



LAMBRECHT meteo - Drum Recorders



General

LAMBRECHT Drum Recorders are suitable for a continuous record of meteorological or climatological parameters, e.g. relative humidity, temperature or air pressure.

The various instruments differ from each other by the kind of the measuring elements, which depend on the measuring value, while all other parts are nearly the same.

General instructions, which are applicable for all drum recorders, especially instructions for the recording device as well as for the change of the graph paper are therefore combined in this operating instructions. Indications about the adjustment or the control of measuring elements will be seen from the operating instructions of the corresponding instruments.



Description

LAMBRECHT Drum Recorders especially consist of the measuring element, which deforms in dependence of the measuring value, the recording device, the lever gearing, which transfers the deforming of the measuring element to the recording device, as well as the clockwork drive with the recording drum.

All parts are mounted on a stable base plate, which guarantees the firm correlation of the indicated parts and thus the maintenance of the measuring accuracy. Moreover the hinged protecting case is connected with the base plate by a frame joint and spring catch. At the head end, a handle has been provided for, while the side walls of the casing are glazed or have same ventilation holes, so that the measuring value may affect the measuring element unchecked. From a recess in the base plate - approx. before the recording drum - protrudes the grooved head of the adjustable lever connected with the damper rod. The felt-tipped pen is lifted up from the chart by means of the adjustable lever.

The construction of the multiple recorders is analogously the same. According to the number of the measuring values to be determined, there are two or three measuring elements in the casing and also the same number of transmission and recording devices. The recording drum has been provided with the driving mechanism also used in the single recorders, it is, however, twice or treble as high (recording width).

Choice of the place of installation

Recording instruments have to be installed on a firm table or a cantilever free from vibration. Vibrations, to which the instruments are exposed, generally cause a thick and blurred recording with a too high consumption of ink. Furthermore it has to be guaranteed that the measuring value may influence the measuring element unchecked and unadulterated. Especially Thermographs as well as Hygrographs have, therefore, to be protected against thermal radiation or heat conduction respectively. When installing the instrument in the open air, in most cases the use of a protection screen, e.g. Thermometer Screen (1096) acc. to DIN 58 658, our catalogue no. (1096), which protects the instruments against radiation influence and rain, is necessary.

Setting to work

Recording instruments have to be unpacked carefully paying attention to the completeness of all accessories (graph paper, felt-tipped pen and eventually hair grid).

After having put up the instrument on a firm base, the spring catch can be unlocked and the casing be opened. The recording lever fastened during the transport has to be taken off the damper rod by cutting the string or by removing the metal clamp respectively. This clamp may be moved to the lower end of the damper rod, so that on one hand it does not hamper the movements of the recording lever and on the other hand it can be used again for locking the recording lever on a possible transport. The cardboard, which secures the adjustable lever, has then to be removed.

Referring to the instructions for use of the different instruments, the measuring element and the transmission device have to be prepared for the measurements (according to the type of instruments: insert and regenerate hair grid and connect measuring elements with the write device etc.).

After that, the recording device is to be started. For this purpose, the recording lever must be departed from the recording drum by means of the damper rod and the protecting cap has to be taken from the felt-tipped pens.

The value of the record depends largely on the pressure of the felt-tipped pen on the graph paper. Should the recording pressure be too strong the friction between the pen and the paper is too high so that the measuring value will not be recorded steadily according to its temporary course, but by degrees. In case of a very low recording pressure, there runs the risk that the recording may be interrupted at times. The recording pressure may be controlled after having put the pen on the paper by inclining the instrument by approx. 30° forward. When doing this the felt-tipped pen will dislodge from the paper for approx. 1-2 mm. If the pen is too loose or too tight the milled nut at the side of the axis of the recording lever has to be adjusted in such a way that the correct tension of the springy recording lever is achieved.

In the case of Large-Size Barographs this adjustment is not necessary, as the recording lever has pivotally been fixed at a slightly inclined axis and thus the pen is always close to the paper because of its own weight and that of the recording lever. As the recording pressure depends besides the weight of the recording device also on the inclination of the recording lever joint to the horizontal line, in case of these instruments care has to be taken for an exact and horizontal installation. In the case of drum recorders with adjustable recording pressure, a slight inclination of the place of installation may be considered by turning the milled adjustment screw.

Having put on a graph paper (see below) and wound up the clockwork, the instrument has to be taken to the prepared place of installation, the felt-tipped pen has to be started and, in case, the start of the recording should be marked by the time (by lifting the recording lever slightly by approx. 1-2 mm). The instrument is now ready for use.



Exchange and application of graph paper

The application of a new graph paper has to be made in the following order:

1. Preparation of a new graph paper by putting down the date, the place and, in case, the number of the instrument as well as the dimensions (in the case of blank graph papers). Especially in the case of meteorological measurements, the graph papers should be stored near the instrument, so that between the ambient air and the chart the hygroscopical balance may develop. By this, alterations of the length of the graph paper, which spoil the paper, are avoided.
2. Marking the time on the old chart by lifting the recording lever carefully by about 1-2 mm and by fixing the time.
3. Lifting the felt-tipped pen off the paper by means of a disengaging device. If necessary, the instrument should be taken to a place suitable for the change of the graph paper.
4. Opening of the casing by means of the spring catch.
5. Loosening the metal clamp, which serves to fastening the graph paper (pushing upwards) and taking off the inscribed paper.
6. Winding up of the clockwork in the direction of the engraved arrow in the cover of the drum.
7. Application of the new, already prepared graph paper. Press the chart closely to the drum, so that it fits tightly everywhere and its lower edge has good contact with the slightly protruding edge of the drum. Attach the metal clamp again.
8. Adjusting the recording drum to the time of the beginning of the recording. For this the felt-tipped pen has to be put in the immediate vicinity of the graph paper by means of the disengaging device, without touching the paper. Then the clockwork drum has to be turned counter-clockwise (looking from above) until the pen lies above that curve of the graph paper, which corresponds to the actual time. If the drum has been turned too far, it has to be pushed back in the opposite direction and then be slowly turned again counter-clockwise to the corresponding curves, until the pen has been adjusted to the correct time. This is the only way by which the „backlash“ of the clockwork can be made ineffective.
9. Raise again the recording lever entirely, close the casing, take the instrument to the place suitable for measurements.
10. The pen should then again be brought into contact with the paper and the time should be marked, showing the beginning of the recording.
11. Completion of the description of the old graph paper (special events, time markings etc.).

Maintenance

The maintenance of the measuring elements has to be effected according to the operating instructions of the different instruments. The maintenance of the recording device is restricted to the change of the graph paper to be effected at the times of observation as well as to the exchange of the felt-tipped pen.

When attaching the new felt-tipped pen you should pay attention to push it up against the recording lever so that the writing radius will remain unchanged.

Do not oil all joints and bearings (exception: clockwork as well as pivot bearings of Large-Size Barographs). The lever systems and recording devices supported in elastic pivots carry out relatively slow and small movements so that an oiling is not only unnecessary but even noxious in the most cases.

The drum clockworks, however, should be cleaned and slightly reoiled by a watchmaker at intervals of 3 to 5 years. It is recommendable to specify the temperature range in which the instruments will be utilized so that the most suitable oil can be chosen.

At regular intervals depending on the degree of contamination of the air, also the lacquered and chromium-plated surfaces of the recorders should be cleaned with a soft brush, or in case of considerable contamination, with a piece of wet cloth. Particularly when using the recorders in the open air (in the thermometer screen), adherent dirt otherwise often feigns a corrosion.

At the same time it might be necessary to eliminate errors at the recording device, which cause a faulty recording. As far as they need not be corrected by experts the errors are indicated as follows:

1. The pen writes jerks in the curve.

Reason:

- a) The recording lever has been tightened too much.

Remedy:

Adjustment of the knurled screw near the axis of the recording lever (see description above).

- b) The joints and axle bearings are dirty.

Remedy:

The recorder must be sent to the manufacturer. Cleaning of the joints and axle bearings is just possible after having dismantled the recorder. Afterwards a calibration is necessary.

2. The felt-tipped pen records a very thin curve and sometimes stops writing altogether.

Reason:

The pen does not press tightly enough against the paper.

Remedy: The knurled nut has to be operated at the recording lever.

3. The curve is thick and blotchy.

Reasons:

- a) The installation of the instrument is not free from vibrations.

Remedy: Proper installation (see above).

- b) Pen or paper are unsuitable.

Remedy: LAMBRECHT pens and graph papers have to be used.



We draw your attention to the fact that the correlation between ink, graph paper and recording pen has been tested in a variety of experiments in order to ensure perfect records, which, these tests proved, are guaranteed when using LAMBRECHT graph papers and felt-tipped pens.

In case of recording instruments, the clock drums of which are equipped with a device for direct changing over from weekly to daily rotation, the switching over is effected by turning the hand lever below the recording drum:

To the **left**: recording duration **24 hours**

To the **right**: recording duration **7 days**

The inscription on the hand lever and base plate allows to ascertain very easily the actual service condition. Care should be taken that the lever is always turned to the right or to the left up to the top. If, however, the recording period is switched by interchanging the gears, special instructions will be supplied with the instruments.



Quality System certified by DQS according to
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Subject to change without notice

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