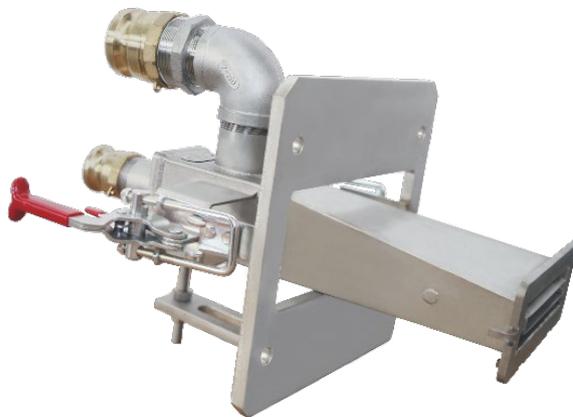


Anderson Thermal Solutions (Suzhou) Co., LTD

FFO52 Burner Operation Manual



No:	ATS–Operation Manual–FFO52
Subject::	FFO52 Burner Operation Manual
Version :	V1.0
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Review :	David



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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 instructions

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. Oxygen 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.

4. Description

FFO – FlexFire® oxygen burner is a trademark of Anderson Thermal Solutions (Suzhou) Co., Ltd., it is designed for oxygen firing glass furnace.

FFO52 - Oxygen FlexFire® burner with wide flat flame coverage and high flame brightness; It is one of the ideal burners for glass melting.

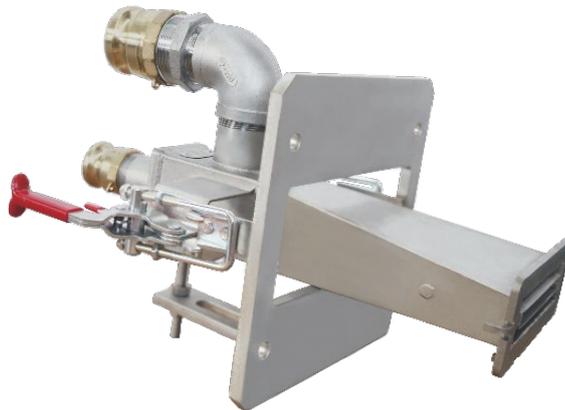


Figure 1: FlexFire®52 Oxygen Burner

Attention!

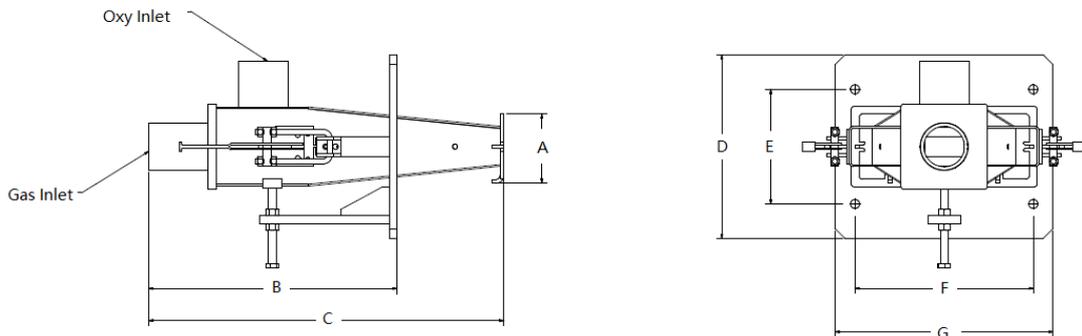
- When the burner stops for more than 20 minutes, remove the burner and seal the burner block opening. Prevent burner damage.
- To adjust the burner, loosen fixing T-bolts and lock it again after the adjustment is completed
- Do not remove the metal gas hose or locking device when the gas is not completely shut down

4.1 Burner data sheet

Model	Input Power (kW)	Gas Flow (NM ³ /H)		Gas inlet Pressure (mbar)		Oxygen Flow (NM ³ /H)		Oxygen Pressure (mbar)		Flame Length(mm)	Flame Width(mm)
		Min	Max	Min	Max	Min	Max	Min	Max	Max	Max
52G0600	150-600	15	60	2	40	30	120	3	50	950	600
52G1200	300-	30	120	2	40	60	250	3	50	2400	900
52G2400	600-	60	240	2	40	120	480	3	50	3300	1100
52G3600	900-	90	360	2	40	180	720	3	50	5000	1300

Typical burner length and dimension

Model	Input Power (kW)	Size(mm)									
		A	B	C	D	E	F	G	Gas Inlet	Oxy Inlet	
52G0600	150-600	86	323	488	285	178	230	285	1 ½"	2"	
52G1200	300-1200	86	298	463	285	178	230	285	2"	2 ½"	
52G2400	600-2400	107	383	548	285	178	275	336	2 ½"	3"	
52G3600	900-3600	122	403	564	275	205	320	375	2 ½"	3"	



Notes: Special lengths available upon review.

Figure 2: FlexFire®52 Oxygen Burner Dimension

4.2 Installation of the burner

Inspect burners and burner block for obvious damage. Inspect and clean the inside of the block opening to prevent debris from obstructing gas and flames.

Fix the burner with four T-bolts corresponding to the four T-slots of the burner block with nuts on the burner brick, check whether the center of the burner is aligned with the center line of the brick hole, and at the same time, the brick and the burner are horizontal due to the overall level. The burner bracket and the brick need to be sealed with a 3mm thick ceramic fiber gasket. Tighten all mounting bolts. Then connect the oxygen and natural gas flexible hose.

Attention!

- Gas and oxygen must be equipped with check valves, otherwise tempering may occur.
- Ensure that the furnace temperature is above the minimum requirement for the ignition temperature of the fuel.

4.3 Burner start

Before starting, verify that all shut-off valves for natural gas and oxygen are closed before starting. Check that the gas and oxygen hoses are properly and securely connected to the burner. Prepare the gas and oxygen lines, open the oxygen shutoff valve closest to the burner, and let oxygen flow through the burner at a rate of about 30 standard cubic meters per hour to cool the burner. Open the corresponding gas flow regulating valve to establish the gas flow. Initially adjust the oxygen/gas ratio to 2: 1. The oxygen and gas flow can then be adjusted according to normal actual parameters. Repeat the above steps until all burners are ignited.

4.4 Burner shut down

To temporarily close the burner, you need to close the front stop valve of the natural gas burner. Then adjust the oxygen gas flow to a minimum cooling flow of $30\text{Nm}^3/\text{H}$. The burner does not need to be removed from the burner block at this time. Do not use this burner if stopped for a long time. You need to close the ball valve burner downcomer, and then close the oxygen ball valve on downcomer. Disconnect the oxygen and natural gas quick connector and remove the burner from the bracket. Use insulation fiber to block burner block opening.

4.5 Burner maintenance

The burner requires regular inspection. Inspection after long periods of non-use is particularly important. During the first month of burner operation, the nozzles need to be inspected weekly. In the second month, the frequency of inspections can be extended to once every two weeks. Anderson recommends that each nozzle be inspected at least monthly. At each inspection, the burner needs to be removed from the burner block in order to fully check the status of the burner.

5. Spare parts

With proper use and regular servicing of the burner, we recommend the following parts:

- Quick Coupler high temperature gasket
- Outer nozzle gasket
- Spare burner nozzle

6. Appendix

6.1 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

6.2 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				

6.3 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.