



new needs, new solutions

**RODAX<sup>®</sup>**



FURNACE & BOILER  
THERMOCOUPLES



## RODAX TEMPERATURE SENSORS SUPERIOR QUALITY ADAPTED TO YOUR NEEDS

### With you every step of the way

Although we offer complete temperature solutions, we are specialised in furnace and boiler thermocouples, and multipoint reactor temperature assemblies for use in the chemical, petrochemical and energy industries. As we realize that these are critical applications, we work closely with our customers. Our engineers are there to guide you every step of the way.

Over the years we have worked for clients like Esso, Shell, Total, Q8, Foster Wheeler, Jacobs Engineering, etc.

### Project Management

In working together with the above mentioned companies, we have developed a strong management tool to support your most demanding project requirements.

We are thus capable of handling large projects in a professional way.

### Certified quality

As we provide services and products for critical industrial processes, all our products are tested to the max. Apart from that, we operate under the ISO 9000:2008 quality system. We are both IECEx and ATEX certified by Kema according to European Directive 94/9/EC (Equipment intended for use in potentially Explosive Atmospheres). And we are also Gost R certified.

### More than 20 years of experience

We are situated close to Antwerp and Rotterdam, two of the largest petrochemical complexes of the world.

Since our incorporation in 1985 we serve these markets. By developing highly functional services and products we created a loyal customer base.



# DESIGNED TO LAST

Rodax Furnace and Boiler Thermocouples are installed in challenging environments. Therefore, special care must be taken in defining the right product and choice of materials for the process involved. In order to maximize and maintain safety of operations, tube skin temperatures need to be precisely monitored. That is why Rodax Furnace and Boiler Thermocouples have been designed to meet strict objectives:

## Long life

The selected head type and sheath material are very critical to process conditions. Companies aim to increase time between stops, nowadays typically between 4 and 6 years versus a tube life design of 10 years. Tubes can indeed exceed the design life time when run at a lower than intended temperature. Our expert engineers will assist you in the choice of materials so you can save considerably on downtime and maintenance.

## Economy on fuel

Measuring the exact temperature is very critical to firing the furnace or boiler at an economic rate.

## Increased tube life and tube reliability

Tube failures are most commonly due to overheating. Economic firing of furnaces or boilers reduces material wear. Therefore particular attention must be paid to on-stream tube temperature monitoring. Coke detection requires a very accurate measurement method as well.

## Rodax criteria for correct measurement:

- Choosing the best mounting method and sensor form.
- Defining the materials needed in dialogue with the customer.
- Identifying the best way to conducting your measurement outside the furnace.



# EXPERT ADVICE FOR MAXIMUM EFFICIENCY

## Prior to installation

It is very important that furnace thermocouples are correctly installed in order to keep providing reliable measurements at least until the next stop.

All furnaces do have individual characteristics. Our engineers can assist you by conducting a survey of the geometry of pipes where the thermocouples are planned to be located and by drawing up individual installation guidelines for contact, guiding and expansion.

The next step is to dimension the shape of the thermocouple and the choice of materials taking into account the expansion or creep of the pipes, the radiation effects on the mineral insulated cable and the specific requirements of the customer (location of the thermocouple, ATEX requirements). This allows us to preshape the thermocouples at the factory, thus saving considerable installation time.

In case of a requirement for shielding and maximum protection of the mineral insulated cable against radiation, a layer of ceramic braid cover resisting up to 1500° C can be applied.

The thus conceived individual drawings are tagged and stored for future reference possibly helping to reduce the next shutdown time.





# ON-SITE INSTALLATION & SERVICES

## Experience and expertise at your service

Our company is VCA certified and our individually certified welders are very familiar with the environment. They have extensive experience in performing precision tasks according to the procedures laid down by our engineering department. Nevertheless, we always have engineers on-site to supervise the installation.

We maintain a complete set of mobile equipment for installation, repair or modification on site.



# FLEXIBLE CONFIGURATION OPTIONS

## Rodax furnace and boiler thermocouple models

The following basic types are available:

BOILER & FURNACE THERMOCOUPLES							
Configurations	Area Classification	Type					Nomenclature
		50	51	52	53	54	
Straight F	D	FD50	FD51	FD52	FD53	FD54	General
	E	FE50	FE51	FE52	FE53	FE54	IECEX/ATEX Ex i
	F	FF50	FF51	FF52	FF53	FF54	IECEX/ATEX Ex e
Expansion loop G	D	GD50	GD51	GD52	GD53	GD54	General
	E	GE50	GE51	GE52	GE53	GE54	IECEX/ATEX Ex i
	F	GF50	GF51	GF52	GF53	GF54	IECEX/ATEX Ex e
S-loop H	D	HD50	HD51	HD52	HD53	HD54	General
	E	HE50	HE51	HE52	HE53	HE54	IECEX/ATEX Ex i
	F	HF50	HF51	HF52	HF53	HF54	IECEX/ATEX Ex e

All types of thermocouples are available. Most popular are types K and N.

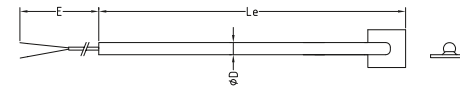
We offer a wide variety of materials. Most used are Hastelloy X, HR 160, Inconel 600, SS 310 and SS446 in single, heavy and double wall constructions.

For more details visit our website [www.rodax-europe.com](http://www.rodax-europe.com)

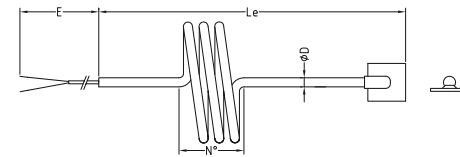


## Available configurations

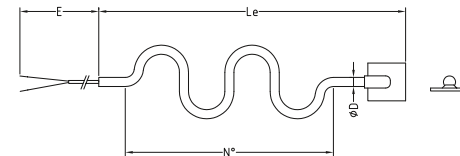
### Straight Type F



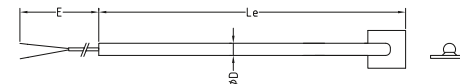
### expansion loop Type G



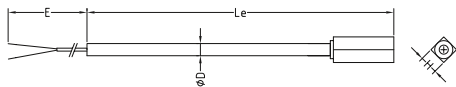
### expansion S loop Type H



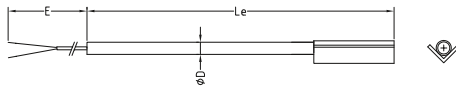
### PAD TYPE FS-50



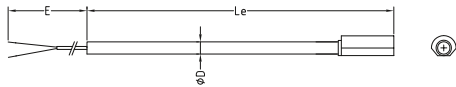
SQUARE TYPE FS-51



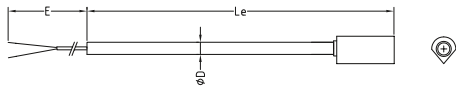
V TYPE FS-52



STRAIGHT WITH MACHINED TIP FS-53



MACHINED POINTER TIP FS-54



# OPTIMAL PERFORMANCE IN EXTREME CONDITIONS

## Flue gas temperature measurement

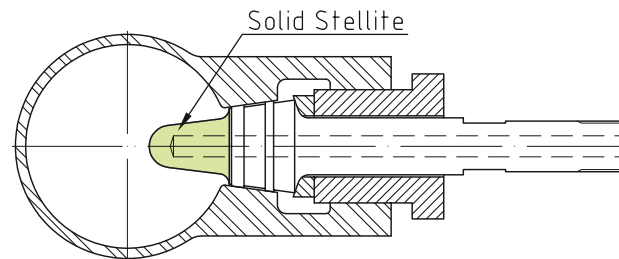
Flue gas temperature sensors are designed for temperature measurement in harsh environments such as high temperatures (max. 1600° C) and abrasive media.

All ceramic materials are available. However, we prefer to work with Silicon Carbide as this material has excellent chemical resistance properties, high abrasive resistance and thermal shock resistance, very low permeability and a high mechanical strength compared to other ceramics.

All wells are made to customer specification.

Most thermocouples used are types R, S, B, K and N.

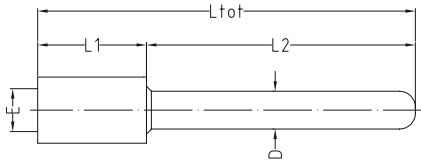
Model of a coil outlet thermocouple



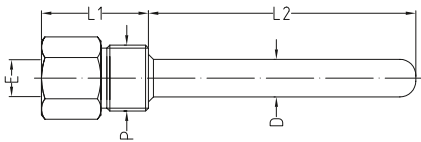


# ALL CRITICAL FACTORS UNDER CONTROL

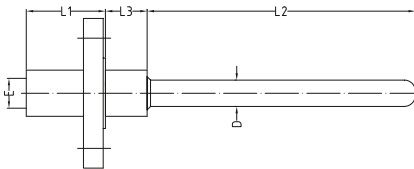
Ceramic thermowell Hexoloy type, without process connection



Ceramic thermowell Hexoloy type, threaded process connection



Ceramic thermowell Tubular Hexoloy, flanged connection



## Furnace outlet temperature measurement

During the refining process the interior of the tubes becomes congested with baked-on coke, mostly just before the bend. As a consequence, more heat is required on the furnace tubes to maintain charge temperatures. Through time this build-up may even completely plug the tubes. Our skin thermocouples monitor the temperature at the most vulnerable spots.

These coke particles are also very abrasive. They fly at high speed through the tubing system towards the outlet causing extreme wear and tear on the inside walls. The outlet thermowell tip must therefore be protected with a wear-resistant layer. Among the choices available we offer bar stock Alloy 6B. Thermowell tips are Eutalloy or a stellite layer.

All wells are made to customer specifications.

Most thermocouples used are types K and N.



# A WIDE RANGE OF ASSEMBLIES

## Industrial assemblies

- Quality materials
- 100% process control
- Proven reliability of measurements
- Designed to last at least 10 years



We manufacture a very broad range of assemblies covering the majority of industrial applications.

In order to cover the needs of our customers we developed and perfected high vibration resistant temperature sensors for the most demanding applications like rotating equipment.

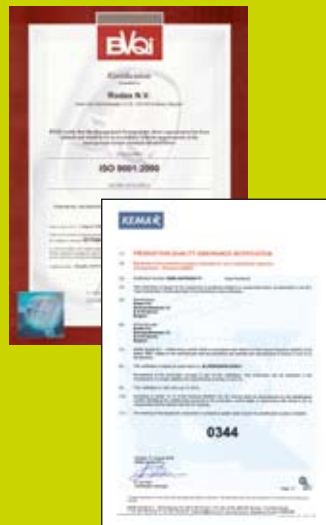
Finally we produce a complete range of machined and bar stock thermowells.



## Multipoint reactor temperature measurement

Our 20 years of experience with assemblies for chemical reactors makes us experts in the field. We work with quality materials that are processed in a fully controlled environment. That is why we are able to manufacture all popular types of thermocouples and materials and why we have designs from discrete to weld-in types available in all industrial dimensions.

Key features are rugged, reliable and long life design criteria.



## Certifications

- Certified to ISO 9000:2008
- Certified by Kema for ATEX EC 94/9/EC for use in potentially explosive atmospheres.
- Certified IECEX by Kema
- Gost R certified.
- Lloyds full retraceability for materials.
- Welder qualifications WPS/PQR available for many materials.



Santvoortbeeklaan 33, 2100 Antwerpen - Belgium • T: +32 (0)3 360 90 00 • F: +32 (0)3 326 44 74

[customersupport@rodax-europe.com](mailto:customersupport@rodax-europe.com)  
[www.rodax-europe.com](http://www.rodax-europe.com)