and connectors				
Burner bodies and air wings				

Attention: Safety audit is prohibited when burner is running, otherwise, an accident could be caused!



If you have any questions. Please call us or send an e-mail to get more information

Our telephone no. is +86 (512) 6592 4663

Our email address is: info@andtecs.com

Meanwhile, you can also visit our website www.andtecs.com to get more product information.