

*Continuous monitoring for pyro-process optimization*  
**CEMTEC<sup>®</sup>**



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Once upon a time in Peru...





A black and white photograph of a person's head and hands. The person's head is tilted back, and their hands are clasped over their face, suggesting a state of distress or frustration. The background is blurred, showing what appears to be a workshop or laboratory setting with various tools and equipment.

**Not again, please...**

**Bending probes**

**Low availability**

**Maintenance nightmare**

**Always gets stuck**

**Doesn't work properly**

**Why me...?**

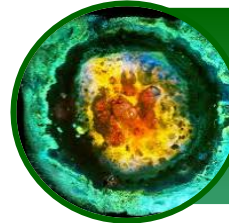
# Many challenges



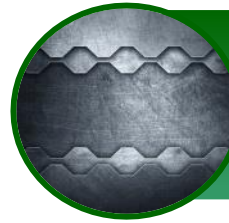
Extreme high temperatures (up to 1400 °C)



Extreme high dust content (up to 2000 g/m<sup>3</sup>)



Corrosion caused by high concentrations of chlorides, alkali and sulfates (depending on fuels)



Harsh process and surrounding conditions



Optimal position difficult to reach



The goal of this presentation is to show you the importance and benefits of having a gas sampling system at the kiln inlet chamber



Although this presentation will show you features of the **CEMTEC** probe of **ENOTEC**, there are other companies doing their best with different approaches and designs

**Please objectively research, question and compare all approaches**

# Do we really need this...?

If your main targets are to..

- **optimize** the combustion process
- **reduce** specific emissions
- **prevent** raw material build-up tendency
- **enable** low NO<sub>x</sub> operation
- **increase** SNCR efficiency
- **maintain** clinker product quality
- **reduce** refractory wear and destruction



..then you need an analyzing technology that is

**Fast – Reliable – Continuous**

# Interdependency in the Pyro-Process

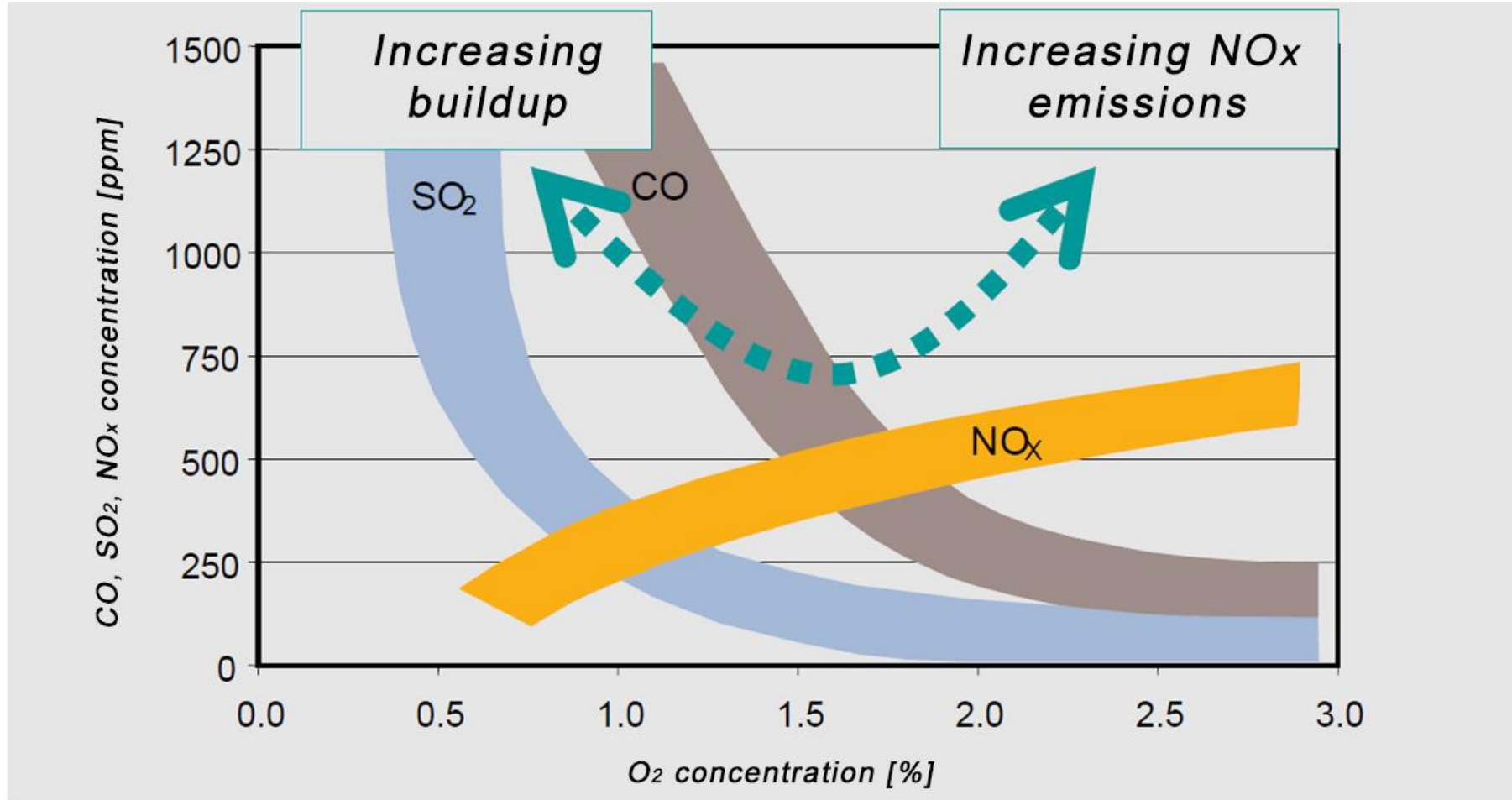
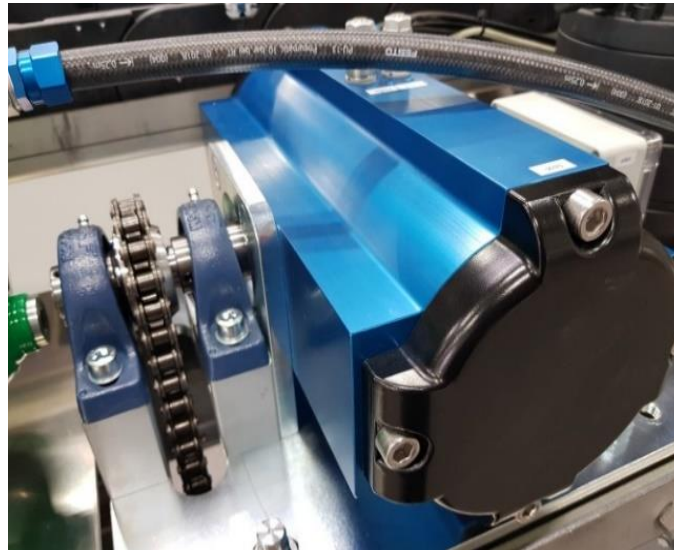
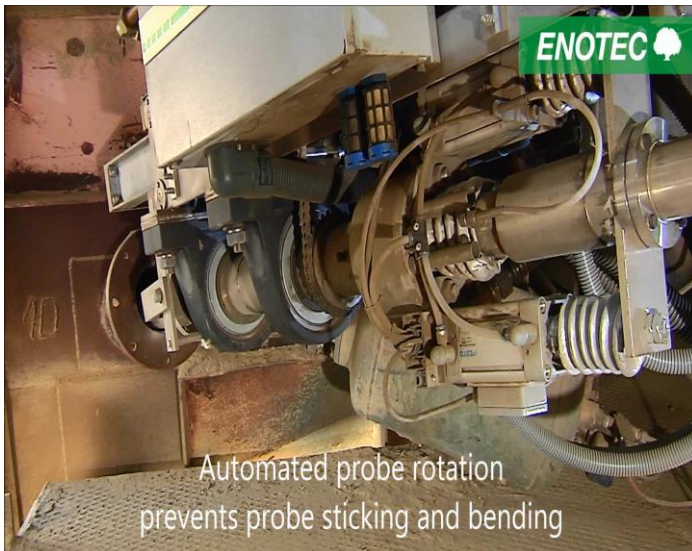


Image from the VDZ - Union of German cement producers



## Challenge #1 Temperature up to 1400 °C

- Cyclic probe rotation for coolant temperature homogenization
- Probe rotation prevents also thermal bending (prevention of hot spots)
- Automated probe retraction within seconds





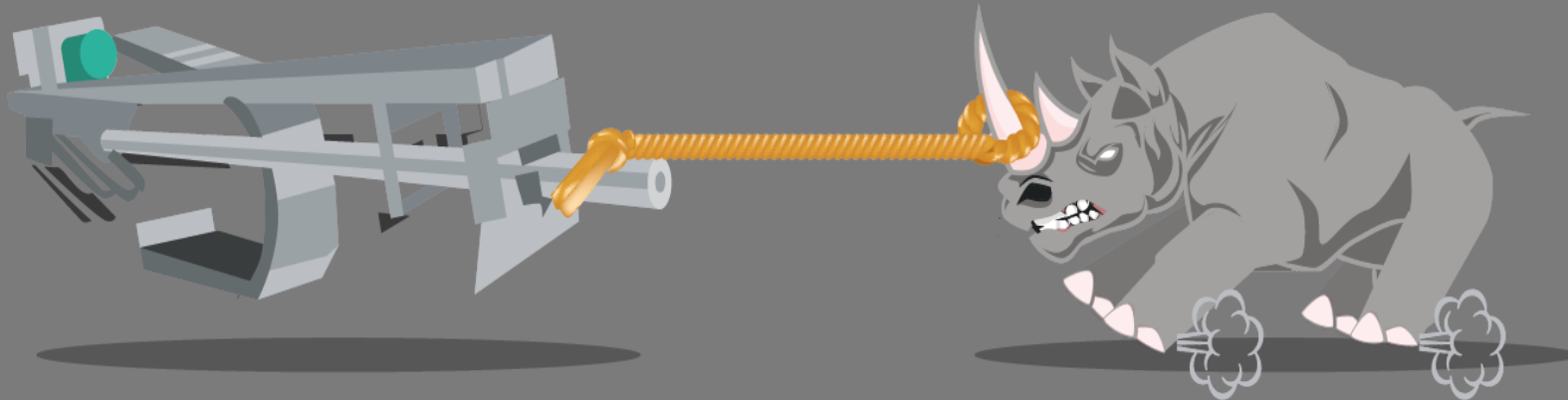
## Equipment protection

- Automated pneumatic probe retraction with up to 2 t force within seconds by toothed rack and wheel (no chains)
- Failsafe due to pneumatic motor with 1000 l reserve compressed air tank
- Flange seals automatically when CEMTEC® probe is removed – no electrical parts

**Probe does not get stuck in the process, even in case of power failure, etc.**



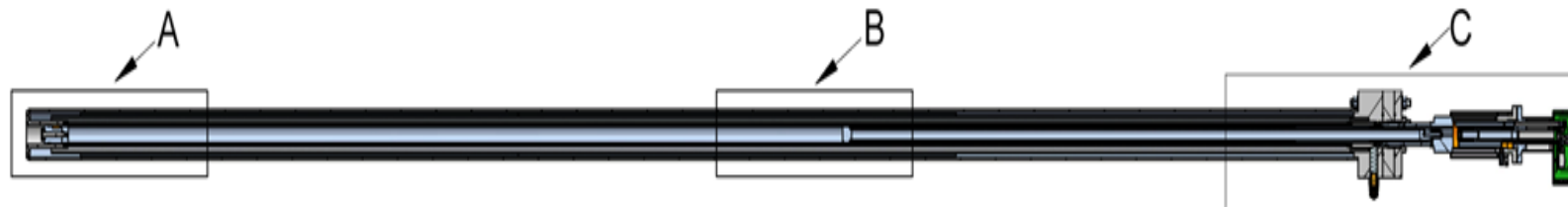
*Guess who is stronger,  
CEMTEC<sup>®</sup> or a rhino?*



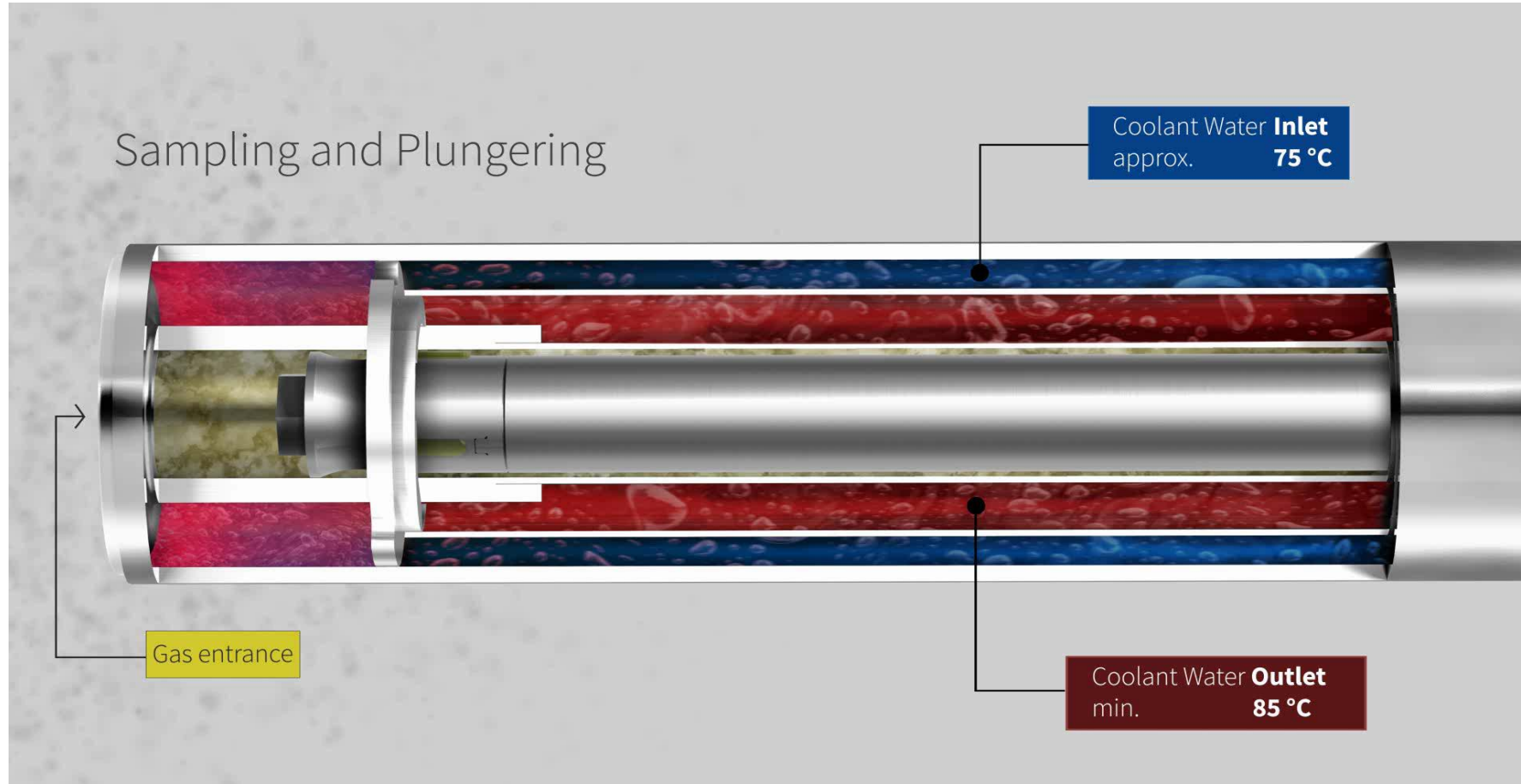
*CEMTEC<sup>®</sup> can pull back the weight of a rhinoceros...  
...and the probe will never stick in the process.*

## Challenge #2 Dust content up to 2 Kg/m<sup>3</sup>

- Automated plunger permanently keeps the flue gas entrance free
- Filter with a 2000 cm<sup>2</sup> surface and a porosity of just 3 μm
- Impulse shock blower



## Probe Gas Entrance Section View







## **A small gap (0.8 mm) implies:**

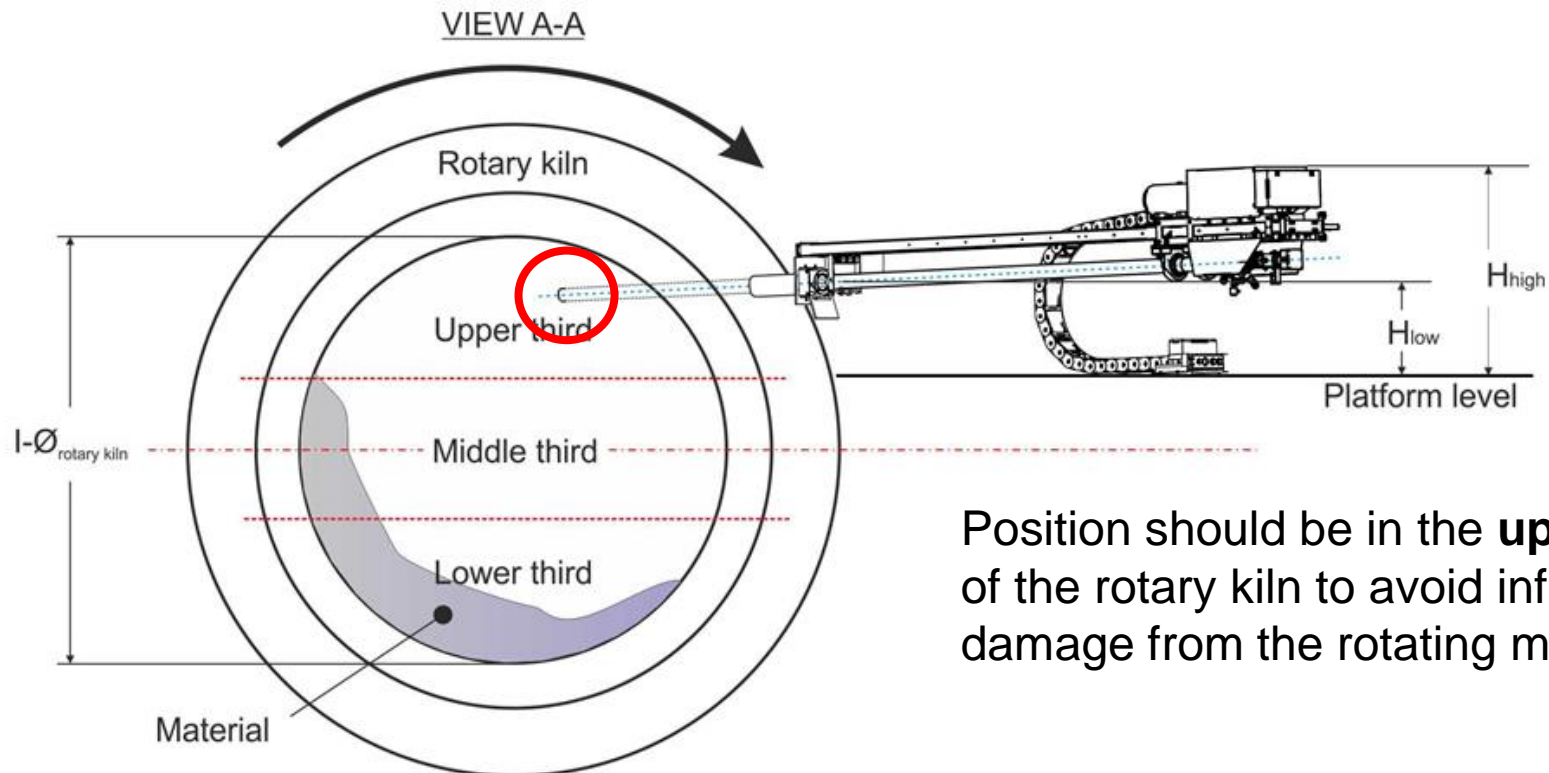
- Reduced dead volume
  - Faster measurement
  - Short response time to process changes
- Less dust entering the probe
  - Less purging
  - Reduced risk of blockages and condensation

**Higher availability of measuring values (95%)**

## Challenge #3 Probe position

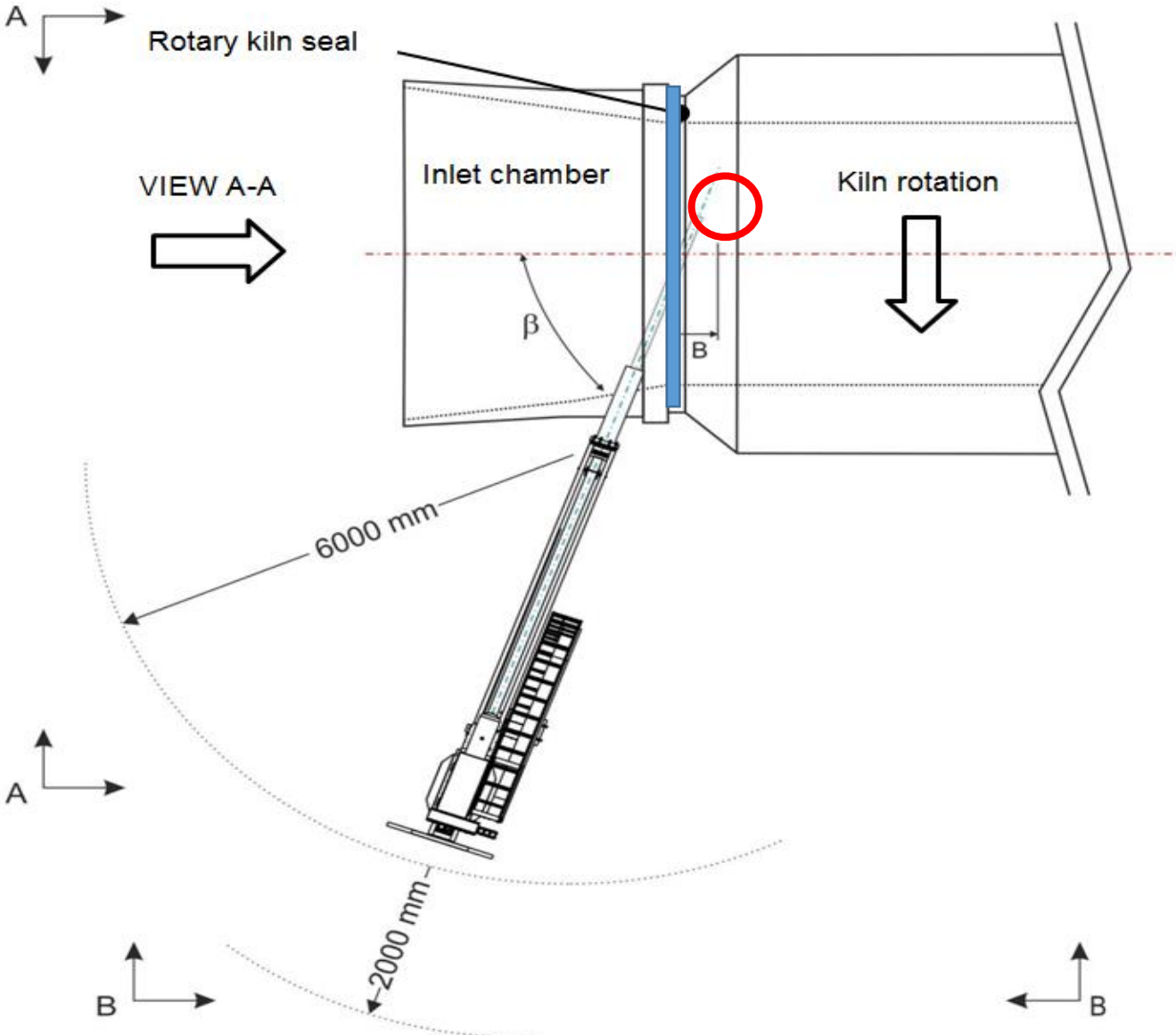
Rotary kiln rotation (seen from the inlet chamber to the burner)

- Clockwise - probe position should be on the **RIGHT** side.
- Anticlockwise - position should be on the **LEFT** side.

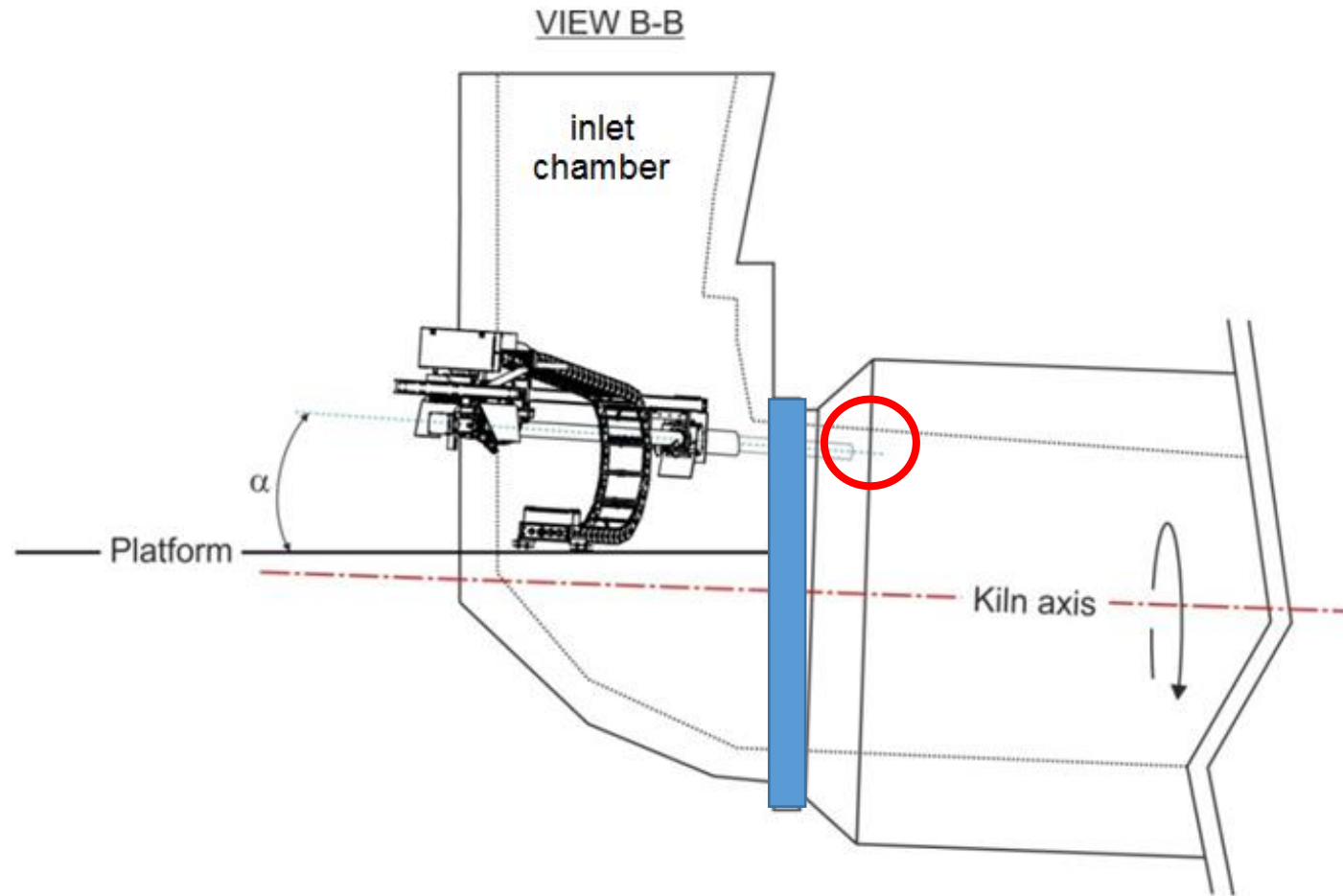


Position should be in the **upper third** of the rotary kiln to avoid influences or damage from the rotating material

The probe tip must be inside the rotary kiln to avoid measuring any air leakage at the seal

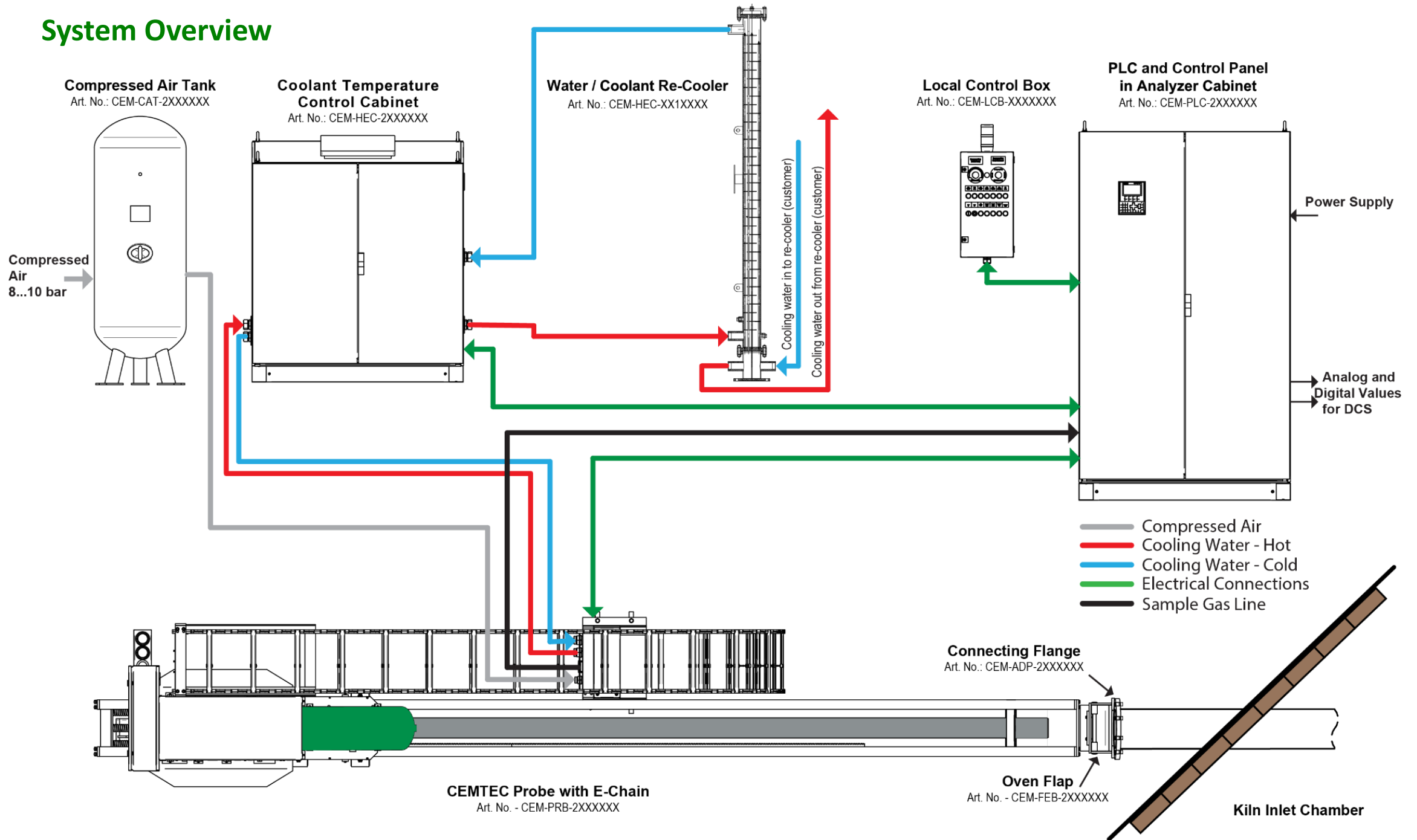


The probe must be positioned at a declining angle of typically 2° to 3° to the installation platform to ensure a safe operation of the probe

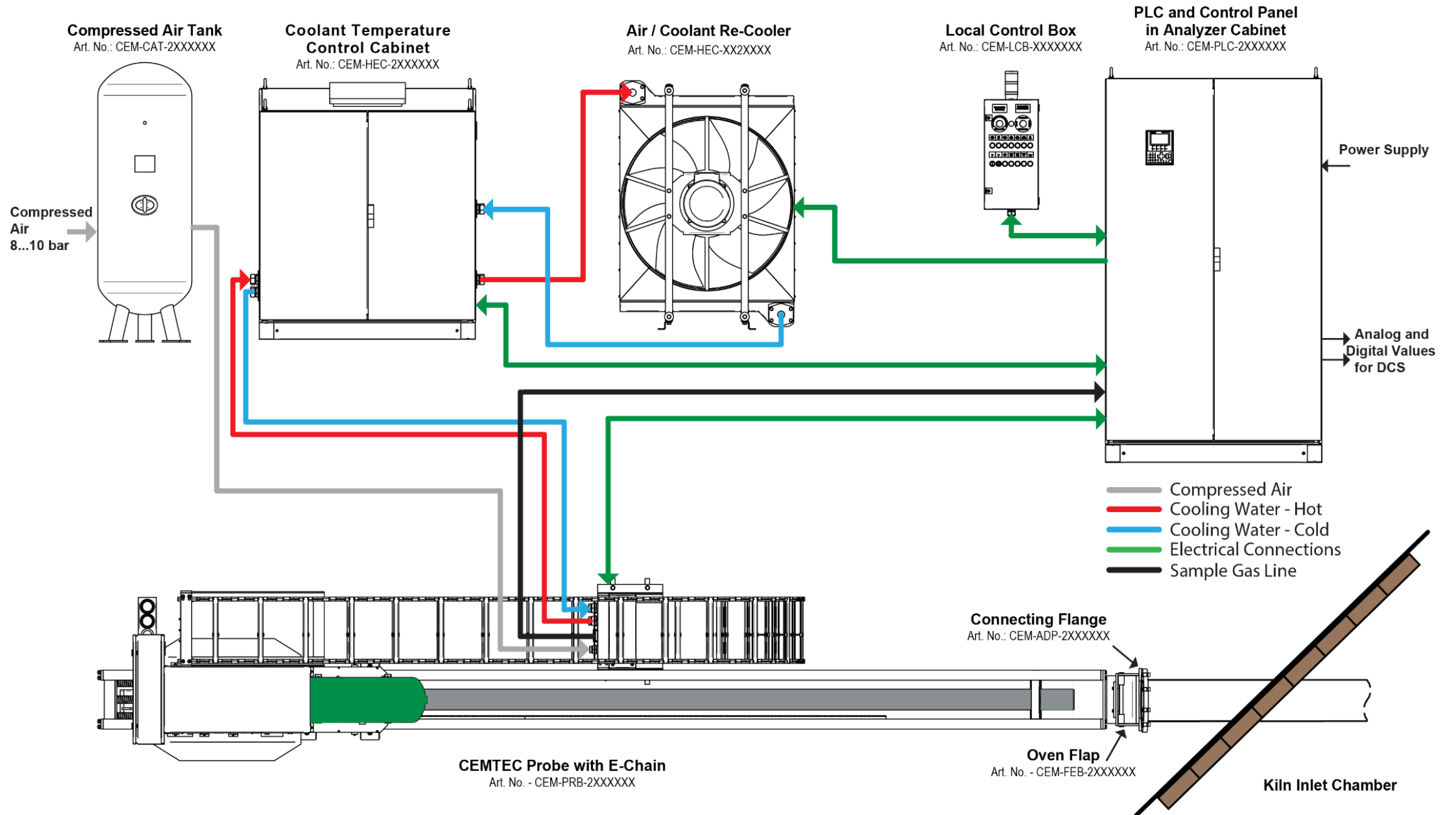




# System Overview



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## **Some benefits of a fast, reliable and continuous gas sampling system:**

- Optimization of the pyro-process
- Emission reductions for upcoming environmental regulations
- Allows an increasing usage of alternative fuels
- Less maintenance of the equipment (less costs, more safety)
- Homogeneous clinker quality
- Longer plant life and production time
- ROI between 9 and 18 months



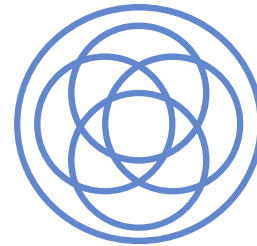
**HEIDELBERGCEMENT**



**CONICH**







**Cement Alliance**



[cementalliance.org](http://cementalliance.org)



How did the story end...?



***Thank you for  
your attention!***



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