

HOW TO MEASURE OUTLET AIRFLOW



INTRODUCTION

Unico now offers the Pro'sKit Industries Anemometer MT-4615. This device is ideal for measuring the airflow in the Unico System.

This device simplifies checking airflow and airflow balance in the Unico System. It is highly accurate, allowing you to determine if your duct system has leaks by comparing the total airflow from all outlets to the airflow indicated by the motor amperage chart provided with the blower (or the programmed airflow if using an EC motor).

For comprehensive airflow measurement, two methods are available: one, using velocity and, two, direct display of calculated airflow.


The Velocity method entails using the Pro'sKit Anemometer MT-4615 to directly measure airflow velocity in knots at each outlet. This method offers real-time data on velocity, convertible into airflow via provided tables. Technicians can accurately assess airflow and system performance following the outlined procedure.

Alternatively, the calculated airflow display enables direct measurement in both CFM (Cubic Feet per Minute) and CMM (Cubic Meters per Minute) by inputting the outlet area into the anemometer. This method provides a quick and straightforward means to

obtain airflow readings without additional conversion. Technicians can measure airflow for each outlet configuration using the "Procedure of Direct Display of Airflow" and Table 2. This procedure is ideal if all your outlets are the same, as it avoids the need for lookup tables or mathematical calculations.

Unico offers both methods, ensuring versatility and accuracy in airflow measurement to meet technicians' preferences and requirements. You can switch between both methods by changing the meter display to either airflow (CFM or l/s) or velocity (knots). Whether for real-time velocity measurements or direct CFM/CMM readings, the Pro'sKit Anemometer MT-4615 facilitates efficient and precise airflow assessment in the Unico System.

PROCEDURE USING VELOCITY

1. Press the Power Button – 
2. Press the "UNIT" button until Knots appear below the displayed number.
3. Place the meter against the outlet with the fan centered over the outlet.
4. Record the velocity reading in KNOTS.
5. Calculate airflow using Table 1 on page 2.
6. Use the Unico Service Report Form (Bulletin 30-100) to record your readings and to determine the system total airflow.

Example:

2-inch round outlet with KNOTS reading of 16.0 has 44.3 CFM (or 20.9 l/s).


TABLE 1: PRO'SKIT ANEMOMETER KNOTS-TO-AIRFLOW TABLE

Velocity	Airflow				Velocity	Airflow			
	Slotted Outlet Straight		Slotted Outlet 90 Degree			Round Outlet, 2 Inch (50 mm)		Round Outlet, 2.5 Inch (63mm)	
Knots	CFM: 5.6 x Knots	L/s: 2.64 x Knots	CFM: 5.53 x Knots	L/s: 2.61 x Knots	Knots	CFM: 2.77 x Knots	L/s: 1.31 x Knots	CFM: 3.0 x Knots	L/s: 1.42 x Knots
3.2	17.9	8.5	17.7	8.4	10.00	27.7	13.1	30.0	14.2
3.4	19.0	9.0	18.8	8.9	10.50	29.1	13.7	31.5	14.9
3.6	20.2	9.5	19.9	9.4	11.00	30.5	14.4	33.0	15.6
3.8	21.3	10.0	21.0	9.9	11.50	31.9	15.0	34.5	16.3
4.0	22.4	10.6	22.1	10.4	12.00	33.2	15.7	36.0	17.0
4.2	23.5	11.1	23.2	11.0	12.50	34.6	16.3	37.5	17.7
4.4	24.6	11.6	24.3	11.5	13.00	36.0	17.0	39.0	18.4
4.6	25.8	12.2	25.4	12.0	13.50	37.4	17.6	40.5	19.1
4.8	26.9	12.7	26.5	12.5	14.00	38.8	18.3	42.0	19.8
5.0	28.0	13.2	27.7	13.0	14.50	40.2	19.0	43.5	20.5
5.2	29.1	13.7	28.8	13.6	15.00	<i>41.6</i>	<i>19.6</i>	45.0	21.2
5.4	30.2	14.3	29.9	14.1	15.50	<i>42.9</i>	<i>20.3</i>	46.5	21.9
5.6	31.4	14.8	31.0	14.6	16.00	<i>44.3</i>	<i>20.9</i>	48.0	22.7
5.8	32.5	15.3	32.1	15.1	16.50	<i>45.7</i>	<i>21.6</i>	49.5	23.4
6.0	33.6	15.9	33.2	15.7	17.00	<i>47.1</i>	<i>22.2</i>	51.0	24.1
6.2	34.7	16.4	34.3	16.2	17.50	<i>48.5</i>	<i>22.9</i>	52.5	24.8
6.4	<i>35.8</i>	<i>16.9</i>	35.4	16.7	18.00	<i>49.9</i>	<i>23.5</i>	<i>54.0</i>	<i>25.5</i>
6.6	<i>37.0</i>	<i>17.4</i>	<i>36.5</i>	<i>17.2</i>	18.50	<i>51.2</i>	<i>24.2</i>	<i>55.5</i>	<i>26.2</i>
6.8	<i>38.1</i>	<i>18.0</i>	<i>37.6</i>	<i>17.7</i>	19.00	<i>52.6</i>	<i>24.8</i>	<i>57.0</i>	<i>26.9</i>
7.0	<i>39.2</i>	<i>18.5</i>	<i>38.7</i>	<i>18.3</i>	19.50	<i>54.0</i>	<i>25.5</i>	<i>58.5</i>	<i>27.6</i>
7.2	<i>40.3</i>	<i>19.0</i>	<i>39.8</i>	<i>18.8</i>	20.00	<i>55.4</i>	<i>26.1</i>	<i>60.0</i>	<i>28.3</i>
7.4	<i>41.4</i>	<i>19.6</i>	<i>40.9</i>	<i>19.3</i>	20.50	<i>56.8</i>	<i>26.8</i>	<i>61.5</i>	<i>29.0</i>
7.6	<i>42.6</i>	<i>20.1</i>	<i>42.0</i>	<i>19.8</i>	21.00	<i>58.2</i>	<i>27.5</i>	<i>63.0</i>	<i>29.7</i>
7.8	<i>43.7</i>	<i>20.6</i>	<i>43.1</i>	<i>20.4</i>	21.50	<i>59.6</i>	<i>28.1</i>	<i>64.5</i>	<i>30.4</i>
8.0	<i>44.8</i>	<i>21.1</i>	<i>44.2</i>	<i>20.9</i>	22.00	<i>60.9</i>	<i>28.8</i>	<i>66.0</i>	<i>31.1</i>
8.2	<i>45.9</i>	<i>21.7</i>	<i>45.3</i>	<i>21.4</i>	22.50	<i>62.3</i>	<i>29.4</i>	<i>67.5</i>	<i>31.9</i>
8.4	<i>47.0</i>	<i>22.2</i>	<i>46.5</i>	<i>21.9</i>	23.00	<i>63.7</i>	<i>30.1</i>	<i>69.0</i>	<i>32.6</i>



The values shown in *Blue-Italics* are above the recommended value and may have unacceptable sound levels.

PROCEDURE USING DIRECT DISPLAY OF AIRFLOW

1. Press the Power Button – 
2. Once Power is turned on, Press the FUNCTION Button.
3. Change the area input depending on which outlet is being measured based on Table 2. To do so press the UNIT button to cycle the number upwards until it is 0 (it does not go down only up. i.e. 1,2,3).
4. Press the MAX/MIN button to move to the next decimal place and repeat step 3 for the next three decimal places until you reach the target value.
5. Your display should then read 0.xxx m². Press the MAX/MIN button to highlight the unit of measurement. The m² should then start Flashing. Once flashing, select the UNIT button again to toggle between m² and ft².
 - a. For example: If you are measuring a 2.0 Inch Outlet you would enter 0.027 ft².
6. Once you have the desired area entered, press the FUNCTION button again.

7. You should now have “FLOW” on the top of the screen. At the bottom of the screen CMS will automatically be selected. To obtain CFM or CMM reading, press the UNIT button until the appropriate unit of measurement is displayed.
8. Record the CFM or CMM reading.
9. Use the Unico Service Report Form (Bulletin 30-100) to record your readings and to determine the system total airflow.

TABLE 2: PRO'SKIT ANEMOMETER – AREA INPUT FOR CFM READINGS

Configuration	Area Input ft ²
2.0" Outlet	0.027
2.5" Outlet	0.03
Straight Slotted Outlet	0.055

Note: The Pro'sKit Anemometer displays only four significant figures. Consequently, converting ft² to m² will yield only one significant figure. For optimal accuracy using SI units, follow the same procedure until step 7, but use CMM instead of CFM.