FLUKE®

922

Airflow Meter

Users Manual

PN 2683880
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Introduction

The Fluke 922 Airflow Meter (“the Meter”) is a handheld instrument that measures differential pressure and calculates air velocity and air flow.

The Meter ships with the following items:

- Holster
- Carrying case
- Tubing and tubing strap
- Four AA Batteries (installed)
- Users Manual
- Wrist Strap

Safety Information and Symbols

A ⚠**Caution** identifies conditions and actions that may damage the Meter. A ⚠**Warning** identifies conditions and actions that pose hazard(s) to the user.

⚠⚠Warning

To avoid injury, or damage to the Meter, follow these safety guidelines:

- **Read the entire Users Manual before using the Meter.**
- **Use the Meter only as described in the Users Manual or the protection provided by the meter may be impaired.**
- **Inspect the Meter before use. Do not use it if it appears damaged.**
- **The Meter contains no user-serviceable parts. Do not open the Meter. For service, the Meter must be sent to Fluke. See "Contacting Fluke".**
- **Have the Meter serviced only by qualified service personnel.**
- **Adhere to local and national safety codes. Individual protective equipment must be used to prevent injury.**

⚠Caution

To avoid possible damage to the Meter, avoid using the Meter in an excessively dirty or dusty atmosphere. Excessive particle intake can damage the Meter.

International symbols used on the Meter and in the manual are explained in Table 1.

Table 1. International Symbols

Symbol	Description	Symbol	Description
⚠	Risk of danger. Important information. Refer to manual.		Recycling information
	Battery	N10140	Conforms to Australian standards
CE	Conforms to EU directives		Do not dispose of this product as unsorted municipal waste. Contact Fluke or a qualified recycler for disposal.

Pushbutton Functions

Figure 1 and Table 2 explain the Meter's pushbuttons.

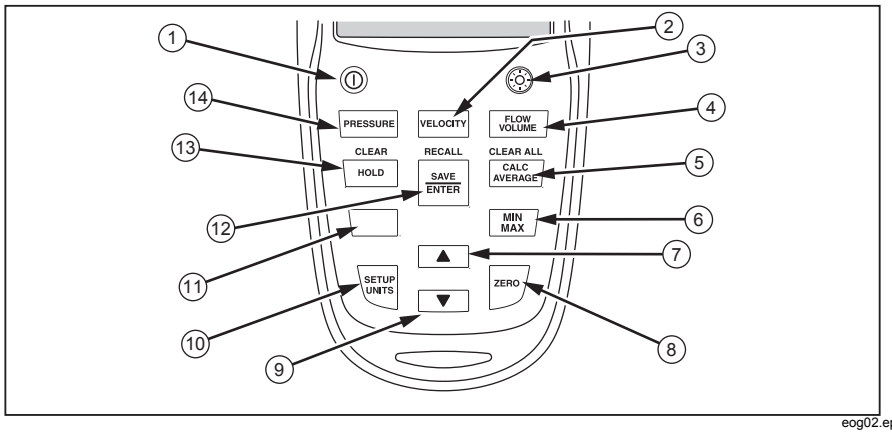

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Figure 1. 922 Airflow Meter

Table 2. Pushbuttons

Pushbutton	Function
①	Power button. Press to turn the Meter on or off. Hold for 5 seconds to display Meter's firmware version.
②	Activates velocity mode. See "Measuring Velocity".
③	Turns the backlight on and off.
④	Activates flow mode. See "Measuring Flow".
⑤	Calculates average of stored values.
⑥	Activates live Min Max Avg functions. See "Min Max Avg".
⑦	Used to increase manual inputs, scroll through memory, and to navigate the Setup menu.
⑧	Press and hold 2 seconds to zero out the display before taking readings.
⑨	Used to decrease manual inputs, scroll through memory, and to navigate the Setup menu.
⑩	Press to enter the Setup menu. See "The Setup Menu".
⑪	Used to access secondary features listed in yellow on the Meter.
⑫	Used to store data and accept changes to the setup menu and flow parameters.
⑬	Holds the present reading.
⑭	Activates pressure mode. See "Measuring Differential Pressure".

Display

Figure 2 and Table 3 describe the display.

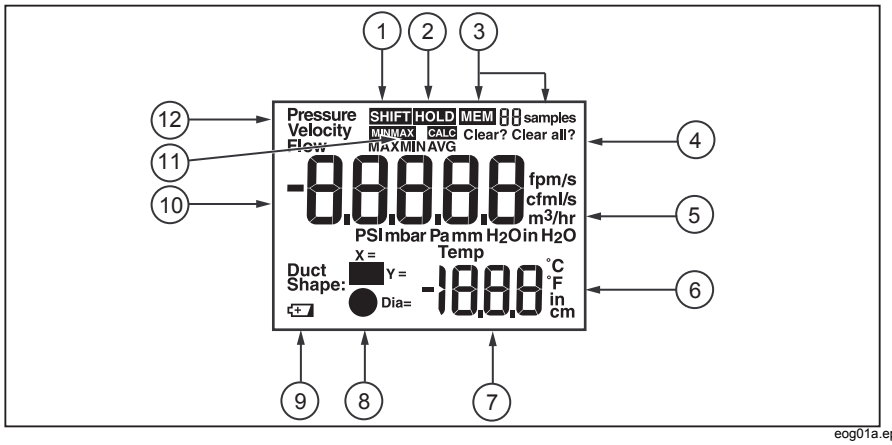

Figure 2. Display

Table 3. Display Description

①	Shift key is in use and secondary menu functionality is engaged
②	Hold is engaged
③	Annunciators showing that sample memory is being accessed and the number of samples
④	Indicates that a stored sample (or all samples) is about to be deleted from memory
⑤	Units of pressure, velocity, and flow
⑥	Units of length and temperature
⑦	Digits for temperature and setup parameters
⑧	Duct shape choices
⑨	Low battery indicator. Replace the battery as soon as the low battery indicator appears.
⑩	Digits for main measurements of pressure, velocity, and flow
⑪	Min Max and Hold indicators
⑫	Pressure, Velocity, or Flow modes are active

Using the Meter

Power

To turn Meter power on or off, press ⏻. Meter power is provided by four AA batteries. To replace the batteries, see “Maintenance”.

Measurement Units

The Meter supports both Metric and US measurement units. Select the desired measurement type using the Setup menu. See “The Setup Menu”.

Note

*If any measured value of any parameter is above the specified range, the Meter shows “***OL***”.*

Backlight

Press ☼ to turn on the backlight. The backlight automatically turns off after 2 minutes.

Automatic Power Off

To conserve battery power, the Meter changes to sleep mode after 20 minutes of inactivity. To turn the Meter back on, press ⏻. To disable automatic power off, turn the meter on while simultaneously holding ⏻ and ☼ until the display shows **APO OFF**. Repeat this procedure to re-enable this feature. The display shows **APO ON**.

Temperature

Ambient temperature is displayed on the Meter as a reference. The temperature can be displayed in either °C or °F. See "The Setup Menu".

Secondary Menu Modes

Use [ ] with other select pushbuttons to shift to secondary menu modes and functions:

- Press [ ] and then [HOLD] to access the Clear functions. See “Clearing Sample Data”.
- Press [ ] and then [SAVE ENTER] to access the Recall menu. See “Recall”.
- Press [ ] and then [CALC AVERAGE] to access the Clear All function. See “Clearing Sample Data”.

Zero

To zero differential pressure, velocity or flow, have both pressure ports open to ambient conditions, then, press and hold [ZERO] for 2 seconds. Upon zeroing, the meter beeps.

Min Max Avg

The Min Max mode stores live minimum (MIN) and maximum (MAX) input values. When the input drops below the stored minimum value or above the stored maximum value, the Meter beeps and stores the new value. Min Max mode also calculates an average (AVG) of all readings taken since the mode was activated. This mode can be used to capture

intermittent readings, record maximum and minimum readings while you are away or when you cannot watch the Meter.

To use Min Max mode, press MIN MAX. The maximum reading appears first. Each subsequent press of MIN MAX steps through the minimum, average, and live readings, and back to the maximum reading.

To exit Min Max mode, press MIN MAX for approximately two seconds. When in Min Max mode, the Auto-off feature is automatically disabled.

Hold

Pressing HOLD captures the current reading and holds it on the display. If HOLD is pressed while in Min Max mode, the reading is held on the display and Min Max mode continues to store minimum and maximum values.

Saving Samples

The Meter saves various samples in its three major modes. To save a sample, do the following:

1. When taking a sample, press SAVE ENTER to store the sample. The Meter can save up to 99 samples in each of its three modes.
2. Once the samples are taken, press CALC AVERAGE to view the average of all the samples.

3. Press CALC AVERAGE, PRESSURE, VELOCITY or FLOW VOLUME to exit calculate mode. If the memory is full (99 samples have been stored), more samples cannot be stored. If the user attempts to store another sample, the Meter flashes "**Full**" and does not save new readings.

Measuring Differential Pressure

To measure differential pressure, do the following, see Figure 3:

1. Press PRESSURE to enter the pressure mode.
2. Connect a single hose to the "**Input (+)**" port, leaving the "**Ref (-)**" port unconnected.
3. With the tubing open to ambient conditions press and hold ZERO for 2 seconds.
4. Place the input hose in a different zone than the Meter.
5. The Meter displays the differential pressure of the input zone with respect to the reference zone. For instance, a positive reading means that the input zone is positively pressured with respect to the Meter location or its reference zone.

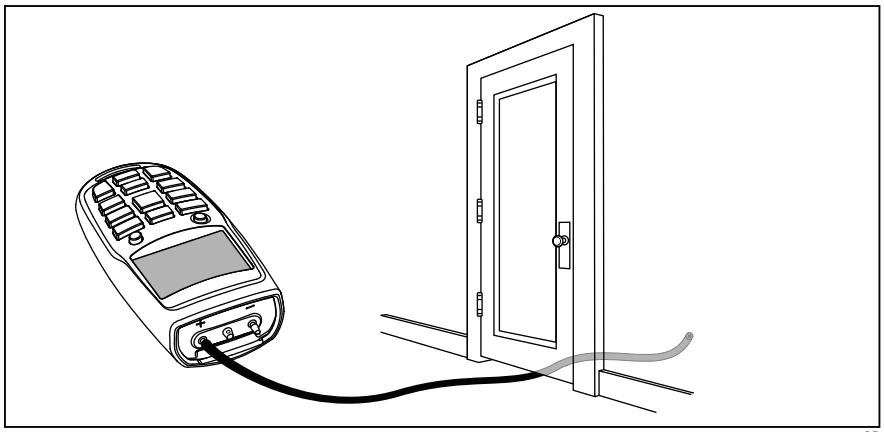

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Figure 3. Differential Pressure Measurement

Measuring Velocity

The Meter uses standard ambient conditions (temperature =21.1 °C/70 °F, barometric pressure = 14.7 psia / 1013 mbar), to approximate actual velocity and flow.

Velocity Measurement

To measure velocity, do the following:

1. Press VELOCITY to enter Velocity mode.
2. Connect the hoses to the pitot tube and to the Meter. The "**Input (+)**" pressure port on the Meter connects to the yellow hose from the total pressure connection of the pitot tube. The "**Ref (-)**" pressure port on the Meter connects to the black hose from the static pressure connection of the pitot tube. See Figure 4.

   Note

   If Measure Velocity measures negative on the display, check to make sure that the hoses are attached to the correct ports on the Meter and the pitot tube.
3. With the pitot tube open to ambient conditions press and hold ZERO for 2 seconds.

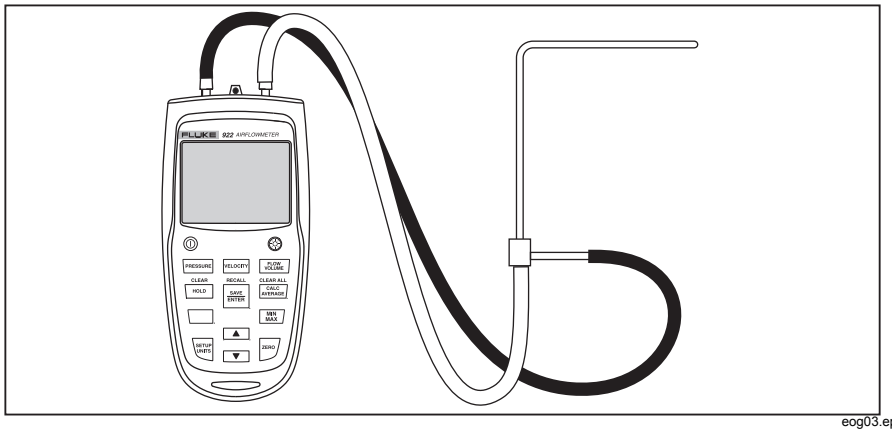

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Figure 4. Pitot Tube Connection

Measuring Flow

1. Press [FLOW VOLUME].
2. The Meter requests the duct shape and size. The Meter stores the last duct shape and size that is entered. If the duct is different than the stored version, press [▼] or [▲] to find the proper duct type for the measurement (rectangular or round).
3. Press [SAVE ENTER] to select the duct type.
4. If the duct is rectangular, use [▼] and [▲] to select the X dimension and press [SAVE ENTER] to store it. Use [▼] and [▲] to select the Y dimension. Hold [▼] or [▲] to increase the rate of change. Press [SAVE ENTER] to store it.
5. If the duct is round, use [▼] and [▲] to select the duct diameter and press [SAVE ENTER] to store it.
6. To measure flow, refer to Steps 2 - 3 in "Measuring Velocity".

Note

If Measure Velocity measures negative on the display, check to make sure that the hoses are attached to the correct ports on the Meter and the pitot tube.

Notes

HOLD, SAVE, CALCULATE, SHIFT, MIN MAX, ZERO, and SETUP UNITS can be used when measuring pressure, velocity and flow.

If PRESSURE *or* VELOCITY *is pressed before pressing* SAVE ENTER *for the final time, the Meter will escape the flow setup process and will not save any of the selections made or values entered.*

The Setup Menu

Use the Setup menu to change the following Meter parameters:

- Pressure units
- Velocity units
- Flow (Volume) units
- Temperature units
- Duct dimension units

To modify the Meter setup parameters:

1. From any screen, press SETUP UNITS to enter Setup menu editing mode.
2. Use ▼ and ▲ to change the measurement units. Hold down ▼ or ▲ to increase the rate of change.

3. Press SAVE ENTER to store the change. The Meter beeps to signal that the change has been stored. With each press of SAVE ENTER, the menu moves to the next parameter. To exit the Setup menu without changing subsequent parameters, press PRESSURE, VELOCITY, or FLOW VOLUME.

Clearing Sample Data

The Meter stores data that periodically will need to be cleared. Individual samples or the entire data memory can be cleared. When the memory is full (99 samples), it shows “Full” on the display when SAVE ENTER is pressed and the Meter emits short beeps and will not save any value unless some samples are cleared.

To clear individual sample data, do the following:

1. Press either PRESSURE, VELOCITY, or FLOW VOLUME to clear samples for that mode.
2. Press ⌐.
3. Press HOLD (CLEAR).
4. Use ▼ and ▲ to select the desired sample number. The last measurement saved appears first.
5. Press SAVE ENTER to clear the sample. Note that the number of samples displayed is reduced.

To clear all sample data, do the following:

1. Press ⌐.
2. Press CALC AVERAGE (CLEAR ALL).

3. Press SAVE ENTER to clear all samples. The Meter beeps and the display shows 0 samples.
4. To exit (CLEAR) or (CLEAR ALL) without deleting samples, press PRESSURE, VELOCITY, or FLOW VOLUME before pressing SAVE ENTER.

Recall

1. Press either PRESSURE, VELOCITY, or FLOW VOLUME to recall samples for that mode.
2. Press ▭.
3. Press SAVE ENTER (RECALL) to recall samples. Use ▼ and ▲ to locate the desired sample. Hold ▲ or ▼ to increase the rate of change.
4. Press PRESSURE, VELOCITY, or FLOW VOLUME to exit the Recall menu.

Maintenance

This section provides basic maintenance information, including battery replacement instructions.

⚠Caution

Do not attempt to repair or service the Meter unless qualified to do so and have the relevant calibration, performance test, and service information.

Cleaning

Clean only with soap and water. Remove any residue afterwards.

Periodically wipe the case with a damp cloth and mild detergent.

Do not use abrasives or solvents.

Replacing the Batteries

When the low battery symbol appears ( ) the meter will not save samples and “bAtt” appears on the display when SAVE ENTER is pressed.

The Meter uses four AA batteries (supplied). To replace the batteries, do the following (see Figure 5):

1. Turn off the Meter.
2. Remove the holster.
3. Place the Meter face down on a nonabrasive surface and loosen the battery door screw with a Phillips screwdriver.
4. Lift the battery access door away from the Meter.
5. Replace the batteries as shown in Figure 5. Observe the battery polarity shown in the battery compartment.
6. Secure the battery access door back in position with the screw.
7. Reinstall the Holster.

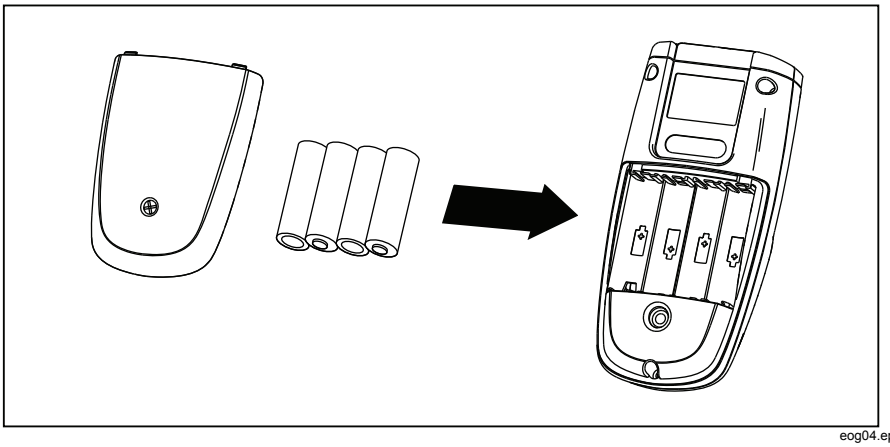

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Figure 5. Replacing the Batteries

Specifications

Parameter	Range	Accuracy	Resolution	Units Displayed
Air Pressure	± 4000 Pascal ± 16 in H_2O ± 400 mm H_2O ± 40 mbar ± 0.6 PSI	±1% + 1 Pascal ±1% + 0.01 in H_2O ±1% + 0.1 mm H_2O ±1% + 0.01 mbar ±1% + 0.0001 PSI	1 Pascal 0.001 in H_2O 0.1 mm H_2O 0.01 mbar 0.0001 PSI	Pa in H_2O mm H_2O mb PSI
Air Velocity	250-16,000 fpm 1-80 m/s	±2.5% of reading at 2000 fpm (10.00 m/s)	1 fpm 0.001 m/s	fpm m/s
Air Flow (Volume)	0-99,999 cfm 0-99,999 m^3/hr 0-99,999 l/s	accuracy is function of velocity and duct size	1 cfm 1 m^3/hr 1 l/s	cfm m^3/hr l/s
Temperature	0 to 50 °C 32 to 122 °F	±1 % + 2 °C ±1 % + 4 °F	0.1 °C 0.1 °F	°C °F
Use of Zero function is required to achieve these specifications.				

Environmental	
Operating Temperature	0 °C to +50 °C
Storage Temperature	-40 °C to +60 °C
Temperature Coefficient	0.025 X (specified accuracy) / °C (< 18 °C or > 28 °C)
Relative Humidity: Non condensing (< 10 °C) 90 % RH (10 °C to 30 °C) 75 % RH (30 °C to 40 °C) 45 % RH (40 °C to 50 °C)(Without Condensation)	
IP Rating	IP40
Operating Altitude	2000 m
Storage Altitude	12000 m
EMI, RFI, EMC	Meets requirements for EN61326-1
Vibration	MIL-PREF-28800F, Class 3
Maximum Pressure at each Port	10 PSI

Agency Approvals

CE Conforms to EU directives

N10140 Conforms to Australian standards

Replacement Parts

Replacement Part	Part Number
Battery 1.5 V Alkaline Size AA (4) NEDA 15A, IECLR6	650181
Holster	2729807
Wrist Strap	2729793
Hoses, 1 black and 1 yellow w/test lead strap	2766087
Battery Door	2729818
Battery Door Screw	2729829
Hard Carrying Case	2774694
Users Manual	2683880
Users Manual on CD	2766430

Accessories and Optional Items

Description	Item or Part Number
Toolpak Meter Hanging Kit Includes: Magnetic Strip, 2 Straps (9 inch and 12 inch), 2 Latch Tabs	TPak
Fluke 922 Kit Includes: Fluke 922 Airflow Meter, 12 inch pitot tube, TPak Magnetic Strip, TPak Strap, 9 inches, TPak Latch Tab, Four AA Batteries 1.5 V Alkaline, Users Manual, Large Carrying Case	Fluke 922-Kit