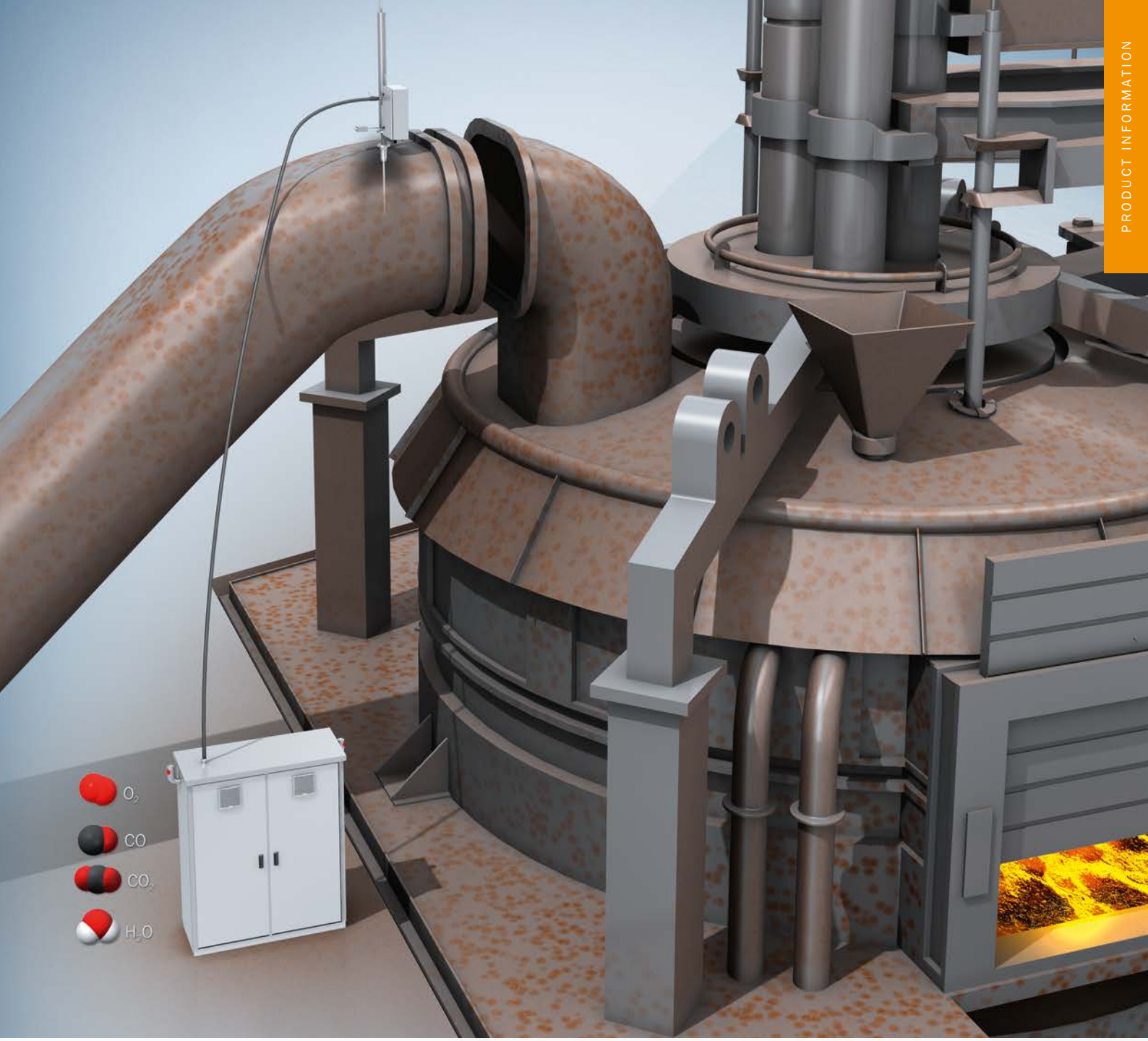
PRODUCT INFORMATION



METPAX300

INCREASED EFFICIENCY AND SAFETY

Customized analyzer systems

SICK
Sensor Intelligence.

PRECISE DATA, EVEN WHEN THINGS ARE HOTTING UP

One third of all worldwide crude steel production worldwide takes place in an electric arc furnace. The radiation energy of the electric arc melts various raw materials. The ingredients of the charge mix and the use of metallurgical methods such as carbon and oxygen injection or the use of the side wall burner affect the composition of the exhaust gas from the furnace. For this to be controlled efficiently, the gases produced during crude steel production must be monitored continuously. With the METPAX300 extractive process gas analyzer system, SICK can get close to the action and provide reliable monitoring results throughout the entire melting process.

METPAX300 enables significant savings thanks to the efficient use of materials, ensures precise process control, and makes a vital contribution to plant safety.

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CONTINUOUS DATA ANALYSIS BOOSTS TRANSPARENCY IN THE MELTING PROCESS

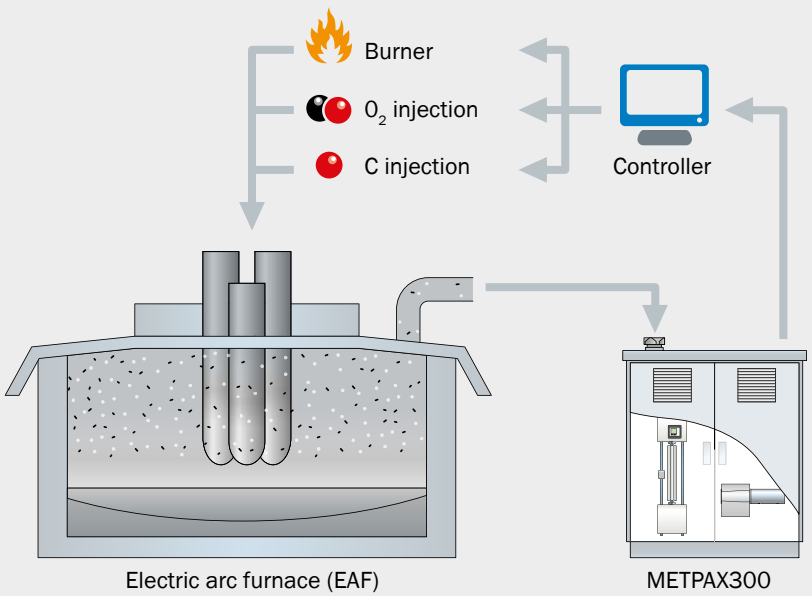
An important variable for the processes in the electric arc furnace (EAF) is the right concentration of oxygen, carbon monoxide, and carbon dioxide in each case. Precise process control can only be achieved through continuous monitoring of the gas concentration.

The METPAX300 gas analyzer system supplies this data to the process controller, which controls the oxygen or carbon injection rates and regulates the output of the burners accordingly. As an option, METPAX300 can detect the hydrogen and total carbon content in addition to CO, CO_2, O_2, and H_2O. These values make the process even more transparent. The data, which is collected on a continuous basis, can be entered directly into the customer's control system for further processing.

In this way, METPAX300 enables an efficiently regulated melting process with less sampling. The benefits are clear: shorter tap-to-tap times, reduced use of resources, and lower energy consumption.

Data analysis in the melting process

METPAX300 enables significant savings thanks to the efficient use of materials and precise process control, and makes a vital contribution to plant safety.



RELIABLE DATA FOR EFFICIENT PROCESSES

The METPAX300 gas analyzer system is used for continuous monitoring of the melting process and optimizes the overall process in three ways: It increases the economic efficiency of the process through precise measurement of the relevant gas concentrations, it boosts process reliability significantly, and it prevents unnecessary environmental pollution. Based on tried-and-tested analyzers, METPAX300 provides particularly reliable, precise results.

Ensuring safety

Explosions pose a serious safety risk in crude steel production. As soon as the balance between the different gas constituents is disrupted, the risk of explosion increases. Leakages in the cooling system can also present a problem. For this reason, METPAX300 also detects the H_2O concentration and, optionally, the H_2 content of the exhaust gas. This information is used to identify leakages in the water cooling system – which could have disastrous consequences for the melting process – quickly and reliably.

Sustainable production

If the gas concentration is too high, this not only has a negative effect on the conversion costs, but also results in increased environmental pollution. Thanks to continuous analysis and precise process management, unnecessarily high pollutant values in the exhaust gas can be avoided.

Data analysis in the melting process

1. Electric arc furnace (EAF)
2. Water-cooled exhaust gas line
3. Water-cooled gas sampling probe
4. Heated cross-flow filter
5. Air jet pump (N_2 or compressed air)
6. Heated measuring gas line
7. Excess flow return
8. MCS300P process gas analyzer (CO, CO_2, and H_2O)
9. TRANSIC100LP laser oxygen transmitter (O_2)
10. Analyzer cabinet

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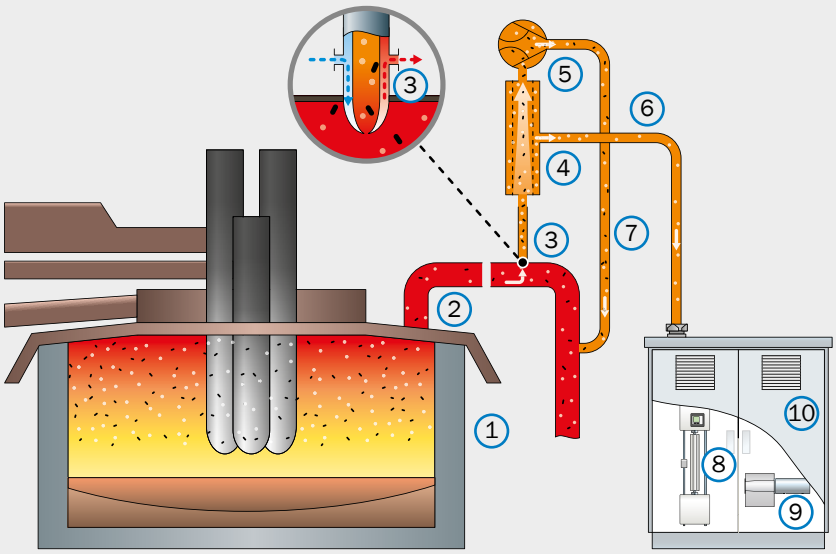
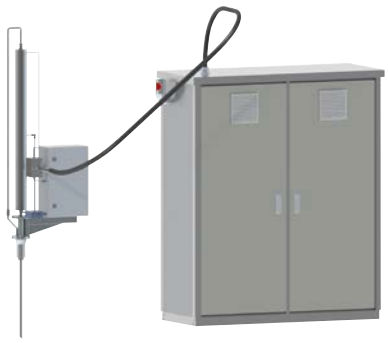
METPAX3000 – INCREASED EFFICIENCY AND SAFETY

The extractive measuring method provides particularly high data reliability. The water-cooled gas sampling probe can withstand temperatures of up to 1,800 °C without any problems. It is located in the first section of the exhaust gas line near the furnace and is positioned in such a way that it extracts the furnace exhaust gas before it mixes with the false air from the gap. The exhaust gas is conveyed through a cross-flow filter at high speed. Some of the cleaned exhaust gas is diverted via the measuring gas line to the analyzer cabinet where the gas components are analyzed. The excess sample flow is returned to the exhaust gas line of the EAF with the dust from the filter.

Additional analyzer modules can be added to the system for H_2 (FIDOR) and/or C_{ges} measurement (THERMOR).



INCREASED EFFICIENCY AND SAFETY



Product description

The METPAX300 customized analyzer system (Metallurgic Process Analyzer) contains the tried-and-tested MCS300P process gas analyzer and the TRANSIC100LP laser oxygen transmitter. The system is ideally suited to the harsh ambient conditions in steelworks. The water-cooled sampling probe can handle temperatures up to 1800 °C and is suitable for use in areas with high concentrations of dust thanks to its innovative cross-flow filter. The analyzer cabinet, made from stainless steel, is cooled and flushed to prevent overheating and dust ingress. Continuous measurement of CO, CO_2 and O_2, combined with monitoring of the water content, enables the electric arc furnace to be controlled in an efficient and resource-saving manner, making a vital contribution to plant safety.

At a glance

- Precise measurement of CO, CO_2, H_2O and O_2. Up to three further gas components can be measured simultaneously or retrofitted as required.
- Ideally suited to the harsh ambient conditions in steelplants
- Extremely low-maintenance and rugged design

Your benefits

- Prevents explosions which can arise due to water leakage or excessive CO levels in exhaust gas
- Enables the burners to be fine tuned (ratio of CH_4 to O_2)
- Reduces energy consumption through optimally adjusted O_2 injection and optimal combustion of the CO in the furnace
- The measurement of the ratio of CO to CO_2 provides information on the carbon content in the melt
- The measurement of the ratio of CO to CO_2 and O_2 enables conclusions to be drawn regarding the slag quality

CE

Additional information

→ www.sick.com/METPAX300

For more information, simply visit the above link to obtain direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.

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Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

System

Measured values	CO, CO_2, O_2, H_2O, H_2 (optional), VOC (optional), many other IR / VIS active gases and liquids
Maximum number of measurands	9 (6 simultaneously with the MCS300P, O_2 with TRANSIC, H_2 with THERMOR, VOC with FIDOR)
Measurement principles	Interference filter correlation, Gas filter correlation (MCS300P), Tunable diode laser spectroscopy (TRANSIC), Flame ionization detection (FIDOR), Thermal conductivity measurement (THERMOR)
Measuring ranges	
CO	0 ... 1,000 ppm / 0 ... 40 vol. %
CO_2	0 ... 3,000 ppm / 0 ... 40 vol. %
H_2O	0 ... 2 vol. % / 0 ... 40 vol. %
O_2	0 ... 5 vol. % / 0 ... 100 vol. %
H_2	0 ... 1 vol. % / 0 ... 100 vol. %
C_{ges}	0 ... 0.6 ppm / 0 ... 6,200 ppm
	Other measuring ranges on request
Process temperature	≤ +1,750 °C
Sample gas temperature	≤ +220 °C
Ambient temperature	+5 °C ... +50 °C
Storage temperature	–20 °C ... +60 °C
Ambient humidity	≤ 80 % Non-condensing
Electrical safety	CE
Enclosure rating	Housing: IP54 With additional dust protection
Analog outputs	2 outputs: 0/4 ... 22 mA, 500 Ω Electrically isolated; max. number of outputs depends on application
Analog inputs	2 inputs: 0/4 ... 22 mA, 100 Ω Electrically isolated; max. number of inputs depends on application
Digital outputs	5 outputs: 2 power relays, electrically isolated; 3 outputs, potential-free; max. number of outputs depends on application
Digital inputs	4 inputs: Open contacts, potential-free; max. number of inputs depends on application
Interfaces	Ethernet
Bus protocol	Modbus OPC
Indication	Status LEDs LC display
Input	Functional keys
Model	Sheet steel or stainless steel control cabinet
Dimensions (W x H x D)	1,600 mm x 2,160 mm x 600 mm
Weight	≤ 600 kg Depending on configuration

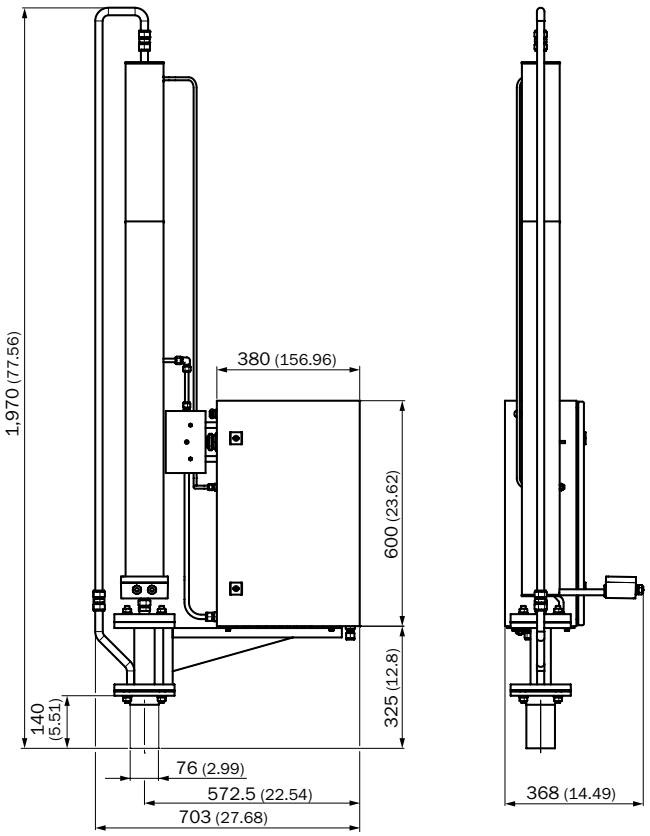
Power supply	
Voltage	115 V / 230 V
Frequency	50 ... 60 Hz
Power consumption	5 kW ... 10 kW Plus measurement gas lines and probe
Auxiliaries	Depending on version

Ordering information

Our regional sales organization will help you to select the optimum device configuration.

Dimensional drawings (Dimensions in mm (inch))

Probe



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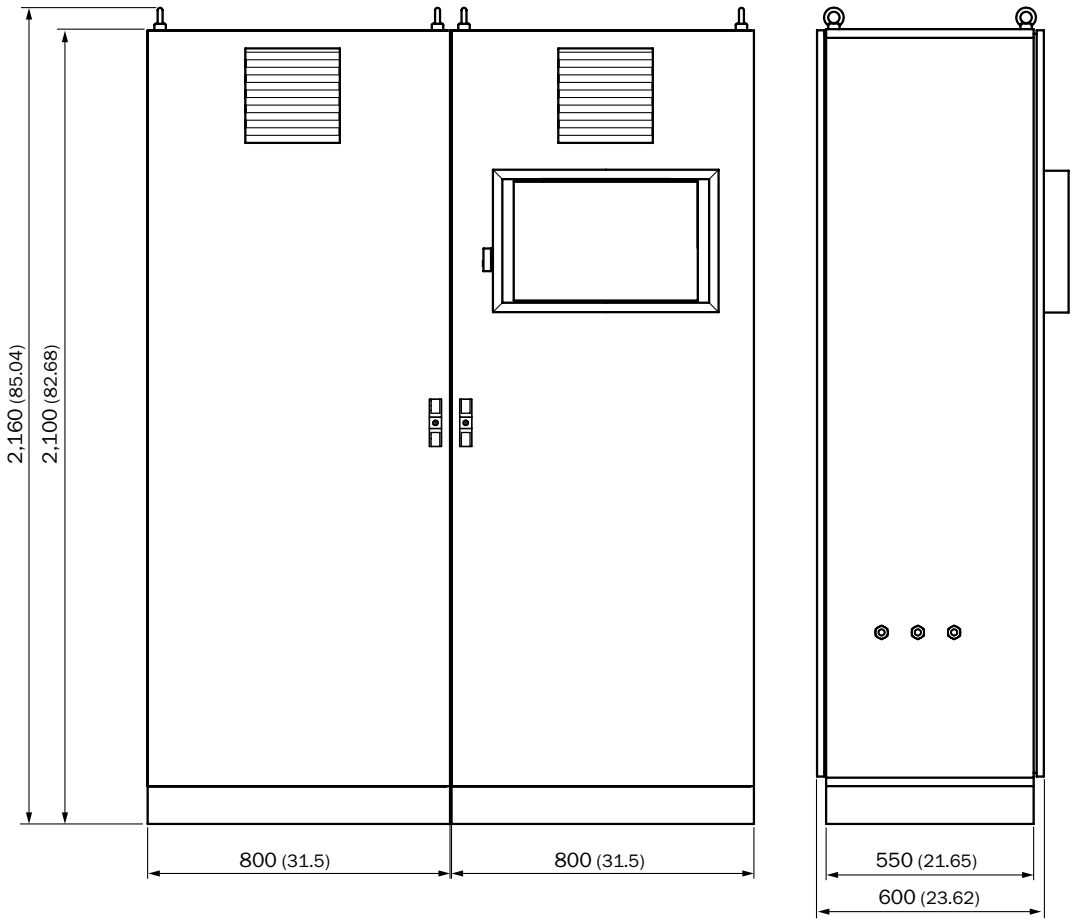
System control cabinet



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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 8,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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Detailed addresses and further locations → www.sick.com

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