Gauged Thermograph

Instruction for use 2.0600.50.000 / 2.0604.50.000

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1. Range of Application

The thermograph automatically measures and records the air temperature of the surroundings. It may be calibrated for use in determining the air temperature of storage rooms for cooled, frozen or deep-frozen food. The instrument works without an external source of energy by means of a manual spring clockwork mechanism on the recording drum.

2. Physical-Technical Bureau of Standards - Registration and Calibration

The thermograph has been approved for use by the Physical-Technical Federal Bureau of Standards. The registration number is Z14.53/8904.

The thermograph is usually uncalibrated at the time of delivery. If the instrument is to be calibrated, then it must be presented to the nearest local bureau of standards. The period of validity of the calibration is indicated by the year in the main verification stamp in conjunction with the calibration regulation. For example, at present the period of validity for this model is 6 years. After 6 years of use, the instrument must be presented for recalibration.

3. Mode of Operation and Construction

Temperature is measured by means of a high-quality, aged bimetallic measuring element which has been bent to form a ring. The curvature of the radius changes when the temperature changes. This change in radius is recorded over a system of levers onto the recording strip with the aid of a fibre-tipped pen. The recording strip is fixed to a drum which is driven by a mechanical clockwork mechanism for time-dependent registration.

There is a control thermometer for control and testing purposes. The column with the bimetallic measuring element and the system of levers and the drum clockwork mechanism are mounted to a sturdy base plate. The measurement system is also protected by a perforated sheet hood. A partition to protect against manipulation has been installed between the drum clockwork mechanism and the measuring system. The control thermometer is mounted to this partition.
The entire instrument is covered by a tiltable, securable hood which can be locked with a safety lock.
Recording only takes place when the hood is closed. When the hood is open, the recording arm is raised from the recording strip.

4. Models Available

Temperature Range	Recording Period	Order-No.
- 35 ... 45 ° C	24 hours	2.0601.50.000
	7 days	2.0600.50.000
	14 days	2.0603.50.000
	31 days	2.0604.50.000

5. Technical Specifications

Drum Chart Recorder

Measuring range	: -35 °C ... + 45 °C
Permissible variation:	: 1% of the measuring range
Permissible calibration variation	: 1 °c
Time response	: t (0,9) = 20 min. in still air
Position of use	: horizontal
Gear accuracy	: 60 s/d + 60 s/d$^{+\ [\ t\text{-}20°C\ ]}$ - 3 s/(°C-d) DIN 8300

Recording time (d)	: 1	7	14	31
Rotation time (h)	: 25,6	176	352	783
Thrust (mm/d)	: 40,01	20	11,45	9

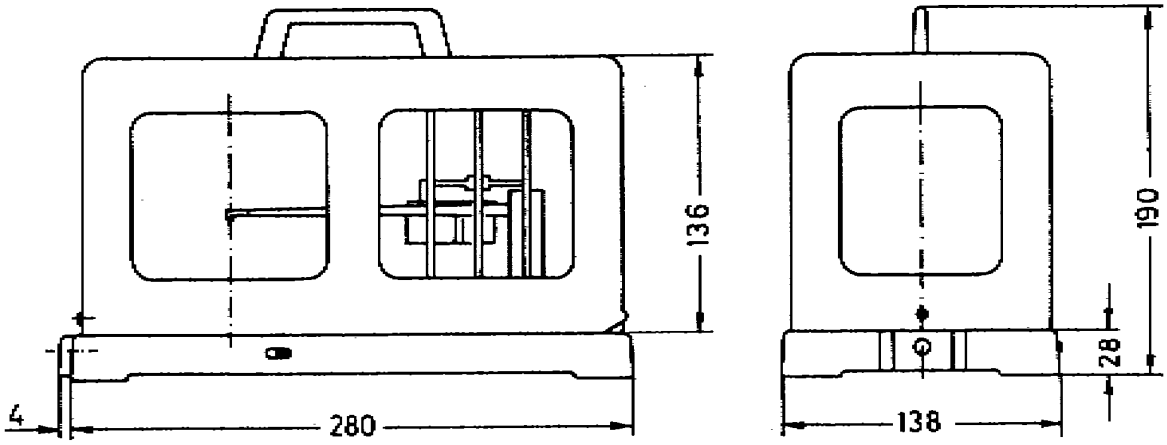
Control thermometer	: - 10 ... + 20 °C
Graduation	: 0,5 °C
Storage temperature	: - 40 °C ... + 50 °C
Recording period of the fibre-tipped pen	: ca. 200 m or 1 year in climate 20/60
Drum clockwork mechanism	: U 93 x 93 x ... A, DIN 58658
Clockwork	: drive
Gear Accuracy	: DIN 8300
Weight	: ca. 2,8 kg

Recording Paper

Recording width	: 82 mm
Recording paper	: Paper 90 - 100, DIN 16234
Moisture expansion	: transverse 0,25 %
Temp.-Graduation	: - 35 °C ... + 50° C

Recording period	: 24 h	7 d	14 d	31 d
Time graduation	: 15 min.	2 h	2 h	6 h

Scale Drawing:



6. Preparation for Use

6.1 Site of Installation

The site of installation should be vibration-free. In addition the recorder should not be exposed to heat sources such as radiators or the sun.
In storage rooms for food, set the thermograph up in the warmest spot.

6.2 Putting the Instrument into Operation

Open the hood, press the release button on the side, lift the hood up and remove the foam rubber.

Wind the clockwork mechanism with the key in the drum.

Mark the recording strip with date and signature (see section „Operation in situations where calibration is prescribed“)

Place the recording strip onto the drum (see section 9.2 „Changing the recording strip“)

Remove the tip protector from the fibre-tipped pen.

Rotate the drum back and forth clockwise (compensation for play) so that the recording pen is pointing to the current time.

Replace the hood over the instrument, secure it and lock it.

Now the instrument automatically records the temperature for the recording period.

Carry out a function test (see section 9.4 „Function Control“)

7. Function test

To check whether the instrument is functioning properly, the temperature of the control thermometer and the measured value are read one after the other and the difference between the two temperatures is formed.. The difference may not exceed 1°C. If the difference is greater than 1°C, the instrument will have to be recalibrated.

PLEASE NOTE: Before this test is carried out, the air temperature in the vicinity of the thermograph must have been nearly constant for approximately 30 minutes. This function test cannot be carried out when there is considerable fluctuation in temperature.

For use in situations where calibration is required, section 9.4 describes the time point when the „function test“ should be carried out if there is some doubt concerning the accuracy of the measured value.

8. Operation in situations where calibration is prescribed

If the instrument is being used in situations where calibration is prescribed, the opening and closing of the case must be done by designated persons. They are responsible for the key and they are responsible for marking the recording strip when operation is started.
Before the recording strip is removed or changed, a function test must be carried out and the precise time when the case was opened must be recorded. The test value and the time must be entered on the recording strip by the designated person or by someone he names. The entry must be initialled.

9. Maintenance

9.1 Changing the Recording Pen

The fibre-tipped pen should be replaced at least once a year.
Remove the used pen carefully from the recording arm. Insert the new pen and remove the tip protector.
Do not write with the new fibre-tipped pen and make sure that you do not touch the recording tip when placing the new pen into position.

9.2 Changing the Recording Strip

To change the recording strip, raise the chart holder and swing it out. Remove the recording strip. Place the new recording strip onto the lower edge of the drum and wind it around the drum. Swing the chart holder into its original position and secure it.

9.3 Setting the gear regulator

If the rotation times of the recording drum have changed, you can reset the gear regulator of the drum clockwork mechanism. Open up the case. You will see an opening marked with + and -. Open the opening by moving the sealing plate. Reset the now revealed gear regulator lever towards either + or - so that the drum rotates either faster or slower.

+ if the drum should rotate more quickly
- if the drum should rotate more slowly

9.4 Function Test

To check the accuracy of indication, the measured value of the control thermometer must be compared to the value indicated on the recording strip. After an adjustment period (ca. 30 minutes), the value shown on the recording strip may not deviate by more than the given measuring accuracy.
If the thermograph shows a measuring inaccuracy greater than that indicated in the technical specifications, then the instrument must be recalibrated.

9.5 Recalibration

Thermographs which have been repaired or whose verification stamp has been violated or removed are considered to be non-calibrated. This also holds true for recorders whose period of validity (at present 6 years) has expired. They have to be recalibrated by the local Bureau of Standards.

10. Spare Parts

All replacement parts can be ordered

Part	Order-No	Remarks
Fibre-tipped recording pen	500847	
Control thermometer	502452	
Recording strip 24 h	205174	100 pieces
Recording strip 7 d	205175	100 pieces
Recording strip 14 d	205176	100 pieces
Recording strip 31 d	205177	100 pieces

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Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

Zulassungsschein
Innerstaatliche Bauartzulassung
Nr. 122/90-3.12

Auf Grund der §§ 9 und 29 des Eichgesetzes vom 11. Juli 1969 (BGBl. I S. 759) in Verbindung mit den §§ 16 Abs. 1-3 und 17 Abs. 1 der Eichordnung vom 12. August 1988 (BGBl. I S. 1657) in ihren derzeit gültigen Fassungen wird der Firma: Adolf Thies GmbH & Co. KG
3400 Göttingen

folgende Bauart zur innerstaatlichen Eichung zugelassen:

Temperaturschreiber zur Registrierung der ihn umgebenden Lufttemperatur

Thermograph, eichfähig

Die Bauart erhält folgendes Zulassungszeichen:

14.53
89.04

Die wesentlichen Merkmale und gegebenenfalls die Zulassungsauflagen, Befristungen und Bedingungen sowie inhaltlichen Beschränkungen sind in der Anlage festgelegt. Sie ist Bestandteil der Zulassung und umfaßt 7 Seiten).

Physikalisch-Technische Bundesanstalt
- Abteilung 3 -

Im Auftrag

U. Braasch
Technischer Regierungsamtmann

Braunschweig, den 12.10.1990

Dienstsiegel

– Hinweise und Rechtbehelfsbelehrung auf der Rückseite –

Zulassungsscheine ohne Unterschrift und ohne Dienstsiegel haben keine Gültigkeit.
Die Zulassungsscheine dürfen nur unverändert weiterverbreitet werden.
Auszüge oder Änderungen bedürfen der Genehmigung der Physikalisch-Technischen Bundesanstalt, Bundesallee 100, Postfach 33 45, D-3300 Braunschweig.