

701229

MET ONE HNPC-6 Handheld Airborne Particle Counter

USER MANUAL

May 2008, Edition 4



EXCELLENCE IN PROCESS ANALYTICS

701229

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Section 1 Specifications

Specifications are subject to change without notice.

Instrument	
Dimensions (W x L x H)	114.3 mm x 209.6 mm x 57.2 mm (4.5" x 8.25" x 2.25")
Weight	1.0 kg (2.2 lb)
Number of size channels	Six
Standard	0.3, 0.5, 0.7, 1.0, 2.0, 5.0 μm
IAQ	0.5, 0.7, 1.0, 2.0, 5.0, 10.0 μm
Custom	0.3 to 20 μm available
Flow rate	0.1 cfm (2.83 L/min)
Light source	Laser diode; index guided (26,000 MTBF at 25 °C)
Calibration	PSL particles in air (NIST traceable)
Counting efficiency	50% at 0.3 μm ; 100% for particles > 0.45 μm (per JIS B9921:1997)
Zero count	1 count/5 minute (per JIS B9921:1997)
Coincidence loss	5% at 2,000,000 particles per cubic foot
Relative humidity	$\pm 7\%$, 20% to 90%, non-condensing
Temperature	$\pm 3\text{ }^{\circ}\text{C}$, 10 °C to 40 °C (50 °F to 104 °F)
Data storage	500 sample records (rotating buffer)
Data recorded	Date, time, counts, relative humidity, temperature, sample volumes, alarms, label
Display	Graphic liquid crystal with back light
Alarms	Counts, low battery, sensor fail
Count modes	Concentration, totalize, audio
Delay time	0 to 24 hours
Sample inlet	Isokinetic probe
Interface	RS232 and RS485 through RJ45
Vacuum source	Internal pump (flow controlled)
Housing	Injection molded plastic
Power	AC Adapter, 12 VDC at 2.5 A, 90 to 250 VAC, 50 to 60 Hz
Rechargeable battery	NiMH, 4.8 V at 4.5 Ah; replaceable
Recharge time	2 hours
Continuous operating time	8 hours
Standards	CE, JIS B9921: 1997
Environment	
Operating temperature	10 °C to 40 °C (50 °F to 104 °F)
Operating humidity	20% to 90%, non-condensing
Storage temperature	-10 °C to 50 °C (14 °F to 122 °F)
Storage humidity	Up to 90%, non-condensing
Compliance	
Standards	JIS B 9921-1997—Light Scattering Automatic Particle Counter
	Federal Standard 209E—Standard Practice for Defining Size Calibration, Resolution and Counting Accuracy of an Air-Borne Particle Counter Using Near-Monodispersed Spherical Particulate Material.

Section 2 General Information

2.1 Safety information

Read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

To make sure that the protection provided by this equipment is not impaired, do not use or install this equipment in any manner other than that specified in this manual.

2.1.1 Use of hazard information

DANGER

Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation that can result in minor or moderate injury.

Important Note: Indicates a situation which, if not avoided, can cause damage to the instrument. Information that requires special emphasis.

Note: Information that supplements points in the main text.

2.1.2 Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol, if noted on the instrument, will be included with a danger or caution statement in the manual.

	This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.
	Electrical equipment marked with this symbol cannot be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user. Note: To return for recycling, contact the equipment producer or supplier for instructions on how to return end-of-life equipment, producer-supplied electrical accessories and all auxiliary items for proper disposal.
	This symbol, when noted on a product enclosure or barrier, indicates that a risk of electrical shock and/or electrocution exists.
	This symbol, if noted on the product, indicates the need for protective eye wear.
	This symbol, when noted on the product, identifies the location of a fuse or current limiting device.
	This symbol indicates a laser device is used in the equipment.
	This symbol, when noted on the product, indicated the presence of devices sensitive to Electro-static Discharge (ESD) and indicated that care must be taken to prevent damage with the equipment.

2.1.3 Electrostatic discharge (ESD) considerations

Important Note: To minimize hazards and ESD risks, maintenance procedures that do not require power to the particle counter should be performed with power removed.

Delicate internal electronic components can be damaged by static electricity, resulting in degraded instrument performance or eventual failure.

The manufacturer recommends taking the following steps to prevent ESD damage to the instrument:

- Before touching any instrument electronic components (such as printed circuit cards and the components on them) discharge static electricity. Touch an earth-grounded metal surface such as the chassis of an instrument or a metal conduit or pipe.
- To reduce static build-up, avoid excessive movement. Transport static-sensitive components in anti-static containers or packaging.
- To discharge static electricity and keep it discharged, wear a wrist strap connected by a wire to the earth ground.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and work bench pads.

2.1.4 Battery safety information

WARNING

An explosion can occur if the internal battery is replaced incorrectly.

Figure 1 shows the label that appears on the battery for the safety of the user.

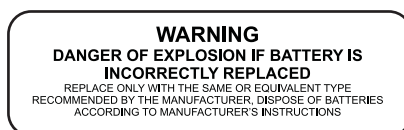


Figure 1 Battery safety label

2.2 General product information

The MET ONE Handheld Airborne Particle Counter-6 (MET ONE HHPC-6) (refer to [Figure 2 on page 9](#)) is a portable instrument that measures, counts, stores and reports airborne particulates. The standard MET ONE HHPC-6 can hold 500 samples in the memory. The data records include the date, time, counts, sample labels, volume, alarm flags, temperature and relative humidity. Use the interface cable and software provided with the MET ONE HHPC-6 to download the data records to a personal computer (PC). The internal battery can power the MET ONE HHPC-6 when the MET ONE HHPC-6 is mobile. The MET ONE HHPC-6 can also be connected to an AC power adapter provided, for extended or stationary sampling.

The MET ONE HHPC-6 is commonly used for the following:

- To monitor the air quality in clean-rooms, manufacturing processes and pharmaceutical production
- For mold remediation
- For Indoor Air Quality (IAQ) monitoring

Note: Option EX enables the MET ONE HHPC-6 to store up to 2000 sample records. This option can only be added at the factory.

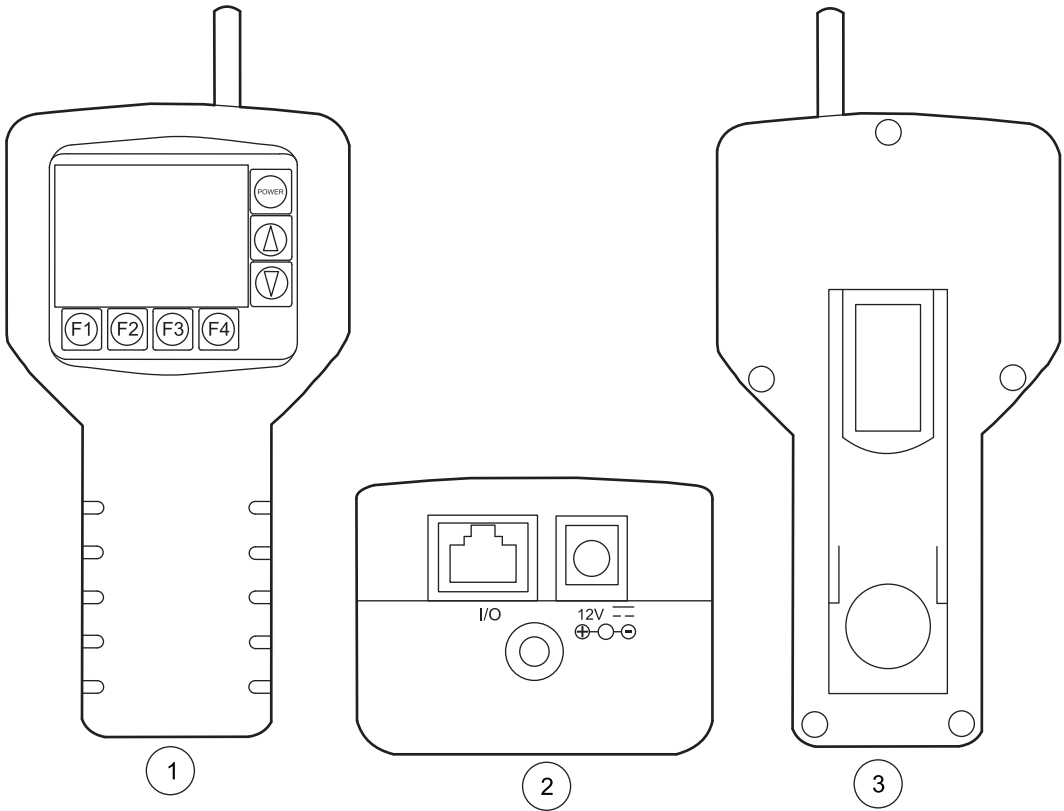


Figure 2 MET ONE HHPG-6

1	Front view	3	Back view
2	Bottom view		

Section 3 Installation

DANGER

Only qualified personnel should conduct the tasks described in this section of the manual.

3.1 Unpack the instrument

Remove the components from the shipping container and inspect for damage. Verify that all the items listed in [Figure 3](#) are included. If any items are missing or damaged, contact the manufacturer or sales representative.

Retain the original packaging materials. Use the original packaging material to store or ship the instrument to protect against damage during storage or transportation.

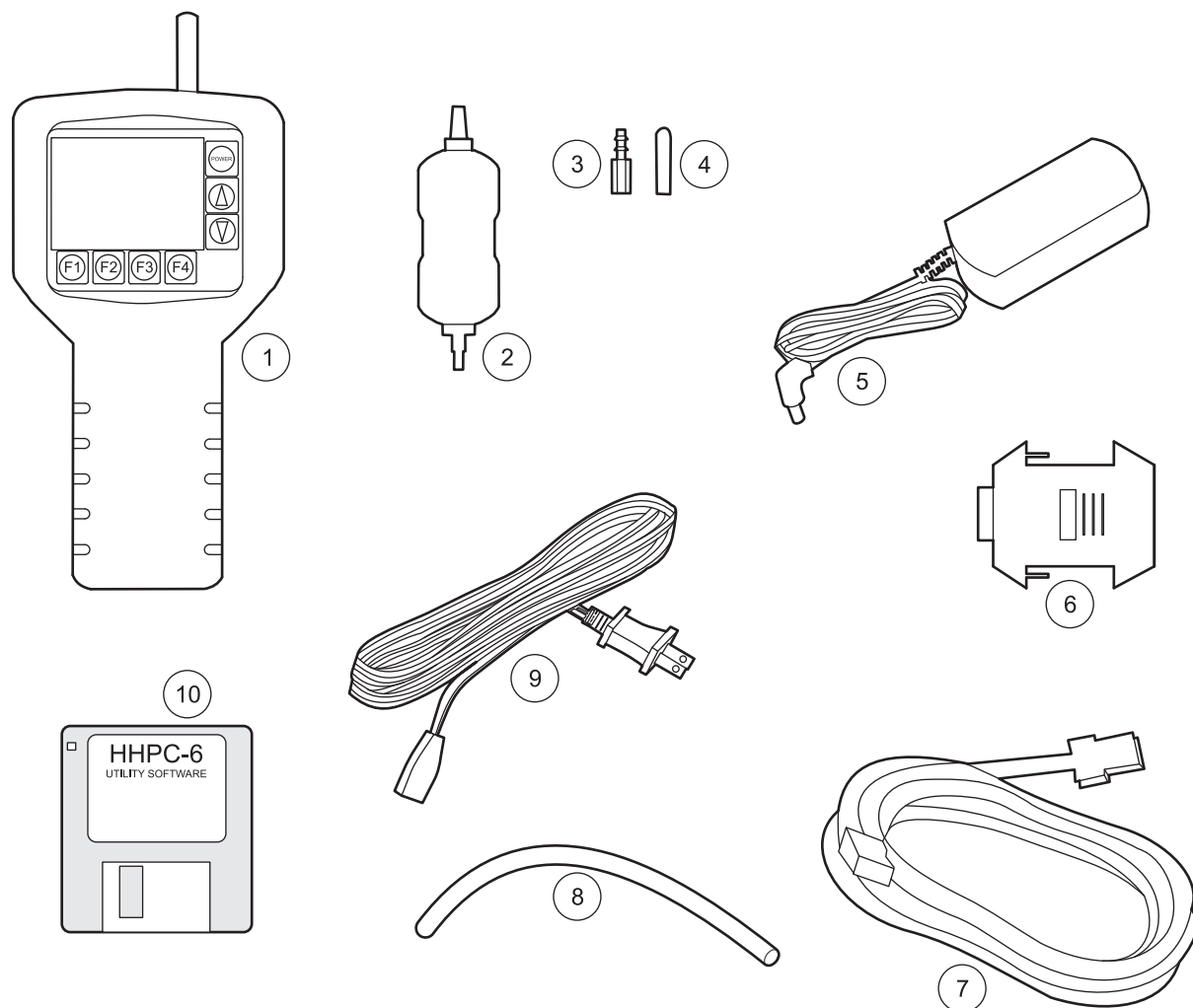


Figure 3 List of packaged items

1	MET ONE HHPC-6	6	RJ45 to DB9 adaptor (SA000070-01)
2	Zero count filter	7	RS232 modular cable (VP894408)
3	Intake nozzle, 1/8" hose barb (P000026-01)	8	6 1/4"–OD high purity tubing (VP792002)
4	Isokinetic probe cap	9	US power cord (VP623501)
5	AC/DC power supply (VP624005)	10	Utility software diskette (CS200020-01)

3.2 Installation guidelines for the MET ONE HHPC–6

The MET ONE HHPC–6 is ready to use when shipped and has default configuration settings ([section 4.4 on page 18](#)). Refer to the general guidelines during installation:

1. Lift the MET ONE HHPC–6 from the shipping container or the carrying case and place it on a flat surface.
2. Remove the layer of protective plastic from the LCD screen
3. Remove the isokinetic probe cover (black plastic cap) before the startup.

Note: *The pump and other internal electrical components will be damaged if the cap is left on.*

3.3 Mechanical installation

The MET ONE HHPC–6 is shipped with two different intake devices:

- Isokinetic probe
- Intake hose barb

Important Note: *Do not use a wrench to connect or disconnect the intake nozzle or isokinetic probe. Finger-tighten the connection.*

3.3.1 Install the isokinetic probe

The isokinetic probe (refer to [Figure 4 on page 13](#)) is used to sample ambient air samples. The isokinetic probe is pre-installed and ready for use as soon as the MET ONE HHPC–6 is unpacked. To install the isokinetic probe:

1. Attach the isokinetic probe to the intake nozzle on the MET ONE HHPC–6 by turning the isokinetic probe to the right.
2. Remove the black plastic cap attached to the isokinetic probe.

Note: *Make sure that the cap is attached to the isokinetic probe when the probe is not in use. The cap protects the MET ONE HHPC–6 from debris and contamination.*

To sample areas that are difficult to reach, connect longer tubing to the isokinetic probe with a hose barb end.

Note: *Use a maximum of four feet of high purity or approved tubing only. Incorrect size or type of tubing will affect the sample accuracy.*

3.3.2 Install the intake hose barb

Connect the intake hose barb (refer to [Figure 4 on page 13](#)) to the MET ONE HHPC–6 for zero counting and purging or to sample areas that are difficult to reach.

To install the intake hose barb:

1. Unscrew the isokinetic probe from the MET ONE HHPC–6.
2. Attach the hose barb to the MET ONE HHPC–6.
3. Remove the protective cap of the intake hose barb.

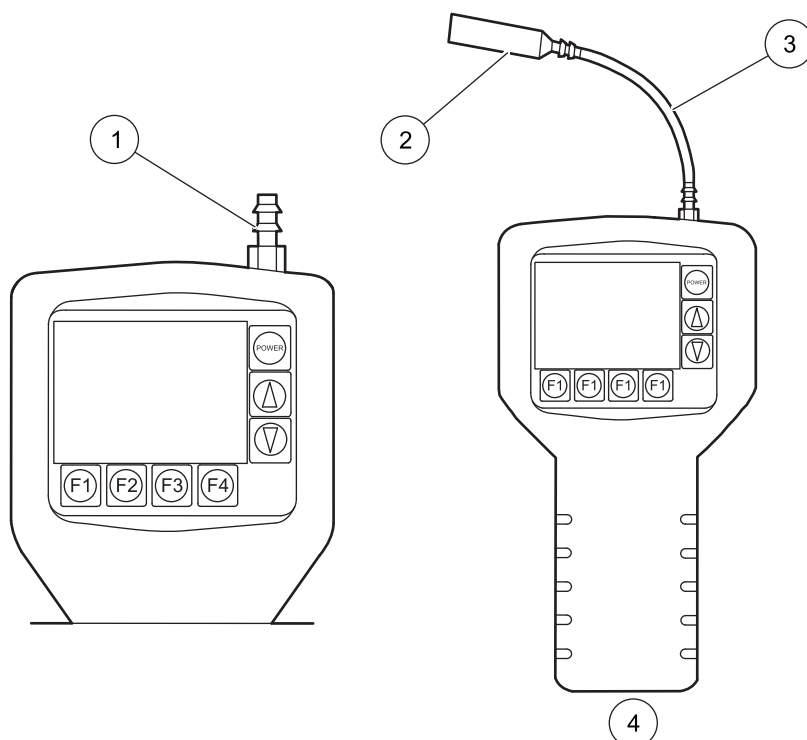


Figure 4 Isokinetic probe with tubing and zero count filter

1	Hose barb fitting	3	Tubing
2	Isokinetic probe	4	MET ONE HHPC-6

3.3.3 Install the zero count filter

In a clean-room application, the zero count filter (refer to [Figure 3 on page 11](#), item 2) verifies that the MET ONE HHPC-6 is not counting electrical noise signals from internal components and is not subject to external interference. In indoor air quality and other applications, the zero count filter cleans out the sensor immediately after a high concentration sampling.

To connect the zero count filter:

1. Remove the isokinetic probe from the MET ONE HHPC-6.
2. Secure one end of the 6-inch high purity to the intake hose barb.
3. Secure the opposite end of the 6-inch high purity tubing to the zero count filter.

Note: Make sure that the arrow of airflow direction or the indicator on the zero count filter points towards the tubing.

3.3.4 Connect the AC/DC power supply

Important Note: Do not use a power supply unit that does not supply the required voltage and charging current (polarity) to operate the MET ONE HHPC-6.

To connect the external power supply:

1. Turn off power.
2. Plug one end of the power cord into the external power supply and the other end into an electrical wall receptacle.
3. Plug the external power supply jack into the power port (refer to [Figure 5](#)).

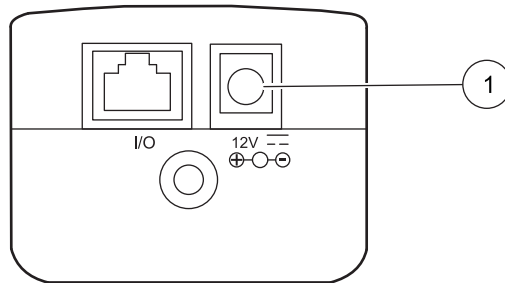


Figure 5 Location of power port

1	Power port
---	------------

4.1 Install the MET ONE HHP C-6 Utility software

1. Plug one end of the modular cable (VP894408) to the MET ONE HHP C-6. Plug the opposite end of the modular cable to the DB9 to RJ45 adapter.
2. Plug the DB9 to RJ45 adapter (SA000070-01) to the RS232 serial communication port on the PC. If the PC does not have an RS232 serial communication port, plug the DB9 to RJ45 adapter to the USB to RS232 adapter.
3. Insert the MET ONE HHP C-6 Utility software diskette into the drive.
4. Copy HHP C6 Utility.exe and HHP C6.ini to a working directory on the PC. If the communications port to be used is other than Com1, open HHP C6.ini and change Port=Com1 to Port=ComX (where X represents the number of the port to use.)
5. To open the Utility software, double-click the HHP C6 Utility.exe file. The MET ONE HHP C-6 Utility window is displayed (refer to [Figure 6](#)).
6. Follow the instructions in the Readme.txt file on the diskette to install the software.

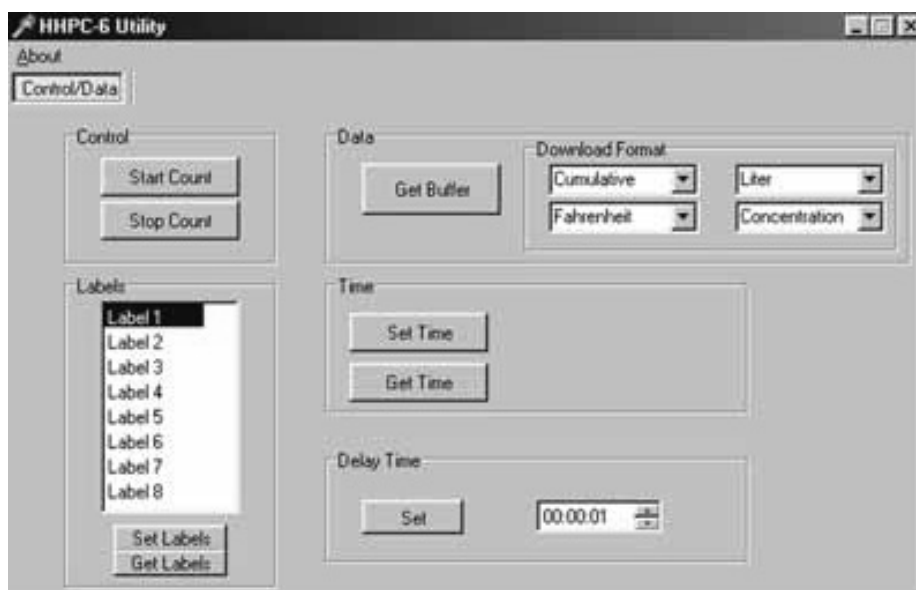


Figure 6 MET ONE HHP C-6 Utility window

4.2 Power up

Press the **POWER** button on the right of the display to turn on the MET ONE HHP C-6. When the MET ONE HHP C-6 is powered on, the MET ONE Opening screen is displayed briefly followed by the Main screen.

4.3 LCD and keypad

The MET ONE HHP C-6 has a Liquid Crystal Display (LCD) with a keypad on the right and bottom of the display.

Note: If the MET ONE HHP C-6 does not power up, double-check the AC connection or the battery power. To charge the battery, refer to [section 5.1 on page 33](#).

4.3.1 Keypad

Important Note: Do not use the MET ONE HHPC–6 stand when operating the keypad.

The MET ONE HHPC–6 keypad (refer to [Figure 7](#)) contains the following:

- Function keys
 - **F1**—Starts and stops the sample
 - **F2**—Selects the setup screen
 - **F3**—Selects the Date, Time and Delay Screen
 - **F4**—Selects the sample label screen

The function keys are also used to select the various screens available.

- **POWER** buttons
 - On
 - Off
- **UP** and **DOWN** arrow keys

The **UP** and **DOWN** arrow keys are used to scroll within the selected screen. The **UP** and **DOWN** arrow keys also change the LCD contrast of the Main screen

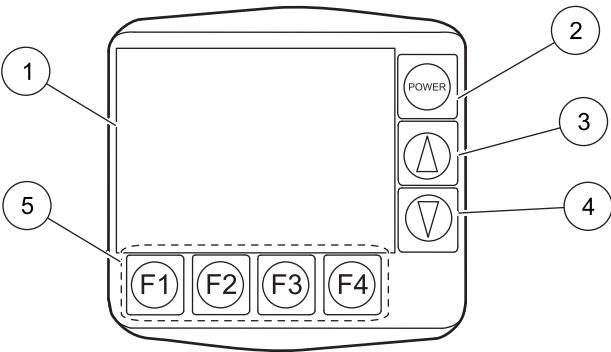


Figure 7 Keypad

1	Display screen	4	DOWN arrow key
2	POWER button	5	Function keys
3	UP arrow key		

4.3.2 Displays/screens

Press the corresponding button from the keypad at the bottom of the LCD to invoke the following screens:

- Main screen
- Setup screen
- Clock setup screen
- Label menu screen

4.3.2.1 Main screen

The following information is displayed in the Main screen:

- Channel sizes and corresponding counts
- Sample air relative humidity (% RH)
- Sample air temperature (°C or °F)
- Battery charge indicator (amount of charge remaining in the battery, refer to [Table 6 on page 33](#))
- Sampled volume indicator (clock timer symbol)
- Selected sample volume

4.3.2.2 Setup screen

The following information is displayed in page 1 of the Setup screen:

- Type of count mode (Concentration, Totalize or Audio)
- Sample volume (in L) or sample time (in seconds or minutes)
- Type of count date (Cumulative or Differential)
- Number of samples
- Status of password (Enabled or Disabled) 2

The following information is displayed in page 2 of the Setup screen:

- Alarm limit (1 to 100,000)
- Alarm size (size of particles)
- Input/output port (Printer, Print buffer or Serial 9600)
- Temperature (°C or °F)
- Buffer count (number of samples stored in the buffer)

4.3.2.3 Clock setup screen

The following information is displayed in Clock setup screen:

- Date (MM/DD/YYYY or DD/MM/YYYY)
- Time (HH:MM:SS)
- Delay time (HH:MM:SS)

4.3.2.4 Label menu screen

The following information is displayed in Clock setup screen:

- List of location labels

4.4 Factory default settings

Table 1 provides the default settings for the MET ONE HHPC–6.

Table 1 Default settings

Parameter	Default setting
Count mode	Concentration
Sample volume	1.0 L
Count data	Cumulative
Number of samples	1
Alarm limit	0
Alarm size	1st channel
I/O port	Printer
Temperature	°C
Buffer count	0
Label location	1

4.5 Configuration setup

Once the MET ONE HHPC–6 is unpacked and connected to the appropriate intake device, use the default settings to conduct a 1-minute count cycle. Download the data to a PC and print the results.

To reset the MET ONE HHPC–6 to the default settings:

1. Hold down the **F1** key and press the **POWER** button.
2. Release the **F1** key when the message “Defaulting data” is displayed on the screen.

To perform a 1-minute count cycle:

1. Remove the isokinetic probe cover (black plastic cap).
2. Press the **POWER** button to turn on the MET ONE HHPC–6.
3. Press **F1** (Count) on the Main screen. The count cycle begins and the display above **F1** changes to “RUN”. After one minute, the count cycle concludes and the display above **F1** changes to “COUNT”. The results are saved automatically in the print buffer. Refer to [section 4.7.3 on page 30](#) to transfer the data to a PC and print the results.

4.6 Custom settings

Change the factory-set default settings as needed for a specific application before sampling. Use the function (**F1** to **F4**) and arrow keys on the keypad to customize the settings as required.

4.6.1 Set the count mode

To set the count mode:

1. Press **F2** (Setup) on the Main screen. The Setup Page 1 screen is displayed with the current Count Mode field selected (refer to [Figure 8 on page 19](#)).
2. Press **F3** (Right arrow) to view the count modes available.

Table 2 provides a description of the various count modes that are available.

Table 2 Count modes

Mode	Description	Example
Concentration	The Concentration mode is used to take a quick snapshot of airborne particulate samples, especially in areas where particulate levels are unknown and may exceed the operating levels of the counter. The MET ONE HHPC-6 estimates the count per cubic foot or liter depending on the volume selected. The MET ONE HHPC-6 updates the displayed results by calculating the completed sample counts and volume compared to the balance of volume.	If the selected volume is 0.1 cubic foot (1-minute sample) and the sample is allowed to complete, then the displayed result is 10 times the actual sampled counts. If the same sample display was viewed at the sixth second of sampling, the displayed result is 100 times the actual sampled count.
Totalize	In the Totalize mode, the particle counts are displayed and accumulated as sampled. When the sample is completed, the record is stored and the value is displayed on the screen until the next sample is started.	N/A
Audio	In the Audio mode, the MET ONE HHPC-6 beeps each time the alarm limit exceeds. Refer to section 4.6.6 on page 25 .	If the limit is set for 10, the counter beeps when the count first reaches 10 and beeps again for every multiple of 10.

- Press **F4** (Return) to select the displayed mode and return to the Main screen.

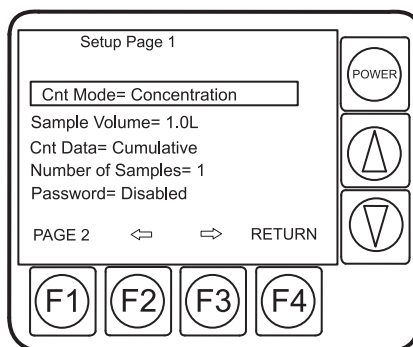


Figure 8 Setup screen, page 1

4.6.2 Set the sample time or volume

The default Sample Volume setting is 1.0 L.

To set the sample volume:

- Press **F2** (Setup) on the Main screen. The Setup Page 1 screen is displayed with the Count Mode field selected.
- Press the **DOWN** arrow key to move to the Sample Time field (refer to [Figure 9 on page 20](#)).
- Press **F2** (Left arrow) and **F3** (Right arrow) to scroll through all sample volume and standard sample time selections.
- Press **F4** (Return) to select the displayed selection and return to the Main screen.

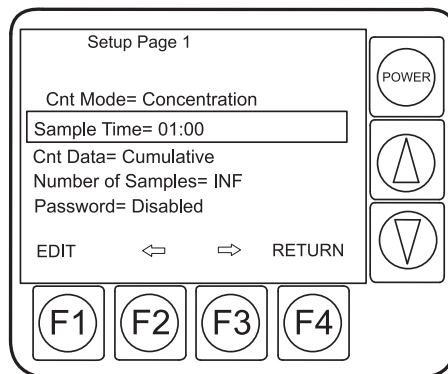


Figure 9 Select sample time

Use the **UP** and **DOWN** arrow keys to select the second selection line of Sample Time or Sample Volume. When Sample Time is highlighted, the display will change from "PAGE 2" to "EDIT" (refer to [Figure 9](#)). The display will change back to "PAGE 2" when the cursor is moved to another line or the Sample Time is changed to Sample Volume.

To set the custom sample time:

1. Press **F2** or **F3** before the Sample Time is changed to select the sample results display mode (refer to [Figure 10 on page 20](#)). The sample results will be displayed in Liters (L) or Cubic feet (CF).
2. Press **F1** (Edit). The cursor highlights the first two digits (Minutes).
3. Press **F3** to select Seconds.
4. Use the **UP** or **DOWN** arrow keys to select the required sample time.
5. Press **F1** to save the change or press **F4** to exit the operation. The MET ONE HHPC-6 will automatically convert the selected time to volume because all sample results have to reference the volume sampled. For example, if Sample Time is set to CF = 02.00, the Main screen displays 0.20 CF. The volume selected is displayed in the right column of the Main screen. Refer to [Table 3](#) for details.

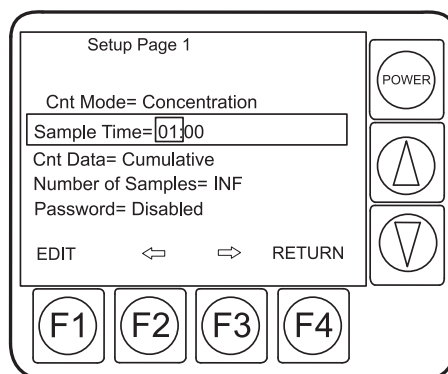


Figure 10 Change sample time

Table 3 lists the Sample Time and Volume options available.

Table 3 Sample time and volume options

Sample volume	Sample volume
1.0L	21 seconds
10.0L	3.53 minutes
0.01CF	6 seconds
1.0CF	10 minutes
2.83L	60 seconds
28.3L	10 minutes
0.10CF	60 seconds
Manual	Continuously sample until the MET ONE HHPC-6 is manually stopped
Sample Time (L)	1 second (0.05 L) to 59 minutes 59 seconds (169.85 L)
Sample Time CF	1 second (0.0017 cubic feet) to 59 minutes 59 seconds (6 cubic feet)

4.6.3 Set the method for counting data

To set the method for counting data:

1. Press **F2** (Setup) on the Main screen. The Setup Page 1 screen is displayed with the Count Mode field selected.
2. Press the **DOWN** arrow key to move to the Count Data field (refer to [Figure 11 on page 21](#)).
3. Press **F2** (Left arrow) or **F3** (Right arrow) to toggle between the following counting methods:
 - Cumulative—Includes all particles that are larger than or equal to the particle size selected, represented by the SUM symbol.
 - Differential—Includes all particles that are larger than or equal to the particle size selected, but smaller than the next greatest particle size, represented by the delta symbol.
4. When the required method is highlighted, press **F4** (Return) to select that method and return to the Main screen.

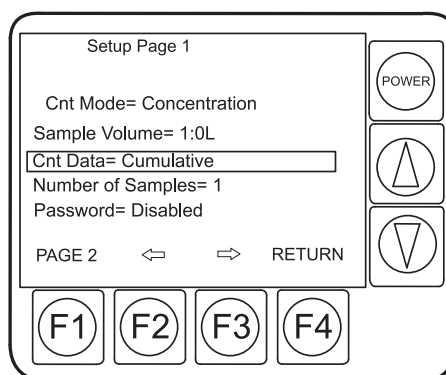


Figure 11 Setup screen with count mode selected

4.6.4 Set the number of samples

To set the number of samples:

1. Press **F2** (Setup) on the Main screen. The Setup Page 1 screen is displayed with the Count Mode field selected (refer to [Figure 12 on page 22](#)).
2. Press the **DOWN** arrow key to move to the Number of Samples field.
3. Press **F3** (Right arrow) to select the number of samples until the required number is displayed.
4. Press **F4** (Return) to select that number and return to the Main screen.

Note: If **F2** is pressed when the number of samples is equal to one, the Number of Samples field displays “INF” for continuous sampling. Press **F2** (Left arrow) again for the sample count to be equal to the buffer size.

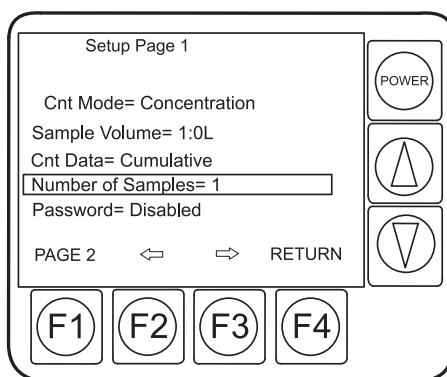


Figure 12 Setup screen with number of samples selected

4.6.5 Set password protection

The password protection function is present with firmware version B and later (Catalog No. 2087005). The Setup Password function enables a system administrator to prevent users from modifying the settings of the MET ONE HHPC–6. Once the Setup Password function is enabled, the counter allows two types of login:

- System Administrator login—Has permissions to change all settings on the MET ONE HHPC–6.
- User login—Allows the operator to change only the location ID (label) on the Main screen. All other MET ONE HHPC–6 settings can only be set by the system administrator.

To enable password protection:

1. Press **F2** (Setup) on the Main screen. The Setup Page 1 menu is displayed.

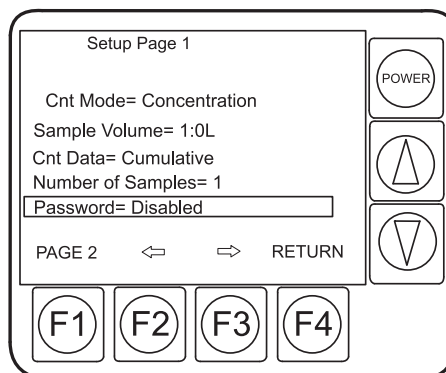


Figure 13 Setup screen with password selected

2. Use the **DOWN** arrow key to scroll to the Password=Disabled field.
3. Press **F2** (Left arrow) or **F3** (Right arrow). The Enter Password screen is displayed (refer to [Figure 14 on page 23](#)). A box prompt to enter the password is displayed. Passwords can be a minimum of one character and a maximum of eight characters. Initially, the box prompt will contain the character "A".
4. To change the character, use the **UP** or **DOWN** arrow keys to scroll through the characters a to z, 0 to 9, A to Z and space.
5. Press **F2** (Left arrow) or **F3** (Right arrow) to move to the next character.
6. When the password is set, press **F4** (Enter) to enter the system administrator mode.

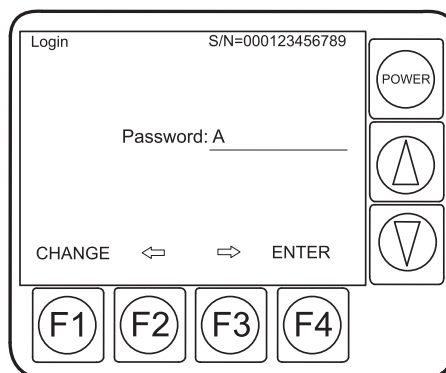


Figure 14 Enter password screen

4.6.5.1 Log in as the system administrator

Once the password has been enabled, the display will show a Login screen.

To log in as the system administrator:

1. Press **F1** (Admin) or **F4** (User) on the Login screen. A box prompt to enter the password is displayed.
2. Use the **UP** or **DOWN** arrow keys to scroll through the available characters (a to z, 0 to 9, A to Z and space).

3. Enter the correct password to login as a system administrator.
4. Press either **F4** (Enter) or **F1** (Change) to change the password.

Note: To login as an operator without programming permissions, select the **F1** (User) key on the login screen. There is no need to enter a password.

5. If the password entered is incorrect, a message “Invalid Password”. Subsequently, the MET ONE HHPG–6 will display the Login screen.

4.6.5.2 Change the setup password

To change the setup password:

1. Go to the Password Entry screen.
2. Press **F1** (Change). The New Password screen is displayed (refer to [Figure 15](#)).
3. Use the **UP** or **DOWN** arrow keys to modify the password.
4. After the new password is entered, press **F1** (Save) to save the settings. To cancel without saving the changes, press **F4** (Escape).

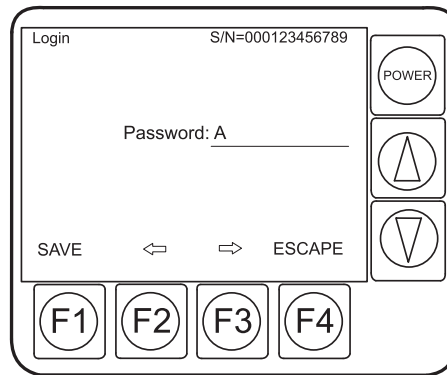


Figure 15 New password screen

4.6.5.3 Disable password protection

To disable the setup password and allow all users to modify the settings:

1. Log in as the system administrator.
2. Scroll to the Password= Enabled field on the Setup Page 1 screen and press **F2** or **F3**. A message “Password=Disabled” is displayed.

Any user may now login and modify the settings of the MET ONE HHPG–6.

4.6.5.4 Reset the password

If the password of the system administrator is forgotten or lost, contact the manufacturer to receive a new password. Technical support will require the following information to issue a new password:

- The serial number of the MET ONE HHPG–6.
- The current date setting of the MET ONE HHPG–6 in the MMDDYYYY format, where MM is the two-digit month, DD is the two-digit day and YYYY is the four-digit year.

4.6.6 Set the alarm count and size

When the alarm is set, an audible alarm is triggered when counts reach the count limits on the selected particle size.

To set the alarm count:

1. Press **F2** (Setup) on the Main screen. The Setup Page 1 screen is displayed.
2. Press **F1** (Page 2) on the Setup Page 1 screen to go to the second page of the screen. The Setup Page 2 Screen is displayed.
3. Press **F3** (Right arrow) or **F2** (Left arrow) in the Alarm Limit field to move forward to display the limits. The range for the count limit can be set from 1 to 100,000.
4. When the required limit is selected, press the **DOWN** arrow key to move the cursor to the Alarm Size field.
5. Press **F3** (Right arrow) to move forward or **F2** (Left arrow) to move back to display the various particle sizes.
6. Press **F4** (Return) to accept both the particle count and size alarm settings and return to the Main screen.

4.6.7 Select input/output (I/O) port

Select any of the I/O port options listed in [Table 4](#).

Note: The MET ONE HHPC-6 I/O port will have the Printer option selected by default.

To select the I/O port:

1. Press **F2** (Setup) to display the Setup Page 1 screen.
2. Press **F1** (Page 2) to display the Setup Page 2 screen.
3. Use the **DOWN** arrow key to scroll down to the I/O Printer field.
4. Press **F2** (Left arrow) or **F3** (Right arrow) to scroll through the options available.
5. Press **F4** to select the required option and return to the Main screen.

Table 4 I/O port definitions and applications

Port definition	Application
Printer	Select this option to connect to the Serial Thermal printer. This option is commonly used when a hard copy of the printed data is required after the completion of each sample data.
Print buffer	Select this option to print the sample data stored in the sample buffer using the Serial Thermal printer. This option is commonly used at the end of the sample period. This option can also be selected as and when required.
Serial 9600	Select this option to connect the MET ONE HHPC-6 to a PC.

4.6.8 Set the temperature

The temperature and relative humidity sensor is contained within the MET ONE HHPC-6. Allow the MET ONE HHPC-6 to acclimatize to the room conditions for improved accuracy. Temperature and relative humidity results will be displayed and stored in the buffer at the end of each sample.

To set the temperature:

1. Press **F2** (Setup) to display the Setup Page 1 screen.
2. Press **F1** (Page 2) to display the Setup Page 2 screen.
3. Use the **DOWN** arrow key to scroll down to the Temperature field.

4. Press **F2** (Left arrow) or **F3** (Right arrow) to scroll through the two options available.
5. Press **F4** to select the temperature reporting method (°C or °F) and return to the Main screen.

4.6.9 Set buffer count

To set the buffer count:

1. Press **F2** (Setup) to display the Setup Page 1 screen (refer to [Figure 8 on page 19](#)).
2. Press **F1** (Page 2) to display the Setup Page 2 screen.
3. Use the **DOWN** arrow key to scroll down to the Buffer Count field.
4. Press **F2** (Left arrow) or **F3** (Right arrow) to scroll through the two options available. This menu will display the number of samples stored in the buffer (memory).
5. Select Clear Buffer to delete all samples stored in the buffer. The MET ONE HHPC-6 stores sample data measurements in a 500 or 2000 (EX Option) rotating buffer. The MET ONE HHPC-6 overwrites previous records when the buffer is full.

Note: The MET ONE HHPC-6 deletes previous records in the buffer when the buffer is full, based on a first in, first out order.

6. Press **F4** (Return) to return to the Main screen.

4.6.10 Set the clock date and time

4.6.10.1 Set the date

1. Press **F3** (Clock) on the Main screen. The Clock Setup screen is displayed (refer to [Figure 16 on page 26](#)). The date area is selected by default or by the last change made in the settings. The cursor indicates the current selection.
2. Press **F4** (Enter) to exit the screen if the information displayed is correct.
3. Press **F1** (Program) to make changes. The display above **F4** will change to "FORMAT". The cursor will move to the first two digits of the date.
4. Press **F4** (Format) to toggle the order in which the date is displayed (MM/DD/YYYY or DD/MM/YYYY).
5. Press **F1** to accept the changes.
6. Press **F4** to exit the screen.

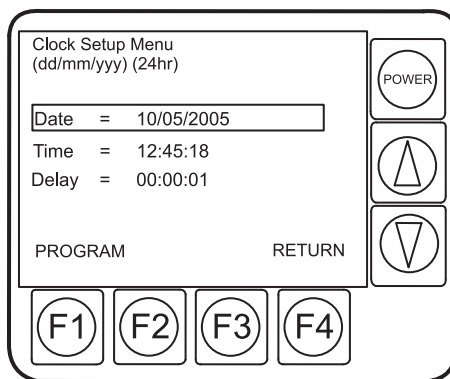


Figure 16 Clock setup screen

4.6.10.2 Set the time

To change the time displayed:

1. Press **F3** (Clock) on the Main screen.
2. Use the **UP** or **DOWN** arrow keys and move the cursor to the Time field.
3. Press **F1** (Program) to make changes in the selected field. The display above **F4** will change to "FORMAT". The cursor will move to the first two digits of the time.
4. Press **F4** (Format) to toggle between standard and military time.
5. Press **F2** (Left arrow) or **F3** (Right arrow) to move the cursor to hours, minutes or seconds.
6. Use the **UP** or **DOWN** arrow keys to select the correct hours, minutes or seconds.
7. Press **F1** (Enter) to accept the changes.
8. Press **F4** to exit the screen.

4.6.10.3 Set the delay time

To set the delay time:

1. Press **F3** (Clock) on the Main screen.
2. Use the **UP** or **DOWN** arrow keys to move the cursor to the Delay field.
3. Press **F1** (Program) to make changes in the selected field. The display will change to "FORMAT". The cursor will move to the first two digits of the delay time (HH:MM:SS).
4. Press **F2** (Left arrow) or **F3** (Right arrow) to move the cursor to hours, minutes or seconds.
5. Use the **UP** or **DOWN** arrow keys to select the correct hours, minutes or seconds.
6. Press **F1** (Enter) to accept the changes.
7. Press **F4** to exit the screen.

Note: Delay time will apply to all future multiple samples. This feature is commonly used to run unmanned multiple samples at delayed intervals.

4.6.11 Edit labels

Labels can be used to identify samples or blocks of samples in different rooms or locations without the need to download the sample data to a PC each time. Labels are also helpful when notes cannot be maintained to correlate each sample or blocks of samples to the specific location.

Note: The MET ONE HHPC-6 is shipped with default label names for Location 1 to Location 8.

4.6.11.1 Edit labels with the keypad

To edit labels using the keypad:

1. Press **F4** on the Main screen to display the Label Menu screen (refer to [Figure 17](#)).
2. Press **F1** (Edit) to edit the first label.

3. Use the **UP** or **DOWN** arrow keys to select a label. When the cursor reaches the top or bottom label, the screen begins to scroll.

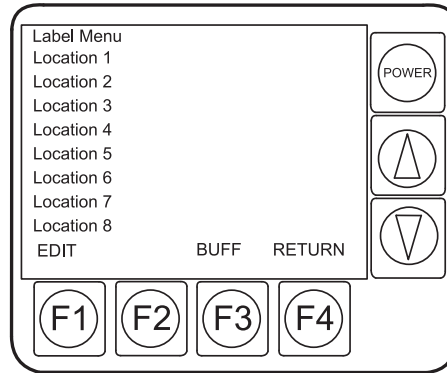


Figure 17 Location menu screen

4. Press **F1** (Edit). A box cursor is displayed on the first letter of the label (refer to [Figure 18](#)).

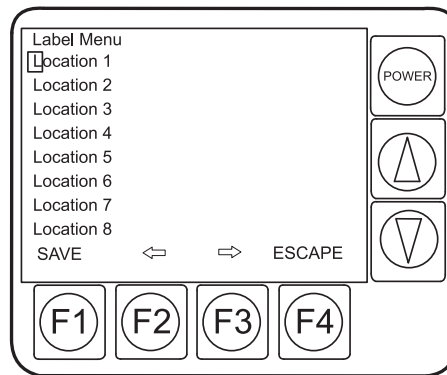


Figure 18 Edit the location label

5. To change the character, use the **UP** or **DOWN** arrow keys to scroll through the characters a to z, 0 to 9, A to Z and space.
6. Press **F2** (Left arrow) or **F3** (Right arrow) to move to the next character.
7. Press **F1** (Save) to save the label or **F4** (Escape) to exit the Edit mode without saving the changes.

4.6.11.2 Edit labels with the MET ONE HHPG-6 utility software

To edit labels using the MET ONE HHPG-6 Utility software:

1. Open the MET ONE HHPG-6 Utility application (refer to [section 3. on page 14](#)).
2. Highlight the required label and type over the label. Repeat the process until all the required changes are complete.
3. Select **SET LABEL** to save the changes.
4. Select **GET LABEL** to verify that the changes are saved.

4.7 Counter operation

Once the MET ONE HHPC-6 configuration is set:

- Use the zero count filter to verify the operation of the MET ONE HHPC-6.
- Collect the air samples.
- Transfer the data taken from the air samples to a computer for further analysis.
- Print the data if necessary.
- Review the number of samples in the print buffer
- Clear the print buffer if necessary.

4.7.1 Verify the MET ONE HHPC-6 with a zero count filter

Once the configuration for the MET ONE HHPC-6 is set, verify the operation using the zero count filter. All HHPCs must be verified prior to sampling to make sure that the instrument is not false counting due to sensor leakage, internal or external electrical interference or any other reason. Before the MET ONE HHPC-6 is used in a clean-room or a clean manufacturing environment, purge the MET ONE HHPC-6 with a zero count filter.

Note: The verification process of the MET ONE HHPC-6 meets the Japanese Industrial Standard B9221-1997 (JIS).

To verify the MET ONE HHPC-6:

1. Install the zero count filter (refer to [section 3.3.3 on page 13](#)).
2. Set the Sample Volume to Manual operation mode. Continue to sample until there are no new counts.

Note: Initial counts are typically from particles shed from components used for zero counting.

Note: Follow the zero count process or guidelines as per the applicable industry standard(s).

3. Remove the zero count filter. Attach the isokinetic probe to resume normal operations.

4.7.1.1 Verify MET ONE HHPC-6 with a zero count filter for indoor air and other applications

Important Note: Follow all applicable industry guidelines before the verification process of the MET ONE HHPC-6.

The zero count process may not be necessary when sampling indoor air quality or other non-clean-room sampling. Consider the following conditions before sampling indoor air:

- If the sample concentration is higher than 500,000 particles per cubic foot on the smallest sized channel, further larger volume sampling may not be necessary since the high counts provide ample statistical data.
- If the smallest sized channel counts are low, then set the sample volume to 0.1 CF or larger.

To sample indoor air:

1. Set the sample volume to 0.01 CF in the Concentration counting mode.
2. Purge the instrument after each high sampling count and connect the zero count filter (refer to [section 3.3.3 on page 13](#)).
3. Set the sample volume to 0.1 CF and start sampling.

Note: The process purges particles from the instrument flow path and keeps the sensitive optics clean. Refer to [Table 2 on page 19](#) for detailed information on sample counts.

4.7.2 Collect samples

Important Note: Place the MET ONE HHPC–6 upright and remove the isokinetic probe cover (black plastic cap) so that the intake barb or the isokinetic probe is not obstructed.

To collect samples:

1. Press the **POWER** button to turn on the MET ONE HHPC–6.
2. If needed, select the required settings on the Setup Screen. Press **F2 (SETUP)**, then select the required settings on the Setup Page 1 screen.
3. Press **F2** (Page 2) to select the required settings on the Setup Page 2 screen.
4. Press **F4** (Return) to return to the Main screen.
5. Press **F1** (Count) on the Main screen to start sampling. The cycle will automatically stop on completion of the sample. If the Sample Volume is set to Manual, the MET ONE HHPC–6 will continuously sample until **F1 (STOP)** is pressed.

4.7.3 Transfer sample data to PC

Refer to [section 3. on page 14](#) to install the MET ONE HHPC–6 Utility software.

To transfer sample data from the MET ONE HHPC–6 to a PC:

1. Press **F2** (Setup) on the MET ONE HHPC–6.
2. Press **F1** (Setup Page 2) and verify if the I/O port is set to Serial 9600. If not, press the **DOWN** arrow key to scroll down to I/O Port. Press **F3** to select Serial 9600.
3. Press **F4** to accept the operation and return to the Main screen.
4. Start the MET ONE HHPC–6 Utility.exe software.

[Table 5](#) lists the software options available in the MET ONE HHPC–6 Utility program.

Table 5 MET ONE HHPC–6 Utility software options

Software options	Functions
Control	1 Select START COUNT to remote start the MET ONE HHPC–6 sampling. 2 Select STOP COUNT to remote stop the MET ONE HHPC–6 sampling. This function can be used to verify the MET ONE HHPC–6 to PC electrical connection and software installation or configuration.
Get Buffer	1 Select GET BUFFER to download all sample data stored in the MET ONE HHPC–6 data buffer. The PC will prompt for a unique file name. 2 Enter the file name with a CSV file extension. Do not change the file extension to avoid storing data in unreadable file formats. CSV files are commonly viewed with Microsoft® Excel® or similar software that supports CSV type data files. This function does not delete the MET ONE HHPC–6 data buffer.
Download Format	MET ONE HHPC–6 stores data in the raw format. The user may download and display the stored data in any combination regardless of the settings when sampling. Example: The user may download the data in Cubic Meters and Differential Mode even if the original sampling was performed at 0.1CF and Cumulative Mode.
Time	1 Select SET TIME to program the Time and Date. 2 Select GET TIME to display the set Time and Date on the MET ONE HHPC–6.
Delay Time	Use the computer keyboard number keys, LEFT, RIGHT, UP and DOWN arrow keys or a mouse to set the Delay time. The selected Delay Time will apply to multiple samples. This feature is commonly used when unmanned multiple samples are run at delayed intervals.
Labels	Select GET LABELS to download and display the current labels stored in the MET ONE HHPC–6. Refer to section 4.6.11.2 on page 28 to edit labels with the MET ONE HHPC–6 Utility software.

4.7.4 Print sample data

Sample data is automatically stored in a print buffer. Print the sample data at the end of each run or print them all at once.

To print the sample data:

1. Make sure that the MET ONE HHPC-6 is connected to a serial printer.
2. Press **F2** (Setup) on the Main screen of the MET ONE HHPC-6.
3. Press **F1** (Page 2) on the Setup screen to go to the second page of the screen. The Setup Page 2 screen is displayed.
4. Press the **DOWN** arrow key to go to the I/O Port field.
5. Press **F3** (Right arrow) to display the options:
 - Printer—Prints the data at the end of each sample run.
 - Print buffer—Prints all the records stored in the buffer.
 - Serial 9600—Allows the MET ONE HHPC-6 to communicate with the MET ONE HHPC-6 Utility software.

4.7.5 Store sample data

The MET ONE HHPC-6 stores each sample data in a 500-record rotating buffer. Data is stored in a first in, first out order. Thus, when record 501 is saved, the first record is automatically deleted, leaving a total of 500 records.

If option EX is used, the MET ONE HHPC-6 can store as many as 2000 records and have a 2000-record rotating buffer. Thus, when record 2,001 is saved, the first of the 2000 records is automatically deleted, leaving 2000 records remaining in the buffer.

4.7.5.1 Review the buffer

To review the buffer:

1. Press **F3** (Buff) on the Location menu screen (refer to [Figure 17 on page 28](#)). The Buffer Review screen is displayed.

Note: When the user enters the Buffer Review screen for the first time the last record stored in the buffer is displayed (refer to [Figure 19 on page 32](#)).

2. Use the **UP** or **DOWN** arrow keys to change the record displayed. The user can scroll from the newest to the oldest or the oldest to the newest data record stored in the buffer.
3. Press **F4** (Return) to return to the Label screen.

Note: When the user returns to the Buffer Review screen at a later instance, the record that was last selected at the Buffer Review screen will be displayed.

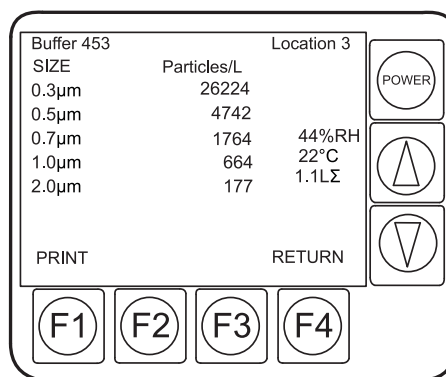


Figure 19 Buffer review screen

4.7.5.2 Display the number of samples in the print buffer

To display the number of samples in the print buffer:

1. Press **F2** (Setup) on the Main screen.
2. Press **F1** (Page 2) on the Setup screen. The number of samples in the buffer is displayed in the Buffer Count field.

4.7.5.3 Clear the buffer

To clear the buffer:

1. Press **F2** (Setup) on the Main screen.
2. Press **F1** (Page 2) on the Setup screen to go to the second page of the screen. The Sample Page 2 Screen is displayed.
3. Press the **DOWN** arrow key to go to the Buffer Count field.
4. Press **F3** (Right arrow) until the message "Clear Buffer" is displayed.
5. Press **F4** (Return) to clear the buffer and return to the Main screen.

Section 5 Maintenance

DANGER

Only qualified personnel should conduct the tasks described in this section of the manual. Service should be performed only by factory-authorized personnel.

5.1 Battery maintenance

The battery symbol indicates the relative battery charge status, described in [Table 6](#). The dark section of the battery indicates the charge that remains in the battery.

The power supply provided with the MET ONE HHPC–6 serves as a battery charger and a direct power source. Connect the power supply for continuous and long-term sampling.

Table 6 Battery status indicator

Indicator	Charge Mode	Description
+ (single plus sign)	Trickle charge	The battery goes into trickle charge in one of the following instances: • The battery is 95% charged • The battery temperature reaches the cut off point due to rapid charge • External power supply is attached to a unit that is almost completely charged
++ (double plus sign)	Rapid charge	The battery goes into rapid charge in one of the following instances: • Power supply is first connected and has not yet fully charged the unit • Battery charge drops below 95% capacity

To charge the battery:

1. Connect the external power supply as described in [section 3.3.4 on page 14](#).
2. Turn on the MET ONE HHPC–6. The battery indicator displays a + (single plus sign) to indicate that the external power supply is attached.
3. To place the MET ONE HHPC–6 into a fast charge mode, turn the MET ONE HHPC–6 on and wait for 15 seconds. Attach the MET ONE HHPC–6 to the external power supply.

Note: If the MET ONE HHPC–6 is not powered up when the external power supply is attached, it indicates that the battery is charged with a trickle charge.

5.1.1 Charge a drained battery

To charge a drained battery:

1. Attach the external power supply to the MET ONE HHPC–6.
2. Wait for five minutes. Turn on the MET ONE HHPC–6.
3. If the battery indicator does not display a ++ (double plus sign) within 15 seconds, detach the external power supply. Wait for 15 seconds and attach the external power supply again. The battery indicator will display a ++ (double plus sign) within 15 seconds.
4. Leave the MET ONE HHPC–6 attached to the power supply until a + (single plus sign) is displayed.

5.2 Calibrate the MET ONE HHPC–6

Return the MET ONE HHPC–6 to the manufacturer annually for recalibration according to the JIS B 9921–1997 standards. The calibration date is displayed on the manufacturer decal on the back of the MET ONE HHPC–6.

Section 6 Troubleshooting

6.1 Problems and recommendations

Table 7 lists the problems, reasons for the problems and recommended actions in the MET ONE HHPC-6.

Table 7 Troubleshooting procedures

Symptom	Possible reason	Recommended action
The MET ONE HHPC-6 does not zero count.	Zero count filter or hose barb is not properly attached to the MET ONE HHPC-6.	Reattach the filter or hose barb.
	Internal air leak.	Contact Technical Support for repair or service.
	Cell contamination by excessive dust exposure.	Return the MET ONE HHPC-6 to a factory authorized service center.
The MET ONE HHPC-6 does not turn on when the power is turned on.	Battery voltage too low.	Connect the external power supply to the MET ONE HHPC-6 for operation and charge. Turn on the power again.
The MET ONE HHPC-6 displays the message "Low Battery".	Battery voltage too low.	Connect the power supply/charger to the MET ONE HHPC-6. If the LCD display shows a + (single plus sign) next to the battery indicator (slow charge), then turn the power off and back on for a rapid charge. The battery indicator will show ++ (double plus sign).
The MET ONE HHPC-6 does not charge.	Wrong or slack power connection.	Disconnect the power jack from the MET ONE HHPC-6 and the power cord from the AC power source (wall receptacle). Disconnect the cord/plug from the power supply and connect the cord/plug to the power supply firmly. Restore all connections to the MET ONE HHPC-6 and power source. If the problem persists, contact Technical Support for repair or service.
The MET ONE HHPC-6 display is too dark or light.	Display setting is not set appropriately.	On the Main screen, press the UP arrow key to darken the display and the DOWN arrow key to lighten the display.
Unable to download data in the buffer.	The MET ONE HHPC-6 Utility software is not installed properly.	Refer to the Utility program Readme text file on the Utility software disk for the latest setup and test functions. Corrective information is not included here because it is constantly updated to keep up with changes in the operating system.
The MET ONE HHPC-6 display shows the message "CAL FAIL".	The sample exceeded the concentration limit (too many particles) which produced a temporary alarm.	No corrective measure is required other than to stop sampling in that environment.
	The sensor is contaminated.	Connect the zero count filter and program the MET ONE HHPC-6 to run for one hour.
	The laser light has dropped below acceptable level.	Contact Technical Support for repair or service.
No temperature/humidity reading or an incorrect reading is displayed.	The temperature and humidity reading is displayed after the sample is in progress.	Allow the MET ONE HHPC-6 to acclimatize to the sampling environment for greater accuracy.

6.2 Restore default settings

For program malfunctions, restore the default settings.

To restore the default settings:

1. Disable passwords as described in [section 4.6.5.3 on page 24](#).
2. Press the **POWER** button to turn on the MET ONE HHPC-6.
3. Press and hold **F1**.
4. Release **F1** when the message “Defaulting Data” is displayed on the screen.

To review the default settings, refer to [section 4.4 on page 18](#).

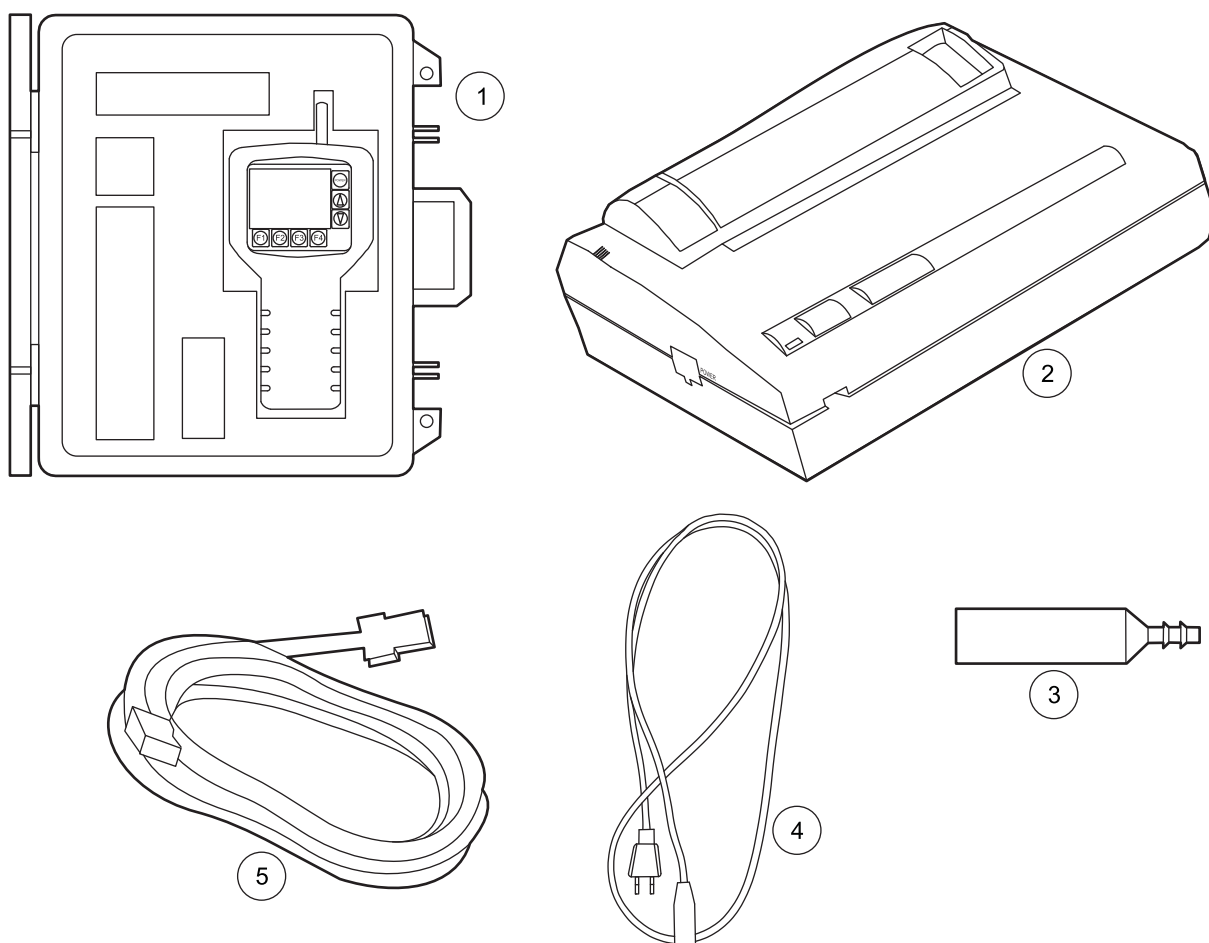
Note: Restore the default settings to erase all buffer content and reset all the operation variables to the factory settings. The message “Defaulting Data” is displayed as the MET ONE HHPC-6 initializes the system.

Section 7 Replacement Parts and Accessories

7.1 Accessories

Description	Quantity	Catalog no.
Intake nozzle, 1/8" hose barb	1	MP000026-01
AC/DC power supply	1	VP624005
US power cord	1	VP623501
RJ45 to DB9 adaptor	1	SA000070-01
RS232 modular cable	1	VP894408
MET ONE HHPG-6 Utility software	1	CS200020-01
6¼"-OD high purity tubing	1	VP792002

7.2 Optional accessories



1 Carrying case (SA00008901)	4 European power cord (VP625300)
2 Serial thermal printer (SA000094-01)	5 RS232 serial interface extension cable (EP096010)
3 Isokinetic probe, hose barb (MP000120-01)	

Section 8 Service Contact Information

U.S.A. customers

By Telephone:

(541) 472-6500

6:30 a.m. to 5:00 p.m. PST

Monday through Friday

By Fax:

(541) 474-7414

By Mail:

Hach Ultra

481 California Avenue

Grants Pass, Oregon 97526

Email:

TechSupportGP@hachultra.com

Website:

www.hachultra.com

International customers

By Telephone:

41 22 594 64 00

By Fax:

41 22 594 64 99

By Mail:

Hach Ultra

Service Department

6, route de Compois, C.P. 212,

CH-1222 Vérenaz, Geneva, Switzerland

Website:

www.hachultra.com

Information required

- Your name
- Your phone number
- Your company name
- Your fax number
- Model number
- Serial number
- Comment or question

Section 9 Limited Warranty

Hach Ultra warrants this instrument to be free of defects in materials and workmanship for a period of one year from the shipping date. If any instrument covered under this warranty proves defective during this period, Hach Ultra will, at its option either repair the defective part without charge for extra parts and labor or provide an equivalent replacement in exchange for the defective product.

If any diode covered under this warranty proves defective during this period, Hach Ultra will, at its option, either repair the defective diode without charge for parts and labor or provide an equivalent replacement in exchange for the defective product.

To obtain service under this warranty, the customer must notify the nearest Hach Ultra service support center on or before the expiration of the warranty period and follow their instructions for return of the defective instrument. The customer is responsible for all costs associated with packaging and transporting the defective unit to the service support center and must prepay all shipping charges. Hach Ultra will pay for return shipping if the shipment is to a location within the same country as the service support center.

This warranty shall not apply to any defect, failure or damage caused by improper use or maintenance or by inadequate maintenance or care. This warranty shall not apply to damage resulting from attempts by personnel other than Hach Ultra representatives or factory authorized and trained personnel, to install, repair or service the instrument; to damage resulting from improper use or connection to incompatible equipment; or to instruments that have been modified or integrated with other products when the effect of such modification or integration materially increases the time or difficulty of servicing the instrument.

THIS WARRANTY IS GIVEN BY HACH ULTRA ANALYTICS WITH RESPECT TO THIS INSTRUMENT IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED. HACH ULTRA ANALYTICS AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR NON-CONTRACTUAL PURPOSE. HACH ULTRA ANALYTICS' RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. HACH ULTRA ANALYTICS AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES EVEN IF HACH ULTRA ANALYTICS OR ITS VENDORS HAS BEEN GIVEN ADVANCED NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

DECLARATION of CONFORMITY

We,

Hach Ultra Analytics
481 California Avenue
Grants Pass, Oregon 97526

declare under sole responsibility that the

Particle Counter, Model HHPC-6, Part Number 2087001

conforms to Directive 89/336/EEC for Electromagnetic Compatibility and Directive 73/23/EEC for Low Voltage. Compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

EN 61326:1998, Class A / EN 500081-1:1992 Emissions:

EN 55011 :1991 Class A Radiated
EN 55011 :1991 Class A Conducted

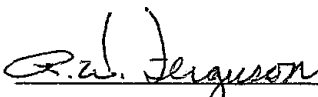
EN 61326:1998 / EN 50082-1:1997 Immunity:

EN 61000-4-2 Electrostatic Discharge
EN 61000-4-3 Electromagnetic Field
EN 61000-4-4 Electrical Fast Transient
EN 61000-4-5 Surge Test Common and Differential mode
EN 61000-4-6 3 Volt Modulated Interfering Signal
EN 61000-4-8 Susceptible Magnetic Fields
EN 61000-4-11 Voltage Interruption Test

EN 61010-1:1993 Amendment 1 & 2, Safety Requirement for Electrical Equipment for Measurement, Control and Laboratory Use

EN 60825-1:1993 Safety of Laser Products, Equipment Classification, Requirements and User's Guide.

Hach Ultra Analytics
August 20, 2003
(Place and date of issue)


R. W. Ferguson-Engineering Director
(Name/signature of authorized person)

DECLARATION of CONFORMITY

We,
Hach Ultra Analytics
481 California Avenue
Grants Pass, OR 97526
declare under sole responsibility that the

Model: HHPC-6

Part Number: 2087615-AII, 2087616-AII and 2087617-AII

conforms to Directive 89/336/EEC for Electromagnetic Compatibility and Directive 73/23/EEC for Low Voltage. Compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

EN 61326:1998, Class A, Group 1, Emissions:

EN 55011:1991 Class A Radiated
EN 55011:1991 Class A Conducted

EN 61326:1998, Immunity:

EN 61000-4-2 Electrostatic Discharge
EN 61000-4-3 Radiated Immunity, Amplitude Modulated
EN 61000-4-4 Electrical Fast Transient
EN 61000-4-5 Surge Transients
EN 61000-4-6 Conducted Immunity
EN 61000-4-8 Immunity to Power Frequency Magnetic Fields
EN 61000-4-11 Voltage Dips and Interrupts

EN 61010-1:1993 Amendment 1 & 2, Safety Requirement for Electrical Equipment for Measurement, Control and Laboratory Use

EN 60825-1:1993 Safety of Laser Products, Equipment Classification, Requirements and User's Guide.

Hach Ultra Analytics
26-APR-04
(Place and date of issue)

Shawn Hogan, Engineering Supervisor
Shawn Hogan
(Name/signature of authorized person)

Appendix A Data Communications

A.1 Remote serial interface (I/O port)

The MET ONE HHPC–6 is equipped with an RS232 communications port, an RS232 cable and an RJ45 connector. The RS232 communications port is used to communicate with a PC to download data and for remote operation. The communication protocol (ENGR–124) is available upon request for software development.

The specifications and wire pin-outs for the I/O port are:

- Baud rate: 9600 baud
- Data bits: 8 bits
- Parity: None
- Stop bits: 2 bits

A.1.1 DB9 serial connection

If the computer or terminal has a 9-pin serial port with a female connector, use the modular RJ45 to DB9 connector provided along with the RS232 cable. The MET ONE HHPC–6 is already configured as a Data Communication Equipment (DCE), so the use of a null-modem cable is not required. [Figure 20](#) shows the cable pin diagram.

HHPC-6	Adapter		
RJ-45 Female	RJ-45 Female	DB-9 Female	DB-9 Male
Rs485 B	1	1	N/C
Rs485 A	2	2	RX
SD	3	3	TX
RD	4	4	DTR
CS	5	5	GND
ER	6	6	N/C
N/C	7	7	N/C
GND	8	8	DSR
N/C	9	9	N/C

Figure 20 Pin layout for the RJ45 to DB9 connector cable

A

accessories, included	37
alarm count	25

B

battery safety	8
buffer count	26

C

Certification	41
connections, adjustments	12
custom settings	18

D

default settings, factory	18
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H

hazard information	7
hose barb	12

I

I/O port	25
Indoor air	29
instrument, specifications	5
isokinetic probe	12

K

keypad	16
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L

labels	27
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P

password protection	22
precautionary labels	7
product information, general	8

R

recommendations	35
Replacement Parts	37

S

Safety	7
screens	16
specifications, environment	5
status indicator, battery	33

T

troubleshooting procedures	35
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U

Unpack, instrument	11
--------------------------	----

Z

zero count filter	13
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	Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user. <i>Note: For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment for proper disposal.</i> Important document. Retain with product records.
	GERMAN Elektrogeräte, die mit diesem Symbol gekennzeichnet sind, dürfen in Europa nach dem 12. August 2005 nicht mehr über die öffentliche Abfallentsorgung entsorgt werden. In Übereinstimmung mit lokalen und nationalen europäischen Bestimmungen (EU-Richtlinie 2002/96/EC), müssen Benutzer von Elektrogeräten in Europa ab diesem Zeitpunkt alte bzw. zu verschrottende Geräte zur Entsorgung kostenfrei an den Hersteller zurückgeben. <i>Hinweis: Bitte wenden Sie sich an den Hersteller bzw. an den Händler, von dem Sie das Gerät bezogen haben, um Informationen zur Rückgabe des Altgeräts zur ordnungsgemäßen Entsorgung zu erhalten.</i> Wichtige Informationen. Bitte zusammen mit den Produktinformationen aufbewahren.
	FRENCH A partir du 12 août 2005, il est interdit de mettre au rebut le matériel électrique marqué de ce symbole par les voies habituelles de déchetterie publique. Conformément à la réglementation européenne (directive UE 2002/96/EC), les utilisateurs de matériel électrique en Europe doivent désormais retourner le matériel usé ou périmé au fabricant pour élimination, sans frais pour l'utilisateur. <i>Remarque : Veuillez vous adresser au fabricant ou au fournisseur du matériel pour les instructions de retour du matériel usé ou périmé aux fins d'élimination conforme.</i> Ce document est important. Conservez-le dans le dossier du produit.
	ITALIAN Le apparecchiature elettriche con apposto questo simbolo non possono essere smaltite nelle discariche pubbliche europee successivamente al 12 agosto 2005. In conformità alle normative europee locali e nazionali (Direttiva UE 2002/96/EC), gli utilizzatori europei di apparecchiature elettriche devono restituire al produttore le apparecchiature vecchie o a fine vita per lo smaltimento senza alcun costo a carico dell'utilizzatore. <i>Nota: Per conoscere le modalità di restituzione delle apparecchiature a fine vita da riciclare, contattare il produttore o il fornitore dell'apparecchiatura per un corretto smaltimento.</i> Documento importante. Conservare con la documentazione del prodotto.
	DANISH Elektriske apparater, der er mærket med dette symbol, må ikke bortskaffes i europæiske offentlige affaldssystemer efter den 12. august 2005. I henhold til europæiske lokale og nationale regler (EU-direktiv 2002/96/EF) skal europæiske brugere af elektriske apparater nu returnere gamle eller udtjente apparater til producenten med henblik på bortskaffelse uden omkostninger for brugeren. <i>Bemærk: I forbindelse med returnering til genbrug skal du kontakte producenten eller leverandøren af apparatet for at få instruktioner om, hvordan udtjente apparater bortskaffes korrekt.</i> Vigtigt dokument. Opbevares sammen med produktdokumenterne.

SWEDISH Elektronikutrustning som är märkt med denna symbol kanske inte kan lämnas in på europeiska offentliga sopsstationer efter 2005-08-12. Enligt europeiska lokala och nationella föreskrifter (EU-direktiv 2002/96/EC) måste användare av elektronikutrustning i Europa nu återlämna gammal eller uttrangerad utrustning till tillverkaren för kassering utan kostnad för användaren. *Obs! Om du ska återlämna utrustning för återvinning ska du kontakta tillverkaren av utrustningen eller återförsäljaren för att få anvisningar om hur du återlämnar kasserad utrustning för att den ska bortskaffas på rätt sätt.* Viktigt dokument. Spara tillsammans med dina produktbeskrivningar.

SPANISH A partir del 12 de agosto de 2005, los equipos eléctricos que lleven este símbolo no deberán ser desechados en los puntos limpios europeos. De conformidad con las normativas europeas locales y nacionales (Directiva de la UE 2002/96/EC), a partir de esa fecha, los usuarios europeos de equipos eléctricos deberán devolver los equipos usados u obsoletos al fabricante de los mismos para su reciclado, sin coste alguno para el usuario. *Nota: Sírvase ponerse en contacto con el fabricante o proveedor de los equipos para solicitar instrucciones sobre cómo devolver los equipos obsoletos para su correcto reciclado.* Documento importante. Guardar junto con los registros de los equipos.

DUTCH Elektrische apparatuur die is voorzien van dit symbool mag na 12 augustus 2005 niet meer worden afgevoerd naar Europese openbare afvalsystemen. Conform Europese lokale en nationale wetgeving (EU-richtlijn 2002/96/EC) dienen gebruikers van elektrische apparaten voortaan hun oude of afgedankte apparatuur kosteloos voor recycling of vernietiging naar de producent terug te brengen. *Nota: Als u apparatuur voor recycling terugbrengt, moet u contact opnemen met de producent of leverancier voor instructies voor het terugbrengen van de afgedankte apparatuur voor een juiste verwerking.* Belangrijk document. Bewaar het bij de productpapieren.

POLISH Sprzęt elektryczny oznaczony takim symbolem nie może byćlikwidowany w europejskich systemach utylizacji po dniu 12 sierpnia 2005. Zgodnie z europejskimi, lokalnymi i państwowymi przepisami prawa (Dyrektywa Unii Europejskiej 2002/96/EC), użytkownicy sprzętu elektrycznego w Europie muszą obecnie przekazywać Producentowi stary sprzęt lub sprzęt po okresie użytkowania do bezpłatnej utylizacji. *Uwaga: Aby przekazać sprzęt do recyklingu, należy zwrócić się do producenta lub dostawcy sprzętu w celu uzyskania instrukcji dotyczących procedur przekazywania do utylizacji sprzętu po okresie użytkowania.* Ważny dokument. Zachować z dokumentacją produktu.

PORTUGUESE Qualquer equipamento eléctrico que ostente este símbolo não poderá ser eliminado através dos sistemas públicos europeus de tratamento de resíduos sólidos a partir de 12 de Agosto de 2005. De acordo com as normas locais e europeias (Directiva Europeia 2002/96/EC), os utilizadores europeus de equipamentos eléctricos deverão agora devolver os seus equipamentos velhos ou em fim de vida ao produtor para o respectivo tratamento sem quaisquer custos para o utilizador. *Nota: No que toca à devolução para reciclagem, por favor, contacte o produtor ou fornecedor do equipamento para instruções de devolução de equipamento em fim de vida para a sua correcta eliminação.* Documento importante. Mantenha junto dos registos do produto.

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