KELLER

Creating Solutions

K-Matic Moisture Control

for use in material preparation and shaping

in cooperation with NDC TECHNOLOGIES

KELLER A DIVISION OF GROUPE LEGRIS INDUSTRIES

K-Matic Moisture Control

On-line near infrared moisture measurement as a guarantee for stability in process monitoring

- Consistent quality
- Reduce Waste
- Faster Start-up & Product Change Times
- Increase Process Productivity

On-line measurements that can be trusted

For a stable production of ceramic products a uniform humidity of the factory blend is essential. Therefore, the adjustment of the preparation water content is an important part of the shaping process. With the help of infrared radiation, water contained in the operating mass can be detected and a constant mixing water content can be set with the determined data.

NDC Technologies brings its world renowned NIR technology experience of over 40 years to bulk materials processors with tight budgets and the requirements are for the most part moisture measurements.

It is often claimed that accuracy is not decisive. However, this is not true in practice, because even if only simple monitoring of the measured values is required, it is still the basis for manual intervention in the process. Reliable equipment and accurate measurement results are therefore essential.

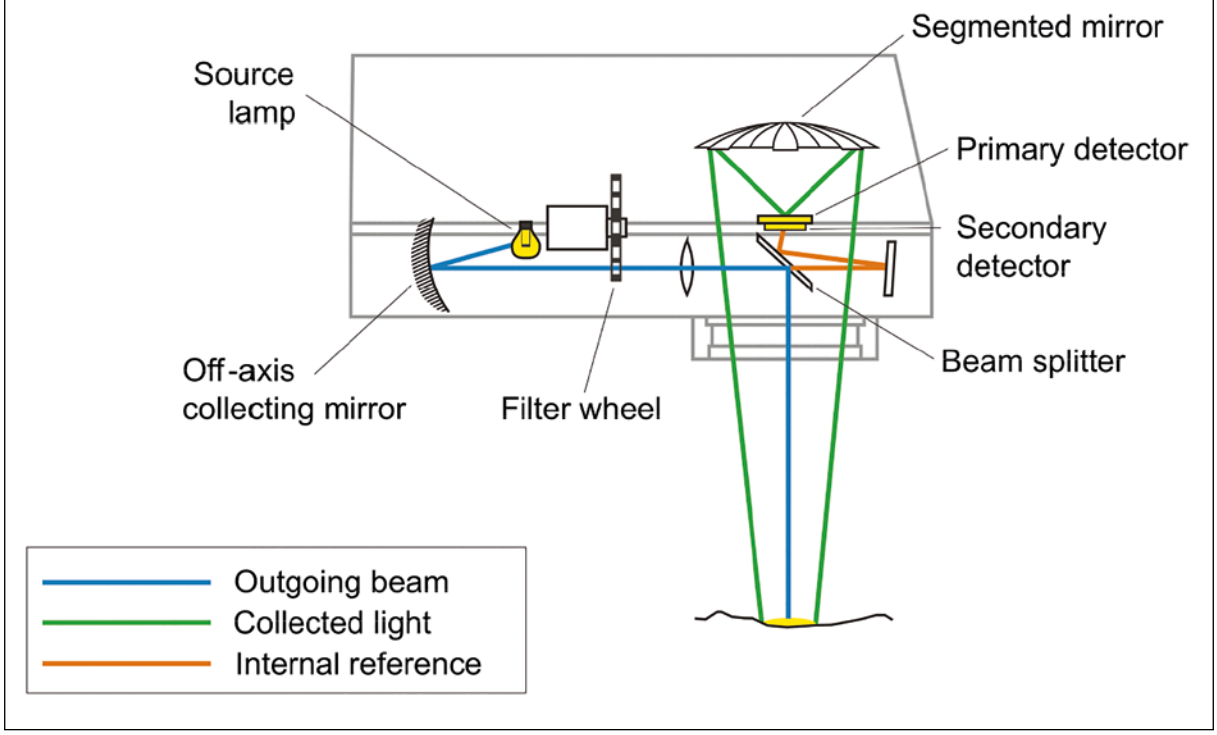
For years, generic instrumentation suppliers have offered moisture gauges which promise measurements at a low price. However, in practice, experience has not met expectation: these gauges need regular re-calibration, have poor measurement accuracy and instrument stability which limit their application where process control or even simple monitoring is important.

In cooperation with NDC, KELLER now offers, through K-Matic Moisture Control, a dependable, stable and accurate on-line measurement which allows processes to be tightly and consistently controlled manually or automatically with confidence. Our pedigree of solid long-term instrument stability, no effects from ambient condition changes and tolerance to process physical changes (such as pass height) are all offered in K-Matic Moisture Control so that end users can see the benefits of on-line process gauging and achieve an enduring return on investment and contribution to their bottom line.

Key benefits of on-line measurement:

- Reducing waste or scrap
- Improving product quality and consistency and gaining a competitive advantage
- Faster start-up and product change times
- Increasing product yield through closer operation to the product specification
- Ensuring legislative compliance and meeting safety standards
- Avoiding risk of plant damage due to overload caused by too stiff material

Moisture Measurement Operation



How K-Matic Moisture Control measures moisture

Proven technology for proven results

K-Matic Moisture Control is based upon NDC Technologies' proven optical filter technology. Light at a specific wavelength is absorbed by moisture. The rotating filter wheel projects pulses of light at this wavelength, and other reference wavelengths not absorbed by moisture, onto the product. Some of this light is absorbed and the rest is scattered/reflected. The gauge light collecting optics focus the reflected intensities onto a detection system which compares the amount of moisture absorption with the reference wavelengths providing a measurement independent of pass height variations, changes in source lamp intensity and atmospheric dust.

Algorithms convert the infrared signals into an output that is proportional to moisture content and calibration is carried out using the normal slope and intercept (Span and Trim) controls to achieve agreement with the customer's primary reference method. The measurement speed is very fast (over 60Hz) and therefore delivers a continuous measurement of moisture which can be output as a 4–20 mA signal or via serial bus or Ethernet protocols to the process computer.

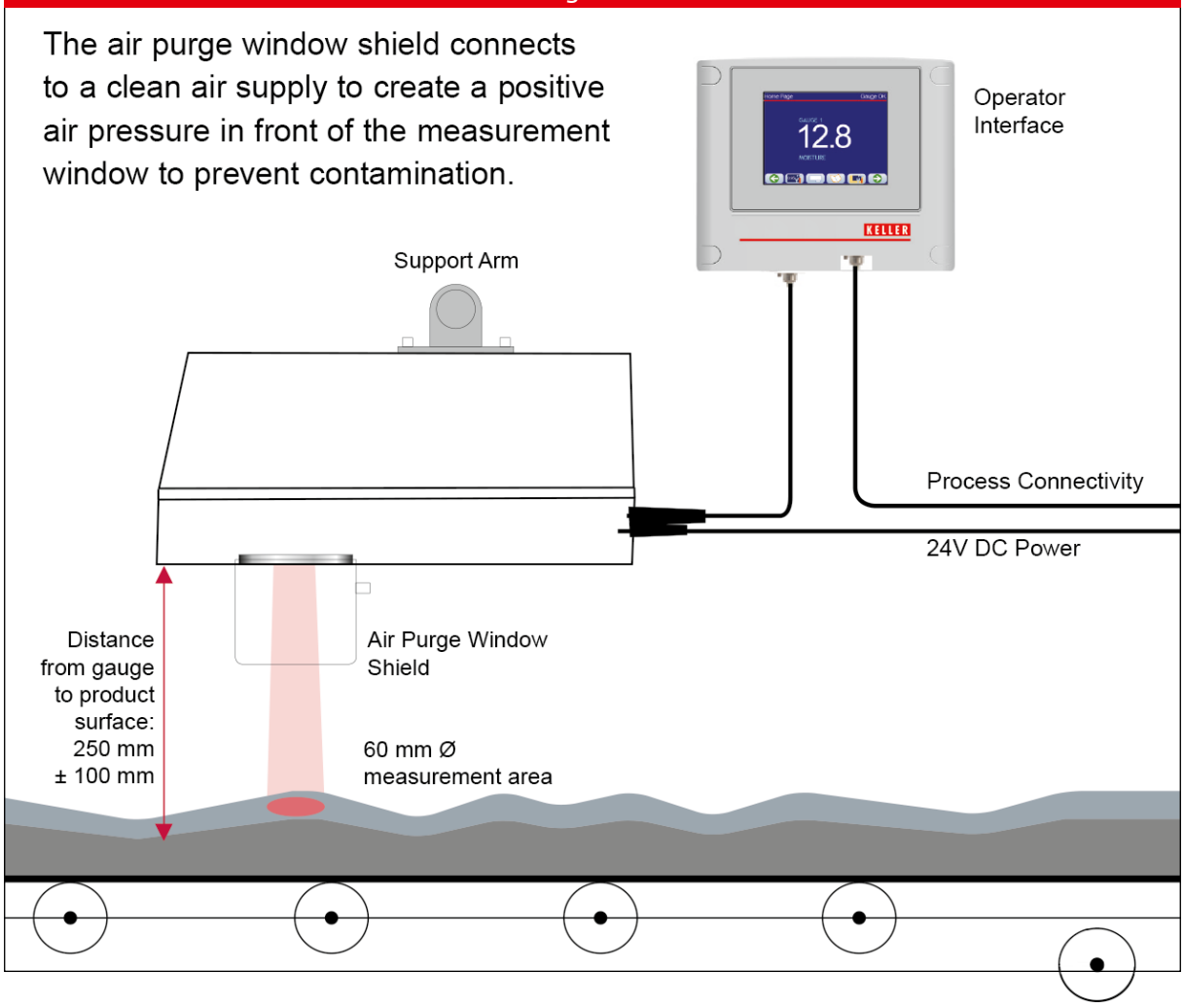
Key applications

- Aggregates, such as sawdust, papermaking sludge, sand
- Biomass
- Ceramic materials
- Sinter Mix
- Chemicals, Minerals and Building Materials such as: Bauxite, Dolomite, Phosphates, Nitrates, Limestone, Clay, Sand, Concrete Mixes, Power station fly ash, Sodium Carbonate, Fluorspar (Calcium Fluoride)

If you do not see your application listed, please contact us.

K-Matic Moisture Control

K-Matic Moisture Control Recommended Configuration



K-Matic Moisture Control in the process

Gauging configurations and installation

K-Matic Moisture Control in its most basic configuration is supplied as a single gauge with Operator Interface (OI), with 10m of interconnecting cable. It is also available in a dual gauge configuration both connected into a single OI. These dual configurations allow for the most common single-point measurements, for example after a dryer or conditioner. With dual heads, measurements before and after a drying or conditioning process can be monitored.

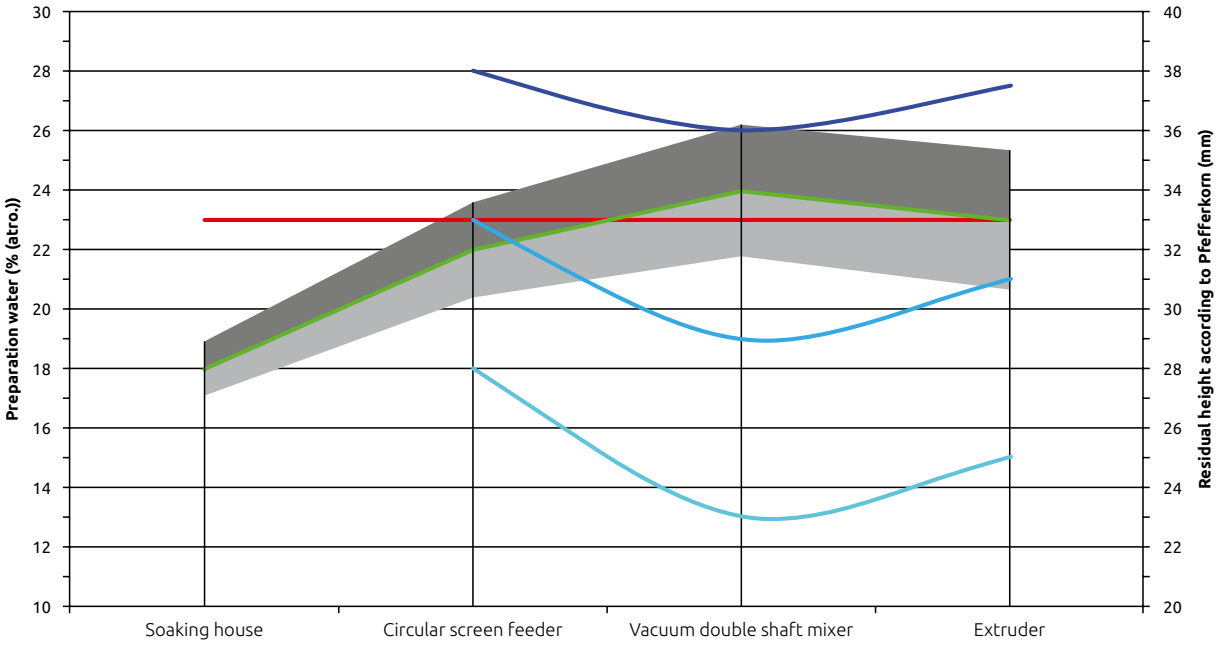
The gauge as standard is supplied with an Air Purge Window to keep the sapphire optics free of dust and other volatile contaminants. In line with best practices, window contamination can be monitored as standard and alarms output to a PLC in the event routine maintenance has been neglected.

K-Matic Moisture Control can be installed easily in most processes and as a non-contact measurement it is typically installed above a conveyor belt carrying the product.

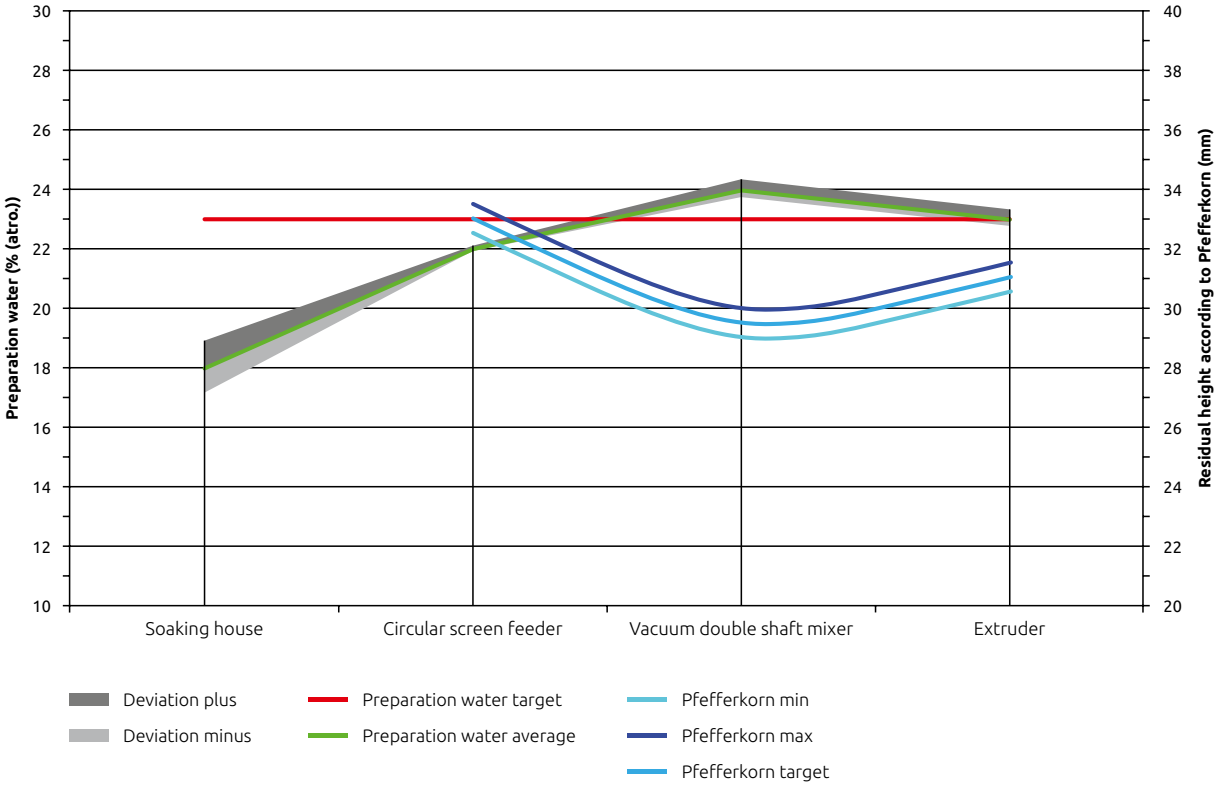
For high-temperature environments, the gauge head can be cooled using an integral Vortex cooler attached to the side of the casing allowing it to operate in temperatures up to 80°C (176°F).

Moisture control (as in the example on the circular screen feeder) can reduce the deviation of the preparation water content from the setpoint and thus have a decisive influence on the product quality.

Deviations of preparation water content without moisture control



Deviations of preparation water content with moisture control



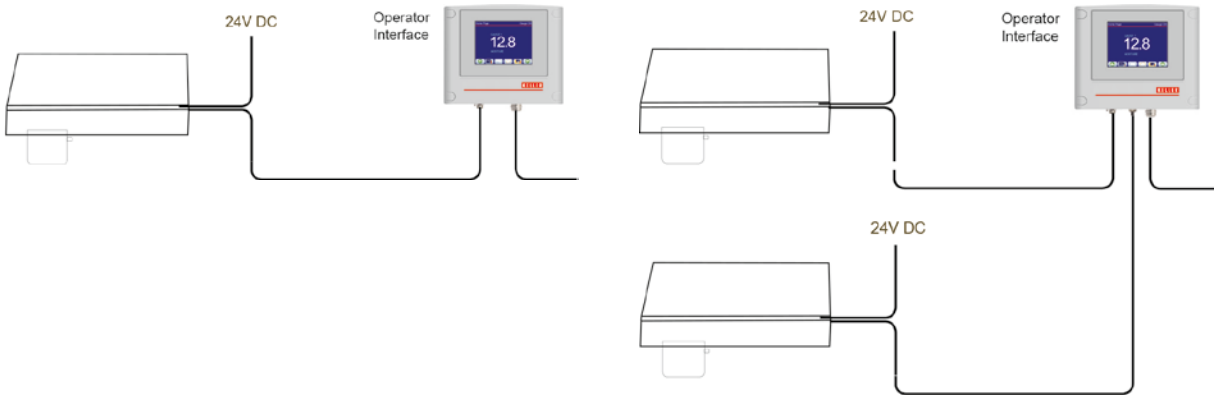
K-Matic Moisture Control

K-Matic Moisture Control Specifications

Source Lamp	Quartz halogen 20 W underrun, lifetime >40,000hrs
Filter Wheel Motor	24 V brushless DC
Operating Temperature Range	0-45°C (32-113°F)
Gauge and IO	10 m of interconnecting cable between gauge and OI, Cat 5e LAN cable
Power Consumption	35 W (Gauge and Operator Interface)
Head Construction	Stainless steel with Air Purge Window
Response Time	2-1000 seconds configurable
Measurement Speed	63 Hz
Environment	Gauge & OI IP65/Nema 4
Optical Window	Sapphire
Moisture Range	0-95% depending on application
Process Connectivity	4-20 mA standard, 8 Digital Inputs (Opto-Isolated), 8 Digital Outputs (FET Driven)
Optional	Ethernet IP, ProfiNet, Modbus TCP, Profibus, DeviceNet all from OI
CE compliant	EMC EN61326

System Configuration

Configuration includes one or two gauges, stainless steel with Air Purge Window(s), connected to an Operator Interface (OI) with 1/4 VGA colour touch screen and Universal Power Supply delivering 24V DC with 10m of cable to gauge and OI.



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