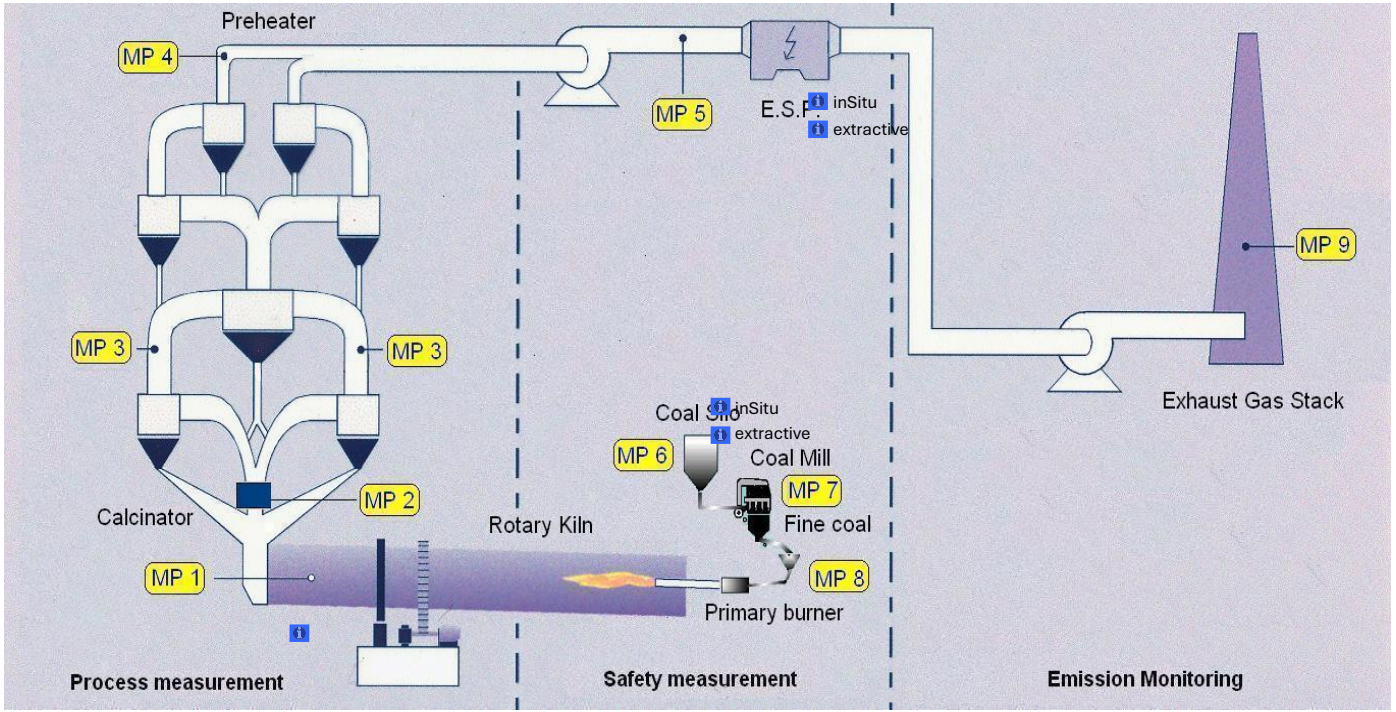
Cement Plant
Gas Analytical Solution

Applications of Gas Analysis in Cement Plants

Cement Industry Gas Analytical Solutions – Measuring Points



Challenges for Kiln Inlet Systems

Cement Kiln Inlet Application - Challenges

Gas sampling systems in cement works must be able to withstand a very tough environment:

High gas temperature up to 1400 °C . Probe Bending

High dust concentration up to 2000 g/m^3 .Probe Chockage

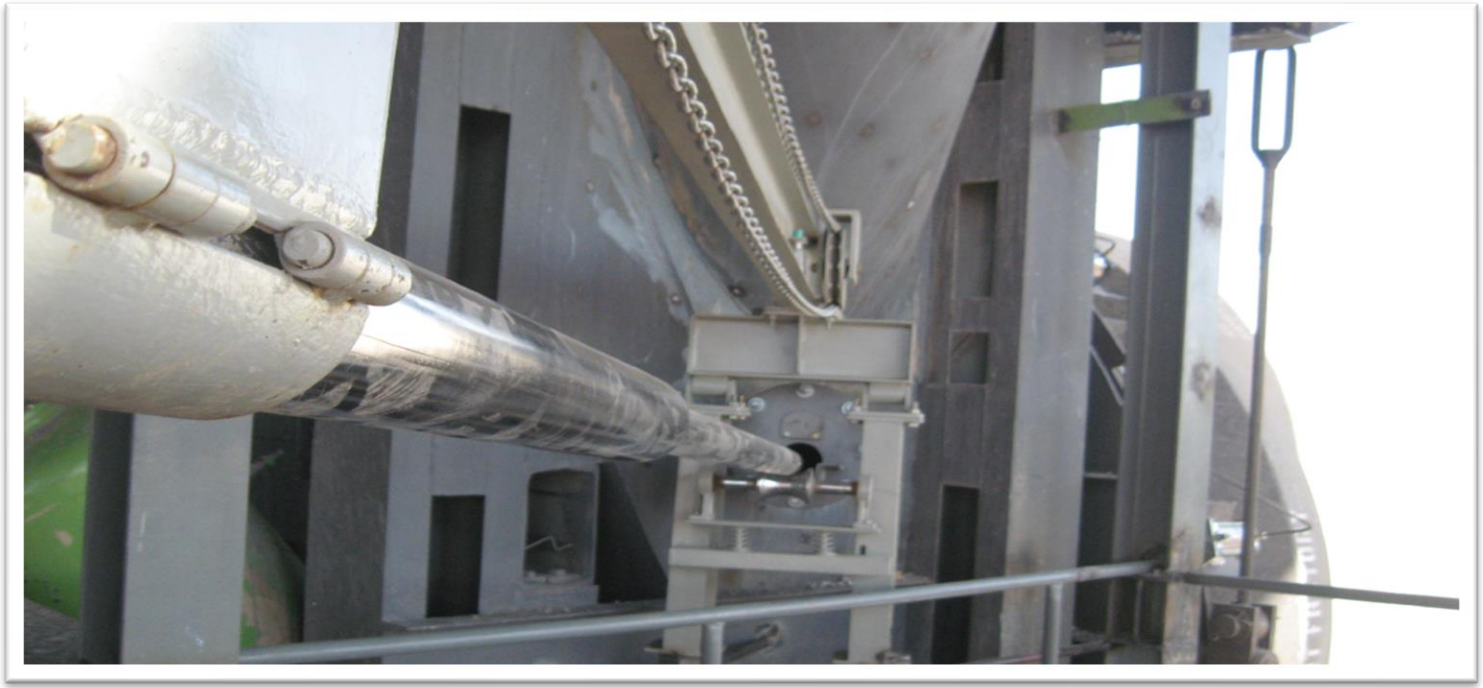
High content of Alkalis, Sulfates and Chlorides

High level of mechanical stress and strain

Usual Complaint of wrong O2 reading due to False Air

- **We have more than 250 Kiln Inlet System installed in 51 countries around the world**
- **One of the largest Kiln Inlet system manufacturer in the world**
- **More than 100+ Kiln Inlet systems installed in India**

A Nice Kiln Inlet System During Initial Installation



Kiln Inlet System After Some Months

Kiln Inlet System After Some Months

Typical Problems Observed In A Few Kiln Inlet Installation

- The Probe Filter need to be cleaned once every day. With the clogging of the filter the flow was reducing.
- There is a huge deposition of Materials on the probe which has to be poked and removed every two hours.
- The Oxygen reading was on the higher side- though there was no leakage in the system
- At the Entry point of the Gas in the probe (port of the probe) was getting blocked with dust and as a result flow was reducing.
- The Blow back is required every 10 to 15 minutes and reading is not available for 1 to 1.5 minutes

Just having a product is not Enough ....

For a **successful Kiln Inlet** Design

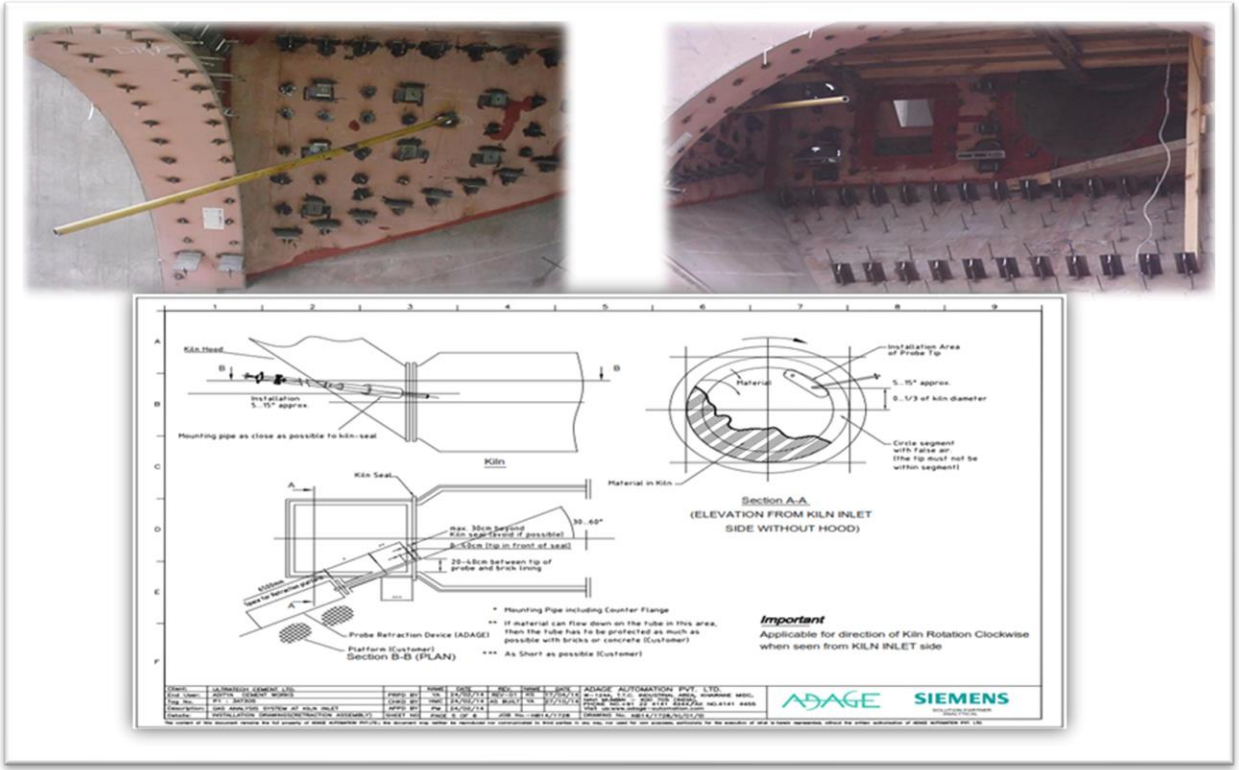
One would need KNOWHOW & EXPERTISE & FIELD PROVEN EXPERIENCE

1. **Power Cylinder based advanced retraction design or Redundant Retraction Motor**
2. **Kiln Probe design with Straight tube Probe**
3. **External Surface Cleaning of Kiln Probe with Air Blaster & scrapper**
4. **Probe Blaster for Probe Tube cleaning**
5. **Color Touch Screen Graphic MMI for alarm log & preventive maintenance**
6. **Minimum 4 level of Filters**
7. **Special Probe Material ***
8. **..... Many more design considerations to have successful reading**

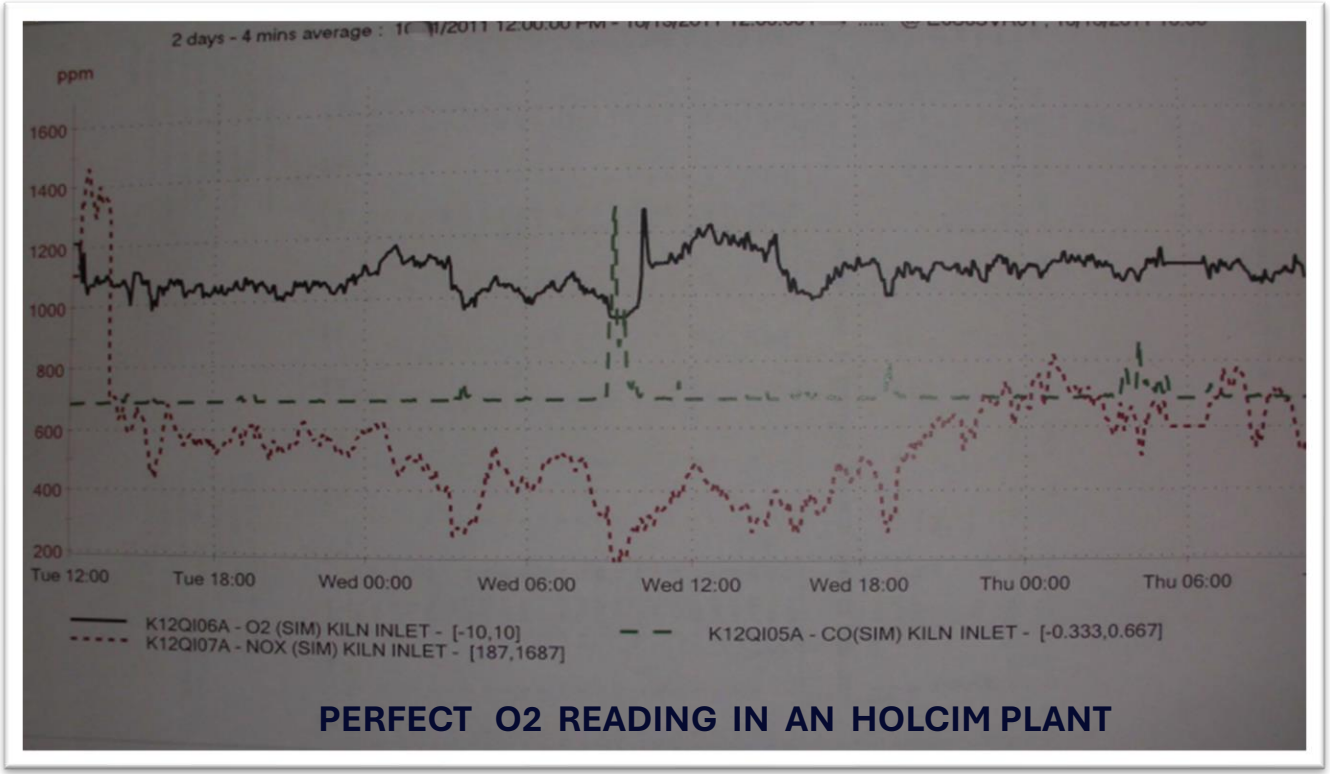
(* patent pending)

Adage Kanoo Kiln Inlet System

Cement Kiln System ---- Need Expertise For Good Reading



Cement Kiln System ---- Need Expertise For Good Reading

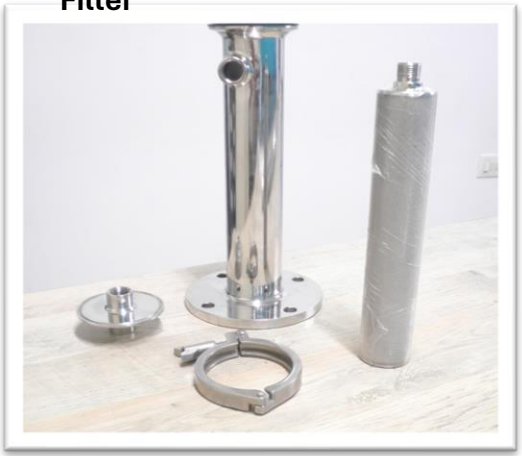


CHANGES IN THE HEATED PROBE FILTER FOR KILN INLET FOR CEMENT PLANTS USING PET COKE OR ALTERNATE FUEL

Conventional Kiln Inlet Probe Filter

Ceramic Filter
With membrane gasket
Filter Length : 130 MM

New Design Kiln Inlet Probe Filter

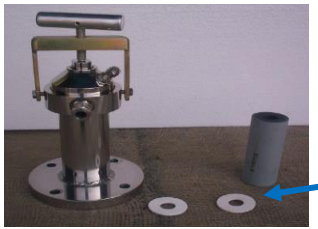


SS Filter
No Gaskets
Filter Length : 260 MM

Highlights Of The New KAS 9002 Probe Head

SL No.	Features	Benefits
1	Easy To Open and Maintain	Reduced Time and ease of maintenance.
2	No Special Tools needed to Dismantle the Filter	Reduced Time and ease of maintenance.
3	No Glass Wool Gaskets Necessary	Reduced Inventory
4	Old Filter is of 130 mm Length.. New Filter of 260 mm length	Increased surface area.. More sampling time... Increased availability
5	Filter of Sintered SS.. Having more retention of Particles	Increased Filtration
6	Filter Easy To Clean with long Life	Reduced Inventory Reduced Down Time.

CONVENTIONAL KILN PROBE HEAD !!



TO Clean or Replace the filter (make sure to put the gaskets on the top and bottom of the filter)

Replace and connect the probe as previously. Ensure that all the gaskets are put, and there is no leakages.

WE NOW HAVE A NEW PROBE !!

WATER CIRCUIT	Deposition on the Probe
PROBE COOLING	Probe Withdrawal due to Pressure Fault.
	The Temperature of the Water needs to be kept at 60 -70 deg. This also means that the dust (cement) settles over the probe and solidifies.
	Probe Gets Bent.
	Daily maintenance done on the probe.
	Reduced Availability.

Conventional Probe Conditioning

WATER CIRCUIT

PROBE COOLING

ADAGE KANOO PROBE CONDITIONING UNIT

Benefits :-

Sl. No	Features	Benefits
1	Volume of water Circulated is more	Better Cooling
2	Use Of Water Tank .. With the addition of additives with the water the Temperature of the circulating liquid can be increased.	No requirement of make-up water every day. Higher Temp
3.	Pressure Fault due to temperature difference (inside the Kiln and out Side the Kiln)	Pressure Fault thing of the Past.
4.	Water Can be circulated at Higher Temperature	Deposit over the probe doesn't solidify
5	Since there is always a buffered volume- there is no need of the pressure signal- therefore no withdrawal of the Probe due to pressure fault.	Reduced Maintenance
6	Eliminates water being inside the Analyser room making the total thing easy to maintain.	Reduced Maintenance

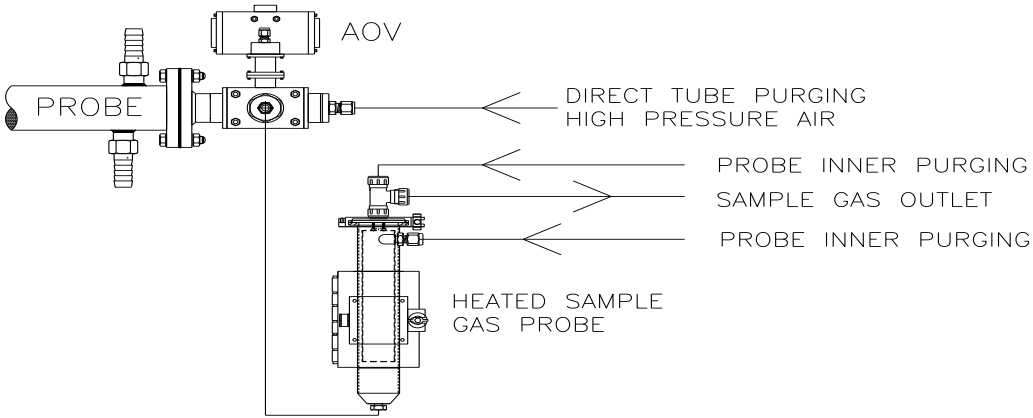
CEMENT KILN SYSTEM - Common Problem and Solution

Dust On the Probe is often be a problem..

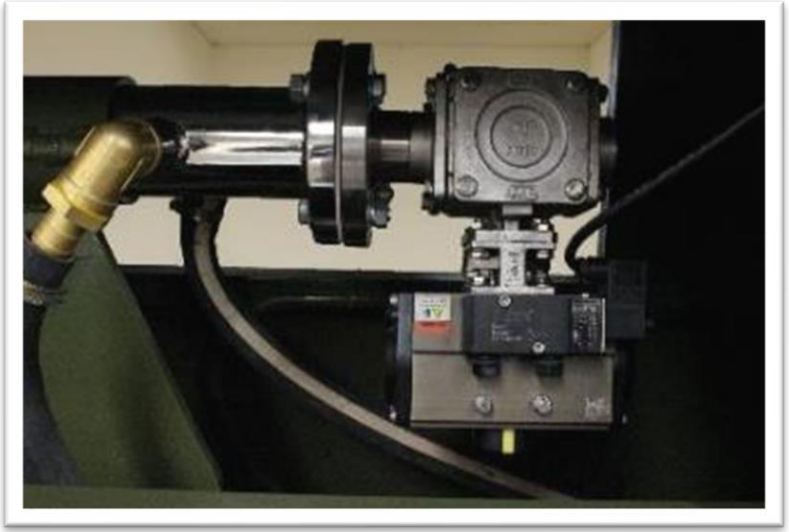
With Probe Tube Top Purging

With Dust Scrapper in counter flange

Probe Tube Purging



1. The Sample is draw in through the Probe Tube Assembly. There is a lot of dust which is also drawn in through the Probe Tube.
2. The Conventional filter cleaning pressure fails to clean the Probe Tube properly. (As there is pressure drop in the Filters)
3. Direct Probe Tube Purging with High pressure Air in additional to the air Purge from Filter cleaning , keeps the Probe tube clean, and reduces maintenance on the Probe. Increases availability.



The New Pneumatic actuator makes Direct Tube Purging with High Pressure Air Possible.

Probe With Pneumatic Actuator

Deposits on the Probe Tube

The Kiln Inlet is Filled with Dust and there are huge deposits on the Probe. This dusts solidifies on the surface making the Probe heavier leading to bending.

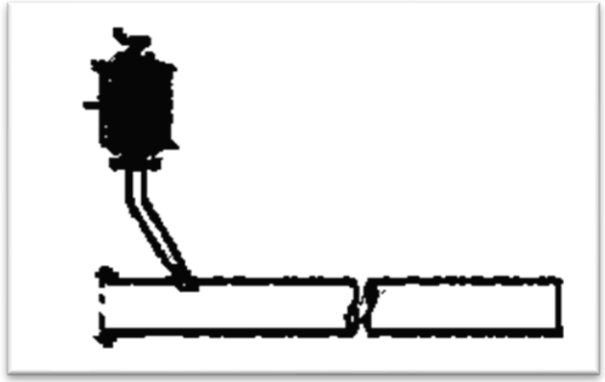
A simple Scrapper arrangement removes the deposits on the Probe on each retraction.

Deposits In The Bushing Tube

- The Dust removed by the Scrapper falls inside the Bushing Tube.
- Shift Maintenance has to poke and push the dust back in the process.
- The Probe while insertion also faces resistance due to the accumulated Scrapped dust.
- Mechanism for automated removal of the dust deposits is necessary

Air Blasting of Bushing Tube

An Air Blaster is installed on the Bushing Tube, and after every withdrawal of the Probe, the Blast of ait makes all the debris fall back into the process.

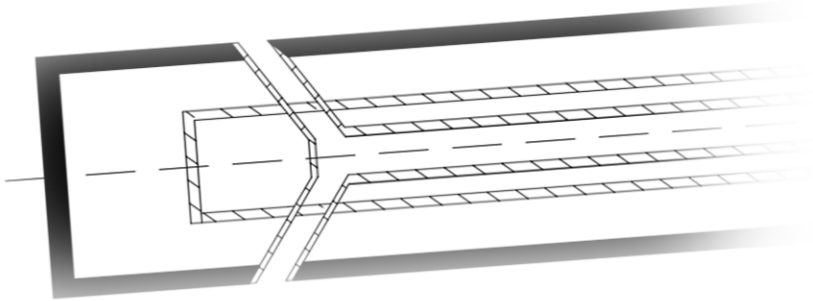


Air Blaster

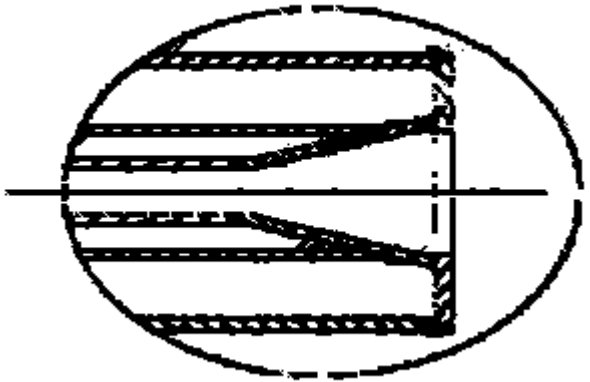
Bushing Tube for KAS

Old Probe Design with Twin Inlet at the bottom

- The Sample Inlets are small and tends to get clogged.
- Due to prolonged usage of the probe there is a slight Sagging of the Probe. The Probe if rotated the openings are now on the top side of the Probe. This makes direct dust entry in the Probe.
- The Angle of construction creates many welding points inside the Probe, leakage from these spots are a cause of huge concern after some period of usage.



New & Improved Probe Design

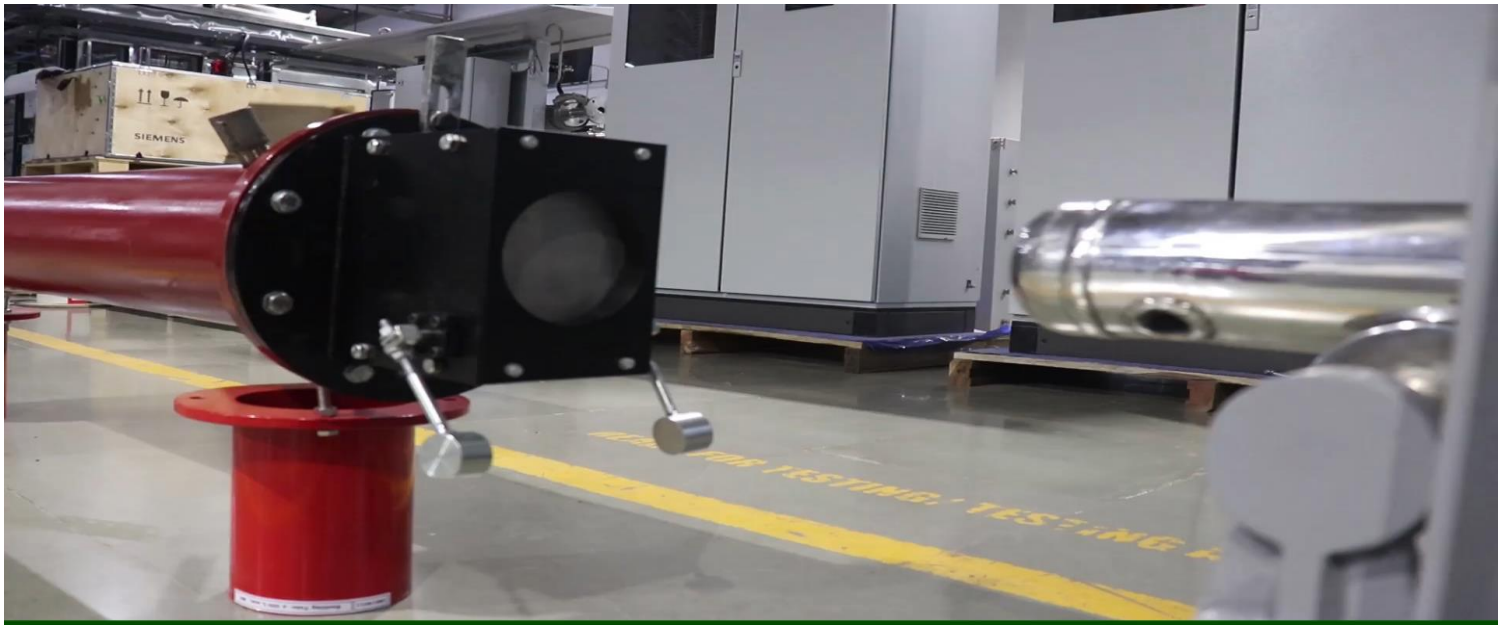


The New Improved Design makes the opening wider, with this design the welding in the construction of the Probe are easier and leakage are a thing of the past.

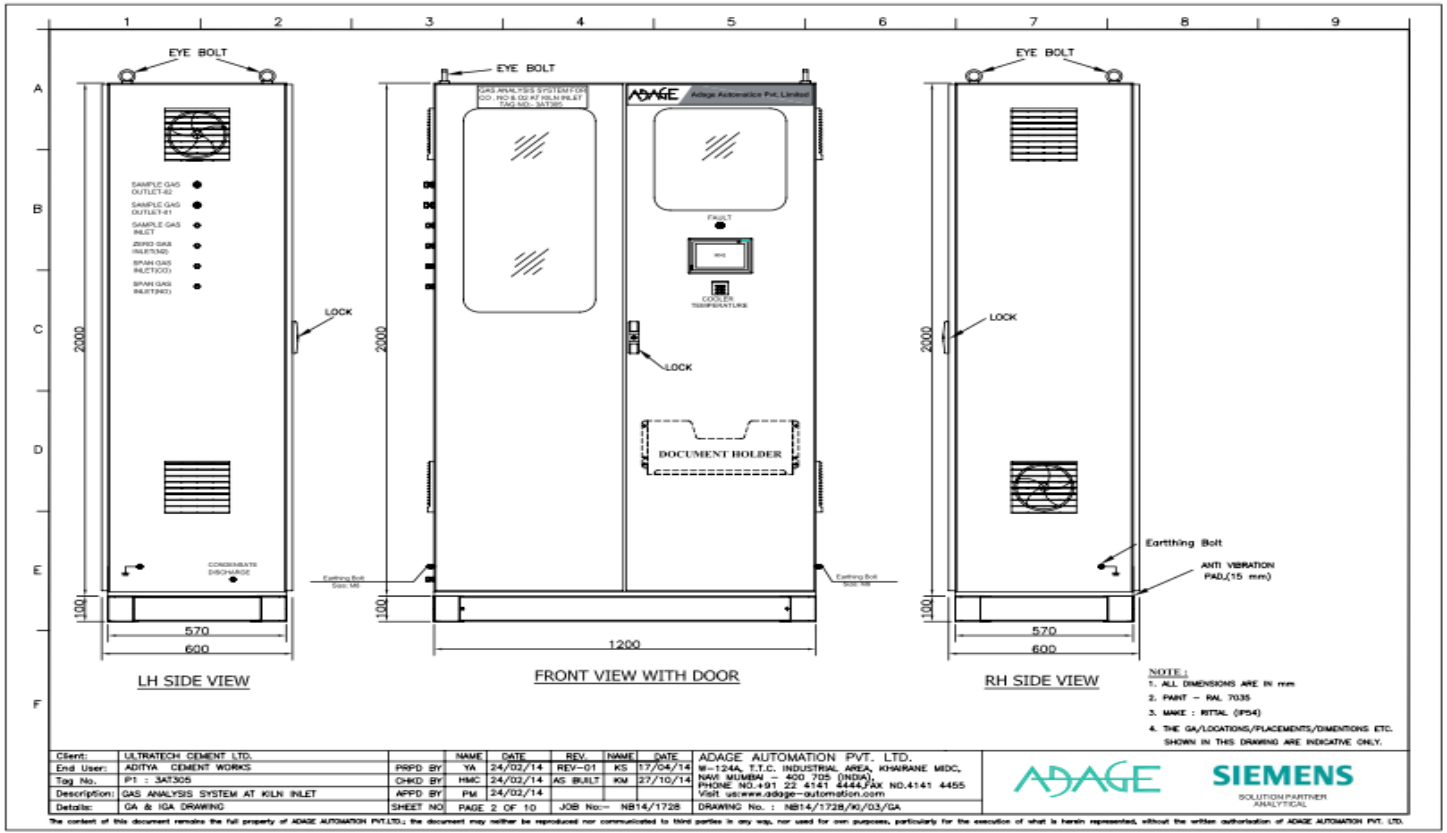
With the Direct purging of the Probe Tube the Dust and debris are also instantly removed. We have reduced Probe chokage.

Safe Operation

The Safety of the Plant operation is of Utmost importance. When the Probe is withdrawn there is a automatic shut off of the Probe entry point. It prevent any back fire and accidents.



Kiln Inlet System Panel GA Drawing



Retraction with Protective Cover for Safe operation and ease of maintenance.

THANK YOU

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