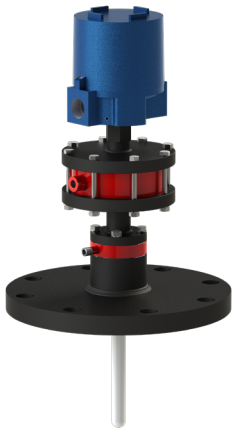
Model HTP • Thermocouple, Sulfur Processing Service

Features

- Worldwide 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
- More than 50 years of proven results in hundreds of installations worldwide
- Keeps working accurately in sulfur service long after other thermocouple designs fail
- Accuracy is continuously verified



Model HTP

Description

The Delta Controls **Model HTP** Thermocouple is designed for the primary purpose of reliably protecting a vessel and its refractory lining from excessive temperatures. The HTP provides long-term accuracy and reliability in sulfur processing service.

The design of the HTP is a result of careful attention to design detail, more than 50+ years of experience, and numerous field installations. The thermocouple junction is isolated from corrosive and invasive gases by using a constant 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 primary thermowell, body or seals. Process gases that 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 HTP is built to meet each customer's specific installation requirements, such as thermocouple type, insertion length, and construction materials. Installation tools are available, and recommended to accurately produce the refractory aperture in the correct size and alignment needed by the refractory thermowell and HTP Thermocouple assembly.

Specifications

Thermocouple Types:	B, R, S (others available)
Flange Material:	Carbon steel or stainless steel
Trim, Bolting, Seats:	Stainless steel
Primary Thermowell:	Blended alumina ceramic
Housing Material:	Aluminum or 316 Stainless Steel
Process Connection:	ANSI 6.0 in Class 150 std (other sizes, types, ratings available)
Flush Gas:	Nitrogen (11 L/h)
Working Pressure:	150 psig (10 bar) at vessel skin temperature of 500 °F (260 °C)
Working Temperature:	0 °F to +3100 °F (0 °C to +1700 °C)
Required Accessories:	Model HNP Nozzle Packing Kit Model HRW Refractory Thermowell Model HFS Flush Gas Station
Optional Accessories:	• Model HRG Refractory Drilling System • Model TEW Thermocouple Extension Wire • Model HMB Horizontal Mounting Bars • Model HRS Refractory Stop • Model HRM Casting Mandrel • Field training, consultation and assistance
Certifications:	
Housing	Third Party Listed by CSA NRTL/C (USA and Canada) Class I, Groups B, C and D; Class II, Groups E, F and G; Class III; Encl 4X

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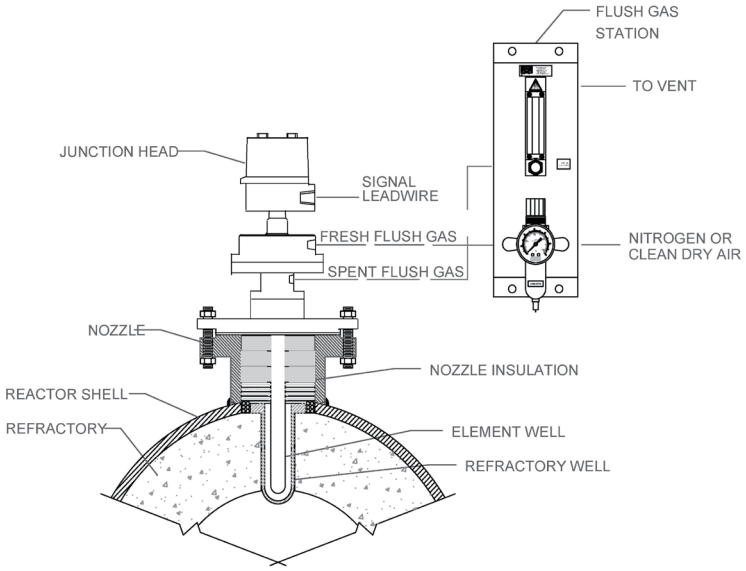
HTP Installed in a Claus Thermal Reactor

The clean flush gas flows through the HTP and sweeps away hydrogen, sulfur compounds, and corrosive gases that may migrate through the primary thermowell. The gas flows from Model HFS Flush Gas Station into the upper chamber, down an annulus, over the thermocouple hot junction, up the inside of the primary thermowell, and out through the vent connection to the Model HFS Flush Gas Station. The pressure regulator output is set to approximately 5 psi (0.34 bar) above the internal reactor pressure. The flow meter is set to 11 liters per hour.



Model Numbering System

MODEL EXAMPLE	MODEL	-	T/C 1	-	T/C 2	-	T/C 3	-	INSERTION LENGTH	-	PROCESS CONNECTION	-	OPTIONS
	HTP	-	R	-	R	-	O	-	15.0	-	6"150RS	-	AA

MODEL	DESCRIPTION
HTP	Thermocouple, Sulfur Processing Service

T/C [1]	DESCRIPTION	RANGE [1]
B	(-) platinum +6% rhodium / (+) platinum +30% rhodium	+212 °F to +3270 °F (+100 °C to +1799 °C)
R	(-) platinum / (+) platinum +13% rhodium	+32 °F to +3200 °F (0 to +1760 °C)
S	(-) platinum / (+) platinum +10% rhodium	+32 °F to +3200 °F (0 to +1760 °C)
O	None (T/C 2, T/C 3 only)	

INSERTION LENGTH	DESCRIPTION
**.*	**.* in from flange face to inside face of the refractory

PROCESS CONNECTION	DESCRIPTION
4"150RS	4 in Class 150 raised face flange, carbon steel
4"300RS	4 in Class 300 raised face flange, carbon steel
6"150RS	6 in Class 150 raised face flange, carbon steel
6"300RS	6 in Class 300 raised face flange, carbon steel
4"150RY	4 in Class 150 raised face flange, 316 Stainless Steel
4"300RY	4 in Class 300 raised face flange, 316 Stainless Steel
6"150RY	6 in Class 150 raised face flange, 316 Stainless Steel
6"300RY	6 in Class 300 raised face flange, 316 Stainless Steel

Model Numbering System

MODEL EXAMPLE	MODEL	-	T/C 1	-	T/C 2	-	T/C 3	-	INSERTION LENGTH	-	PROCESS CONNECTION	-	OPTIONS
	HTP	-	R	-	R	-	O	-	15.0	-	6"150RS	-	AA

OPTIONS	DESCRIPTION
AA	None
XPB	300 grade stainless steel housing

Notes:
[1] Temperature shown is the maximum recommended for continuous service

REQUIRED ORDERING INFORMATION

- Detailed model number
- Tag or nameplate detail (if required)
- Documentation & testing packages (if required, refer to Additional Resources)

INSTALLATION DETAILS

- Nozzle inside diameter
- Shell thickness
- Nozzle inside height
- Refractory thickness
- Nozzle angle from vertical

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