

# FASA Fiber Optic Extension

## USER GUIDE

### APPLICATION

The Honeywell FASA-GLASS and FASA-QUARTZ fiber optic extensions for viewing heads make it possible to sight a flame in a hostile environment such as where intense heat or chemicals are present, where flame viewing is obstructed or where burner depth requires the sensor closer to the flame. A fiber optic bundle is used to transmit flame radiation to the remotely located flame detector/viewing head. Flexible stainless steel tubes enclose the fiber optic bundle with forced air injected for cooling.

A lens is used to focus the flame to one end of the fiber optic bundle, with the other end coupled directly to the viewing head. This effectively extends the optical path of the standard Honeywell viewing head, allowing for greater flexibility in sighting flame.

The Honeywell fiber optic viewing head extension is well-suited for solving the sighting problems associated with tilting or movable burners or nozzles. The flame envelope from this type of burner can be tilted from a horizontal position up or down as much as 30 degrees. It would be impossible to follow this flame pattern with a fixed sighting through the burner wind box. Welding the tip guide (lens end) of the fiber optic viewing head extension to the movable air compartment nozzle solves this problem.

The Honeywell fiber optic viewing head extension can also be used in applications where it is impossible to find a clear, unobstructed view of the flame. The fiber optic extension is mounted inside the windbox for a clear unobstructed view of the flame.

Another application would be gas and oil fired turbines where there can be a combination of high levels of vibration, high temperature and pressure excursions.

Generally speaking, the Honeywell fiber optic extension should be considered for applications where the flame signal is poor from a normal windbox location, the temperature exceeds the viewing head ambient rating, where under high load conditions the target flame moves away from the line of sight or view is obstructed.

Typical applications may include:

- Tilting burner firing pulverized coal, oil or gas
- Low NOx coal burners
- Gas and oil fired turbine generator
- Where a clear view of flame is not possible in register type burners

### FEATURES

- **Transmission up to 40 feet (about 12 meters)**
- **Withstands high/low temperatures -40 to +760° F (-40 to +400° C)**
- **Corrosion protected stainless steel construction**

### SPECIFICATIONS

#### Purge/Cooling Air Required (typical):

10 SCFM @ 10" WC (0.25 Nm<sup>3</sup>/min @ 25.4 mm WC) above back pressure. Purge and cooling air must be oil and moisture free delivered at less than 40° C (100° F)  
 1 in. NPT connection on outer carrier mount  
 ½ in. NPT connection on viewing head flange (model dependent).

#### Temperature:

Lens and fiber optics: See above

#### Environmental Ratings:

NEMA 4X (IP56) and lens end sealed meets hazardous location

#### Mounting:

Outer carrier tube guide 3.375 in. OD x 9 in. long. Stainless steel, welded to air compartment nozzle. Outer carrier tube connected to 3 in. NPT mounting assembly via 3 locking screws. Note mounting may be project specific. The above is an example only.

### Product Description

The Honeywell fiber optic extension typically consists of three major assemblies; outer carrier tube and tip guide, inner carrier tube and lens assembly with fiber optic bundle.

One end of the outer carrier tube is fitted inside with 4 guides (rods) for centering the inner carrier tube lens assembly holder. This end of the outer carrier tube slips into the tip guide which is permanently fixed. One end of the inner carrier tube is designated the lens assembly holder. The lens assembly is coupled to the fiber optic bundle. The lens assembly and fiber optic bundle are fastened inside the inner carrier tube lens assembly holder with a pan head screw.

The fiber optic cable bundle is removable for installation and maintenance. To replace the fiber optic cable, remove the fiber optic assembly inner carrier. Unscrew the lens assembly from

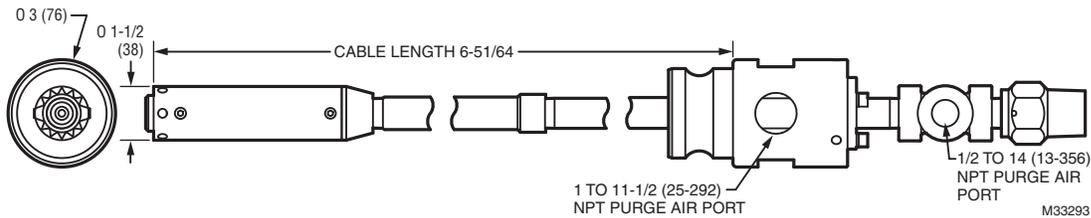


the outer carrier. There are two parts to the lens assembly, the lens cartridge and the fiber optic coupler. The lens cartridge contains a lens and a quartz window with a retaining ring. The window is forward of the lens and serves to protect the lens

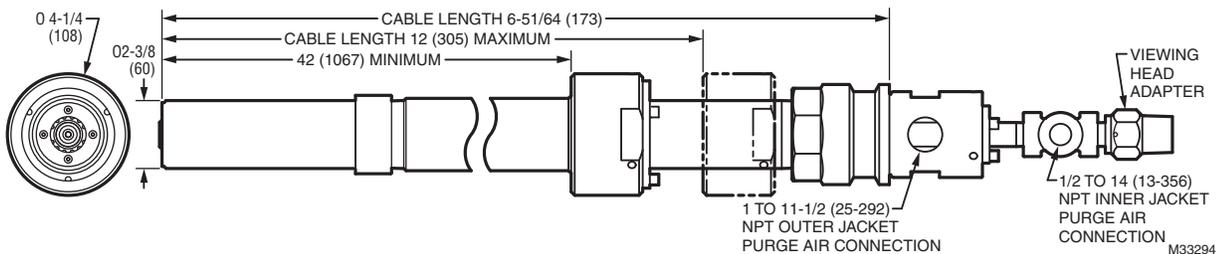
from being damaged or becoming dirty due to oil spray or coking from solid fuels. The fiber optic lens cartridge is ordered separately.

**Table 1. Fiber optic extension component ordering list.**

Base Part Number	Length Adder	Description
FASA-GLASS	FASA-GLASS-FT	Glass fiber optics complete assembly for IR flame detection with guide pipes and flex connection. Standard assembly length 5-feet. Standard 5-ft fiber optic cable. Use FASA-GLASS-FT to add additional assembly length in 1-ft increments. Order lens cartridge separately. Order viewing head adapters separately.
FASA-QUARTZ	FASA-QUARTZ-FT	Quartz fiber optics complete assembly for UV/IR flame detection with guide pipes and flex connection. Standard assembly length 5-feet. Standard 5-ft fiber optic cable. Use FASA-QUARTZ-FT to add additional assembly length in 1-ft increments. Order lens cartridge separately. Order viewing head adapters separately.
FOLC-9C	-	Fiber optic lens cartridge and coupler - 9 degree connection.  NOTE: The 9 degree lens cartridge is typically only used on rigid fiber optic extension systems (not flexible extensions).
FOLC-SC	-	Fiber optic lens cartridge and coupler - straight connection.
S550FOAD	-	Fiber optics adapter for S55XB and S55XBE viewing head.
S550FOADY-FT	-	Fiber optics adapter with air purge connection for S55XB and S55XBE viewing heads.
S550FOADY-FT-AL	-	Fiber optics adapter in aluminum with air purge connection for S55XB and S55XBE viewing heads.
S700FOAD	-	Fiber optics adaptor for S700 series viewing heads with lens and retainer ring.
S800FOAD	-	Fiber optics adaptor for S800 series viewing heads with lens and retainer ring.



**Fig. 1. Inner carrier assembly example.**



**Fig. 2. Outer carrier assembly example.**

**Table 2. Fiber optic extension component ordering list.**

Base Part Number	Length Adder	Description
FOC-GLASS	FOC-GLASS-FT	5-ft Fiber optic cable, glass bundle for IR viewing heads with high temperature epoxy. Use FOC-GLASS-FT adder for each additional foot in length required.
FOC-QUARTZ	FOC-QUARTZ-FT	5-ft Fiber optic cable, quartz bundle for UV/IR viewing heads with high temperature epoxy. Use FOC-QUARTZ-FT adder for each additional foot in length required.
FASA-INT-GLASS	FASA-INT-GLS-FT	Glass fiber optics inner carrier assembly for IR flame detection with flex connector. No guide pipes. Standard assembly length 5-ft. Standard 5-ft fiber optic cable. Use FASA-INT-GLS-FT to add additional assembly length in 1-ft increments. Order lens cartridge and viewing head adapters separately, if required.
FASA-INT-QUARTZ	FASA-INT-QTZ-FT	Quartz fiber optics inner carrier assembly for UV/IR flame detection with flex connector. No guide pipes. Standard assembly length 5-ft. Standard 5-ft fiber optic cable. Use FASA-INT-QTZ-FT to add additional assembly length in 1-ft increments. Order lens cartridge and viewing head adapters separately, if required.
FOLC-HC	-	Replacement fiber optic lens cartridge mounting hood/lens housing with 1/2 inch NPT connection.
FLEX-HOSE	-	1/2 in. NPT x 36 in. long flex hose for fiber optics assembly.

## INSTALLATION

### When installing this product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and marked on the product to make sure the product is suitable for the application
3. Installer must be a trained, experienced flame safeguard serve technician.
4. After installation is complete, check out the product operation as provided in these instructions.

### **WARNING**

**Fire or Explosion Hazard.**  
**Can cause property damage, severe injury or death.**

To prevent possible hazardous burner operation, verify safety requirements each time a control or viewing head is installed on a burner.

### **WARNING**

**Electrical Shock Hazard.**  
**Can cause serious injury, death or equipment damage.**

Disconnect the power supply before beginning installation to prevent electrical shock, equipment and control damage. More than one power supply disconnect may be required.

## Location

Humidity- 0-100% non condensing

Temperature - fiber-optic bundle meets 400° C or 752° F

## Mounting

**NOTE: Mounting instructions below apply only to tilting burners. Mount to suit your specific application.**

Outer carrier tube guide 3.375 in. OD x 9 in. long. Stainless steel, welded to air compartment nozzle. Outer carrier tube connected to 3 in. NPT mounting assembly via 3 locking screws.

### **IMPORTANT**

*The lens inside the inner tube assembly, affixed to the fiber optic cable, can be damaged from welding spatter. When welding is to be done in the near vicinity, protect the lens by either removing the inner carrier assembly from the outer carrier assembly or by putting a temporary protective cover over the opening in the mounting block.*

The flame signal generated in the primary combustion zone is transmitted via the fiber optic bundle to the Honeywell viewing head located outside the wind box. For corner fired units the outer carrier tip guide is welded to an air compartment nozzle parallel to the fuel flow. The outer carrier centering guide slip fits into this outer carrier tip guide and the other end is fastened to the burner front plate (outside the wind box) via the 3 in. NPT packing gland.

The flexible portion of the carrier tube allows for the vertical movement of the tilting nozzles (±30°). The outer carrier tip guide can be installed either in the right or left hand side of the nozzle and the outer carrier should be brought straight through the air compartment.

### **IMPORTANT**

*When installing in a tilting burner application make sure there is no excess lag or stretching of assembly. Ensure the outer carrier does not have kink or the possibility of binding when nozzles are tilted up or down. Inner carrier should be removed or installed when nozzle is in horizontal position only.*

## CARE AND MAINTENANCE

With proper purge/cooling air that is free of oil and moisture, periodic cleaning is not required. The fiber optic assembly and cable should last for a long time unless physically damaged, the temperature is elevated beyond the design by restriction or loss of air flow, or using contaminated purge/cooling air.

### Automation and Control Solutions

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