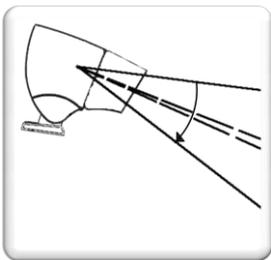


Rota-Sonde

TS5500



Visible Laser Line for easy alignment

Wide Infrared spectrum

Innovative display on back panel

Configurable sensor



Features

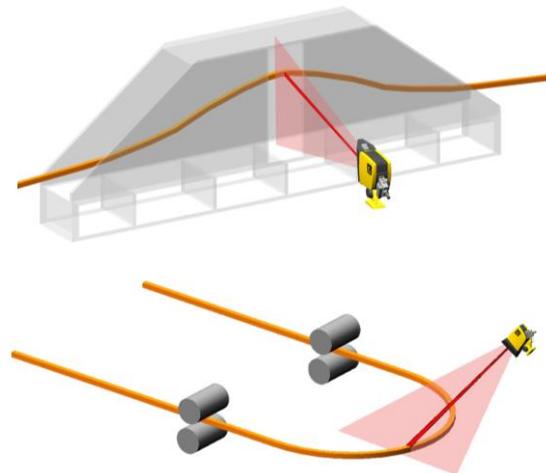
The **Rota-Sonde TS5500** measures the position of a hot product (steel, copper, brass, other alloys) within its field of view and provides an output which is proportional to the angular position of the product within that field.

The **Rota-Sonde TS5500** is a scanning measuring sensor, sensitive to infrared radiation emitted by hot products with a minimum temperature as low as **250 °C** (480 °F).

Main features & benefits:

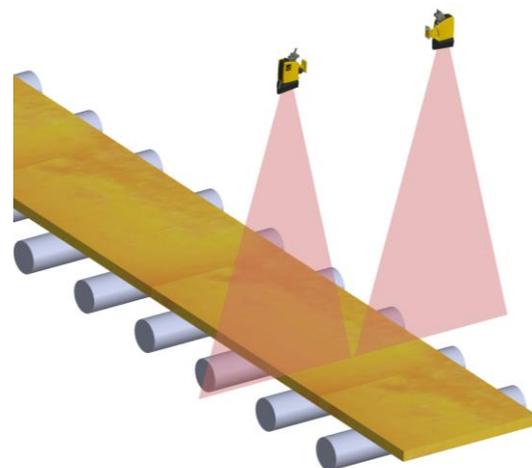
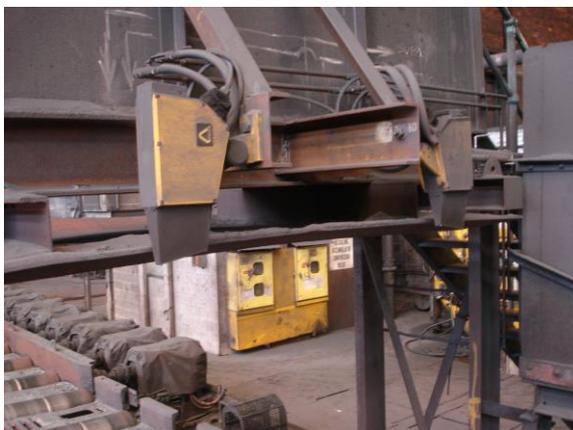
- Quick & Easy commissioning with green laser line (TS55●●-LL) or red laser pointer (TS55●●-LP).
- Control panel with display of position of hot product (% of scanning angle) & led bargraph for Signal level & Threshold setup.
- Sensor configurable by user (TS559●-●●): scanning angle, sensitivity range, output value in product absence.
- 2 analogue outputs (4-20 mA and 0-10 V) and 1 digital output (product presence).
- High sensitivity: from 350 °C (660 °F) or from 250 °C (480 °F), selectable by user.
- No need of shutter adjustment (4 mm fixed shutter) thanks to a better photocell dynamic.
- Self-diagnostic functions: 2 digital outputs Control and Alarm.
- Optoelectronic circuit enclosed in a heavy-duty housing (IP66), designed to work in the harsh environment of the steel industry.
- Air purging and water cooling.
- Connector and cable with metallic protective braid.

Applications



Vertical & Horizontal loop control

The main purpose of loop scanner is to give the position of the product between 2 stands in order to control their speed.



Hot strip, plate, slab centring - Slab edges control for torch machine

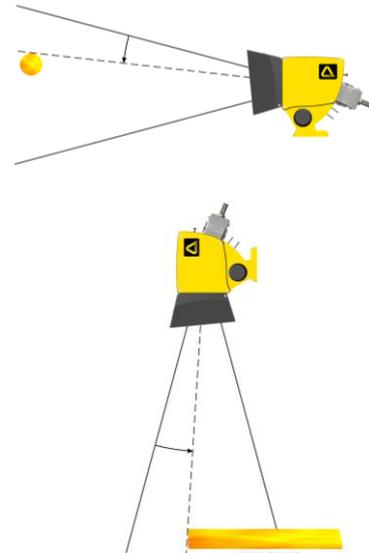
Edge position feedback allows centreline & width measurement.



Operating principle

The **Rota-Sonde TS5500** is sensitive to infrared radiation and is optimized for detection even at low temperature and in the presence of steam. The sensor detects the first edge of the product within the scanned field, i.e. the first transition "no radiation / presence of radiation", direction of scanning being from the top to the bottom of sensor.

When the analytical beam of the sensor detects infrared radiation from the leading edge of a hot product within the scanned field, the reflection of that radiation by the mirrored drum onto the measuring cell provides a signal which is converted into a "measuring" pulse. In addition, the sensor generates a reference pulse, which corresponds to the beginning of the scanned field. The time between the reference pulse and the measuring pulse is equivalent to the angle between the beginning of the scanned field and the position of the leading edge of the hot product. The sensor converts the time into an analogue output, which is proportional to the angle.



Construction

Mechanical Features

- Heavy duty **aluminium housing** (IP66), designed to work in the harsh environment of the steel industry.
- **Adjustable mounting stand** with indication of the inclination angle etched into the toggle joint.
- **Cooling plate** with stainless steel pipe to permit use of industrial cooling water. This cooling plate is independent of the sensor body and includes the connections for air and water. This design permits quick substitution of the sensor without disconnection of the cooling water or purging air and also eliminates the need for the realignment of the sensor.
- Hinged **protective hood with quick latch** to permit easy access to clean the window glass in front of the sensor.
- **Heavy duty connector** and high temperature cable with protective steel braid.



Control panel beneath flip cover

- **Display of angle:** position of hot edge in % of the detection angle, from the bottom of field of view.
- **Bargraph** of 13 green led to display the level of signal and the threshold setup (blinking led).
- Green led for **Product Presence**.
- Orange led for **Control** (low detection margin).
- Red led for **Alarm** (sensor failure).
- Push-button to switch ON/OFF the **Laser**. A long push (> 3 sec) will also generate a **Test** for product simulation.
- Potentiometer for **sensitivity adjustment**.
- Push-button (TS559 version) to let the user **configure** the scanning field of view (50° or 30° or 10°), the output signal in product absence (low or high level), the sensitivity range (N or H). The confirmed choices are displayed with the corresponding blue led in the right part of control panel.



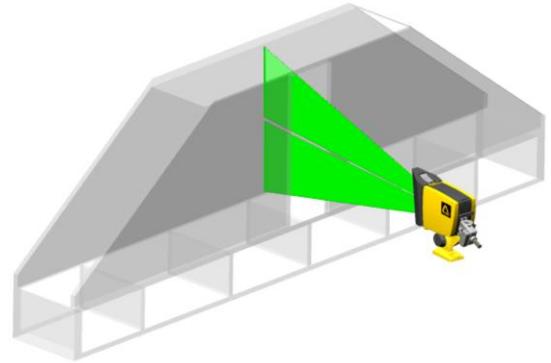


Alignment

In order to help the user to make an accurate alignment of the sensor, the **Rota-Sonde TS5500** is equipped with some new features:

Laser

- **Laser Line** (-LL version): The high visibility green laser line shows the exact position of the detection field. This makes the alignment of the sensor in both directions easier. It helps also to see the limits of the detection area.
- **Laser Pointer** (-LP version): a laser pointer gives the lateral position of the field of detection.



Toggle joint

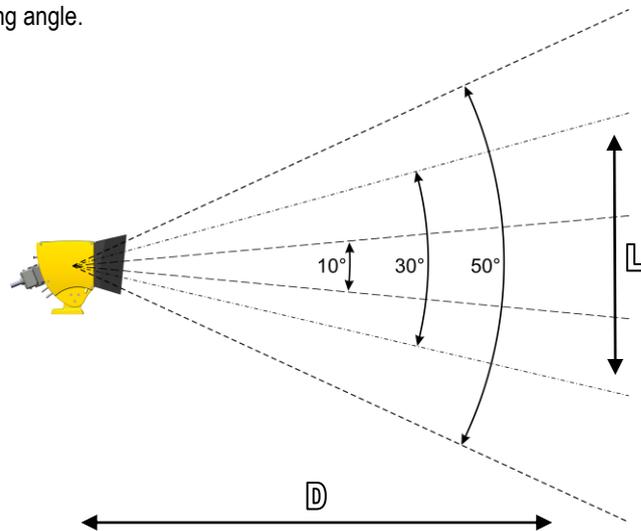
The indication of the tilt angle is useful to position the sensor in a proper way in front of the product and be able to make the trigonometric calculation.



Optics

According to the required field of detection for the application, the vertical scanning angle has to be selected:

- TS559•: easy and quick selection of 10° or 30° or 50° on the control panel
- TS555•: this version has a fix 50° scanning angle
- TS553•: this version has a fix 30° scanning angle.



L (mm)		D (mm)					
		1000 [40"]	2000 [80"]	3000 [120"]	4000 [160"]	5000 [200"]	
Model Angle	TS559•	10°	175 [7"]	350 [14"]	525 [21"]	700 [28"]	875 [35"]
	TS553•	30°	535 [21"]	1070 [42"]	1600 [63"]	2140 [84"]	2675 [105"]
	TS559•						
	TS555•	50°	930 [36.6"]	1860 [73"]	2800 [110"]	3730 [147"]	4660 [184"]
TS559•							

Length (L) of detection vs distance (D) of product from sensor, depending on scanning angle.



Characteristics

Optics

Model	TS553●	TS555●	TS559●
Configurable	no	no	YES
Scanning angle	30°	50°	Configurable by user: 10° or 30° or 50°
Temperature range	Range N: > 350 °C (660°F)		Range N: > 350 °C (660°F) Range H: > 250 °C (480°F)
Response time	Fixed 2 ms		
Horizontal angle	Fixed, 3° max. Hood with shutter 4 mm		
Spectrum sensitivity	1 to 2.6 µm with maximum sensitivity at 2.2 µm		

Outputs / Input

Model	TS55●0	TS55●6
Current Analogue output	4-20 mA (load 500 Ω max) – 4 mA at bottom Signal in product absence: 4 mA (or 20 mA, configurable on TS559●)	
Voltage Analogue output	0-10 V (10 mA max) – 0 V at bottom Signal in product absence: 0 V (or 10 V, configurable on TS559●)	
Product presence output	Push-pull output – Low impedance: 0/24 V – 50 mA, protected against short circuit 0 V: product absence 24 V: product presence	
Product presence output	Relay Single pole changeover Switching capacity: 550VA - 250V - 5A max Closing time: 7.5 ms; Opening time: 3 ms	2 Optocoupled complementary Solid State Relay: Impedance: 50 Ω Switching capacity: +/- 350 V peak +/- 100 mA peak
Signal Amplitude output	0-10 V, analogue voltage proportional to the photocell signal	
Alarm output	Push-pull output – Low impedance: 0/24 V – 50 mA, protected against short circuit 0 V: sensor failure (power supply, internal T°, scanning motor speed) 24 V: sensor ok	
Control output	Push-pull output – Low impedance: 0/24 V – 50 mA, protected against short circuit 0 V: detection margin insufficient. 24 V: detection margin ok	
Test input	0 / 24V - 1mA 0 V: test / 24 V (open): normal operation	
Sensitivity input	0 to 10V - 3mA or external 10k potentiometer to 0V 0V: highest sensitivity, 10V: lowest sensitivity, open: control panel setting	

Laser

Model	TS55●●-LL	TS55●●-LP
Laser type	Laser line, green	Laser pointer, red
Laser class IEC-60825-1	Class 2M	Class 2

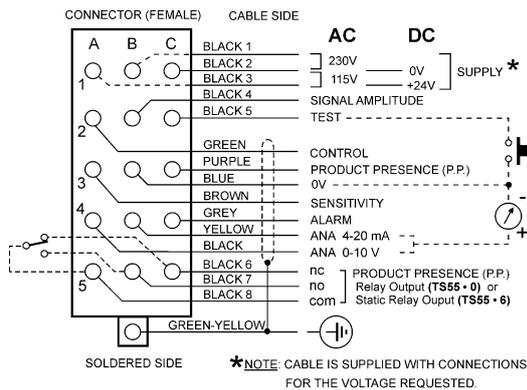


Other specifications

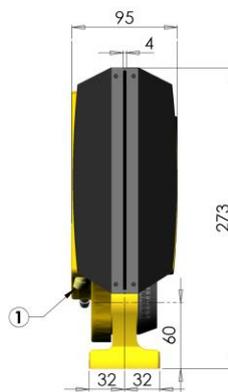
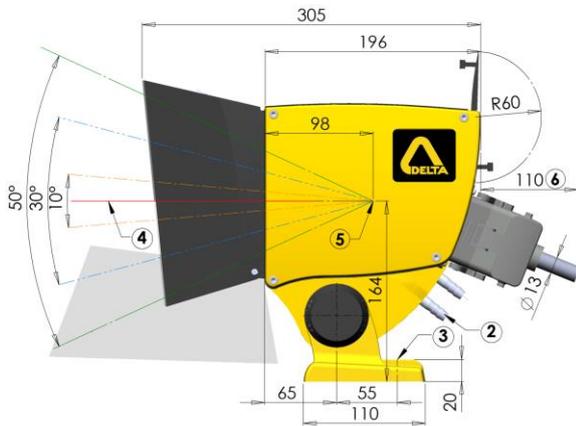
Operating voltage	110 V (-10%) to 120 V (+10%) 50/60 Hz	220 V (-10%) to 240 V (+10%) 50/60 Hz	24 VDC (18 to 30 VDC)
Power consumption	30 VA	30 VA	< 600 mA
Connection - Cable	Connector fitted with silicone cable with protective steel braid Length to specify (standard length 2 m, other length: 3, 5 or 8 m)		
Protecting rating	IP 66 (cast aluminium case)		
Operating ambient temperature	-20 °C to 60 °C (0 °F to 140 °F) without cooling, Up to 120 °C (250 °F) with water cooling: industrial quality water at about 25 °C (77 °F), 1-2 bar and 1-4 l/min		
Weight	7 kg		



Connection



Dimensions



- ① Air supply \varnothing 10
- ② Water supplies \varnothing 10
- ③ Mounting with screw \varnothing 12
- ④ Laser pointer (LP version)
- ⑤ Optical centre
- ⑥ Connector clearance

Reference for order

Rota-Sonde T S 5 5 • • • • • L = •

Scanning angle	Output	Laser	Supply voltage	Cable length
3: 30°	0: Relay	LP: laser pointer	115V: 115 VAC 50/60 Hz	2: 2 m (standard length)
5: 50°	6: Static Relay	LL: laser line	230V: 230 VAC 50/60 Hz	0: no cable, no connector
9: configurable			24VDC: 24 VDC	3: 3 m
				5: 5 m
				8: 8 m

E.g.: TS5596-LL 230V L=2 indicates: Configurable sensor (scanning angle, sensitivity range), Static Relay output, Laser Line, Power supply 230 VAC – 50/60 Hz, Cable length 2 m.

Accessories

- Radiant bar BR4000 for simulation of hot product (battery powered).
- Heat Shield for protection against direct radiations. Reference 7693787.
- Junction box CR5500TS for remote setup and diagnostic.
- Mechanical adaptor to install a TS5500 replacing a TS2000. Reference 7694198.



DELTA

Tel : +33 388 78 21 01 - Fax : +33 388 76 02 29
info@deltasensor.eu - www.deltasensor.eu

DELTA Sensor (China)

Tel: +86 519 8188 2500 - Fax: +86 519 8188 2400 - info@deltasensor.com.cn

DELTA Vertriebsgesellschaft mbH (Germany)

Tel: +49 700 3358 2736 - Fax: +49 700 3358 2835 - info.de@deltasensor.eu

DELTA Sensor (India)

Tel: +91 11 4054 8170 - Fax: +91 11 4054 8172 - info@deltasensor.co.in

DELTA USA, Inc. (North America)

Tel: +1 (412) 429 3574 - Fax: +1 (412) 429 3348 - info@delta-usa.com

DELTA Sensor (Russia)

Tel: + 7 916 682 6027 - info.ru@deltasensor.eu

Subject to change without prior notice

E 1550 6