brabender Messtechnik®


The next generation of moisture measurement

# AQUATRAC Station

Brabender Messtechnik® GmbH & Co. KG

# AQUATRAC Station

**The solution for reliable residual moisture measurement in production and laboratories**

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 AQUATRAC Station shows the practitioner the residual moisture quickly, precisely and reproducibly: An extremely accurate residual moisture measurement with a relative resolution of 1 ppm and an absolute resolution of 0.01 milligrams of water.

In developing the new AQUATRAC Station, we have incorporated all the experience we have gained as recognised residual moisture experts in almost sixty years of cooperation with customers from all sectors of the plastics industry worldwide. The AQUATRAC Station therefore not only stands for an extremely reliable measuring principle - keyword: water-selective, capacitive dew point measurement - but also for reliability and reproducibility. And above all: for excellent and intuitive user-friendliness! Reliable, water-selective results in the shortest possible time, without any reagents, carrier gases or consumables.

**High-precision residual moisture measurement for the future!**

- New measurement principle: Water-selective dew point measurement
- No reagents, auxiliary chemicals or carrier gases
- Exact, reliable, reproducible
- User friendly: fast, simple, intuitive
- Doesn't have errors typically associated with known measurement processes
- No trained personnel necessary


# Measurement sequence

**Intuitive and simple: weigh, fill, start. The AQUATRAC Station does the rest**

It couldn't be simpler, and even with it, the menu on the high-contrast 7" touch screen, which has been thought through down to the last detail, guides you precisely: Select the material from the database, weigh in the sample, fill the sample chamber and start the measurement. The AQUATRAC Station does the rest for you. This speeds up the analysis process and prevents operating errors. Always relieving the user of as much work as possible: This idea is also reflected in the instrument details. The software of the AQUATRAC Station is extremely intelligent! You can edit a preconfigured material database, define who has access to the material database and e.g. define processing limits of the sample material or change abort criteria. As abort criteria, you can set up the measurement time, exceedances of the material processing limits and, of course, the criterion of the gradient of the measurement curve, which has been tried and tested for decades. Of course, these termination criteria can also be combined. In this case, the criterion that occurs first leads to the termination of the measurement. All these settings can be saved in the editable material database, so that settings made once do not have to be repeated. This saves time, prevents operating errors and increases the precision of your measurement. Another highlight is the temperature scan. A residual moisture measurement with defined temperature levels and time intervals. Thus it is possible to distinguish between surface, pore and core moisture. In the case of components, you can even conclude that they are near-surface or completely saturated with water; keyword conditioning. In general, the measurement process is always documented using concrete real-time measurement curves and can be visually checked at any time.

Of course, the software automatically saves the acquired data after the measurement has been aborted as a measurement graph and measurement protocol. The PDF or optional CSV measurement protocol includes all relevant data such as residual moisture in mg, % and ppm, measurement time, date, user, material name, etc. Previous measurements are also immediately

displayed again on the device - for example, if you want to compare the results of one and the same product batch. It is even possible to display previous measurement curves in a current measurement.

The AQUATRAC Station is the balancing act between the demands you place on a high-precision analytical instrument and on a fast, uncomplicated guide for industrial practice that can be operated directly in production by any employee.

## Top precision

**Dew point measurement in the vacuum: highly precise, robust, reproducible and water-selective**

The revolutionary new feature of the AQUATRAC Station is the physical measuring principle: high-precision residual moisture analysis via water-selective dew point measurement. It is well known that moisture analysis using analytical balances, the gravimetric systems using heaters, does not provide reproducible results: These methods tend to measure other volatile sample components such as additives and thus significantly overestimate the water content. It is also well known that chemical methods such as the Karl Fischer method are too complex and complicated for rapid residual moisture analysis in hectic industrial environments. With the dew point measurement, the AQUATRAC Station from Brabender Messtechnik now offers a further method for determining the residual moisture that is just as precise as the calcium hydride method of our AQUATRAC-V mentioned in DIN EN ISO 15512:2019.

But what is the dew point? The dew point is defined as the temperature at which moisture condenses on a surface. The dew point can also be taken as a measure of humidity. The dew point measurement with capacitive sensors is very accurate and the dew point is physically precisely linked to the water content of gases. Then only the gas temperature and device-specific parameters are missing: From these values, the AQUATRAC Station calculates the absolute residual moisture within the AQUATRAC Station and thus the precise water content of the sample.

In the AQUATRAC Station, the water is removed from the sample particularly effectively and quickly by vacuum and elevated temperatures. The vacuum not only generates a high concentration gradient between the sample and the interior of the instrument, which ensures that the water contained in the sample evaporates completely from the material. It also means that the water from the sample cannot condense inside the instrument: Keyword vapour pressure curve. The interior of the AQUATRAC Station is made of selected, hydrophobic, i.e. water-repellent materials whose water vapour desorption rates are known and are naturally taken into account in the evaluation of the measurement. At the same time, the vacuum significantly increases the accuracy of the analysis, since the saturation vapour pressure and the dew point temperature are exponentially linked.

In other words, the new measuring principle, which has been thought through down to the last detail, means a noticeably lower time and effort for the user - and at the same time delivers reliable and exact results without chemicals or consumables.

## The robust alternative

**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 instrument has many interfaces for accessories of all kinds - for example, Precisa balances can be connected directly and integrated into the highly automated analysis process. The sample weight is automatically

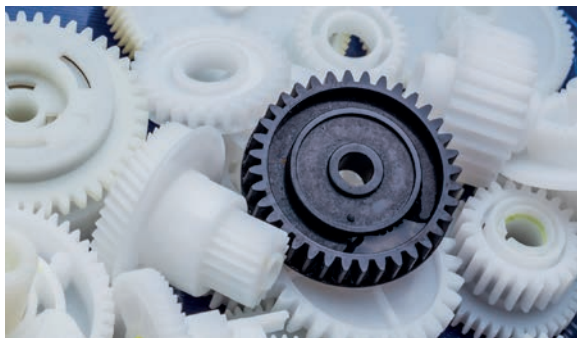
transferred - one of the most common sources of error in residual moisture analysis, typing errors are eliminated once and for all. During a measurement, you can also see the status from a distance using an optional traffic light. Once the analysis is complete, an adjustable light signal indicates this, as well as, for example, if limit values or other selectable scenarios are exceeded.

The same applies to the end of the measuring process: the result logs can also be output directly on site, for example directly next to the dryer or extruder, on an optional label printer - and you have a self-adhesive label with everything you need: The label is glued directly onto the granulate container and thus becomes a kind of residual moisture pass for all subsequent processing steps. Even handwritten entry is finally a thing of the past: quickly export the PDF of the measurement protocol manually or automatically to the network and the documentation requirement is met. Data security is also ensured at all times during automatic storage in the network.

## Applications

**All-round carefree package for residual moisture analysis**

Residual moisture is particularly a problem in polar, hydrophil 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-butadien rubber (SBR), polychloroprene rubber (CR), thermoplastic polyurethane (TPU) etc.

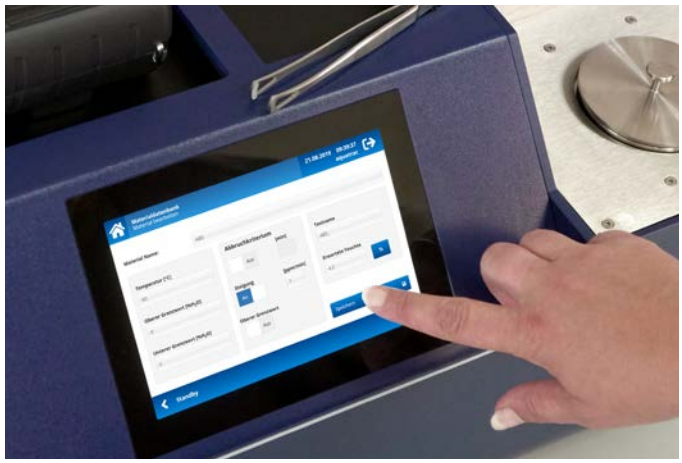
The positioning of the AQUATRAC Station is also universal and flexible. It has many different uses throughout the company, which will immediately help you with error analysis. Here are just a few:

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


AQUATRAC Station

**What's great about the AQUATRAC Station?**

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



## Generation network

**Control and administration also conveniently from the office**

The AQUATRAC Station offers all the comfort you would expect from a modern, state-of-the-art high-end analytical instrument. At the same time, it is optimally prepared for future requirements such as automated data processing. PDF and CSV have been chosen as the file format for the measurement protocols, so that you can conveniently process the data with a software of your choice. An automatic export of the measurement protocols within a network is just as possible as the manual export into the network. Of course, the PDFs and/or CSVs can also be saved directly at the AQUATRAC Station on a USB memory stick. In addition, the software of the AQUATRAC Station is web browser-based and network-compatible. If required, the AQUATRAC Station can also be read and controlled via any office computer, tablet computer or smartphone. Of course, the material and user database can also be easily updated in this way, even while someone is carrying out residual moisture measurements on the device. The times when you had to send the device in for a software update are also finally over, as an update can be easily imported via USB. So you always have a device with the optimal software on site. AQUATRAC Station: high-precision, water-selective, chemical-free and intuitive residual moisture measurement that every employee can now carry out anytime and anywhere.

## Highlights

- Water-specific residual moisture measurement
- No chemicals, gases or consumables required
- Simple to operate, no specialist personnel or training required
- High-precision and reproducible measurement results
- Full network capability for operation and data backup
- Measurement reports in PDF and CSV file format
- Stand-alone device for production and laboratory

## Technical data

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|---|---|
| **Measurement principle** | Water-selective dew point measurement |
| **Sample weight / Sample volume** | 0.05 – 25 g dependent on the expected residual moisture proportion / max. 50 $cm^3$ |
| **Measuring temperatures** | 30 – 160 °C in steps of 1 °C |
| **Precision** | ± 4 % of the measuring range end value |
| **Measuring range** | 0.01 – 15 mg $H_2O$ (absolute) / 1 ppm – 30 % $H_2O$ (relative) |
| **Measuring time / Measurement result in** | 10 – 60 min. / mg, ppm, % |
| **Resolution** | 0.01 mg / 1 ppm / 0.0001 % $H_2O$ |
| **Power supply** | 85 – 265 VAC / 47 – 63 Hz / max. 0.6 kW |
| **Interfaces** | 3 × USB 2.0, 1 × Ethernet |
| **Protection class** | IP20 |
| **Operating temperature** | 10 – 45 °C |
| **Air humidity** | 5 – 95 % non-condensing |
| **Measurement (W × H × D) / Weight** | 562 mm × 275 mm × 404 mm / 27.6 kg |


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