

Thermo-Hygrograph



1 General

Thermo-Hygrographs are used to measure and record air temperature and relative humidity (r.h.). The measured values are recorded, using drum recorders driven by clockworks. These rugged and reliable precision products have been proven over decades of use in business, science and culture around the world. They are suited for service in industry and private environments. To take advantage of the high measuring accuracy and to maintain them for many years in service, please observe our following recommendations.

2 Place of installation

Install the instrument horizontally in a vibration-free location. Depending on the model, the permissible ambient temperature varies between $-35...+80$ °C. The instrument should be protected against direct heat radiation and conduction. For outdoor installation, a protection screen against radiation and precipitation is required.

3 Setting into operation

To open the instrument, gently push down the hood **2**, pull the locking knob **1** and swing up the hood. At the same time hold the styrofoam cushion **22** (located under the cover) and remove it after opening the instrument.

3.1 Removing the transport lock

Loosen the recording arm's transport lock **4** by turning it on the lifting rod **7** by about 90° . Remove the cardboard wedge at the switch-off lever **3** and save it. Carefully remove the protective cap from the felt-tipped pen **5** and save it.

3.2 Mounting the humidity measuring element

Take the humidity measuring element N out of its separate packing. Put the measuring element's mount **8** provided with two bore holes into the upper hooks. Put the lower mount **9** into the lower hook. At the same time lift the recording arm **10**; regenerate the humidity measuring element N as described under 6. The humidity measuring element K is already mounted and is maintenance-free.

3.3 Inserting the battery (quartz clockworks only)

Lift the recording arms using the switch-off lever **3**. Pull off the drum **12** straight and very carefully, making sure not to bend it sideways. Then push aside the yoke spring and check the polarity when inserting the battery (1.5 V, type Mignon/AA). Adjust the desired recording period at the gear wheels. Then remount everything carefully (don't bend the recording arms).

3.4 Winding up the clockwork (mechanical clockworks only)

The moving spring is stretched by turning the winding key **6** anti-clockwise.

3.5 Setting the drum to local time

The felt-tipped pens must be very close to the paper surface (adjusted by using the switch-off lever **3**). Turn the drum **12** counterclockwise until the pen matches the desired time line. If you have turned the drum too far, turn it back beyond the desired time line so that you can resume the adjustment from the beginning. This way the backlash of the toothed gears will be eliminated. Since a graph paper has been already inserted in the factory, the instrument is ready for operation after closing the hood. **Attention:** You must hear locking knob **1** clicking in place! After taking the device to the desired place of installation, you can put the felt-tipped pen into writing position by turning the switch-off lever **3**.

3.6 Change of the recording period of mechanically reversible clockworks (Fig. 3)

When delivered, the recording period is 7 days.

In order to change the recording period to 1 day, open the instrument's housing **2**, unscrew the winding key **6** clockwise and pull the drum completely off the axis.

The gear wheel in the lower part of the drum has to be pulled off and is re-inserted vice versa. Afterwards re-assemble everything.

4.0 Service and maintenance

4.1 Changing graph paper

Using the switch-off lever **3**, take the pen off the paper. Loosen the metal clasp **13** on the clockwork drum by pushing it up. Remove the old graph paper and put on a new one. Both chart ends must be below the metal clasp; the lower edge of the chart must fit evenly to the lower edge of the clockwork drum. Refix the metal clasp. Set the time as described under 3.5.

4.2 Changing the felt-tipped pens

Carefully pull the used felt-tipped pen **5** from the recording arm and attach a new pen. Remove the protective cap and save it.

4.3 Felt-tipped pen contact pressure

To adjust the correct contact pressure, first put the recording arm into writing position using the switch-off lever **3**. Tilt the device by about 30° to the front. If the felt-tipped pens are adjusted correctly, they should now be 1...2 mm from the chart surface. You may have to turn the screws **14** to set the tips to the correct distance. Too much pressure (thick recording line) generates too much friction between the felt-tipped pens and the graph paper, leading to wrong measuring results. If the

pressure is too weak (thin recording line) there is a risk that the recording will be interrupted.

4.4 Cleaning and care

The bearings should not be oiled. Every three to five years, mechanical clockworks should be maintained by a clock maker. The rest of the device may be carefully cleaned, using a soft brush or a damp cloth.

4.5 Putting out of service

If the device is temporarily put out of service, the felt-tipped pens must be covered with the supplied caps to prevent them from drying out.

4.6 Transport

Use the switch-off lever **3** to lift the recording arms and secure them with the cardboard wedge (see 2.1); put the protective caps onto the felt-tipped pens. The recording arm **10** of the humidity measuring element must be secured with the transport lock **4** so that the measuring element is unstressed (recording arm tip at approx. 20% r.h.). For dispatch the humidity measuring element (except the humidity measuring element K) must be unhooked and put into the original flip pack. During transport the quartz clockwork **15** should not be in operation.

5.0 Clockworks (gear wheels or DIP switch)

5.1 Mechanical clockwork (Fig. 2)

Recording time 1 or 7 days (depending on model)
Temperature range -35...+65 °C

5.2 Changeable mechanical clockwork (Fig. 3)

Recording time 1 or 7 days (selectable by changing the gear wheels **24**)
Temperature range -35...+65 °C

5.3 Quartz clockwork (Fig. 4 or 5)

Recording time 1/ 7/ 31 days (can be changed by gear wheels **15** resp. DIP switch **15**)
Temperature range -10...+50 °C (Alkaline battery)
-35...+60 °C (rechargeables)

6 Thermo-Hygrograph 252 (Fig. 1)

The proven natural hair grid is the most frequently used device to measure humidity.

Especially advantageous is the use of synthetic fiber in rooms and in temperatures between -10...+40 °C, since no regeneration is required.

6.1 Humidity measuring element N

The humidity measuring element N consists of human hair that is subject to aging. To maintain its high measuring accuracy, it should therefore be regenerated regularly (approx. every 14 days). To do so, moisten all hair of the measuring element **18** with distilled water. After about 2 minutes, the device will indicate 95 % r.h.. If this value is not reached, a value of 95 % r.h. must be adjusted using the humidity adjusting screw **16**. Due to storage/delivery times etc. we recommend to treat

the humidity measuring element this way when the device is first put into operation. If the values at the measuring location frequently reach 95 % r.h. the measuring element regenerates automatically.

Measuring element	standardized hair grid with seven hair bundles
Measuring range	5...100 % r.h.
Accuracy	± 2 % r.h. (with regular regeneration)
Range of application	-35...+70 °C 0...100 % r.h.

6.2 Humidity measuring element K

A soiled humidity measuring element K (synthetic fiber) may only be cleaned with a soft, dry brush. Do not regenerate the humidity measuring element K!

Measuring element	standardized harp with seven synthetic fiber bundles
Measuring range	25...70 % r.h.
Accuracy	± 3 % r.h.
Range of application	-10...+40 °C 25...70 % r.h.

6.3 Temperature measuring element

From time to time a reference measurement should be made, using a calibrated thermometer. For this purpose, place the calibrated thermometer as close as possible to the temperature measuring element. If required, the felt-tipped pen can be set to the correct temperature value by turning the temperature adjustment nut **17**.

Measuring element	high quality, aged bimetal
Accuracy	± 0.3 °C
Range of application	-40...+80 °C

7 Warranty

Please note the loss of warranty and non-liability by unauthorised manipulation of the system. You need a written permission from LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.

The warranty does not cover:

1. Mechanical damages caused by external impacts (e. g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.
3. Damages caused by improper handling, e. g. by wrong tools, incorrect installation, incorrect electrical installation (false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.

8 Disposal

LAMBRECHT meteo GmbH is listed and registered at the Stiftung Elektro-Altgeräte Register ear under:

WEEE-Reg.-No. DE 45445814

In the category of monitoring and control instruments, device type: “Monitoring and control instruments for exclusively commercial use”.

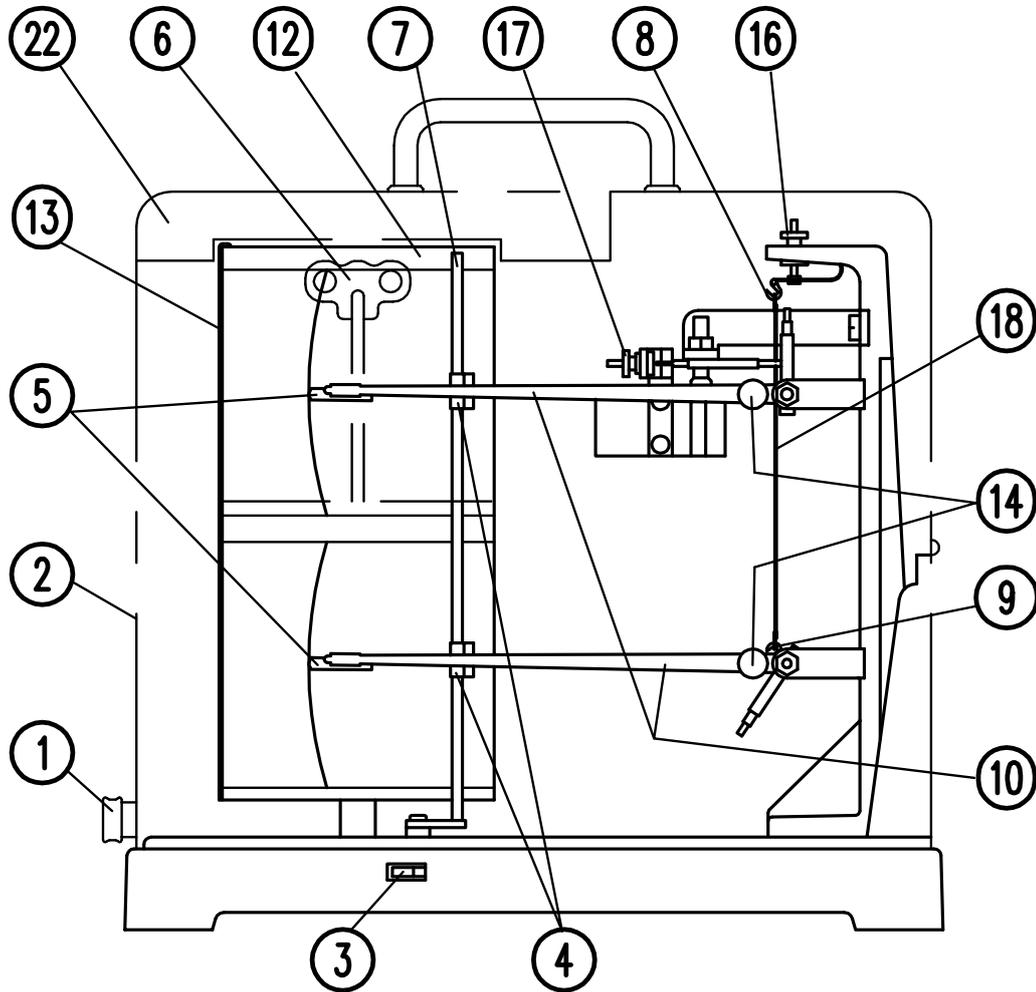
Within the EU



The device has to be disposed according to the European Directives 2002/96/EC and 2003/108/EC (Waste Electrical and Electronic Equipment). Do not dispose the old device in the household waste! For an environmentally friendly recycling and disposal of your old device, contact a certified disposal company for electronic waste.

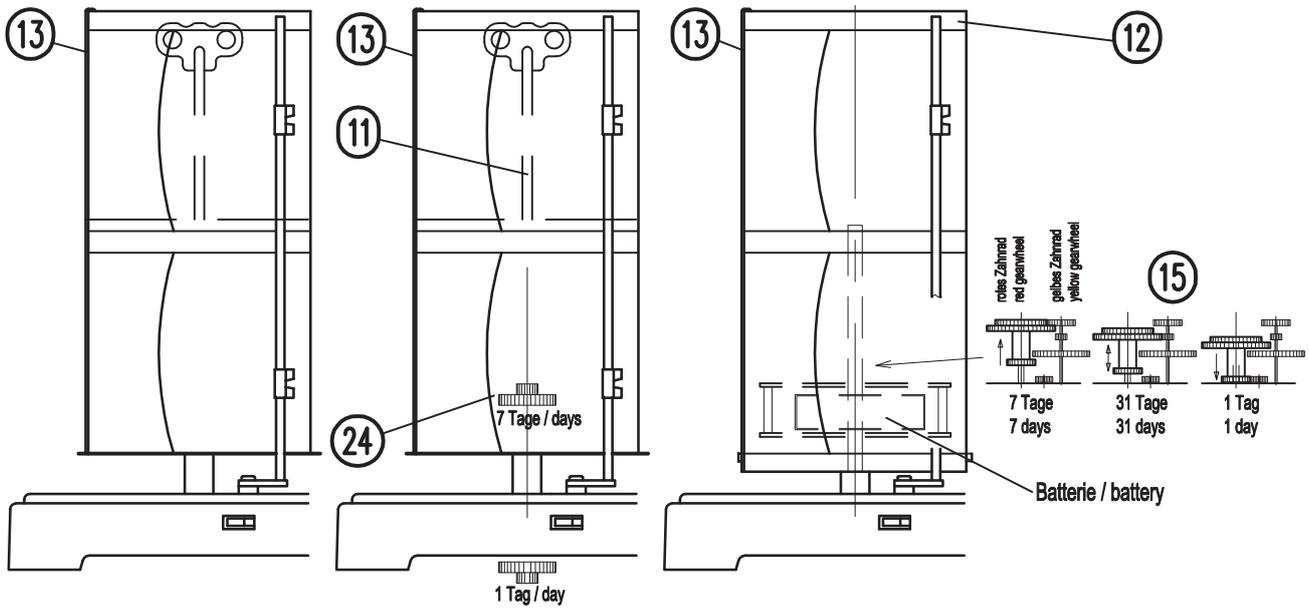
Outside the EU

Please follow the regulations in your country regarding the appropriate disposal of waste electronic equipment.



Thermohygrograph 252 Abb./Fig.1

Clockwork with adjustable gear wheels



Uhrwerk 1 oder 7 Tage
clockwork 1 or 7 days
mechanisch / mechanical
Abb. / Fig. 2

Uhrwerk 7 Tage / 1 Tag
clockwork 7 days / 1 day
mechanisch umsteckbar
mechanical reversible
Abb. / Fig. 3

Quarz-Uhrwerk 1 / 7 / 31 Tage
quartz clockwork 1 / 7 / 31 days
elektrisch / electrical
Abb. / Fig. 4

Clockwork with DIP switch

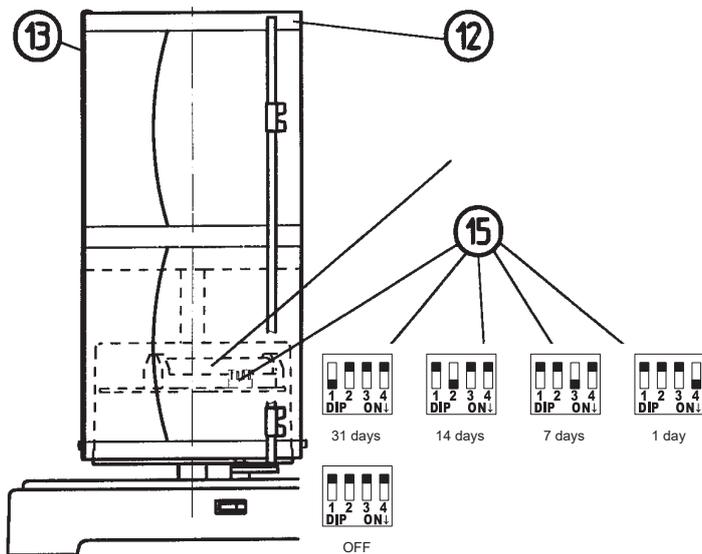


Abb. / Fig. 5