COPELAND

790-* series universal & direct OEM replacement flame sensors

New product introduction

Introducing White-Rodgers OEM direct replacement flame sensors

The White-Rodgers 790-* line of flame sensors

What is a flame sensor?

A flame sensor is a probe that is installed in front of a burner where a flame would burn during operation. Electric is applied to the rod from the control board. When the flame comes on and contacts the rod a DC micro-amp signal is sent back to the control board. This signal tells the board the flame is on.

Old technology of a thermocouple system was slower to react to reading if a flame was present. It relied on the flame heat to generate an electrical signal itself.

W/R OEM flame sensors are now available* for:

- Carrier
- Goodman
- Lennox
- Trane
- York

*Note: Check cross-reference list for exact match.

Easy to install, premium quality, durable

Flame sensor – Where is it used and why is it important?

Purpose

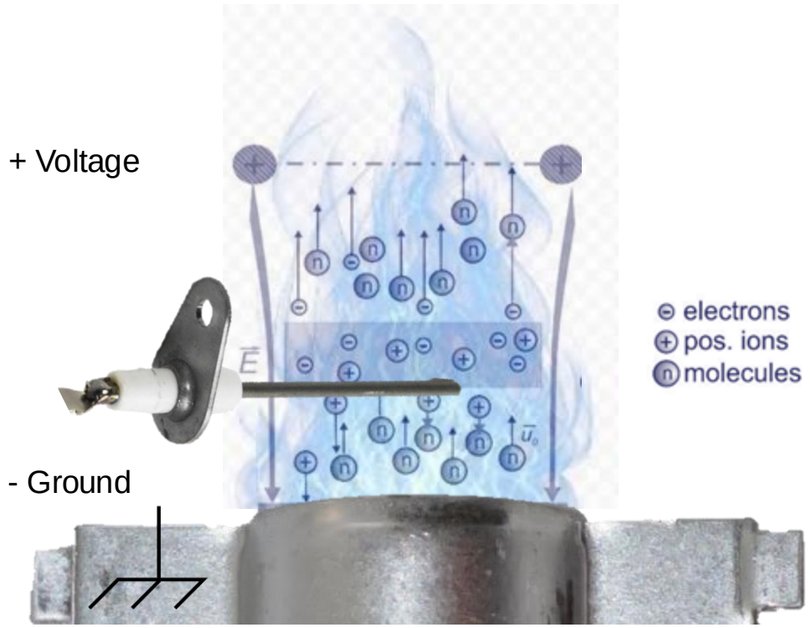
A flame sensor is the industry standard safety circuit for all gas fired furnaces.

- It is the mechanism which proves the gas has ignited.
- If ignition failed without this safety feature, raw gas would be released into the furnace and create potential for an explosion.

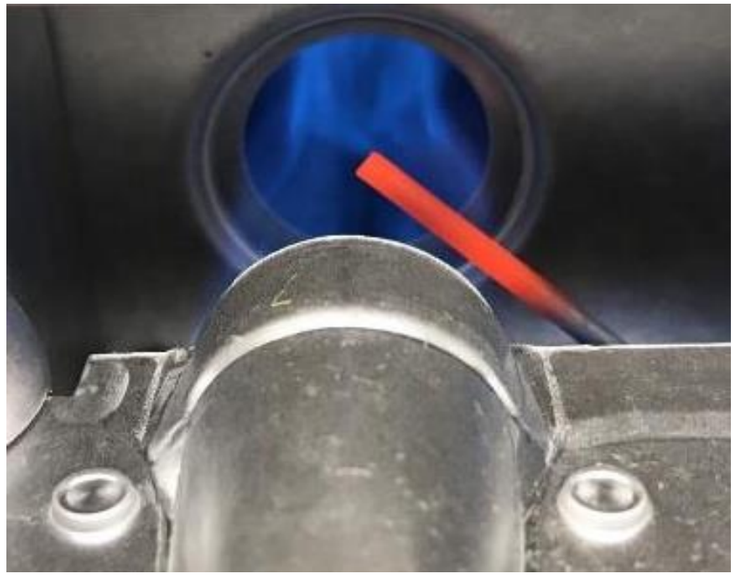
Flame sense science – Understanding gas properties

During the burning process:

- Carbon, hydrogen, & oxygen atoms are separated.
- This “Flame Ionization” process creates free positive ions within the flame.
- The positive ions carry the flame probe voltage to the grounded burner completing an electrical circuit.



- These positive ions only carry ½ of the AC signal to the ground, causing the AC voltage to be rectified to DC.
- The amount of DC voltage grounding to the burner metal through the positive ions is so small it can only be read in microamps.



Flame sensor operation factors

Film build-up

During the combustion process, silicon oxide is formed as a small by-products of the burnt fuel. It appears as a white coating. Silicon compounds are known as insulators and can prevent the voltage from being able to ground.

Surface degradation

Cleaning the probe with a coarse material such as sandpaper can potentially score the probe. The roughing of the probe surface will then allow silicon oxide build up faster.

Metal composition

Flame probe rods have been made of various metals. In the 80’s rods broke. In the 90’s some rods built up silicon oxide rapidly. Today, White-Rodgers probes are made of Kanthal material that has been proven to be more stable & reliable.

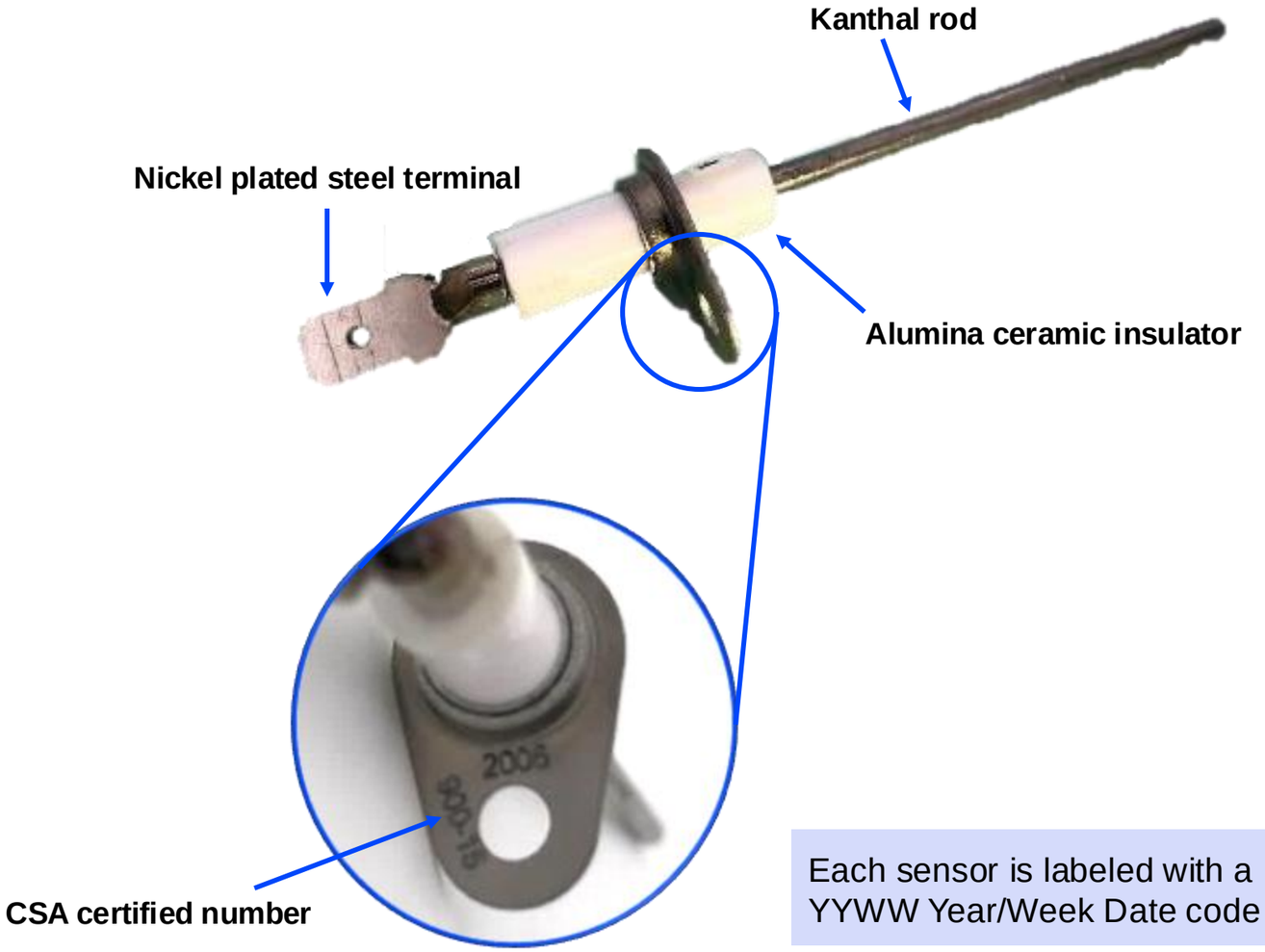
White-Rodgers flame sensor composition

Materials

Nickel plated steel is used for the spade connector terminal, making it corrosion resistant.

Kanthal is made of iron, chromium, & aluminum. It has good conductive qualities that allow electric to pass through it and is resistant to deteriorating.

Alumina ceramic is a widely used advanced ceramic. It is extremely resistant to wear and makes an excellent insulator.



Each sensor is labeled with a YYWW Year/Week Date code

NEW

Premium direct OEM replacement flame sensors

CARRIER / ICP

790-751A1

GOODMAN

790-707A1

- Designed for each specific OEM model
- Simple, straight-forward, and easy to install
- CSA certified
- Withstands 2200°F
- 3 year warranty

LENNOX

790-801A1

TRANE

790-820A1

YORK

790-956A1

White-Rodgers is now offering 790-* series flame sensors that match OEM bracket, lead connection, length, & bend specifications.

NEW

Flame sensor benefits / comparisons

Heat rated higher than the competition

White-Rodgers flame sensors are rated 2200°F compared to our competitors' ratings of 1800°F.

Longer warranty

White-Rodgers flame sensors come with a 3-year warranty compared to other brands 1-year warranty.

Cases include tabs

When vendors purchase a full master carton of flame sensors, the carton will contain 10 hang tabs that can be applied to each box for hanging on a display.

Direct Drop-In OEM Replacements

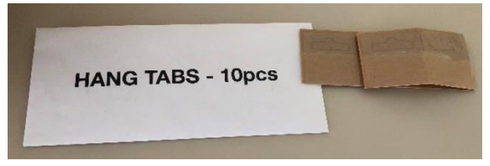
Carrier, Goodman, Lennox, Trane, York

OEM approved construction and material

Durability

High temperature rod withstands 2200°F

3 Year Limited Warranty



WHITE-RODGERS by COPELAND

NEW

New White-Rodgers premium universal flame sensor

UNIVERSAL 790-843A1

White-Rodgers universal flame sensor has more cross-references than any other sensor on the market!

Features

- Designed to be bent & cut to match an existing sensor
- Can be made to replace over 120 SKU’s
- Instructions list cross-references including bending angle
- CSA certified
- Withstands 2200°F 3 year warranty

White-Rodgers previous universal flame sensor

Features

- Had an Alumina ceramic insulator.
- High temperature Kanthal flame rod material was only rated to withstand 1800°F.
- Had a Teflon insulated (250°C rating) lead wire directly connected to the sensor.
- Utilized a single screw, plated steel mounting bracket.
- Did *not* include any cross-reference list or bending/cutting instr.

760-401

The 760-401 product still in inventory has had its pricing dropped to match the new improved 790-843A1 pricing.

Universal instructions explain bends & lengths

Instruction detail

The universal flame sensor comes with instructions that give detail of bend angle and have a diagram showing what degree angles are.

Instruction tables include OEM brand & part number, along with cutting & bending requirements.

A protective sleeve is included in the box to protect the rod during the bending process.

To accurately detect bend angle:

1. Align ceramic portion of flame rod parallel to 0° bend line
2. Place beginning of rod bend in center of red circle
3. Follow °bend line of bent flame rod for correct angle

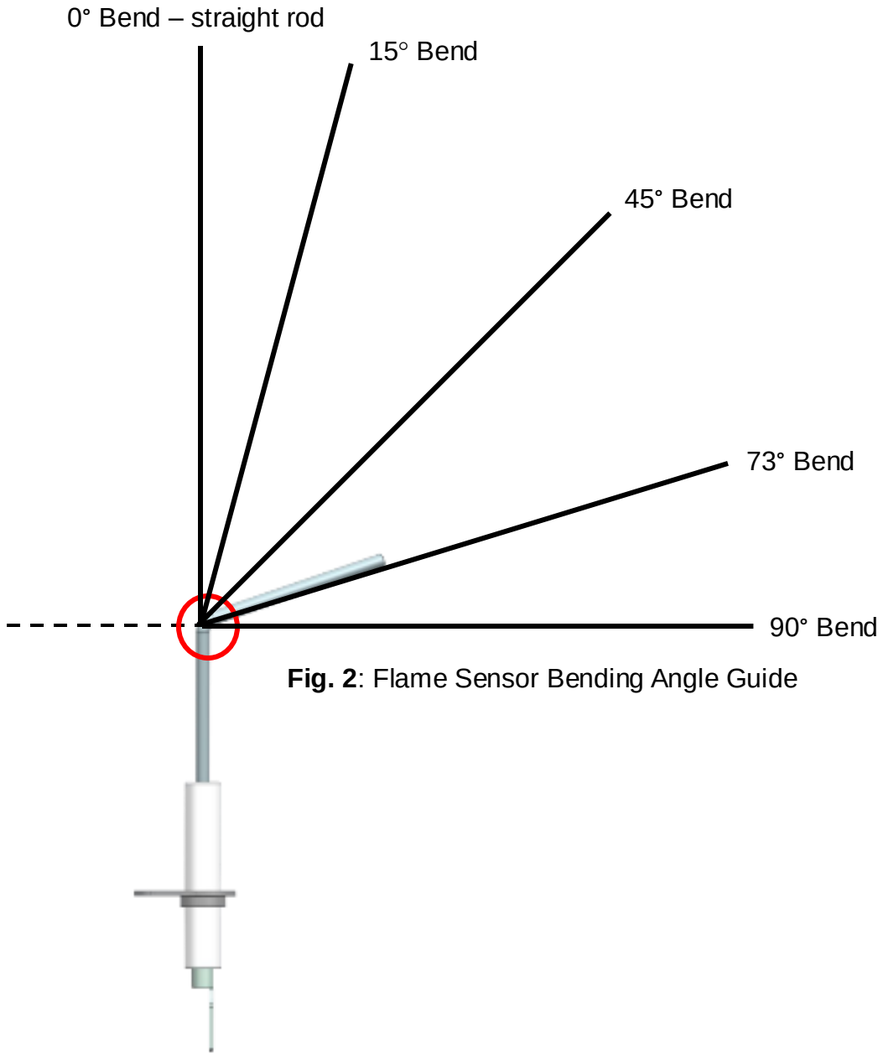


Fig. 2: Flame Sensor Bending Angle Guide

What’s in the box

List of contents:

- Premium flame sensor
- Instruction sheet
- Protective sleeve
- Replacement wire lead
- 3/16” Spade connector

CROSS REFERENCE REPLACEMENT/TABLEAU DE RENVOI DES REPLACEMENTS

A. O. Smith Brands	Goodman /Amana Brands	69W43	Reznor	York/JCI Brands
100110905, 0707	C6437502	44L48	RZ195292	(S1) 025 27773 700
100109908, 66	10735201	28M97, 01	RZ147165	(S1) 025 30788 700
100112678	0130F00010	49M84	Rheem /RUUD Brands	(S1) 025 37499 000
Armstrong	B1172606, -06	52M72	62-23543-01, -02, -06, -08	(S1) 025 35354 000
R44745-001	Lennox /Allied Air Brands	20467102	62-23543-05	S1-2845-3111
R46895-001	98M87	12L09	SP12144	S1-2702-311P
Carrier/ICP Brands	52W29	Modine	Trane/American	(S1) 025 32661 002
LH680013*	R45708-002	5H75031	Standard Brands	02536314000
LH33WZ514*, 516*	83L72	Nordyne Brands	SEN1114, 01114	(S1) 025 35306 000
LH680534*, 014*, 012*	31L71	903600	White-Rodgers	(S1) 025 30802 000
LH33WZ511*, 515*	LB-7940A	632484R	760-401	REPLACES OVER 100 PARTS
24376701	Peerless	760-802		
1380687, 679	51585			
LH33WZ518				

For complete cross reference information please download the WR Mobile App.

No Change | Bend | Cut | Bend + Cut | * Needs Connector

5002-1447001

Cross-References are listed on the box

Universal flame sensor

790-843A1

Flame sensor care & maintenance

A very thin layer of silicon oxide forms during combustion. This creates an insulation barrier for the electrical signal and is easily removed.

- **Failing to properly clean a flame sensor can:**
  - Burn foreign material on rod
  - Scar rod creating additional surface roughness
  - Change electrical signal going to board

Best practices

- Alcohol pad

- Steel wool

Acceptable

- Aluminum oxide cloth

- Putty knife

Not recommended

- Silicon carbide sandpaper

- SOS pads

Flame sensor testing

What your meter reading means

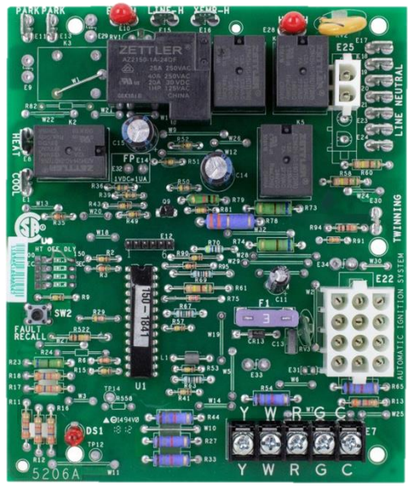
- With a flame present, there should be a reading between 0.1 – 6.0 µA DC.
- Most controls need 0.5 -1.0 µA to “see” the flame and keep the gas valve open. Below that can cause some controls to periodically “drop” out.
- A “good” Microamp reading range is between 2.0 – 5.0 µA.

Quick tips to improve the reading

- Check to make sure the wire is connected solidly.
- Check to make sure the flame rod porcelain is not cracked or grounding the signal.
- Check to see if the rod needs cleaned:
  - Any white film built up on the rod is an insulator needs to be removed.
  - Cleaning does not require a heavy abrasive product.
  - Use very fine steel wool or a piece of paper.
  - Finish with an alcohol wipe.

If the flame sensor is dirty recommend checking the environment for combustion air contamination.

White-Rodgers is rounding out OEM components



OEM integrated furnace controls

3x Carrier
5x Goodman
3x Trane
4x Lennox
1x York

OEM nitride hot surface ignitors

3x Carrier
1x Goodman
3x Trane
2x Lennox
1x York

OEM flame sensors

1x Carrier
1x Goodman
1x Trane
1x Lennox
1x York

Why contractors trust White-Rodgers

- Industry leading products
  - Used by more OEM’s
  - Offering the widest range of universal replacement controls
- Ease of installation
  - Simple, easy to understand instructions
- Reliability of product
  - Quality control provides reliable products
- Affordable
  - Competitive prices
- Supported by knowledgeable representatives
  - Contractor direct phone support

One stop. One solution.
White-Rodgers comprehensive solutions – delivered