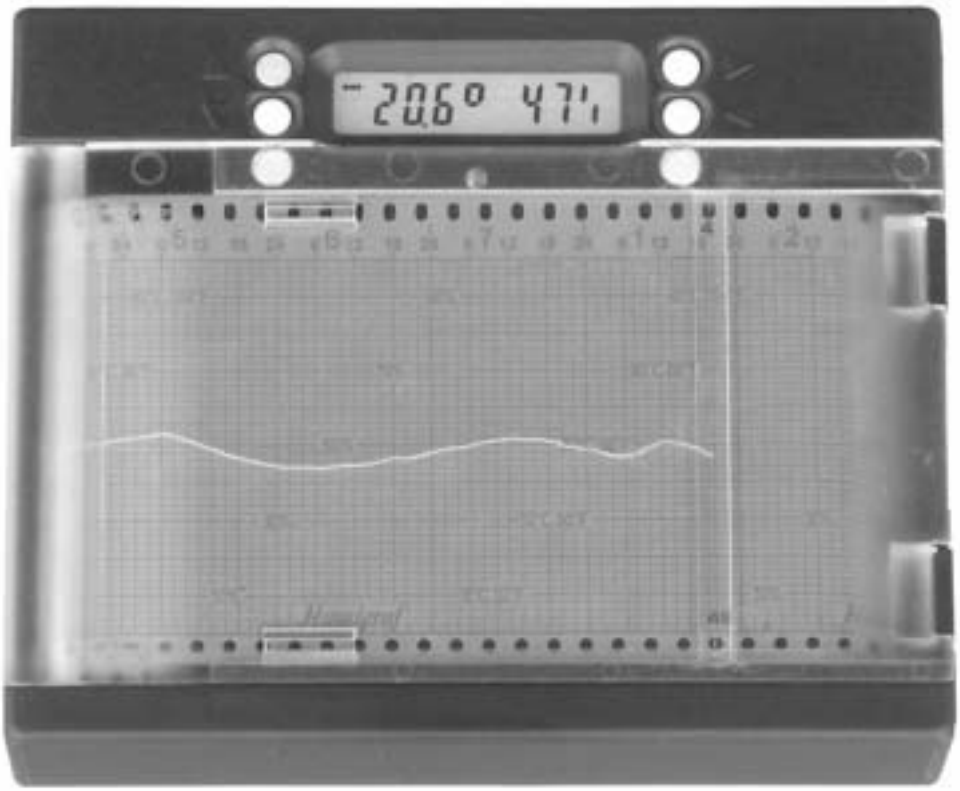
Humigraf

Long-term data taker for recording:
Relative Humidity - Temperature - Dew point



Operating Instructions

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Description

The **Humigraf** measures the temperature and the humidity of the air around it. From this, the dew point can be calculated. The stylus presses against the waxed paper roll from the back, leaving a permanent record of Relative Humidity, Temperature or Dew point. The record is immediately visible in the display as a clear, continuous trace – produced on a rectilinear axis without the use of ink or pens.

In addition, the **Humigraf** has a numerical LCD-Display. This normally shows the current data's, but is also used to select and adjust the **Humigraf's** operating functions.

Minimum and maximum values can be shown on the digital display at the touch of a button.

A microcomputer controls all the functions of the Humigraf. The analogue sensor signals are amplified and digitalised in the Signal Processor and then input to the Microcomputer, which then calculates relative humidity and temperature. The compensation algorithm applied to the sensor guarantees an extremely high accuracy throughout the full operating (i.e. temperature) range. The application of modern electronics (no need for trim potentiometers!) ensures the long-term stability of the Humigraf

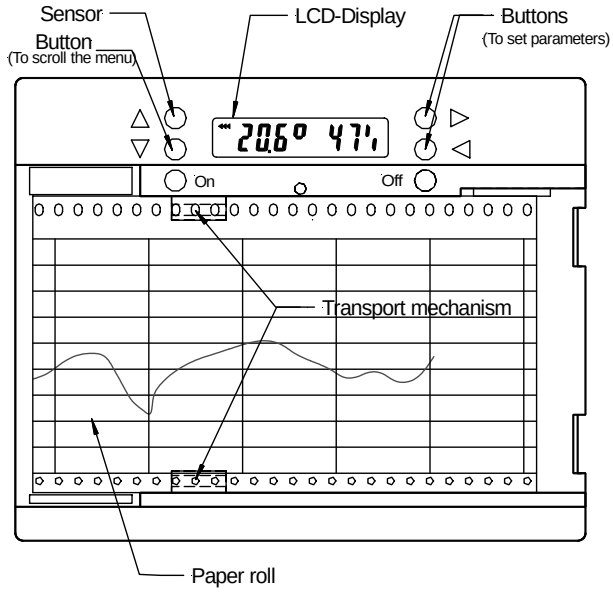
To reduce power consumption the microprocessor is automatically switched to an energy-saving mode between measurements, with only the LCD display and other basic functions operating continuously.

The paper movement is controlled to extremely high tolerances by a small servo motor. A second servo motor controls, via a spindle, the movement of the scriber.

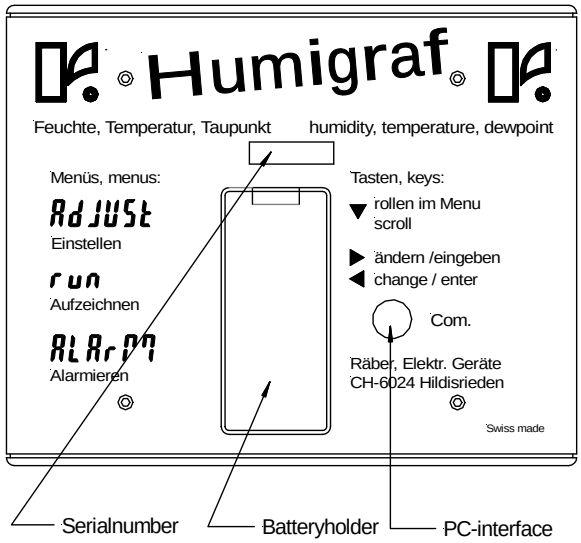
An acoustic and visual alarm indicates that the limit levels set by the user (temperature and relative humidity) have been exceeded.

To guarantee optimum reliability, gold-plated contacts are used throughout the Humigraf. The battery connections use multiple contacts to ensure no open circuits.

Overview



Front face



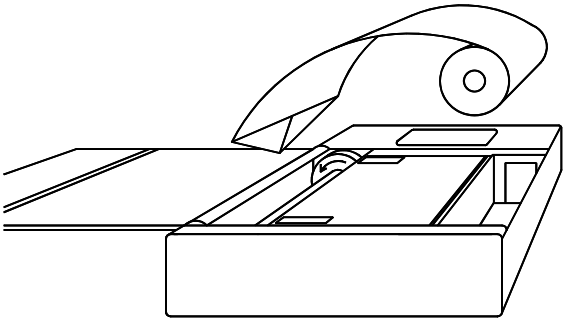
Reverse face

Set - Up

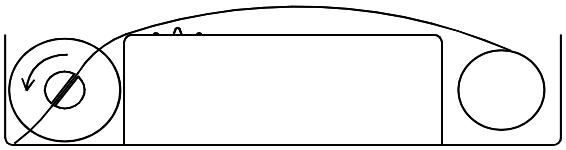
Fitting the Battery

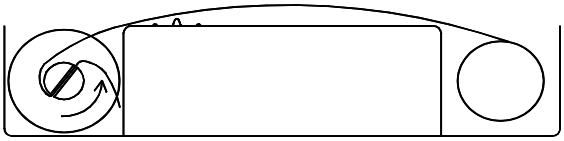
The Humigraf requires a single Alkali Manganese 1.5V battery (Typical sizes: AM2, LR14) with a diameter of 26 mm and a length of 50 mm. With this battery the Humigraf will operate at room temperature for up to one year.
When fitting the battery, ensure that its polarity is correct.

Fitting the paper roll



Fold a 90° point in the end of the paper roll. Fit the paper roll into the right side of the chamber and push the point as far as possible into the slot in the transport spindle on the left side of the chamber. Wind the spindle one or two complete turns in the direction indicated in the sketch, ensuring that the 'teeth' of the transport mechanism mesh cleanly with the holes in the edge of the paper. The time axis on the paper roll is marked with days of the week ('Monday' through to 'Sunday' as 1 to 7), each of which is sub-divided into 24 one-hour segments. Align the paper with the current time and day of the week **approximately 20 mm right of the scriber point**. This ensures that only a minimal correction will be required when the paper is positioned. (See below.)





Switching on the device, closing the cover

After pressing the "ON" button, close the perspex cover. The LCD display will then indicate "+8.8.8.8.8.8.8.8.", to test that all elements of the display are functioning correctly. The scriber point moves to indicate a position of 50%. The paper will be indexed forward by approximately 5 mm, and the LCD display changes to „POS 50%".

Note: If no button is pressed for the next 30 seconds, the Humigraf will automatically switch to the 'Adjust' mode. („POS 50%" and " PAPEr " (see below) can be reset only by switching the device off, then on again.)

Adjusting the scribe

In the event that the scriber point does not lie exactly on the 50% line, the scriber can be adjusted using the buttons to the right of the LCD display. (⇨ Moves the point up, ⇦ down.) If necessary, press the left button ⇩ to change the display to "PAPEr", and move the paper slightly, to determine the exact position of the scriber point, before resetting the display to "POS 50%". Any corrections made at this time will be repeated automatically the next time the device is switched on.

Adjusting the paper position

Press the button ⇩ to the left of the display, which will then indicate "PAPEr". With the right button ⇨ the paper can be indexed to a position corresponding to the current day and time. **Note that backwards indexing of the paper is not possible**. Once the position of both the scriber and the paper has been correctly set up, press the button ⇩ (to the left of the display), to change to the "AdJUSt" mode. ⇨ ⇦

Adjustment ADJUST

Select the parameter to be recorded:

rEC. HU. 1 .....to record Humidity,
rEC. t. 0 .....to record Temperature or
rEC. dP. 0 .....to record Dew point.

Select the units to be indicated:

unit °C .....Indicates temperature recorded in °Celsius,
unit °F ....Indicates temperature recorded in °Fahrenheit.

Submenu Alarm: ALARM

The Alarm menu is accessed by pressing one of the right-hand buttons. Using these, the Upper and Lower limits for (a) Humidity and (b) Temperature can be set; i.e.

AL. 1 20% .....Lower Humidity limit 20%
AL. 2 80% .....Upper Humidity limit 80%,
AL. 1 15°C .....Lower Temperature limit 15°C
AL. 2 30°C .....Upper Temperature limit 30°C.

CALL Adjusts the acoustic alarm signal generated when one of the limits set above is exceeded:

1-9 = the number of alarm tones per minute (each tone 2 seconds long),
Off = no acoustic alarm,
On = continuous alarm tone.

Setting ADJUST to return to the adjust menu.

Time adjustment -2 h

When the display shows " 0 h " the recorder time may be adjusted (e.g. when entering Summer Time or Winter Time, or travelling across a time zone.) If a positive value is entered, the recording paper will advance by the required amount on exiting the Settings menu. If a negative value is entered, the paper feed will stop for the appropriate time

Selecting normal operating mode run

Using the left-hand button ⇩ select "run". Confirm the menu change using one of the two right-hand buttons (⇨⇦). **Note that data recording will start 16 minutes after "run" has been selected.** This is the time required for the sensor to adjust to ambient temperature conditions and apply the compensation algorithm.

Display run

In normal operating (i.e. recording) mode the **Humigraf** records the parameters selected.

Display of Temperature and R.H. +20.6° 47%

The LCD display shows the current Temperature and Relative Humidity. This display is updated once per minute.

Minimum and maximum values of Temperature and R.H.

Using the right-hand button ⇨ the Maximum recorded values can be displayed 32.0°, 56%, the right-hand button ⇦ displays the Minimum recorded values 13.8°, 15%.
Pressing both right-hand buttons ⇨⇦ simultaneously reverts the display to the current values. +20.6° 47%

Display of Dew point dP. 8.5°

The LCD display shows the current dew point, calculated from the current temperature and humidity values. This display is updated once per minute.

Minimum and maximum values of Dew point

Using the right-hand button ⇨ the Maximum recorded value can be displayed dP.↑ 28.3°, the right-hand button ⇦ displays the Minimum recorded value dP.↓ -9.6°.
Pressing both right-hand buttons ⇨⇦ simultaneously reverts the display to the current value. dP. 8.5°

Selecting the Setting menu AdJUSt

Using the left-hand button ⇩ select "AdJUST". Confirm the menu change using one of the two right-hand buttons (⇨⇦).

PC-interface (only applicable to units fitted with this feature)

Description

Humidity and temperature data from the last 20 days is stored in a buffer memory. A data point is recorded every 15 minutes, to a resolution of 0.1°C / 1%.
Using the data transfer cable supplied, this data can be downloaded to a PC for permanent storage or for further manipulation.
The software is compatible with Microsoft 'Windows' Versions 95, 98, NT, 2000 and XP. Using the 'Excel' program, the data downloaded can be automatically displayed graphically using a Macro function.
As this software is freely available, it can be customised by the operator to suit his or her individual data processing requirement.

Software installation

- Close all open applications.
- Insert CD. The installation procedure should then automatically start.
- If required, the program file may be changed.

Download

On the Microsoft 'Setting - Control Panel', select 'Regional Settings' / 'Date' / '**DD.MM.YY'**
Connect the 'Humigraf' to the PC and start the Download program.
Under COM, select the applicable PC interface.
Select "New Excel chart" if you wish an Excel chart showing the data to be automatically created. (It is assumed that your PC already has 'Excel' installed.)
Confirm your download requirement with the command "Download". The data will then be transferred to the PC. As the 'Humigraf' does not have an internal clock, the downloaded data will be stored in a Text File under the current date and time on your PC. 'Excel will then be started and one ore three charts, will be created.
The data in the Text File may be further manipulated or copied to another location. ***If this is not done, it will be overwritten during the next download*.**
If no chart is required, or if you do not 'Excel' installed, the command "New Excel chart" should not be selected. The data will still be stored in the PC in a Text File as described above.

Important information

Location

Do not place the Humigraf where it is directly exposed to heat sources such as radiators, lamps and solar radiation. This will of course cause incorrect temperature values to be recorded. If the instrument is mounted on a wall, ensure that the normal wall temperature is similar to that of the room being monitored – do not select a poorly insulated external wall, for example.

Battery

The Humigraf is designed to operate with one Alkali-Manganese Battery. Thanks to its low power consumption, the device will run from a single 1.5V battery (typical size: AM2, LR14) for approximately 12 months, at room temperature.
As with many types of battery, the Alkali-Manganese battery will increase its discharge rate at high temperatures, which results in a reduced battery life. At low temperatures, the battery is incapable of releasing its full charge. To maximize the battery life, operation of the Humigraf in extreme temperatures should therefore be avoided if possible, as should the use of batteries which have been stored for an excessively long time. Note also that excessive use of the buttons alongside the LCD display, or of the aural alarm, will run down the battery more quickly.

Battery charge indicator

The battery voltage is regularly monitored and indicated on the LCD display by three small arrows in the upper left corner of the display:

Constant	Voltage greater than	1.0	Volt, Battery O.K.
Blinking (slowly)	Voltage between	1.0 and 0.8	Volt, Battery change required soon
Blinking (rapidly)	Voltage between	0.8 and 0.7	Volt, Battery change required urgently
"Lo bAt"	Voltage below	0.7	Volt, Device accuracy cannot be guaranteed

If the battery voltage sinks below 0.9 Volt, the LCD display will, as shown above, change to **"Lo bAt"** and the humidity and temperature will no longer be displayed. Operation of the various menu functions will no longer be possible. The scriber, however, will continue to mark the indicator roll until the battery is completely flat

The battery charge indicator is designed to be compatible with Alkali-Manganese batteries only. Other types of battery, such as rechargeable Nickel-Cadmium cells, have a completely different discharge characteristic and are incompatible with the battery charge indicator.

Alarm signal

When one of the pre-set Relative Humidity or Temperature limits is exceeded, an in-built buzzer will generate an acoustic alarm. Simultaneously, the affected parameter (R.H. or Temperature) will blink on the secondary LCD display. This visual alarm signal can be cancelled by pressing one of the right-hand buttons.
Note that setting the lower limits at 0% / -5°C and the upper limits at 100% / 45°C will disable the Alarm function.

Indicating paper

The graph is inscribed onto a special waxed paper. One paper roll is sufficient for one year's operation. The paper is of high quality and may be stored for many years with no degradation. Note, however, that like all documentation it should be stored in a cool, dry place.

The paper can easily be marked-up using non-soluble felt-tip pens. It is also possible to open the Humigraf's perspex cover and mark-up the paper roll whilst the device is operating. Note that when re-closing the cover it is important to make sure that the holes in the paper roll are still engaged with the cogs of the transport mechanism.

The graph can be easily photocopied, or input into a Personal Computer using a Scanner.

Storage

If the Humigraf is not used for any length of time, ensure that the battery is removed. Even the highest quality batteries can, after prolonged storage, leak and damage the inside of the Humigraf. The Humigraf should be stored in a dry place!

Maintenance

The Humigraf should be cleaned using a soft cloth or tissue, if necessary soaked in ethanol. **No cleaning solvents should be used,** as they could damage the plastic components.

Apart from changing of the battery and the indicating paper, the Humigraf requires no maintenance. The device also contains no adjustable parts.

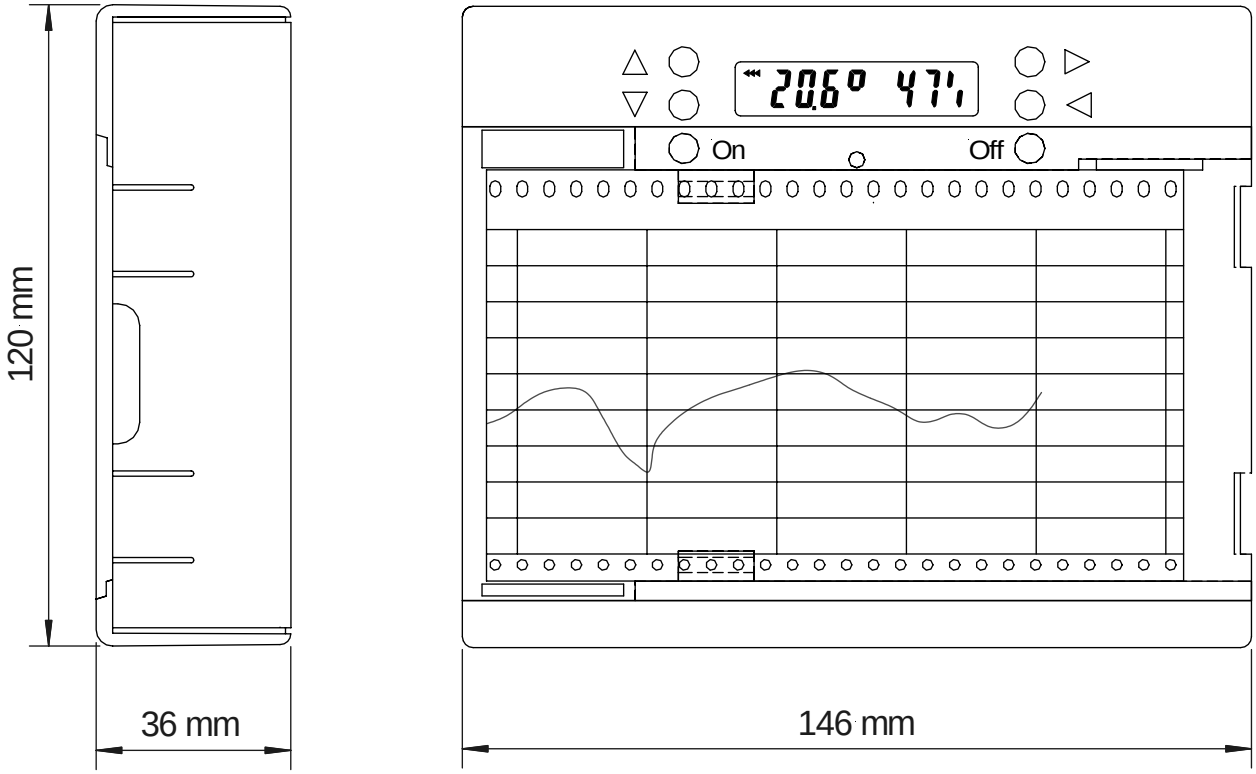
The interior of the device contains no components (trim potentiometers, etc.) which can be adjusted. There is therefore no requirement to open up or dismantle the device, and any attempt to open the Humigraf will invalidate the manufacturer's guarantee!

Summary of Menu Options:

Mode	Display	Description
Set-up:	88888888	Press 'On' button,➔ Display test ➔ Scriber point moves 50% line ➔ Paper indexes forward 5 mm ➔ Display automatically changes to "Pos. 50%".
⇩ **Scrolling through the Menu using the left-hand (LH) button.**	POS 50%	Use the right-hand (RH) buttons to correct the scriber point position to 50%. This correction is stored in the device memory, and is automatically incorporated the next time the unit is switched on.
If no button is pressed for a period of 30 seconds, the Humigraf will automatically switch to "AdJUSt".	PAPEr	Use the RH button ⇨ to move the paper to the correct position. (Note: The paper cannot be moved backwards!)
	AdJUSt	Use the RH buttons to change to the "ADJUST" mode
	run	Use the RH buttons to change to the "run" mode.
Adjust: AdJUSt ⇩ **Scrolling through the Menu using the left-hand (LH) button.** If no button is pressed for a period of 30 seconds, the Humigraf will automatically switch to "run".	rEC HU % rEC t ° rEC dP °C	Use the RH buttons to select the parameter to be recorded. Relative Humidity, Temperature, Dew Point
	Unit °C Unit °F	Select the required unit (Celsius or Fahrenheit)
	ALArM	Use the RH buttons to change to the sub menu Alarm. Sub menu see below.
	-2 h	Use the RH buttons to set the required Time Change. (e.g. Changing from summer to winter time, crossing a time zone.)
	run	Use the RH buttons to change to the DISPLAY mode.
Display: run ⇩ **Scrolling through the Menu using the left-hand (LH) button.**	20.6° 47%	Main display records the selected parameter, the Secondary display shows the temperature and the relative humidity.
	dP 8.5°	Main display records the selected parameter, the Secondary display shows dew point.
	32.0° 56% 13.8° 15% dP 28.3° dP -9.6°	Maximum values: Press the upper right-hand button ⇨ Minimum values: Press the lower right-hand button ⇦ Pressing both right-hand buttons ⇨⇦ simultaneously reverts the display to the current values.
	AdJUSt	Use the RH buttons to change to the "ADJUST" mode
Sub-menu Alarm:	AL 20%	The Lower limit for Humidity can be set with the right-hand buttons ⇨⇦ .

ALArM ⇩ **Scrolling through the Menu using the left-hand (LH) button.** If no button is pressed for a period of 30 seconds, the Humigraf will automatically switch to „AdJUSt“		Setting 0% will disable the Alarm function.
	RL. 80%	The Upper limit for Humidity can be set with the right-hand buttons ⇨⇦. Setting 100% will disable the Alarm function.
	RL. 15°C RL. 59°F	The Lower limit for Temperature can be set with the right-hand buttons ⇨⇦ . Setting -5°C (23°F) will disable the Alarm function.
	RL. 30°C RL. 86°F	The Upper limit for Temperature can be set with the right-hand buttons ⇨⇦ . Setting 45°C (113°F) will disable the Alarm function.
	CALL 3	Use the RH buttons to set the number of aural alarm calls (1-9, On, Off), given when the Storm Warning is triggered. (Alarm sounds for 2 seconds every minute.)
	AdJUSt	Use the RH buttons to change to the “ADJUST” mode

Display dimensions



Technical Data

Relative Humidity:
Range.....0% - 100%
Accuracy .....± 2% (between 10% to 90%)
Resolution 1%
Temperature:
Range (Display, Memory).....- 20° to 60°C
Recording Range .....- 5° to 45°C
Accuracy .....± 0.4° C (0° to 40° C)
Resolution .....0.1°C
Dew point:
Range (Display.....- 20° to 60°C
Recording Range .....5° to 45°C
Accuracy .....± 1°C (RH > 30% at 25°C)
Resolution .....0.1°C

Index Rate.....1 mm/h = 24 mm/day
Display (Main .....Shows recorded data from previous 4 days
Recording Method.....Rectilinear, Maintenance-free
Paper Capacity.....1 Year
Display (Secondary .....8-digit, 7 mm LCD (Liquid Crystal Display)
Memory .....20 Days (Relative Humidity and Temperature)
PC-Interface .....RS-232, Com1 or Com2
Alarm.....Sound and visual. Set point adjustable
Electricity Supply.....1 Alkali Manganese 1.5 V battery (1 year's * operation)
Dimensions .....146 / 120 / 36 mm, (5.75"x 4.75"x1.4")
Weight.....500 g (inc. battery and paper.), (1.10 lb)

Typical values
* only PC-Version

The manufacturer reserves the right to make changes to the unit specification

Accessories available

- **Recording paper (**Humidity 0% bis100%, Temperature and Dew point -5°C to 45°C)
- **Replacement battery** (Available from any electrical goods dealer)
- **Wooden housing Cherry**
- **Wooden housing Mahogany**
- **Wooden housing Walnut**
- **Wooden housing Black**
- **Chrome steel carriage**
- **Wooden casing, Casing black, fitting mirror black**
- **Wooden casing, Casing Mahogany, fitting mirror gold**
- **Wooden casing, Casing Walnut, fitting mirror gold**
- **Installation panel, Black, dim**
- **Installation panel, Mirror, Black**
- **Installation panel, Mirror, Silver**
- **Installation panel, Chrome-plated steel, dim**
- **Installation panel, Mirror, Gold**

The latest information can be found on our Homepage under:

www.barograph.ch

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