

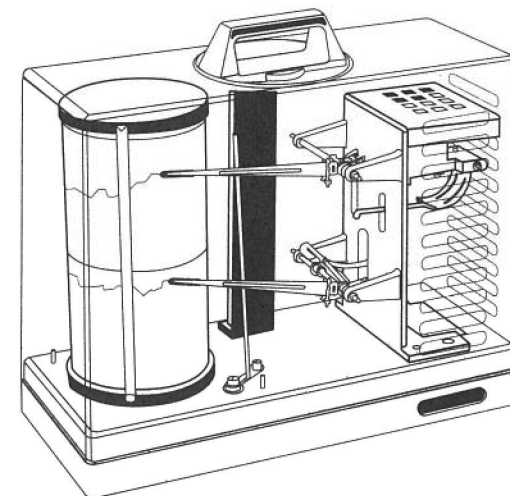
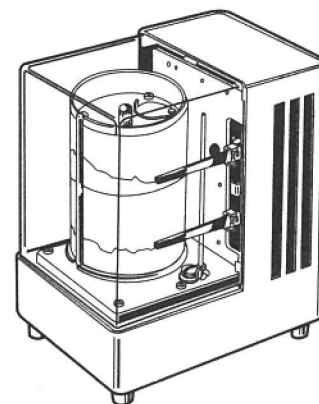
Hygrothermographs

Operating Instructions

Minidrum model 08369-70

Spring-wound, two-speed model 37250-10

Three-speed model 37250-00



 **Cole-Parmer®**
scientific experts

Toll-Free: 1-800-323-4340

Phone: 1-847-549-7600

Fax: 1-847-247-2929

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1065GEN_03_MAN

Manual Part No. 00703-07



37250-00
37250-10

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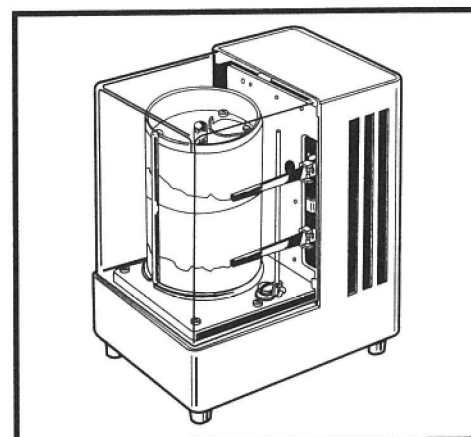
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1. Introduction

Thank you for selecting a Cole-Parmer thermohygrometer. These precision instruments are useful for monitoring temperature and relative humidity conditions over time. They create a permanent chart recording of these measurements for your records. Their quartz-controlled drive maintains an even drum speed even when batteries are weak (or when the spring winding runs down).

Typical applications include general weather measurements, agriculture, horticulture, monitoring the condition of test laboratories, humidity chambers, computer rooms, precision machinery rooms, food storage facilities, warehouses, museums, bank vaults, film and book storage facilities.

You have one of three available models:



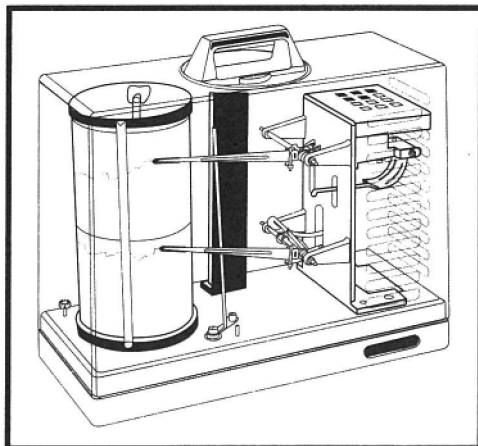
Minidrum hygrothermograph

Model number: 08369-70

Special features:

- Compact size
- Records on 7-day rotation
- Protective acrylic cover locks into place

1. Introduction (continued)

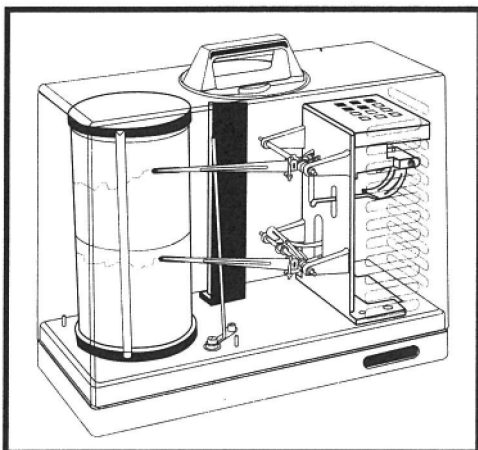


Spring-wound, two-speed hygrothermograph

Model number: 37250-10

Special features:

- Spring wound—no batteries needed
- Records on 1- or 7-day rotation
- Protective acrylic cover locks into place



Three-speed hygrothermograph

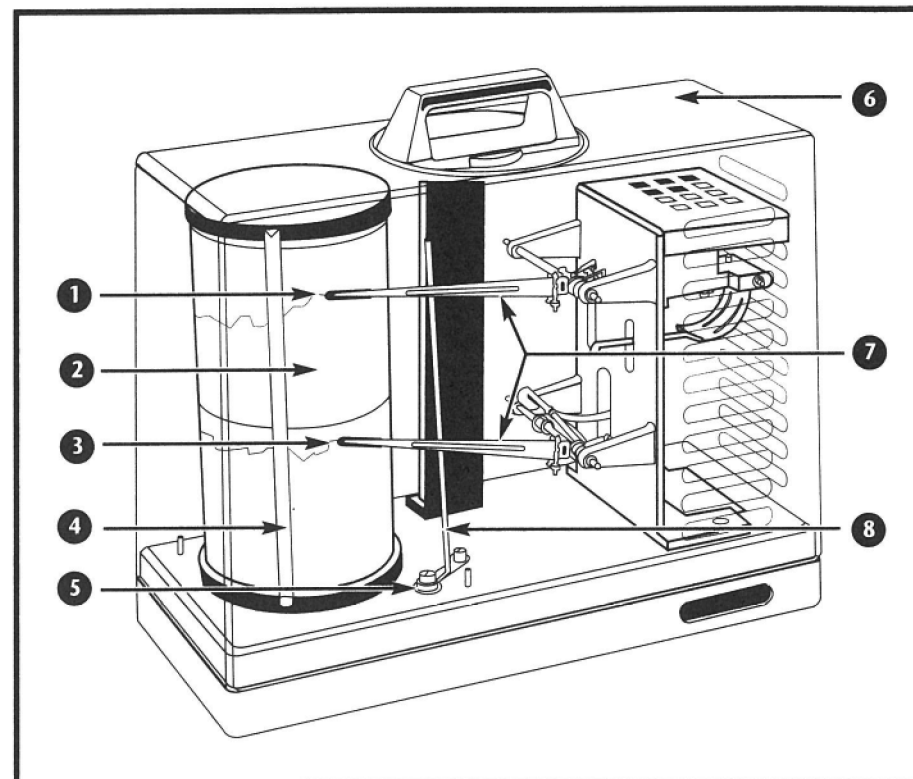
Model number: 37250-00

Special features:

- Records on 1-, 7-, or 32-day rotation
- Protective acrylic cover locks into place

2. Components

All three hygrothermographs have these same features:



1. Pen tip for temperature

2. Cylinder drum with quartz clock

3. Pen tip for humidity

4. Paper holder

5. Pen lift lever

6. Protective cover

7. Pen arms

8. Pen guide

3. Getting started

3.1 Unpacking

1. Remove all components from the packing material.
2. Carefully remove the acrylic or glass protective cover from the hygrothermograph. If your model has a handle, turn the carrying handle to the left until it stops, then lift up the protective cover.
3. Carefully remove the foam piece located beneath the pen arm mechanism.
4. Remove the white paper that secures the humidity pen.
5. Lift the metal pen holding fitting up from the temperature pen until it is removed from the pen guide.
6. Move the pen lift lever towards you to pull the temperature and humidity pens to their resting position.

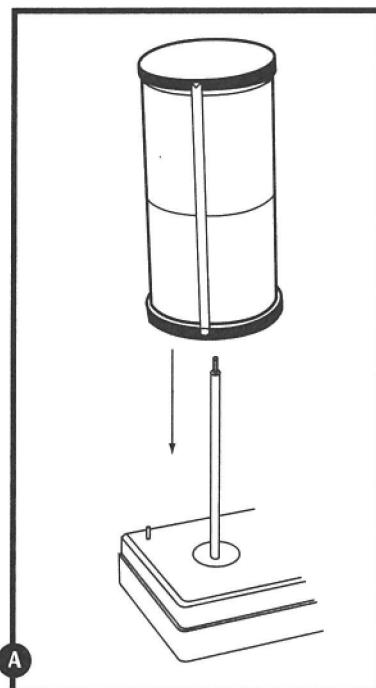
NOTE: Keep all original packing in case you need to transport the instrument.

3.2 Attaching the cylinder drum

1. Unscrew the hold-down nut from the center shaft.
2. Carefully insert the cylinder drum onto the center shaft. Make sure the cylinder drum is completely lowered over the center shaft.

See figure A.

3. Replace the hold-down nut on the top of the center shaft.

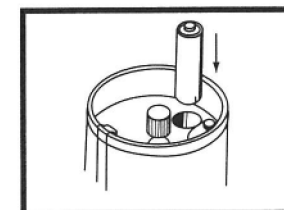
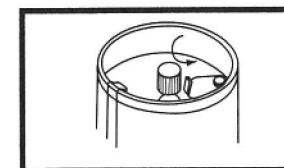


4. Hygrothermograph operation

4.1 Powering your hygrothermograph

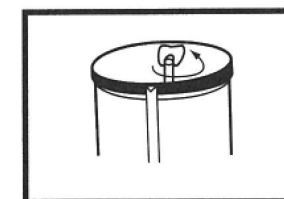
Minidrum model (08369-70):

This model requires one AA battery. The battery compartment is located on top of the cylinder drum. To open the battery compartment, slide the cover of the compartment to the side. Make sure that the + end of the battery is facing up.



Spring-wound, two-speed model (37250-10):

This model is spring wound and requires no batteries. The spring winding shaft is located on top of the cylinder drum. To wind up the unit, turn the shaft counterclockwise until it is too stiff to move any further. This unit will make a “clicking” sound while running. The drum will maintain an even rotation speed even when the spring is winding down.

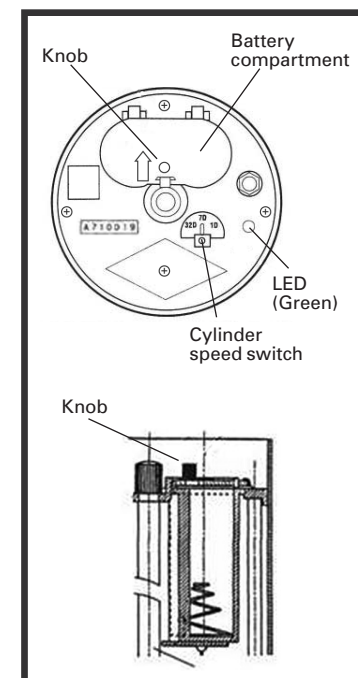


Three-speed model (37250-00):

This model requires two C batteries. The battery compartment is located on top of the cylinder drum. To open the battery compartment, pull the silver knob away from the center of the cylinder drum. Insert batteries into the compartment using the correct polarities (+/-). Close the lid while pulling the knob aside.

This model features a battery indicator. The cylinder will start rotating soon after the batteries are installed. Confirm that the LED indicator (green) is blinking. If the LED light (green) goes out, this indicates low battery status. Replace with new batteries immediately.

NOTE: The cylinder drum will stop operating approximately one month after the LED light (green) goes out if the batteries are not replaced.



4.2 Cartridge pens

To operate the pens:

1. Pull the pen lift lever towards you to move the temperature and humidity pens to their resting position.

See figure A.

2. Remove the pen caps by rotating them counterclockwise.
3. Push the pen lift lever away from you until the temperature and humidity pens are touching the paper on the cylinder drum.

NOTE: Do not touch the pen tips because skin oils will prevent the ink from flowing smoothly.

To replace the pens:

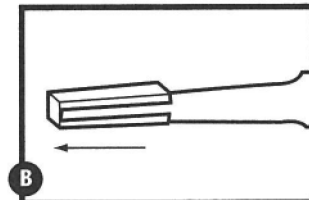
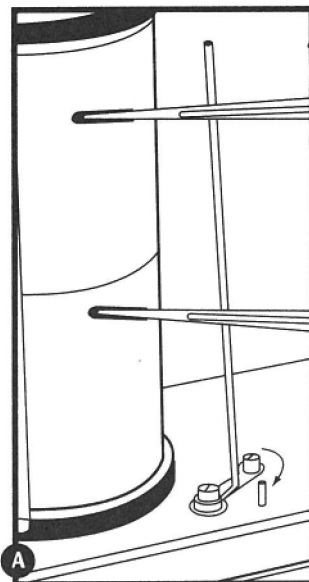
The pen tips can be used for up to a year, but we recommend that you replace them at least every six months. Conditions such as high temperature or low humidity may shorten pen life to three months.

See page 18 to order extra pens.

1. Hold the pen arm in your right hand and pull the pen cartridge off with your left hand. If it is difficult to pull off, use a small pliers.

See figure B.

2. To attach the replacement cartridge pen, insert it over the arm until it is fully attached.



4.3 Setting the time

1. Pull the pen lift lever towards you to move the temperature and humidity pens to their resting position.

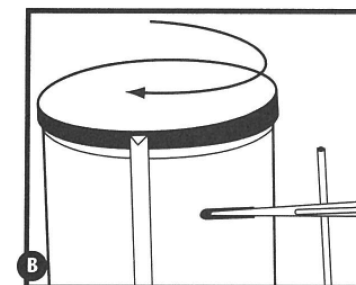
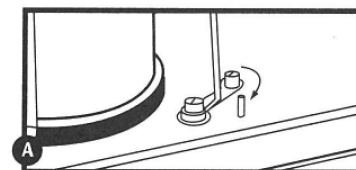
See figure A.

2. Turn the cylinder drum one full rotation clockwise.

See figure B.

3. Turn the cylinder drum counterclockwise until the pen tips align with the correct time of day or night. Numbers indicating time are located at the top and bottom of the chart paper.

NOTE: Make sure that the numbers on the graph are right side up. Change the chart paper when the cylinder has completed one rotation.



4.4 Chart paper

Your cylinder drum comes with one sheet of chart paper already attached. See page 18 to order extra chart paper.

To replace chart paper:

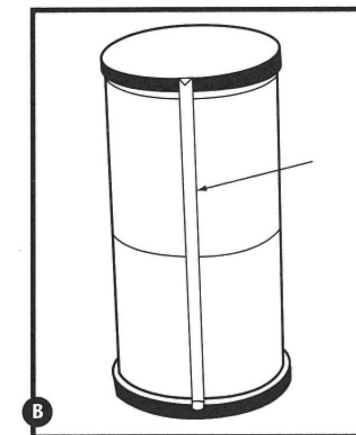
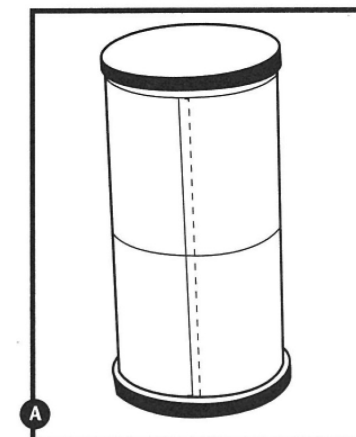
1. Wind the new chart onto the cylinder so that the two ends of the paper overlap.

See figure A.

2. Secure this overlapping section with the paper holder.

See figure B.

3. Make sure the markings on the paper coincide where the overlap occurs.
4. Follow directions above to set the correct time.



4.5 Calibration adjustment

Your hygrothermograph is factory calibrated. However, vibration during shipment may make a slight readjustment necessary.

To adjust calibration:

1. Compare the hygrothermograph reading to another temperature/humidity instrument known to be accurate.
2. Raise and lower the reading by turning the adjustment screws. See the following drawings for location of the adjustment screws.

Location of the calibration adjustment screws

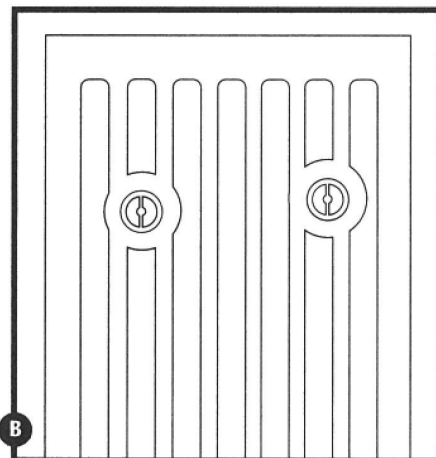
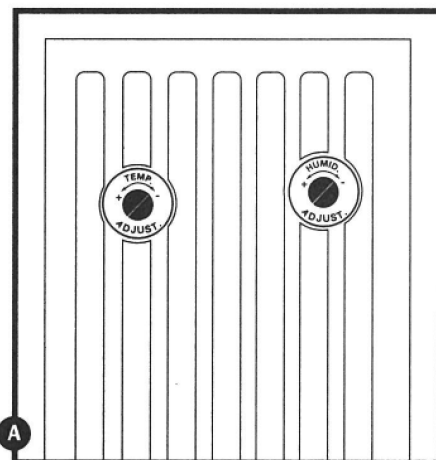
Minidrum hygrothermograph (model 08369-70)

On the minidrum hygrothermograph model, the calibration screws are located behind the two stickers on the back of the beige case protecting the pen mechanism.

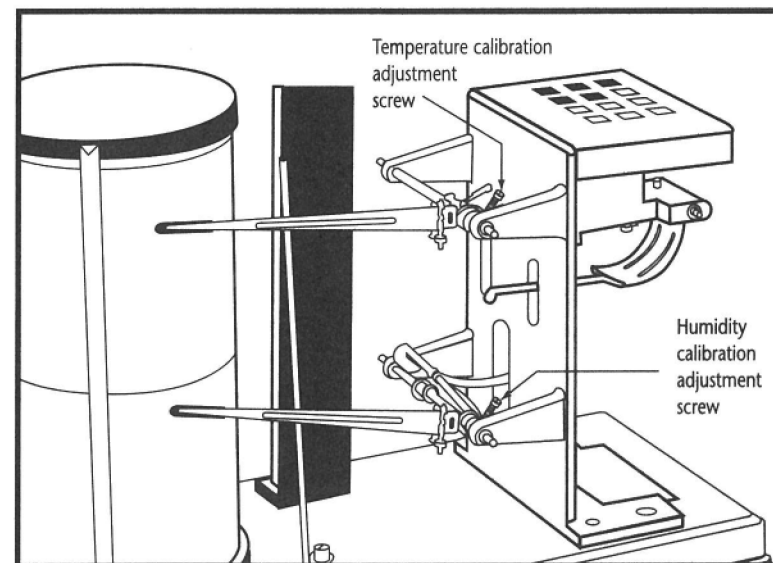
See figure A.

Remove the stickers to reach the calibration adjustment screws.

See figure B.



All other models (models 37250-00, -10)



4.6 Changing drum rotation length

NOTE: Minidrum model 08369-70 operates on a 7-day rotation only.

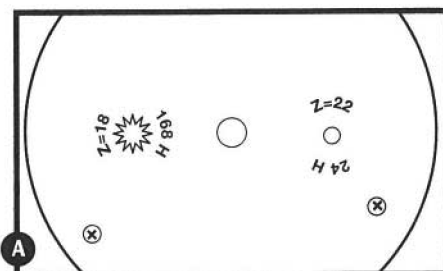
Spring-wound, two-speed hygrothermograph 37250-10

This model lets you select between a 1- and 7-day drum rotation. When you receive your unit from the factory, it is set for a 7-day rotation.

IMPORTANT: Make sure you have the appropriate chart paper for the rotation speed you select. See page 18 to order more chart paper.

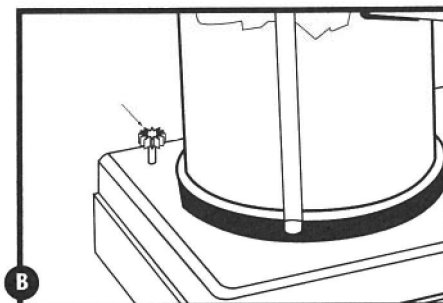
1. Look at the bottom of the cylinder drum. You will see notches for two gears. Only one gear will be in place.

See figure A.



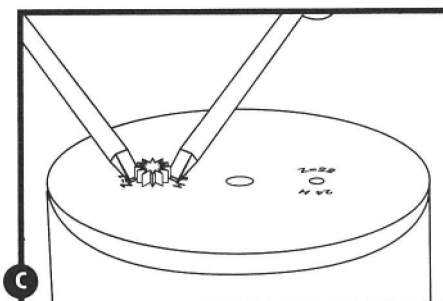
2. The alternate gear is located on a post at the corner of the base. Remove it from the post.

See figure B.



3. Using two screwdrivers, lift the gear currently installed on the bottom of the drum.

See figure C.



4. Insert the other gear onto the opposite shaft on the bottom of the drum.

- The 1-day gear slides on the shaft marked "24 H / Z = 22". This gear has 22 teeth and a larger diameter than the 7-day gear.

- The 7-day gear slides onto the shaft marked "168H / Z = 18". This gear has 18 teeth.

5. Place the gear not in use over the post at the corner of the base for storage.

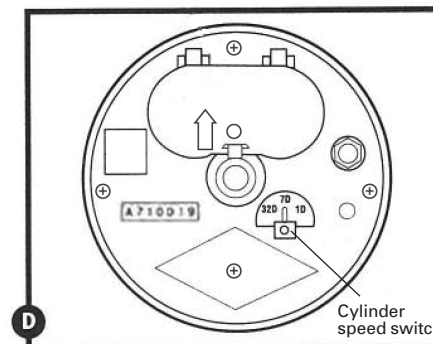
6. Install the cylinder drum onto the cylinder shaft. See page 6 for instructions.

Three-speed hygrothermograph 37250-00

This model lets you select between a 1-, 7-, and 32-day drum rotation. When you receive your unit from the factory, the cylinder speed switch is set for a 7-day rotation.

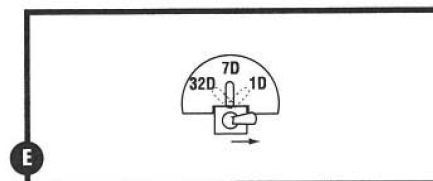
See figure D.

IMPORTANT: Make sure you have the appropriate chart paper for the rotation speed you select. See page 18 to order more chart paper.



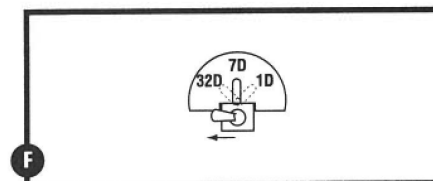
1. To switch from 7-day operation to 1-day operation, flip the switch on top of the cylinder drum to 1D.

See figure E.



2. To switch from 7-day operation to 32-day operation, flip the switch on top of the cylinder drum to 32D.

See figure F.



5. Installing optional axial fan

The external draft fan (optional) attaches to the protective cover. It improves instrument response and accuracy by directly pulling surrounding air into the instrument. Use the fan in areas where ventilation is poor.

NOTE: This axial fan is not for use with minidrum model 08369-70.

Order optional axial fan on page 18.

To attach the fan:

1. Install the fan on the single column of five vents located on the protective cover.

See figure A.

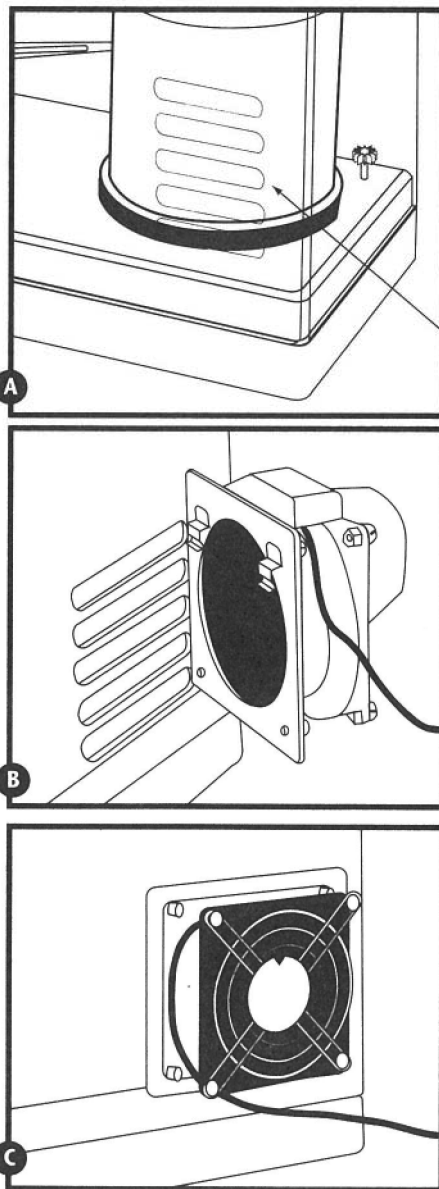
2. Position fan so that the spring clips on the fan go into the upper vent slots on the hygrothermograph cover.

See figure B.

3. Let the fan slide down until it stops. Make sure both spring clips are fully engaged in the cover.

See figure C.

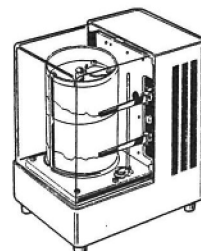
4. Position the instrument so the flow of air from the fan will not be blocked.
5. Plug the power cord into an 110–120 volt, 50/60 Hz outlet.



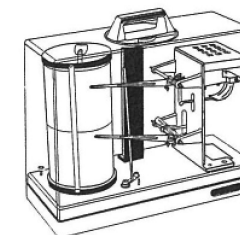
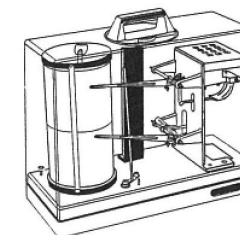
6. Precautions

1. Do not use your hygrothermograph:
 - in direct sunlight
 - in temperatures below -20°C or above 50°C
 - near ovens, stoves, or other heating equipment
 - near harsh chemicals such as paint thinner or ammonia
 - in dusty or wet environments
 - within magnetic fields
 - in areas with strong vibrations, such as loudspeakers or motors
2. For best results, use only the pens and chart paper listed under the "Ordering information" section of this manual (page 18). We cannot guarantee results with other pens and other paper.
3. Do not repair the instrument yourself. Should repairs be necessary, please return the instrument to place of purchase. See the back cover of this manual for information on Warranty and Return of items.
4. If your instrument will not be used for long periods of time, make sure to replace the pen caps and remove the battery.

7. Specifications



Model	Minidrum hygrothermograph
Model number	08369-70
Humidity range	5 to 90% RH
Humidity accuracy	±5% from 5 to 90% RH; ±7% from 5 to 10% RH
Humidity chart range	5 to 100% RH
Humidity sensor	Human hair bundle
Humidity chart graduations	5% RH
Temperature range	–6 to 40°C (22 to 104°F)
Temperature accuracy	±2°C / ±3.6°F
Temperature sensor	Bimetallic strip
Temp. chart graduations	2°C / 2°F
Chart size	3.6"H x 8.1"L
Chart rotation	7 day (172 hr)
Power	One AA battery (included)
Dimensions	6"W x 7.4"H x 3.9"D
Shipping weight	4 lbs



Model	Spring-wound, two-speed hygrothermograph	Three-speed hygrothermograph
Model number	37250-10	37250-00
Humidity range	5 to 90% RH	5 to 90% RH
Humidity accuracy	±3% from 10 to 90% RH; ±5% from 5 to 10% RH	±3% from 10 to 90% RH; ±5% from 5 to 10% RH
Humidity chart range	0 to 100% RH	0 to 100% RH
Humidity sensor	Human hair bundle	Human hair bundle
Humidity chart graduations	1% RH	1% RH
Temperature range	–10 to 50°C (14 to 122°F)	–10 to 50°C (14 to 122°F)
Temperature accuracy	±1°C / ±1.8°F	±1°C / ±1.8°F
Temperature sensor	Bimetallic strip	Bimetallic strip
Temp. chart graduations	1°C / 2°F	1°C / 2°F
Chart size	6.6"H x 11.5"L	6.6"H x 11.5"L
Chart rotation	1 day (26 hr) or 7 day (172 hr)	1 day (26 hr), 7 day (172 hr), or 32 day (810 hr)
Power	Spring wound	Spring wound
Dimensions	13.3"W x 11.5"H x 5.1"D	13.3"W x 11.5"H x 5.1"D
Shipping weight	9 lbs	9 lbs

8. Ordering information

Additional Hygrothermographs

08369-70 Minidrum hygrothermograph

37250-10 Spring-wound, two-speed hygrothermograph

37250-00 Three-speed hygrothermograph

Extra Chart Paper

Model number	Use with model type	Temperature range	Rotation	Increments	Quantity/pack
08369-60	Minidrum	22 to 104°F	7-day	2-hour	100
08369-55	Minidrum	−6 to 40°C	7-day	2-hour	100
08368-10	2- or 3-speed	14 to 122°F	1-day	15-minute	100
08368-20	2- or 3-speed	14 to 122°F	7-day	2-hour	100
08368-30	2- or 3-speed	−10 to 50°C	1-day	15-minute	100
08368-40	2- or 3-speed	−10 to 50°C	7-day	2-hour	100
08368-22	3-speed	14 to 122°F	32-day	6-hour	25
08368-42	3-speed	−10 to 50°C	3 2-day	6-hour	25

Extra Pens

For use with all Cole-Parmer hygrothermographs.

08368-75 Blue pens, 6/ pack

08368-70 Red pens, 6/pack

Axial Fan (for models 37250-00 and -10 only)

37250-50 Optional axial fan. Use for more uniform sample measurements in fluctuating environments. 110 VAC

Humidity Calibration (for models 37250-00 and -10 only)

17030-20 Humidity calibration with data before and after calibration at 30%, 50%, and 70% humidity, at 25°C

9. Appendix 1: Readings in areas with high humidity

The specially processed human hair bundle used in these instruments is the best sensor for ambient humidity measurements in terms of linearity, repeatability, and temperature compensation. Human hair will elongate linearly as humidity increases or decreases in the range of 5 to 90% RH.

However, one of the characteristics of human hair is that exposure to humidity levels above 90% RH causes it to undergo a change of state. This condition is called the “saturated state” and occurs with even short exposure to high humidity levels. When the hair bundle reaches the saturated state, it contracts and causes a 7 to 9% downward shift in the humidity indications. If the humidity then stays below 80%, the hair bundle will elongate linearly for approximately two weeks. After this time period, the hair bundle is in its dry state.

The hair bundle has two curves, depending on the state of the hair bundle. These characteristics can be taken into account when using the instrument. The instrument is calibrated at the factory with the hair bundle in the dry state. Generally, the instrument is used indoors with humidity levels below 90%.

NOTE: When used in air conditioned areas or other areas of moderate humidity, you do not need to adjust the instrument.

How to use the instrument in high humidity areas:

For use above 85% RH, turn the humidity fine adjustment screw counterclockwise to raise the humidity reading by 7 to 9%. Readings will be within specifications over the entire range when the instrument is exposed to high humidity conditions (85 to 100%) at least once every two weeks.

Note any calibration change either on the chart paper or on the instrument itself. This way you can change the instrument back to its original calibration if needed.

10. Warranty

Cole-Parmer warrants this instrument to be free from significant deviations in material and workmanship for a period of one (1) year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse within the warranted time period, please return—freight prepaid—and correction will be made without charge. Cole-Parmer alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on a charge basis.

11. Return of items

Authorization must be obtained from our Customer Service Department before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. We will not be responsible for damage resulting from careless or insufficient packing. A restocking charge will be made on all unauthorized returns.

NOTE: We reserve the right to make improvements in design, construction, and appearance of products without notice.