FLUKE®

5020A
Thermo-Hygrometer

Getting Started

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Introduction

This manual contains getting started information about the Fluke 5020A Thermo-Hygrometer.

The Fluke 5020A is a low-cost, high-accuracy, digital thermo-hygrometer. Its unique combination of features makes it suitable for a wide variety of applications from laboratory to industrial ambient measurement. Features of the thermo-hygrometer include:

- Two channels measure ambient temperature to ±0.125 °C and %RH to ±1.5%

- Two sensors, each measuring temperature and relative humidity; each is detachable, cable-extendable, and interchangeable, with self-contained calibration; each may be assigned a unique 16-character identification

- Display resolution is user selectable up to 0.001 °C and 0.01% RH

- On-board memory holds up to 400,000 time/date-stamped readings

- Removable data card option for additional data storage and ease of data transfer to and from a PC.

- Visual and audio alarms for various alarm or fault conditions

- May be wall mounted or set on a bench top

- Detachable sensors contain their own calibration data for easy recalibrations

- Optional software logs in real-time or shows graphical/statistical data from data card (Data card is optional and not needed to run the software for real-time logging.)

- Password protection of settings

- Large, monochrome LCD, displays temperature and humidity data graphically, numerically, and statistically; 16 pre-defined, user-changeable screen setups; display viewable in bright or dim lighting

- Serial RS-232 and IR interface standard

- Power 12 VDC from external 110-240 VAC to DC converter.

- Uses a standard 9 V battery backup to allow continued measuring during power interruptions.

- Certificate of NIST-traceable temperature and humidity calibration with three each temperature and humidity points

Symbols Used

Table 1 lists the International Electrical Symbols. Some or all of these symbols may be used on the instrument or in this manual.

Table 1. International Electrical Symbols

Symbol	Description
∿	AC (Alternating Current)
≈	AC-DC
🔋	Battery
CE	CE Complies with European Union Directives
---	DC (Direct Current)
⧈	Double Insulated
⚡	Electric Shock
⎓	Fuse
⏚	PE Ground
⚠	Hot Surface (Burn Hazard)
⚠	Read the User's Manual (Important Information)
O	Off
I	On
℠	Canadian Standards Association
CAT II	OVERVOLTAGE (Installation) CATEGORY II, Pollution Degree 2 per IEC1010-1 refers to the level of Impulse Withstand Voltage protection provided. Equipment of OVERVOLTAGE CATEGORY II is energy-consuming equipment to be supplied from the fixed installation. Examples include household, office, and laboratory appliances.
Ⓒ	C-TIC Australian EMC Mark

Safety Information

Use this instrument only as specified in the Users Manual. Otherwise, the protection provided by the instrument may be impaired.

The following definitions apply to the terms "Warning" and "Caution".

- "Warning" identifies conditions and actions that may pose hazards to the user.

- "Caution" identifies conditions and actions that may damage the instrument being used.

⚠ **Warnings**

To avoid personal injury, follow these guidelines.

- **DO NOT use this unit in environments other than those listed in the User's Manual.**

- **Follow all safety guidelines listed in the User's Manual.**

- **Calibration equipment should only be used by trained personnel.**

- **The AC adapter can present safety concerns if misused or damaged. To avoid the risk of electric shock or fire, do not use the AC adapter outdoors or in a dusty, dirty, or wet environment. If the cord, case, or plug of the adapter is damaged in any way, discontinue its use immediately and have it replaced.**

- **Never disassemble the AC adapter. Use only the AC adapter provided with the instrument or equivalent adapter recommended by the manufacturer of this instrument.**

- **The AC adapter has circuits with high voltage inside that could present danger of electrical shock or fire if exposed. If the AC adapter is damaged in any way or becomes hot, discontinue its use immediately, disconnect it from any AC supply, and have it replaced. Do not attempt to open, repair, or continue using a damaged or defective AC adapter.**

- **The instrument battery can present danger if not handled properly. To avoid the risk of exposure to dangerous substances or explosion, immediately remove the battery and discontinue use if it leaks or becomes damaged. Never allow the battery to be shorted, heated, punctured, or dropped. If the instrument is physically damaged, immediately remove the battery to insure that it does not become shorted. While removed from the instrument, store the battery in a location so that it will not come into contact with metal or fluids that might short circuit the battery and where it is safe from excessive temperatures.**

- **Used batteries must be disposed of properly. Check your local regulations for additional information. Never dispose of batteries in fire which may result in explosion with the possibility of personal injury or property damage.**

Cautions

- **If the instrument is dropped, struck, or handled in a way that causes internal or external physical damage, immediately unplug the AC adapter, remove the battery, discontinue use, and contact an Authorized Service Center. Do not attempt to disassemble or repair the instrument, battery, or AC adapter. Refer repairs or replacement components to an Authorized Service Center.**

- **The instrument and sensors are sensitive and can be easily damaged. Always handle these devices with care. DO NOT allow them to be dropped, struck, stressed, or overheated.**

- **Sensors are fragile devices which can be damaged by mechanical shock, overheating, and exposure to fluids. Damage may not be visibly apparent but can cause drift, instability, and loss of accuracy. Observe the following precautions:**

- **DO NOT allow sensors to be dropped, struck, or stressed.**

- **DO NOT overheat sensors beyond their recommended temperature range.**

- **Keep the sensors clean and away from fluids and dust.**

Technical Support

Contact Fluke if you need technical support. When calling, please have the following information ready:

- Model: 5020A
- Serial Number
- Voltage
- Complete description of the problem

To call, using one of the following phone numbers:

USA: 1-888-99-FLUKE
Canada: 1-800-36-FLUKE
Europe: +31 402-675-200
Japan: +81-3-3434-0181
Singapore: +65-738-5655
Anywhere in the world: +1-425-446-5500

Or, visit Fluke's Web site at www.fluke.com.

Specifications

Temperature Range	0 °C to 50 °C
Temperature Accuracy	16 °C to 24 °C: ±0.125 °C (calibrated)
("H" Model)	0 °C to 16 °C, 24 °C to 50 °C: ±0.5 °C (uncalibrated typical)
Temperature Accuracy	15 °C to 35 °C: ±0.25 °C (calibrated)
("S" Model)	0 °C to 15 °C, 35 °C to 50 °C: ±0.5 °C (uncalibrated typical)
Delta Temperature Accuracy	±0.025 °C for ±1 °C changes within 15 °C to 35 °C
Temperature Display Resolution	User selectable up to 0.001 °C (0.0 1°C recorded)
RH Range	0% to 100% RH
RH Accuracy ("H" Model)	20% to 70% RH: ±1.5% RH (calibrated)
	0% to 20% RH, 70% to 100% RH: ±3% RH (uncalibrated, typical)
RH Accuracy ("S" Model)	20% to 70% RH: ±2% RH (calibrated)
	0% to 20% RH, 70% to 100% RH: ±3% RH (uncalibrated, typical)

Delta Humidity Accuracy	±1.0% for ±5% changes within 20% to 70% RH
RH Display Resolution	User selectable up to 0.01% (0.1% recorded)
Inputs	Two sensors, each measuring temperature and relative humidity; each is detachable, cable-extendable, and interchangeable, with self-contained calibration; each may be assigned a unique 16-character identification
Display	240 x 128 graphics monochrome LCD, displays temperature and humidity data graphically, numerically, and statistically; 16 pre-defined, user-changeable screen set-ups are included
Memory	400,000 typical individual time-stamped readings (excluding data card storage)
Alarms	Visual and audio alarms for temperature, temperature rate, RH, RH rate, and fault conditions
Communications	RS-232 and IR
Data Card Interface	Removable data card for transferring data to a computer; data can likewise be uploaded from a data card into the 5020A for graphical and statistical display
Enclosure	The 5020A may be wall-mounted (hardware included) or set on a benchtop
Power	12 V DC from external 100-240 VAC power supply
Battery Backup	Standard 9V battery to allow continued measuring during power disruptions
Operating Range	0 °C to 50 °C
Size (5020A)	125 mm Hx 211 mm W x 51 mm D(4.9 in x 8.3 in x 2.0 in)
Size (Probes)	79 mm H x 19 mm dia. (3.1 in H x 0.75 in)
Weight	0.7 kg (1.5 lb.)
Calibration	Certificate of NIST-traceable temperature and humidity calibration included; supplied data includes three each temperature and humidity points

Environmental Conditions

Although the instrument is designed for optimum durability and trouble-free operation, it must be handled with care. The instrument should not be operated in an excessively dusty, dirty, or wet environment. Maintenance and cleaning recommendations can be found in the Maintenance section of the Users Manual.

For full accuracy, operate the instrument within the calibrated temperature and relative humidity range of the sensors.

5020A

Operating Temperature: 0 °C to 50 °C (32°F to 122°F)

Relative Humidity: 0% to 70% RH

5026A-H/S

Operating Temperature: 0 °C to 50 °C (32°F to 122°F)

Relative Humidity: 0% to 100% RH

AC Adapter

Operating Temperature: 0 °C to 40 °C (32°F to 104°F)

Relative Humidity: 5% to 90% non-condensing de-rating from 40 °C linearly to 50% at 70 °C

General to all

Pressure: 75 kPa-106 kPa

Vibration should be minimized

Altitude less than 2,000 meters

Indoor use only

Unpacking

Carefully unpack the thermo-hygrometer and inspect the instrument to make sure all components are present and in satisfactory condition. Verify that the following items are present:

- 5020A Thermo-Hygrometer
- AC adapter and power cord
- Serial cable
- Getting Started Manual
- CD-ROM with complete Users Manual
- Report of calibration
- Wall mount bracket
- Sensor

- 9V battery

If all items are not present, call your Fluke Authorized Service Center.

How to Get Started

Use Proper Care

First and most important is to understand the safety issues related to the thermo-hygrometer. Carefully read Safety Information.

The thermo-hygrometer and sensors used with it are sensitive instruments that can be easily damaged. Always handle these devices with care. DO NOT allow them to be dropped, struck, stressed, or over-heated.

Learn About the Features and Components

Familiarize yourself with the features and accessories of the thermo-hygrometer by reading Parts and Controls.

Install the Battery

To maintain uninterrupted measurement when power outages occur, you must install the included battery into the rear battery compartment. A standard 9V alkaline battery (NEDA 1604A or IEC 6LR61) is recommended. With a fresh alkaline battery installed, the thermo-hygrometer will continue to measure and record temperature and relative humidity during a power outage for up to 16 hours, typically. However, without external power, the display will be inoperable.

Connect the Sensor

The sensor for channel 1 connects to the socket at the top-right, and the sensor for channel 2, if used, connects to the socket on the right side. Either sensor may be used with an optional extension cable up to 100 feet (30 meters) in length.

Connect the Power Source

The thermo-hygrometer draws power from the provided power adapter. Plug the adapter into a wall outlet of the appropriate voltage and insert the DC plug into the DC power input of the thermo-hygrometer.

Switch the Power On

Power is turned on and off with the power switch located below the stand on the back panel. To switch the power on, toggle the power switch to the **I** position. To switch power off, toggle the power switch to the **O** position. The instrument takes a few seconds to power up, initialize, and begin normal operation. A self-test is performed, displaying the channel configuration and status of the system,

calibration, % battery power, memory, and buttons. If the thermo-hygrometer calibration has expired and the alert message is enabled, the user is notified and must press the $\boxed{\substack{\text{ENTER} \\ \text{MENU}}}$ button to continue initialization. If an error message is displayed on power up see Troubleshooting.

Measure Temperature

After initialization, the temperature and relative humidity measurements for the enabled channels are displayed. If recording is enabled, the measurements will be automatically stored in memory. The display can be configured to display the measurements in a variety of numerical and graphical formats. For information on the various modes of operation of the thermo-hygrometer, see Menu Functions.

Parts and Controls

The functions of the various features of the thermo-hygrometer are described below.

Front Panel

The front panel buttons $\boxed{\substack{\text{ENTER} \\ \text{MENU}}}$, $\blacktriangle$, $\blacktriangledown$, $\blacktriangleleft$, $\blacktriangleright$ and $\boxed{\text{EXIT}}$ are used to select and alter the functions of the thermo-hygrometer (see Figure 1).

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Figure 1. Front Panel

The buttons have different functions depending on whether the main screen or the menu system is displayed.

The functions of each of the buttons from the main screen are as follows:

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[ENTER MENU] - This button is used to display the menu options.

[EXIT] - This button is used to display the alarm window. With the alarm window displayed the Exit button can be used to return to the main screen while preserving the alarm events or the Enter button can be used to clear the alarm events and return to the main screen.

◀ ▶ - These buttons are used to move among enabled display layouts.

⊙ ⊙ - These buttons are used to adjust the display contrast, ⊙ for darker and ⊙ for lighter.

The functions of each of the buttons within the menu system are as follows:

[ENTER MENU] - This button is used to select a menu item, to accept a choice, or save changes to a parameter.

[EXIT] - This button is used to return from a menu or window or cancel changes to a parameter. Pressing the Exit button for a second or so returns from most any menu, menu function, or window back to the main screen.

⊙ ⊙ - These buttons are used to move among menu items or parameters. When editing some numeric or alpha-numeric parameters, these buttons are used to change a digit or character.

◀ ▶ - These buttons are used to change a value or option when editing a parameter. When editing some numeric or alpha-numeric parameters, these buttons are used to move among digits or characters.

IR Port - The infrared window provides a means for communicating with the thermo-hygrometer using infrared serial communications (IR COMM mode) or printing measurements and daily statistics to a IrDA-compatible printer (IRDA mode).

Top Panel

The top panel contains the port for attaching the sensor for Channel 1. An optional extension cable may be used to allow the sensor to be placed in a remote location (see Figure 2).

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Figure 2. Top Panel

Right Side Panel

The right side panel contains the port for attaching the sensor for Channel 2. An optional extension cable may be used to allow the sensor to be placed in a remote location (see Figure 3).

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Figure 3. Right and Left Side View

Left Side Panel

The left side panel consists of the DC power socket, the RS-232 port and the data card slot.

12 V DC Power Socket - The DC plug of the AC adapter plugs into the 12V DC power socket to power the instrument.

RS-232 Port Connector - This socket is for interfacing the thermo-hygrometer to a computer or terminal using serial RS-232 communications.

Data Card Slot - An optional data card is installed in this slot for additional memory storage and data transfer with a computer.

Back Panel

The back panel contains the stand, power switch, battery compartment, and product information, including serial number (see Figure 4).

Stand - The stand can be used to prop up the thermo-hygrometer on a flat surface.

Battery Compartment - The battery compartment holds a 9V alkaline battery used as a backup power source to maintain continuous measurement during a power outage.

Power Switch - The power switch turns the power on and off to the thermo-hygrometer, including power from the battery. Before disconnecting the AC adapter from the instrument, switch the power off to prevent draining the backup battery.

Serial Label - The serial label shows the instrument model and serial number.

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Figure 4. Back Panel

Quick Buttons

When the main screen is displayed, the buttons have the following functions:

`ENTER MENU`- This button is used to display the menu options.

`EXIT`- This button is used to display the alarm window. With the alarm window displayed the Exit button can be used to return to the main screen while preserving the alarm events or the Enter button can be used to clear the alarm events and return to the main screen.

◀ ▶ - These buttons are used to move among enabled display layouts.

▲ ▼ - These buttons are used to adjust the display contrast, ▲ for darker and ▼ for lighter.

Configurations

- Model 5020A-H KIT includes a 5020A-H Thermo-Hygrometer readout, a high accuracy sensor (Model 5026A-H), a thermo-hygrometer readout wall mount bracket, power supply (Model 5020A-PS), and an RS-232 cable.

- Model 5020A-S KIT includes a 5020A-S Thermo-Hygrometer readout, a standard accuracy sensor (Model 5026A-S), a thermo-hygrometer readout wall mount bracket, power supply (Model 5020A-PS), and an RS-232 cable.

Accessories

The following accessories are available to compliment either the high accuracy or standard thermo-hygrometer readout.

- Model 5026A-S Spare Sensor/Standard Accuracy

- Model 5027A-S Spare Sensor Kit includes a standard accuracy probe (Model 5026A-S), sensor case (Model 5026A-CASE), sensor wall mount bracket (Model 5030A-MNT), and 25-foot (7.6 m) extension cable (Model Y5028)

- Model 5026A-H Spare Sensor/High Accuracy

- Model 5027A-H Spare sensor Kit includes a high accuracy sensor (Model 5026A-H), sensor case (Model 5026A-CASE), sensor wall mount bracket (Model 5030A-MNT), and 25-foot (7.6 m) extension cable (Model Y5028)

- Model 5026A Spare Sensor Protective Case

- Model Y5028 Extension cable, 25-foot (7.6 m)

- Model Y5029 Extension cable, 50-foot (15.2 m)

- Model 5030A-MNT Sensor wall mount bracket

- Model 5032A-64MB data card (PC Card), 64 MB

- Model 5020A-CASE Protective Case (includes space for a 5020A Thermo-Hygrometer, two sensors, RS-232 cable, and power cord)

- Model 5020A-PS Spare Power Supply, 100-240 VAC to 12 VDC

- Model 5020A-LW3 LogWare III, single-PC license

- Model 5020A-LWLIC LogWare III, license (for additional PCs)