

Contitherm[®]
Continuous temperature measurement
in liquid steel

The Contitherm system

Concast operators face increasing demands to control casting temperatures within narrower limits, improve yield, enhance safety in liquid steel areas, and reduce manpower. The Contitherm system was developed to address these needs effectively.

Quality and operational benefits through continuous temperature measurement

The Heraeus Electro-Nite Contitherm system offers several improvements for concast operation and control:

- **Reduced Freeze-Off:** Reliable monitoring of cooling trends allows operators to act earlier to help to reducing freeze-off incidents by calling a new ladle earlier.
- **Minimized Breakout and Strand Loss:** Early warnings of unacceptable temperature trends enable confident adjustments to casting speeds, reducing breakout and strand loss.

- **Improved Caster Yield:** By controlling freeze-up and strand losses, the system enhances caster yield. Confidence in the continuous temperature also allows for temperature reductions potentially speeding up casting and increasing yield
- **Safety:** Operator is not required to take a dip each 10 minutes due to the continuous temperature, meaning a significant drop in the operators exposure to steel

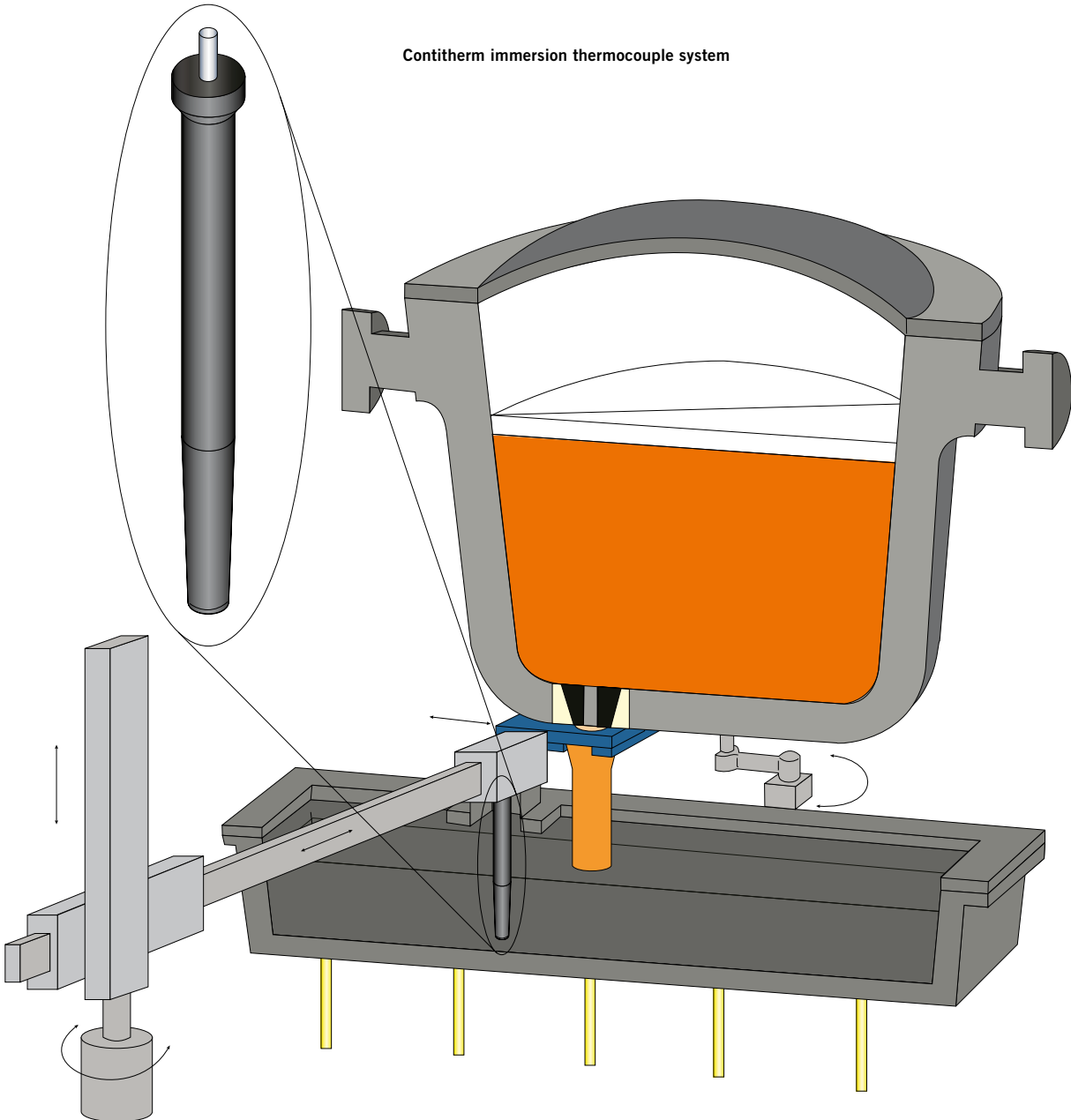
Continuous and Accurate Temperature Control

The Contitherm immersion thermocouple system provides continuous and accurate temperature control of liquid steel in the continuous casting tundish.

The Contitherm sensor features a robust construction with a platinum-rhodium thermocouple for precise temperature measurement and a graphite-alumina refractory outer sheath for extended protection against liquid steel and slag.

It uses a type B Pt30%Rh/Pt6%Rh thermocouple wire, adhering to international standards (IEC584, DIN43710, NBS125, JIS1981, AFNOR, BS4937) based on the IPTS 1968 temperature scale. The wire is selected for an accuracy of +0 to +3°C at the melting point of palladium (1554°C).

Contitherm immersion thermocouple system



The Contitherm sensor typically operates for up to 20 hours, either through a single cast sequence or multiple shorter sequences. After use, the entire unit is disposed of, and a fresh sensor is installed.

The Contitherm system is complemented by a range of handling devices to hold the Contitherm sensor in the

tundish. Signal and extension cables are included to bring the signal to the control room. Instrumentation for signal monitoring with alarms and various outputs are also available. The system is completed with calibration and check devices to enable easy service and maintenance.

The parts of the system

The following shows the essential parts of the Contitherm measurement system



1 Contitherm instrument

Processes and displays the measurements

2 Air pressure regulator

Controls the flow of air for cooling

3 15-metre air cooling hose

Connects the air pressure regulator to the lance

4 15-metre signal cable

Connects the instrument adapter cable with the lance



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5 Hot zone Cable
Connects the probe to the instrument

6 Contitherm 760
Measurement sensor

7 Contitherm 1015
Measurement sensor

8 Instrument adapter cable
Connects the instrument to the lance

Setup, Operation and Connection

Preparing the system

The Contitherm system is suitable for use in all concast plants, slab, bloom or billet, for both long and short tundish sequences. Covered or open tundishes, plasma tundish heating applications etc.

A number of sensible precautions will ensure the most accurate and economic use of the system:

During installation:

- Ensure an immersion depth of at least 300mm.
- Use shielding around the entry hole on plate-covered tundishes to prevent flame impingement or excessive radiant exposure.
- Employ good handling fixtures and train operators to minimize breakage during tundish changes and maximize sensor life.
- Regularly calibrate the instrumentation system and verify the correct use of compensating and connection cables with proper polarity.
- When comparing with dip methods, measure at the same position and perform multiple dips to ensure accuracy. Be aware of natural temperature gradients in the tundish, especially when a new ladle is opened or a strand is closed.

General use:

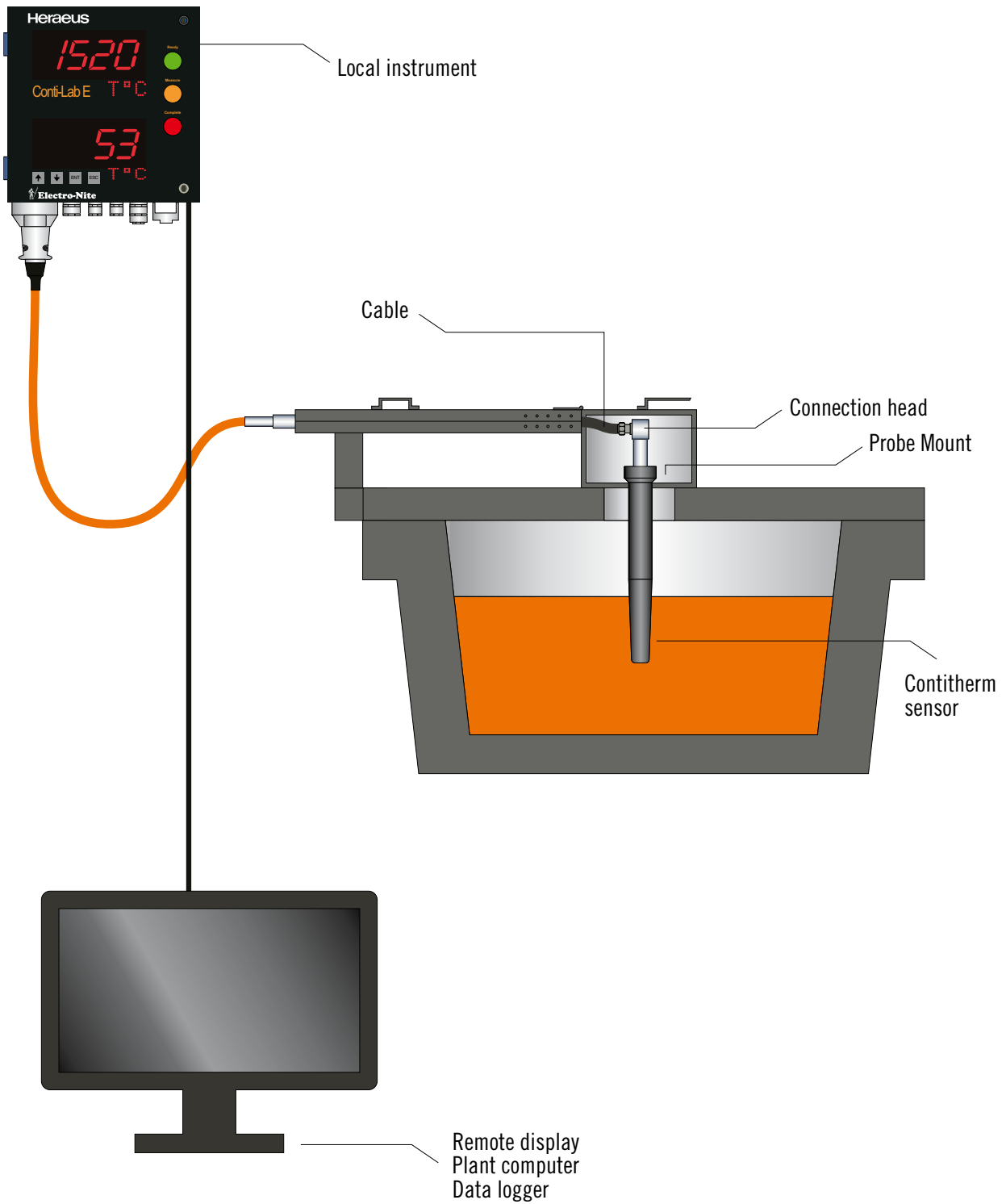
- Keep the Contitherm sensor dry and handle it carefully during immersion and removal.
- Maintain extension cables and intercable connections in good condition.
- Ensure good power cover around the Contitherm on power-insulated tundishes to avoid freeze bridging or excessive radiant exposure.
- Avoid using slag fluxing agents, as they reduce the sensor's lifespan.

Plant Hardware

Each caster application is unique, so Contitherm handling hardware is tailored to each plant. Our engineers can advise plant engineers on the best positioning and handling strategies for optimal performance.



Contitherm 760 & 1015



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