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experience

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Messtechnik®



The next generation of moisture measurement

AQUATRAC Station

Brabender Messtechnik®
GmbH & Co. KG

AQUATRAC Station

the new kind of residual moisture analysis

The all-in-one solution for reliable moisture measurement on the workshop floor

Experienced plastics processors know hidden residual moisture in plastics, either in the granulate or even in the finished component, is a serious problem. Moisture is everywhere – and its removal in a dryer is expensive and takes a long time. The new AQUATRAC Station shows practitioners what's what quickly, precisely and in a reproducible format: Using an extremely precise moisture measurement with an absolute solution of 0.02 milligrams of water.

When developing the AQUATRAC Station, we incorporated all the experience we have gained as recognised residual moisture experts during decades of cooperation with customers from all areas of the plastics industry. As a result, the AQUATRAC Station not only represents an extremely reliable measurement principle – just think: capacitive dew point measurement – but also reliability and reproducible results. And above all: excellent user-friendliness! Reliable results in minutes without reagents, carrier gases or consumables.

Highly precise humidity measurement taken to the next level!

- New measurement principle: Dew point measurement
- No reagents, auxiliary chemicals or carrier gases
- Exact, reliable, reproducible
- Configurable: fast, easy, universal
- Based on international standards
- Doesn't have errors typically associated with known measurement processes



The measurement process

of the AQUATRAC Station

Weigh, fill, start – finished. The software does the rest.

It couldn't be simpler and the menu on the 7" touch screen, which has been designed to cover every detail, also gives you precise instructions: weigh the sample, fill the test chamber and start the measurement. The AQUATRAC Station does all the rest – this speeds up the analysis process and prevents operating errors. Doing as much of the user's work as possible this idea is also reflected in the device details. The AQUATRAC Station software is highly intelligent! You can set up a user database and configure and determine who can access the product database, and define processing thresholds for the sample material. You can choose abort criteria in case measurement takes too long and material processing thresholds are exceeded. There is also the especially smart and time-saving option to abort the measurement if the sample only shows a previously defined amount of water per time unit. Scanning using defined temperature levels and stop times is a further highlight. As a result, it is possible to find the optimal measurement temperature for your product and to distinguish between surface, pore and core moisture. The measurement process is documented based on concrete curve plots. You can see an overview at all times and extrapolations are no longer necessary.

You can view the measurement status from a distance via an optional signal lamp; once the analysis is complete, on request the software can automatically move the data obtained to a database specified by you – using a network cable or optional WiFi. Your measurement result can be displayed in milligrams, percent and ppm. Earlier measurements can also be instantly displayed again – for instance if you wish to compare results in the same product batch.

Easy to use, perfected software: This is how the AQUATRAC Station meets all your requirements of a highly precise analysis device and a fast, uncomplicated adviser for your workshop practice.

Top precision

with the AQUATRAC Station

Dew point measurement in the vacuum: highly precise, robust, reproducible

The revolutionary new feature of the AQUATRAC Station is its measurement principle: Residual moisture analysis via dew point measurement. It is a well-known fact that moisture calculations using analysis scales (so-called gravimetric analysis using halogen or infrared lamps) can be erroneous: These processes tend to also measure other sample components such as additives and therefore tend to overestimate the water content. It is also well-known that chemical processes such as Karl Fischer titration are too labour-intensive for quick residual moisture analysis on the hectic workshop floor. The AQUATRAC Station now brings the existing Brabender measurement technology® dew point measurement as a further highly precise process for residual moisture calculations using calcium hydride. At our customers' request, it works completely without reagents.

The dew point is defined as the temperature at which the humidity contained in the air separates out onto a cold surface. Dew point measurement with capacitive sensors is very precise and the dew point is physically precisely linked to the air water content. All that is missing is the gas temperature: the AQUATRAC Station uses these two values to calculate the absolute air humidity in the test tube and from this the precise water content of the sample.

The AQUATRAC Station uses a vacuum and high temperatures to withdraw the water from the sample very effectively and quickly. The vacuum not only creates a high concentration gradient between the sample and the gas, which ensures that the water contained in the sample fully evaporates from the material. It also ensures that the water from the sample cannot come off the device's pipe walls – whose components include selected hydrophobic (i.e. water-repellent) materials whose water vapour desorption rates are well known and taken into account in the measurement analysis. At the same time, the vacuum increases analysis precision because the saturation vapour pressure and dew point temperature are exponentially linked.

In other words: The new measurement principle has been designed to the last detail and saves the user significant time and work effort – while at the same time delivering even more reliable and exact results and the defined start-up conditions significantly increase the measurement's reproducibility.

The robust alternative –

AQUATRAC Station

No more white laboratory coats: Built as a standalone device for your workshop floor

The AQUATRAC Station is not a PC and also does not need one because PCs can often cause more problems than they solve, set up the device wherever you need it next to your extruder, dryer, injection moulder – anywhere on the workshop floor, in quality management or the laboratory.

And of course the device has many interfaces for accessories of all kinds – for instance, this enables you to directly connect precision scales and integrate them into the highly automated analysis process. The sample weight is used automatically. One of the most regular sources of errors during residual moisture analysis – the typing error – can be avoided once and for all.

The same is true of the end of the measurement process: The results logs can also be output directly on site, using an optional label printer directly next to the dryer or extruder. This



creates an instantaneous self-adhesive label telling you all the important details: If you stick this directly onto the granulate container, the label becomes a kind of "residual moisture passport" for the next processing steps. Manual entry of the results into laboratory records is also no longer required: simply add the printed out logs to the folder and you've met your documentation obligation.



Applications

for the AQUATRAC Station

All-round carefree package for residual moisture analysis

Residual moisture is particularly a problem in polar, hydrophilic plastics which can even sometimes break down in water. But a precise identification of the water content of unpolar, hydrophobic polymers can also help to make the difficult drying and manufacturing process more economical.

The AQUATRAC Station is e.g. suited to analysing the following materials:

Thermoplasts, such as ABS, PBT, PA 6.6, PA 6, e.g. GF30, PA 12, PC, PET, TPE, PEI, LDPE, HDPE, PETP, PMMA, PP etc.

Duroplasts, such as epoxy resin, acrylates, silicon resin, vinyl resin etc.

Elastomers, such as styrene-butadiene rubber (SBR), polychloroprene rubber (CR), thermoplastic polyurethane (TPU) etc.

The positioning of the AQUATRAC Station is also universal and flexible. It has many different uses throughout the company, which will immediately help you with error analysis. Here are just a few:

- Incoming goods checks
- Monitoring and optimisation of granulate drying
- Granulate measurement on the machine
- Finished component measurement
- Laboratory measurements, and many more



AQUATRAC Station

Up-to-date with international standards

thanks to the AQUATRAC Station

No longer dependent on calibration salts or sensitive water standards

There is hardly a request that plastics professionals have mentioned to us as often as whether residual moisture analysis results could be based more closely on international standards. The AQUATRAC Station now lets you realise this important feature.

While a challenge with other tools, this has now become very easy with the new analysis principle of dew point measurement. Device checks with calibration salts and/or water standards are now supplemented with a genuine, direct link to internationally approved average values which were calibrated in NIST or UKAS accredited laboratories. This will ensure that in future, your company will be able to meet all the necessary requirements, including in the field of residual moisture analysis, which modern quality assurance requires certified suppliers of high-quality plastic components to meet.



Generation WLAN –

also with the AQUATRAC Station

Easy control and management also possible from your PC

The AQUATRAC Station offers all the comfort which can be expected from a modern high-end analysis device at the current level of network technology and which at the same time is ideally prepared for future requirements. A WiFi dongle can be attached to the AQUATRAC Station via the USB ports. This makes the device into a so-called access point in ad hoc or client mode. As such, it becomes a communication platform which can link several other devices, such as printers or other computers. The AQUATRAC Station's software is web browser-based, so if required, the output can also be read and controlled via any office computer.

In this way, firmware, language packages and the material database can of course also be updated without problems. The times when the device needed to be returned for a software update are definitely long since gone.

What's great about the AQUATRAC Station:

- Robust construction for production and laboratory
- Adaptable material database makes quality assurance much easier
- Smart menu management and WiFi (optional)
- Signal lights (optional) – Measurement visible any time, anywhere
- Label printer (optional) – Results can be accessed immediately
- Precision scales with USB connection (optional)



Further features

of the AQUATRAC Station

Standalone device for industrial environment

- No reagents, carrier gases or other consumables
- Real-time graph of measured residual moisture
- Export of measurement data in csv format and measurement logs in pdf format
- Editable user and material database
- Temperature scan:
 - to find the optimal material-specific measurement temperature
 - differentiation between surface, pore and core humidity
- Precision scales (optional) can be read via USB
- Label printer (optional) for printing out measurement logs on site
- 3-colour signal light (optional) accessed via USB, to visualise the measurement status in large production halls
- Simple connection to a local network possible via ethernet interface or WiFi dongle (optional):
 - Measurement data and measurement log saving
 - Remote maintenance (via internet connection)
 - Editing of user and material database from the office

Technical data

Measurement principle / test methods:	Dew point measurement / Precise residual moisture calculation, temperature scan
Sample weight / sample volume	0.05 – 10 g dependent on the expected residual moisture proportion / max. 50 cm ³
Solution	0.01 mg / 1 ppm / 0.0001 % H ₂ O
Measurement range	0.01 – 30 mg H ₂ O (absolute) / 1 ppm – 99.9 % H ₂ O (relative)
Precision / Reproducibility	± 0,02 mg H ₂ O / ± 0,03 mg H ₂ O
Temperature range	30 – 200 °C in steps of 1 °C
Measuring time / measurement result in	5 – 600 min / mg, ppm, %
Abort criteria	<ul style="list-style-type: none"> • Increase in residual moisture proportion (standard + user defined) • Exceeding of the upper processing threshold (user defined) • Failure to reach the lower processing threshold after a specific period (user defined) • Fixed measurement period (user defined)
Voltage / frequency / Rated output	100 – 240 VAC ± 10 % / 50 – 60 Hz / max. 600 W
Interfaces	4 × USB 2.0, 1 × Ethernet
Calibration	Multi-point calibration, retraceability to averages based on NIST and UKAS standards
Ambient temperature	10 – 40 °C
Air humidity	10 – 90 % non-condensing
Measurement (L × W × H) / Weight	562 × 404 × 275 mm / 27.6 kg

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