

## Archive Stores



### Archives in general

#### Environmental factors in archive stores

- **Radiation** in the form of light will cause paper to yellow and ink to fade considerably.

- **Air pollutants** such as dust and chemicals accelerate the degradation of important documents.

- **Vibration** for example of archive stores caused by vehicular traffic or construction work can cause mechanical stress on collections.

- **Insect pests** can lead to severe damage through bites and deposits.

- **Temperature & humidity** are the most significant factors that have an impact on archive collections and often interrelate with other environmental factors.

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Archives are an accumulation of historical documents collected over the course of the lifetime of an organisation.

National archives have the role of collecting, cataloguing and securing historical & present day materials within their country. Besides preserving & organising collections, archivists face the great challenge of deciding which records are assigned a lasting value for research purposes and could contribute to the understand-

### Why the need to measure relative humidity?

As in museums, incorrect temperature and humidity levels cause damage to documents, books, photographs and drawings. The rate of decay can double with an increase of as little as 5 °C. Generally warm & damp conditions provide more energy and so increase the speed of decay.

High temperatures can cause document wax seals to soften and even result in the combustion of cellulose nitrate film. At low temperatures organic and plastic materials become brittle making them prone to physical damage. However, one of the most significant consequences of incorrect

ing of a country's history.

Furthermore, archivists transfer the information to more resistant media by digitising documents, drawings and photographs. This makes it easy for researchers to access conserved items without the risk of damaging the originals.

In spite of all the new media available these days some legacy materials need to be preserved in order to show their uniqueness. The oldest

temperature is the incorrect relative humidity that can result - temperature has a direct effect on relative humidity and vice versa.

This particular fact of course is the same in museums, but is often much harder to control in archives since proper ventilation is not easy to achieve in between multiple shelves fully loaded with collections. Studies have shown large deviations of temperature and therefore also humidity (RH) within an archive section. In general, it is recommended to keep the temperature between 20 - 22 °C and humidity between 50 - 60 %rh in archives

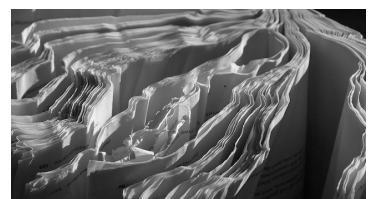
preserved book in the world is possibly an Etruscan script discovered in Bulgaria. It is estimated to be more than 2,600 years old.

Besides all the academic work necessary it requires great technical effort to create the best possible storage conditions suitable for the form of the objects to be preserved - e.g. papyrus and paper require different temperature and humidity conditions compared with microfilm tapes.

where organic material is stored. Otherwise a temperature drop can make condensation inevitable.

RH above 65 % encourages mould and pest activity, RH below 45 % leads to desiccation, shrinking and cracking of organic materials.

The main challenge for architects and HVAC engineers is to create the most homogeneous controlled storage environment possible.



## What solution can Rotronic offer?

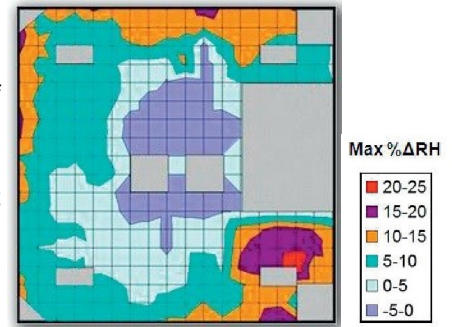
Rotronic can offer a wide range of solutions to either improve the precise monitoring of the environment in archives and products which provide stable control of the desired storage conditions for each type of collection. At the initial monitoring stage Rotronic temperature and humidity data loggers can be used to prepare a climate

map of an archive store. This allows archivists to identify critical areas and helps to evaluate the overall suitability of the storage space.

Rotronic online monitoring systems precisely measure and record temperature and humidity values and activate alarms in the case of defined deviations at any time of the

day or night. A network of Rotronic probes such as HC2-S assist HVAC engineers in maintaining the best possible homogeneity.

Rotronic RH & temperature transmitters provide signals compatible with any HVAC/BMS system to directly control and provide a stable climate in archive stores.



**A climate map illustrating the percentage differences in RH across a floor of the National Archive UK**

## Rotronic products:

### Humidity and temperature probe:

- **HC2-S**  
Standard humidity sensor,  
-50...100°C,  
0...100%rh,  
±0.8%rh and ±0.1K

### Dataloggers:

- **HL-NT range**  
wired online monitoring system for interchangeable probes, (up to 7 probes with docking station)  
32MB flash card
- **HL20 data loggers**  
compact standalone humidity & temperature logger,  
-10°C...60°C, 0...100% rh, +/- 0.8% rh, +/- 0.1K, saves up to 20.000 data values.

- **Log-HC2-RC**

Remote wireless data logger for interchangeable HC2-S probes, saves up to 500.000 measured values, long-term recording up to 6 years, compact to be setup easily in smallest spaces.

### Transmitters:

- **HF5 series**  
For interchangeable probes,  
2 or 3/4 wire configuration,  
Various analogue and digital outputs
- **HF8 series**  
For 2 interchangeable probes, 2 or 3/4 wires configuration, relays outputs & data logging functionality for up to 10.000 measured values



**HF5 transmitter with HC2-S probe**



**HL20-D stand alone data logger collects up to 20,000 data points e.g. for climate mapping**

## Customer benefits:

### Accuracy:

Choosing Rotronic products gives you the best sensor accuracy on the market.

Precise measurement enables you to detect small variations in both temperature and humidity so you can take the necessary action to protect precious archive collections.

### Communication:

Networking with Rotronic is an easy affair! With the wide

range of communication interfaces available, from conventional analogue output signals to digital USB, RS-485, Wireless and Ethernet RJ-45, Rotronic can provide the required interface for your BMS control system, or a third party data acquisition system.

### Long term stability:

With long term sensor stability of under 1 %rh per year (depending on the environment), Rotronic offers the

possibility to "plug & play": install the device and leave it. Rotronic sensors are the best choice for the permanent monitoring of archives.

### Calibration:

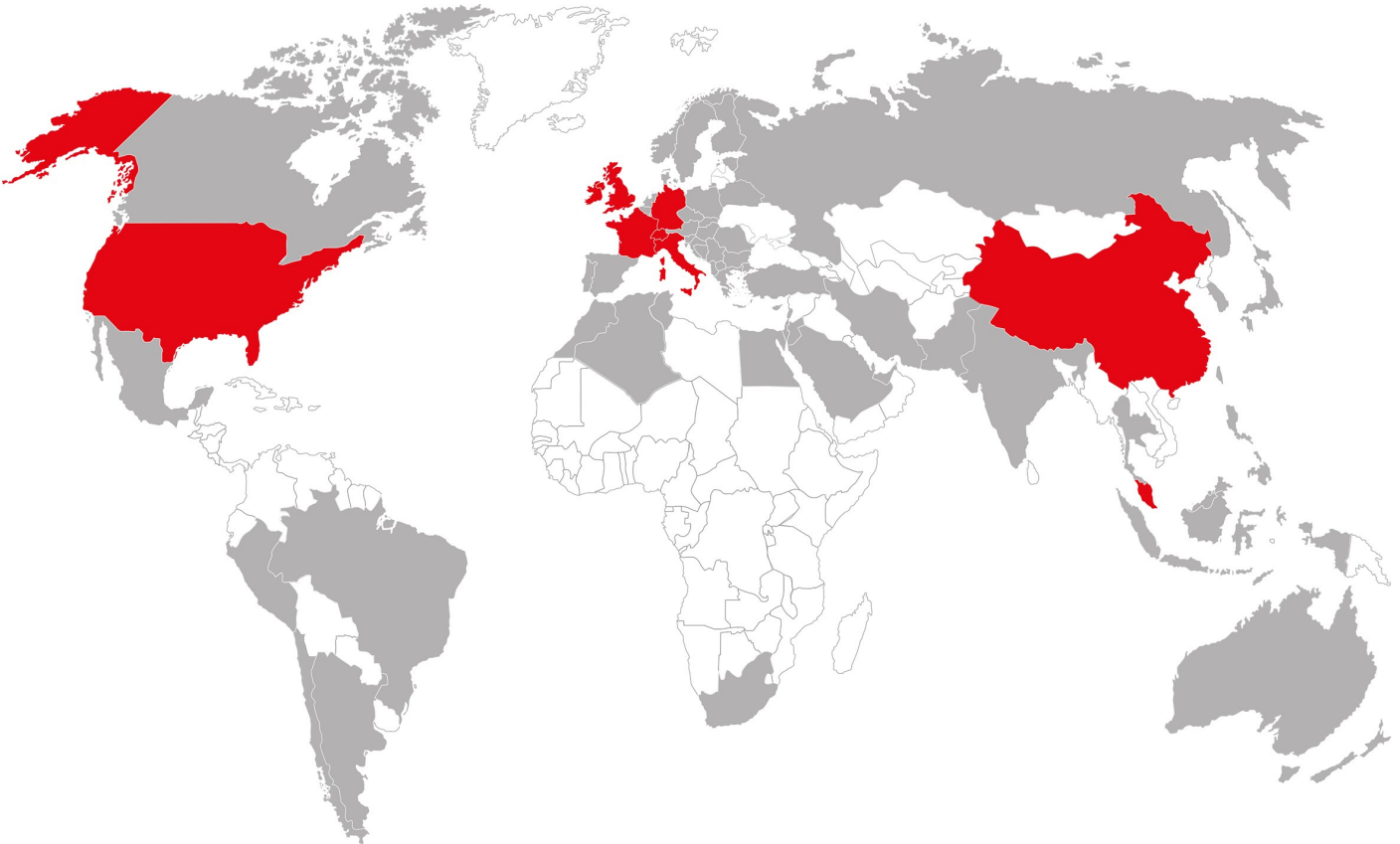
Every Rotronic probe comes with a factory calibration certificate or SCS certificate that meets ISO17025 if required. Rotronic offers a wide range of calibration accessories such as traceable %RH salts & the portable HygroGen2 calibrator for use on site.



**HL-NT online monitoring system**

## Contact us:

Rotronic is represented in more than 40 countries around the world. An up-to-date list of all our partners is available at [www.rotronic.com](http://www.rotronic.com)



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