FORNEY

CLEAR PORT User Manual

Publication 372000-89 Rev. A

• BURNERS • IGNITERS • DAMPERS • CONTROLS

www.forneycorp.com

INTRODUCTION

This manual contains information for the Clear Ports from Forney Corporation, 16479 North Dallas Parkway, Suite 213 Addison, TX 75001.

All personnel should become thoroughly familiar with the contents of this manual before attempting to install, operate or maintain the Clear Port. Because it is virtually impossible to cover every situation that might occur during operation and maintenance of the equipment described in this publication, personnel are expected to use good engineering judgment when confronted with situations that are not specifically mentioned herein.

PROPRIETARY NOTICE

SAFETY ICON DEFINITIONS

DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Provided to notify personnel of potential damage to equipment. This label can also contain important operational information and/or tips that may be useful. These labels are not related to personal injury.

REVISIONS

REVISIONS	DATE	COMMENTS
A	01/2024	Initial Release

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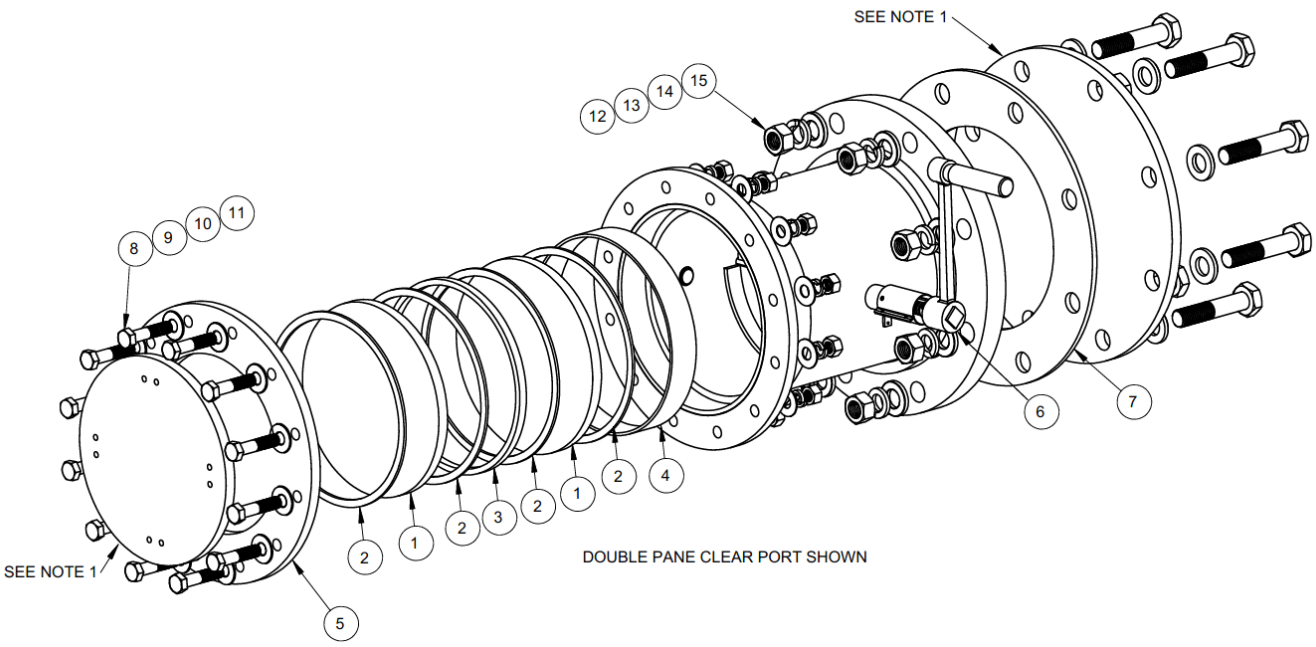
DESCRIPTION

Forney Clear Port observation ports are designed for installation on HRSG ducts and other hot furnaces. Forney Clear Ports provides clear unobstructed view of the duct burner flames as well as pressure parts downstream. Forney Clear Ports includes a butterfly style isolation plate to restrict heat conduction towards the glass. The glass pane is suitable for high temperatures to prevent any discoloration over service life. Butterfly style isolation plate is easy to operate with a spring-loaded side handle. When released, the spring ensures the isolation plate returns to closed position. A cooling air inlet port is provided for user to connect cooling air at specified pressure and flow rate. Forney Clear Ports are Available in 4”, 6” and 8” sizes and are designed to install on a standard #150 ASME flange.



Part No.		Part No.		Part No.	
1	Quartz Glass	2	Primary Gasket	3	Spacer
4	Perimeter Gasket	5	Glass Flange	6	Handle
7	Rear Flange Gasket	8	3/8- 16 UNC SS Bolt	9	3/8-16 UNC SS Nut
10	3/8" SS Flat Washer	11	3/8" SS Lock Washer	12	3/4-10 UNC SS Nut
13	3/4-10 UNC SS Bolt	14	3/4 SS Flat Washer	15	3/4 SS Lock washer

Note 1: Plywood Shipping Shields at both ends are to be removed before installation.

SECTION 2
SPECIFICATIONS

The following specifications are general:

Glass Pane:	Quartz Glass; Fused Silica for High Temperature
Body:	4” , 6”, 8” Schedule 40, 304 Stainless Steel
Isolation Plate:	.25” thick, 304 Stainless Steel
Rear Flange:	Pressure Class: 150, Raised Face, Sch 40, 304 Stainless steel
Gaskets:	High Temperature Ceramic Fiber Temperature Range: -50 to 2,300 Degrees F.
Cooling Air:	Flow: 6 scfm at 3” w.c. above duct pressure
Weight:	4” = 68 lbs., 6” = 91 lbs., 8” = 99 lbs. (45 Kg)
Weilding:	All Welds AWS D1.6 or ASME B31.3
Design Temperature:	1,324 Degrees F.
Design Pressure:	69 MBAR (1.25 PSI)
Mounting Flange (by User):	ASME 4”, 6”, or 8” w/ bolt hole pattern straddling centerline

SECTION 3
SAFETY

Safety is the responsibility of each individual who installs, operates, or maintains Forney equipment. Observe the following safety instructions prior to performing installation, operation, or maintenance on the ClearPort:

CAUTION: High Surface Temperatures are present during operation of HRSG. Always use proper PPE when near or operating the Forney Clear Port when HRSG is in operation.

Eye protection must be worn to safeguard against UV radiation from burner flames.

1. Use this equipment only for its intended purpose.
2. Follow only the installation, operation, and maintenance procedure discussed in this publication.
3. DO NOT climb on or use the Clear Port as a step.
4. DO NOT lock or hold the butterfly style isolation plate in the open position for more than 10 minutes or when unattended.

SECTION 4
INSTALLATION

When installing the Forney Clear Port Safety First. The Clear Port weight approximately 68 to 99 pounds (depending on size), take every precaution when lifting the Clear Port in position for bolting.

3/4” hardware and high temperature ceramic fiber gasket is provided for mounting the Clear Port.

Suggested procedure: With the Clear Port resting on the platform, position the handle on the right side or 3 o’clock position. Install (2) bolts with flat washers in the two top holes of the mounting flange. Use duct tape on the two bolts to prevent them from falling out. Place the high temperature gasket on the two bolts and push all the way back to the flange. Carefully lift the Clear Port to the HRSG mounting flange at the same time align the bolts with the mounting flange holes. While holding the Clear View in position, install the flat washer, lock washer and nut. Loosely tighten the (2) nuts. Install the remaining 3/4” hardware. Using a sequential method of tightening the hardware, torque the bolts 20 ft-lbs. Note: when tightening the bolts, use a crisscross tightening sequence pattern and tighten to 1/3 of the torque required. Once all the bolts are 1/3 of the torque, repeat the tightening sequence to 2/3 of the required torque. Then repeat to final torque. Torque bolts to 94 ft lbs.

Connect the Cooling Air piping. The fitting on the Clear Port is ½” Sch. 40 NPT threads.

Caution: Rout cooling air hose to avoid any low point which may accumulate condensation over period of time. thus, restricting cooling air flow.

Adjust the Cooling Air flow for 6 SCFM at 3.0” w.c. above duct pressure.

SECTION 5
OPERATION

The Clear Port is used for viewing flame combustion in the HRSG. When the isolation plate is rotated 90 degrees, the flame will be visible. Use caution when viewing, the longer the isolation plate is in the open position, the radiant heat from the flame will raise the temperature of the glass and body.

The Handle of the Clear Port has a spring for automatic closure.

Open: Pull the Handle forward to rotate the isolation plate and view the flame.

Close: DO NOT let go of the Handle. No effort is needed to close the Clear Port, guide the Handle back in position with your hand. DO NOT let it slam shut. A spring is used to ensure closure when not in use.

SECTION 6
TROUBLESHOOTING

NOTICE: Work only on the Clear Port when the boiler is shutdown. Make sure the boiler has cooled before attempting repairs

Removing the High Temperature Quartz Glass.

1. The front flange applies pressure to the glass and gaskets for sealing. Remove the (12) bolts and nuts in the front of the Clear Port. As you are removing the bolts, the glass becomes loose, do not allow the glass to fall. Remove the glass before all the bolts have been remove. A Glass to Flange gasket will also be removed with the Glass.
2. After the front flange has been removed and the first glass has been taken out, remove the stainless-steel spacer, the second glass and the gaskets.
3. There is a gasket that lines the inside perimeter of the housing. Remove the perimeter gasket.

Installing the High Temperature Quartz Glass.

1. Ensure all surfaces are clean and dirt free. It is very important that the Glass sits evenly around the edges. Any dirt or build up may cause the Glass to break when tightening the flange.
2. Install the perimeter gasket.
3. Install the round gasket.
4. Install the first Glass. (Hold it in place).
5. Install the round Gasket.
6. Install the Spacer. (Hold in Place)
7. Install the Gasket.
8. Install the Second Glass and hold it in place.
9. Install the Gasket and flange. Applying pressure to the flange, not allowing the assembly to come apart.

   Also be sure to center gasket around the flange.
10. Install the bolts, nuts, flat washers and lock washers. It is recommended that high temperature Locktite is used on the threads of the bolts.

Tightening the Glass Flange Bolts

1. Glass flange bolts torque to 41- 45 in lbs. Note: when tightening the bolts, use a crisscross tightening sequence pattern and tighten to 1/3 of the torque required. Once all the bolts are 1/3 of the torque, repeat the tightening sequence to 2/3 of the required torque. Then repeat to final torque.

SECTION 7
STORAGE

Store the Forney Clear Port in a clean, dry atmosphere. When possible, store the Clear Port in its original shipping container until used. If the Clear Port is removed from its shipping container, store it in a horizontal position with the handle up (or 12 o'clock position) and secure it from rolling. Keep the wooden shipping shields in place at both ends for protection.

SECTION 8
RMA / WARRANTY

Forney Corporation warrants this product to be free of defective material and workmanship. Forney will replace this equipment as long as it is being used for its intended use and is found to be defective upon receipt up to the expiration of the warranty period.

Prior to returning any material to Forney, please contact your Forney customer service representative and provide the contract number or the customer purchase order number.

SECTION 9
SPARE PARTS

When ordering spare parts, contact Forney's Aftermarket Department via any one of the following methods and furnish the following information.

E-mail	Phone	Fax
spares@forneycorp.com	972-458-6100 or 972-458-6142 or 1-800-356-7740 (24-hour direct line)	972-458-6600

1. Contract number
2. Customer purchase order number
3. For each part ordered, provide the following information:
    a. Part number
    b. Part description
    c. Quantity required

The recommended spare parts list in Table 9-1 advises of the minimum stock level of replacement parts that should be in the customer's stock for system startup and the first year of operation. Replacement parts should be ordered as necessary to maintain the suggested stock of spare parts at the recommended level.

TABLE 9-1 Recommended Spare Parts List

Part Description	Part Number	Quantity
Quartz Glass	411635-01	2 for every 20 Clear Ports
Primary Gasket	411682-01	8 for every 20 Clear Ports
Perimeter Gasket	9315113	2 for every 20 Clear Ports
Rear Flange Gasket	411656-01	2 for every 20 Clear Ports
Handle	411693-01	1 for every 20 Clear Ports

The recommended spare parts list advises of the minimum stock level of replacement parts that should be in the customer's stock for system startup and the first year of operation.

NOTICE: Drawing number, stock number, and part number are interchangeable for Forney-supplied items.