

# HTS COMPACT THERMOCOUPLE FOR CLAUS THERMAL REACTORS

## FEATURES

- Compact thermocouple utilizing verified technology for sulfur recovery service
- Worldwide technology standard for protecting Claus thermal reactors
- Maintenance free
- Remains accurate under extreme conditions
- Protects and extends the useful life of refractory and improves reactor up-time
- The only proven thermocouple technology to function reliably long term in sulfur service

## DESCRIPTION

The Delta Controls Model HTS is designed for the primary purpose of reliably protecting a vessel and its refractory lining from excessive temperatures. The HTS is designed for installations without the availability of the preferred larger process connections of the Model HTX. The HTS provides long-term accuracy and reliability in Claus thermal reactor service.

The design of the HTS is the result of attention to detail, 40 plus years of experience, and over 100 field installations. The thermocouple junction is isolated from the corrosive and invasive gases by using a constant very low flow flush gas circulating across the junction. The flush gas is kept at a pressure higher than the internal reactor pressure to mitigate the migration of process gases through the element well, body or seals. Process gases that do enter are carried away by the flush gas. The metered flush gas flow has an insignificant effect on the accuracy of the temperature measurement. The HTS is provided with a nozzle packing kit, the Model HNP, consisting of ceramic fiber rings sized for the customer's nozzle.

For most applications, the Model HTX is preferred as it offers the highest reliability of any Claus Reactor thermocouple. The Model HTS provides a highly reliable alternative compatible with smaller process connections for installations unable to accommodate the recommended 6" process connection of the HTX.

The HTS is built to meet each customer's specific installation requirements, such as; thermocouple type, operating temperatures, nozzle size, insertion length, and materials of construction. The HTS assembly is furnished complete with all necessary installation components. Installation tools are available, and recommended, to accurately produce the refractory bore hole in the correct size and alignment needed for the refractory well and thermocouple assembly.

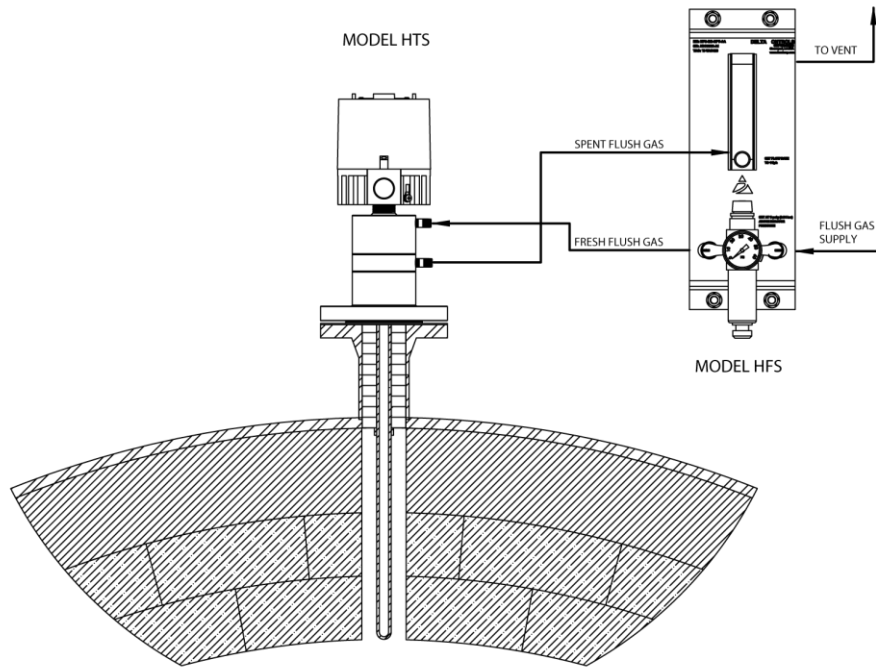


Model HTS with 2"  
Flange Connection

## SPECIFICATIONS

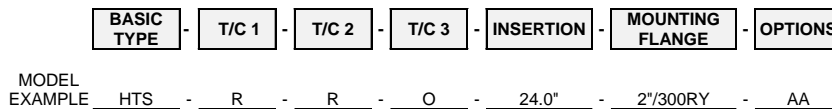
Thermocouple Types:	B, R, S (others available)
Materials:	
Body Material:	Stainless Steel
Trim, Bolting, and Seats:	Stainless Steel
Housing:	Aluminum or Stainless Steel
Element Well:	Blended alumina ceramic
Process Connection:	ANSI 1 ¼", 1 ½" 2" NPTM ANSI 1 ½", 2", 3" RF Flange Other sizes, types, ratings available
Flush Gas:	Nitrogen (11LPH)
Certification:	CL I Div 1 Group B,C,D Enclosure 4X (Housing)
Working Pressure:	150 PSIG (10 Bar) at vessel skin temperature of 500°F (260°C)
Working Temperature:	0 - 3100°F (1700°C)
Required Accessories:	Model HFS Flush Gas Station Model HNP Nozzle Packing Kit
Optional:	<ul style="list-style-type: none"> <li>• Refractory Drill Kit</li> <li>• Thermocouple extension lead wire</li> <li>• Refractory diamond drills and casting mandrels</li> <li>• Field training, consultation and assistance</li> </ul>

## HTS INSTALLED IN A CLAUS THERMAL REACTOR



The clean flush gas flows through the HTS and removes Hydrogen, Sulfur compounds, and corrosive gases that may migrate through the element well. The gas flows into the upper chamber, down an annulus, over the thermocouple hot junction, back up the inside of the element well, and out through the vent connection to the Model HFS flush gas control station. The pressure is set to approximately 5 PSI (0.34 Bar) above the operating pressure of the reactor. This pressure is set by adjusting the regulator. The flow rate through the unit is set to 11LPH. The metered flush gas flow has an insignificant effect on the accuracy of the temperature measurement.

### MODEL NUMBERING SYSTEM



BASIC TYPE	
M/N	DESCRIPTION
HTS	TRIPLE T/C 316 STAINLESS STEEL BODY

T/C 1 & T/C 2 & T/C 3	
M/N	DESCRIPTION *
T	COPPER vs. CONSTANTAN
K	CHROMEL vs. ALUMEL
O	OPEN NO T/C
S	PLATINUM vs. +10% RHODIUM
R	PLATINUM vs. +13% RHODIUM
B	PLATINUM +6% RHODIUM PLATINUM +30% RHODIUM
C	TUNGSTEN +5% RHODIUM TUNGSTEN +26% RHODIUM

INSERTION	
M/N	DESCRIPTION
#"	INSERTION

REPLACE "#" WITH INCHES OF  
INSERTION IN TENTHS

MOUNTING FLANGE	
M/N	DESCRIPTION
2"/150RY	2"/150# RAISED FACE ANSI 316 SS
2"/300RY	2"/300# RAISED FACE ANSI 316 SS
3"/150RY	3"/150# RAISED FACE ANSI 316 SS
3"/300RY	3"/300# RAISED FACE ANSI 316 SS
1.25"MPY	1.25" NPT MALE 316 SS
1.5"MPY	1.25" NPT MALE 316 SS
1.75"MPY	1.25" NPT MALE 316 SS
2"MPY	2" NPT MALE 316 SS

OPTIONS		
M/N	DESCRIPTION	
SS	316 SS TAGS 2.18" x 5.0"	
NIS	ACCURACY CERTIFICATION CHART; TRACABLE TO NIST	C/F
ZZ	CUSTOM ADAPTATION , MATERIALS, ETC.	

**Notes:**

- (1) Temperature shown is the maximum recommended for continuous service

**AUXILIARY COMPONENTS**

M/N	DESCRIPTION - SEE SEPARATE DATA SHEETS	
HNP	Nozzle Packing Kit	
HFS	Flush Gas Control Station	
H6G	Refractory Drilling Kit	
HRS	Nozzle Refractory Stop	



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