GENERAL®

DATA LOGGING
VOC METER

HARDWARE MANUAL

VOC08

Please read this manual carefully and thoroughly before using this product.

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INTRODUCTION

Thank you for purchasing General Tools & Instruments'
VOC08 Data Logging VOC Meter. Please read this user's
manual carefully and thoroughly before using the product.

The VOC08 is an easy-to-use handheld instrument for making
ballpark measurements of mixed-gas volatile organic
compound (VOC) levels as part of an indoor air quality (IAQ)
maintenance program. Examples of VOCs include cigarette
smoke, ammonia, ethanol, and the low levels of toluene
produced during wood finishing and construction products.

Why does the VOC08 lack a VOC accuracy specification?
Because it can only measure the *total* concentration of VOCs
contributed by multiple gases, rather than the concentration
of a single gas. VOC meters that use photo-ionization
detection (PID) technology and ultraviolet lamps to break
down single-gas VOCs into ions are faster and more accurate
than the VOC08, but they cost at least 10 times more. The
VOC08 is therefore a much more suitable solution for home
inspectors and facilities managers who only need to spot-
check concentrations of mixed-gas VOCs.

KEY FEATURES

• Metal-oxide semiconductor sensor within vented ball
  housing detects ammonia, toluene, ethanol, hydrogen
  sulfide (H_2S) and cigarette smoke

• Makes ballpark measurements of total VOC concentration
  as well as accurate measurements of ambient temperature,
  relative humidity (RH), dew point and wet bulb
  temperatures

- Logs up to 32,000 data points. The entire capacity can be devoted to VOC readings, or devoted one-third each to VOC, ambient temperature and RH readings.
- Powerful data logging software that downloads readings to a PC for display/printing as table or graph. Software supports four data logging modes—including starting and stopping recording without a PC.
- Adjustable high VOC concentration audible alarm
- Min/Max memory (for all measured parameters) and data hold
- Automated VOC zero adjustment procedure
- Manually offsettable temperature and RH sensor drift
- Large backlit dual-readout LCD
- 15-minute Auto Power Off (can be disabled)
- Low battery indication
- Tripod mount
- Powered by (6) "AAA" batteries (not included) or AC adaptor (included)
- CE and RoHS approved
- 2-year limited warranty

WHAT'S IN THE PACKAGE

The VOC08 instrument, a PC-compatible data logging program on disc, a USB cable, an AC adaptor and this hardware user's manual come in a soft pouch inside a white box. This hardware manual is also provided as a printable pdf file on the disc, along with a pdf file of the VOC08 software manual.

PRODUCT OVERVIEW

Fig. 1 shows all controls, indicators and physical structures of the VOC08. Fig. 2 shows all possible indications on the LCD. Familiarize yourself with the locations and functions of the control buttons and the meanings of the display icons before moving on to the Setup and Operating Instructions.

1. VOC and temp-RH sensors inside vented ball housing

2. LCD with upper and lower readouts

3. Control buttons

Fig. 1.
The controls, indicators and physical structures of the VOC08

• **HOLD**. **Pressed briefly**, freezes both readouts. Also used to raise VOC high alarm threshold. Pressed at same time as **PWR** button with meter off, disables 15-minute APO function. **Pressed and held**, clears stored Min and Max session values.

• **MODE**. **Pressed briefly**, selects value(s) shown on lower readout: Ambient temperature alternating with RH; Dew Point (DP) temperature; or Wet Bulb (WB) temperature. Also shifts flashing digit one position to the left in VOC high alarm threshold setting mode.

• **PWR**. **Pressed briefly with meter off,** powers meter on. **Pressed and held with meter on,** powers meter off. **Pressed briefly with meter on,** arms/disarms high VOC concentration alarm.

• **MAX/MIN**. **Pressed briefly**, displays on the upper readout the highest or lowest concentration detected since the

meter was last powered on. Also shifts flashing digit one position to the right in VOC high alarm threshold setting mode.

• **SET**. **Pressed and held**, enters VOC high alarm threshold mode; also saves changed VOC alarm threshold settings and temperature/RH offset values.

• **UNIT**. Selects °F or °C unit for ambient, DP and WB temperatures.

• **BKLT**. **Pressed briefly**, turns backlight on and off. Also used to lower VOC high alarm threshold. **Pressed and held in Key Start or Rollover** mode (see Software Manual), starts/stops data logging without a USB connection to a PC.

4. Battery compartment (on back)

5. Threaded tripod mounting screw hole (on bottom)

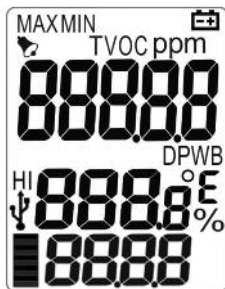6. Jack for AC adaptor (on side)

7. Micro USB jack

Fig. 2. All possible display indications

SETUP INSTRUCTIONS
INSTALL BATTERIES

The VOC08's battery compartment (Fig. 1, Callout 4) is located on the lower back of the meter.

Obtain six "AAA" batteries. **To install them**:

1. Open the battery compartment by using your thumb to slide its cover down and away from the meter.

2. Install the batteries in series in the compartment, observing the polarity markings inside.

3. Close the battery compartment by sliding the cover back up on its track until it snaps shut.

OPERATING INSTRUCTIONS
STANDALONE MODE

To power on the VOC08, press the **PWR** button. The LCD will illuminate and immediately begin scrolling "0s" across the five positions on the upper readout to indicate that it is warming up. During the warmup period, the meter will burn off any dust on the VOC sensor inside the vented ball. If this is the first use of the meter or if it has not been powered on in a long while, the warmup period may last as long as several hours. Normally, it takes 1 to 15 minutes until the scrolling stops and the upper readout stabilizes.

If you need to make ballpark measurements of mixed-gas VOC levels over a period longer than 15 minutes (the meter's Auto Power Off triggering time), you must disable the APO function.

To power on the VOC08 and simultaneously disable the APO function while running on battery power, with the meter off first press and hold the **HOLD** button, and then (without releasing **HOLD**) press and hold the **PWR** button. Doing this will cause a small **n** to briefly appear on the LCD before the meter powers up with both readouts visible. There is no permanent on-screen indication that the APO function has been disabled. So if you disable APO, realize that the batteries will discharge within an hour or two if you forget to manually power off the meter after a measurement session.

Once the meter has been powered on and the values on both readouts have stabilized, the VOC08 automatically begins operating in real-time measurement mode. In this mode you can:

1) **Turn the display backlight on and off** by briefly pressing the **BKLT** button.

2) **Freeze both readouts** by pressing the **HOLD** button.

3) **Change the temperature unit** to/from °F and °C by briefly pressing the **UNIT** button. The VOC08 will "remember" the unit in use when the meter powers off and will resume using that unit for ambient, DP and WB temperatures when it is powered on again.

4) **Change the values shown on the lower readout** by pressing the **MODE** button. The options available by pressing the button repeatedly are (in order): Ambient temperature alternating with RH; Dew Point (DP) temperature; or Wet Bulb (WB) temperature.

Using the **MODE** button to change the value(s) shown on the lower readout

Ambient temp alternating with RH ▶ DP temp ▶ WB temp

5) **Adjust the high VOC concentration audible alarm threshold**. To enter threshold adjustment mode, press and hold the **SET** button. This will produce a display showing **35.00 ppm** (the default alarm threshold) on the upper readout, with the "**5**" flashing. Using the **MODE** and **MAX/MIN** buttons to shift the flashing digit to the left and right, respectively, press the **HOLD** and **BKLT** buttons as many times as necessary to increment and decrement the value of each digit until the desired concentration threshold

is displayed. Then, press and hold the **SET** button to save the setting and return to real-time measurement mode.

6) **Arm and disarm the high VOC concentration alarm**.

   a. To arm the alarm, briefly press the **PWR** button until the 🔔 icon appears in the upper left corner of the LCD.

   b. To disarm the alarm (turn off the beeper), briefly press the **PWR** button until the 🔔 icon disappears.

   c. To cancel the alarm when it sounds, briefly press the **PWR** button.

7) **Display maximum and minimum session values of all measured parameters** by using the **MAX/MIN** button. A measurement session is the period of time during which you measure VOC levels at multiple locations. The session begins when you power on the VOC08; it typically ends 15 minutes after you finish making measurements with the activation of the APO function. Max and Min readings are automatically and continuously updated.

   You can extend a measurement session beyond 15 minutes by pressing any front-panel button or by disabling the APO function (see page 7) by powering the VOC08 through the included AC adaptor.

   The value of being able to quickly determine where the level of VOCs is highest and lowest in a facility should be obvious.

   To display the highest VOC concentration recorded during a measurement session, press the **MAX/MIN** button once with the meter operating in real-time measurement mode. The maximum reading will appear on the upper readout, with the term **MAX** above it on the top line of the LCD.

To display the lowest VOC concentration recorded during a measurement session, press the **MAX/MIN** button twice. The minimum reading will appear on the upper readout, with the term **MIN** above it on the top line.

The figure at right shows both session parameters in their selection sequence relative to real-time measurement mode.

To clear the stored (and continually updated) values of Min and Max from the instrument's short-term (volatile) memory, press and hold the **HOLD** button with the meter operating in Max/Min mode. The letters **Clr** on the bottom line of the LCD will confirm the clearing.

CALIBRATION PROCEDURE
VOC ZERO ADJUSTMENT

To make this temporary calibration procedure worthwhile, be sure the ambient environment is well-ventilated and shows no sign of VOC gases, as evidenced by a **0.00** reading on the meter's upper **TVOC ppm** readout.

To initiate the process, press and hold the **MODE** button for at least five seconds. Initially, five zeroes and the term **CAL** will appear and flash for about 20 seconds (left image on next page). Then the zeroes will stop flashing, with **CAL** continuing to flash (middle image). When calibration has finished, the display will confirm that result by displaying **End** (right image). The meter will respond by resuming operation in real-time measurement mode with the calibration point back at the factory default setting.

Alternatively, you can recalibrate the meter using a standard VOC gas. But be aware that attempting to recalibrate the meter without a standard gas may actually lower the meter's accuracy. For best results, send the meter out for calibration to a qualified laboratory recommended by your distributor.
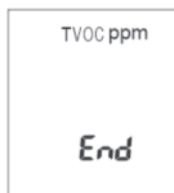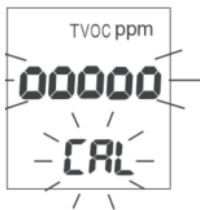
SPECIFICATIONS

VOC Measurement Range / Resolution: 0 to 50 ppm / 0.01 ppm

VOC Warmup Time: 10 minutes first use, 2 minutes thereafter

VOC Sensor Type / Longevity: Metal-oxide semiconductor / 5 years (typical)

Temperature Measurement Range: 14° to 122°F (-10° to 50°C)

Temperature Measurement Accuracy / Resolution: ±1.2°F (0.6°C) / 0.1°

RH Measurement Range: 10 to 90%RH

RH Measurement Accuracy / Resolution: ±5% of reading @77°F (25°C); ±7% of reading elsewhere in range / 0.1%RH

Dew Point Measurement Range: -99.22° to 118°F (-72.9° to 47°C)

Wet Bulb Measurement Range: 12.2° to 118.8°F
   (-11° to 48.2°C)
Data Logging Capacity: 32,000 points
Display Type / Size: Dual readout LCD / 2 in. (51mm) diagonal
Auto Power Off Trigger: 15 minutes of front-panel inactivity
   (can be disabled)
Operating Temperature: 32° to 122°F (0° to 50°C)
   @ 0 to 95%RH, non-condensing
Dimensions: 8.3 x 2.4 x 1.0 in. (210 x 60 x 25mm)
Weight: 7.2 oz. (204g), including batteries
Power Source: (6) "AAA" batteries (not included) or included
   110VAC adaptor

OPERATING & MAINTENANCE TIPS

When the low battery indicator appears in the upper left corner of the LCD, install fresh batteries immediately, following the instructions on pages 6 and 7 of this manual.

The metal-oxide semiconductor VOC sensor is as power-hungry as it is sensitive. General recommends using the included AC adaptor if you expect to routinely conduct measurement sessions lasting more than 15 minutes.

Remove the batteries if you don't expect to use the VOC08 for an extended period of time (months or years).

Abrupt temperature changes will cause condensation and possible vapor penetration. Clean the LCD after the vapor evaporates. Blow off loose particles with compressed air.

Gently brush remaining debris away with a lens hair brush.

Never use a solvent or an abrasive cleaner on the VOC08. To clean the housing, use a soft, damp cloth.

Do not drop or disassemble the meter or immerse it in water.

The VOC08 may display the following two sensor error messages on its bottom readout:

- **E- 1**: The VOC, temperature or RH sensor is damaged, or communication with any of the sensors has failed.
- **E- 2**: The VOC, temperature or RH level is beyond the range of its sensor.

If the LCD persistently shows a value of **00000** for VOC, that usually means that a logging session was initiated before the VOC sensor was fully warmed up.

OFFSETTING SENSOR DRIFT

The meter uses a capacitive RH sensor and a thermistor temperature sensor whose accuracy may drift over the long term. Following is a procedure that you can perform to offset these drifts and maximize the meter's measurement accuracy.

1) **With the meter powered off**, press and hold the **MODE** and **BKLT** buttons with fingers of your left hand while pressing and holding the **MAX/MIN** and **PWR** buttons with fingers of your right hand.
2) When the LCD shows **0.0°C** and **SET**, release all four buttons.
3) To select **°C** or **°F** as the temperature offset unit, press the **UNIT** button.
4) Press the **HOLD** button once for each 0.1° of temperature offset you wish to add, or the **BKLT** button once for each 0.1° of temperature offset you wish to subtract.
5) To offset RH drift instead of, or in addition to, temperature drift, briefly press the **SET** button. This will change the

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displayed unit **°C** or **°F** to **%**. Then repeat Step 4. Each press of the **HOLD** or **BKLT** button increases or decreases the amount of RH offset by 0.1%.

6) When you are satisfied with the offset value(s) you have entered, press and hold the **SET** button to save the settings. After the bottom line of the LCD shows **SAVE** for two seconds, press and hold the **PWR** button to power off the meter with the offsets in place.

NOTE: To apply the maximum amount of temperature offset (+9.9° or -9.9°) or RH offset (+9.9% or -9.9%), press and hold the **HOLD** and/or **BKLT** buttons to quickly increase or decrease the values.
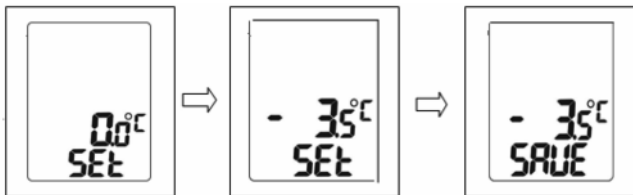
WARRANTY INFORMATION

This product from General Tools & Instruments (General) is warranted to the original purchaser to be free from defects in material and workmanship for a period of two years. Subject to certain restrictions, General will repair or replace this instrument if, after examination, the company determines it to be defective in material or workmanship.

This warranty does not apply to damages that General determines to be from an attempted repair by non-authorized personnel or misuse, alterations, normal wear and tear, or accidental damage. The defective unit must be returned to General Tools & Instruments or to a General-authorized service center, freight prepaid and insured.

Acceptance of the exclusive repair and replacement remedies described herein is a condition of the contract for purchase of this product. In no event shall General be liable for any incidental, special, consequential or punitive damages, or for any cost, attorneys' fees, expenses, or losses alleged to be a consequence of damage due to failure of, or defect in any product including, but not limited to, any claims for loss of profits.

RETURN FOR REPAIR POLICY

Every effort has been made to provide you with a reliable product of superior quality. However, in the event your instrument requires repair, please contact our Customer Service to obtain an RGA (Return Goods Authorization) number before forwarding the unit via prepaid freight to the attention of our Service Center at this address:

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80 White Street   New York, NY 10013   212-431-6100

Remember to include a copy of your proof of purchase, your return address, and your phone number and/or e-mail address.

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