1 YEAR
WARRANTY

User's Guide

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WT-3106

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SYSTEM UTILITY

The WT-3106 is a unique open loop wind tunnel for thermal characterization of components, boards and heat sinks. The unit is made of Aluminum, stainless steel and Plexi-glass™ and produces flows up to 1200 ft/min (6 m/s) with the appropriate fans. Its unique polynomial shape nozzle creates uniform flow in the test section. The general characteristics of the WT-3106 are shown in the table below.

ITEM	SPECIFICATION	EXPLANATION
Overall Length	84" (213cm)	
Test Section Width	24" (60 cm)	
Flow range	Up to 1200 ft/min (6 m/s)	Depending on the fan tray
Wall-to-wall spacing	6” (15 cm)	Designed to accommodate PCBs

The WT-3106 test section can be accessed from the front door for mounting of the boards. A unique internal rail guides provide mechanisms for installation of test specimen of different sizes (e.g., PCB, heat sink). Installation of different fan trays can be provided with the system to accommodate a broad range of velocities that maybe required for different testing applications. The fan trays are equipped with 24 volt-DC fans, which are individually controlled to generate the flow inside the WT-3106**.** Instrument ports are provided throughout the test section (on the front and side-walls) for placement of temperature, velocity and pressure sensors. The electric control box is provided to turn the fans on/off for the purpose of controlling the airflow inside the tunnel. Sensors to measure the flow parameters are also supplied by Omega as optional accessories. A wind tunnel controller can also be supplied by Omega for controlling the flow automatically.

The WT-3106 can be used for the following applications:

- ***Heat Sink Testing-*** Characterize a variety of heat sink sizes for natural and forced convection cooling.
- ***Heat Sink Comparison-*** Test two heat sinks side by side and compare their thermal performance in the same environment.
- ***Component Testing-*** Test vehicle for component characterization.
- ***PCB Testing-*** Test actual or simulated PCBs for thermal and flow distribution.
- ***Flow Visualization-*** Observe flow distribution when a PCB or test object is placed in the tunnel by smoke or buoyant bubbles through the all Plexi-glass™ test section.
- ***Variable Speed-*** Change the flow rate by controlling the fan RPM.
- ***Flow Direction-*** Test the effect of flow direction (fan failure simulation) by controlling the fans (either variable RPM or on/off).
- ***Quick Access-*** Quickly change the test specimen through the side panel.
- ***Sensor Port-*** Measure pressure, velocity and temperature through the ports at the entrance and exhaust of the test section.
- ***Data Center-*** View data and monitor events at the data center (optional accessory)

SYSTEM COMPONENTS

The part numbers identified in Figure 1 show the system components of the WT-3106. These part numbers are described below:

1. Test Section
2. Instrument ports
3. Fan tray
4. Diffuser section
5. Fan box (0n/off)
6. Nozzle section
7. Controller
8. Fan connector
9. Test door
10. Stands
11. Honeycomb
12. Screens

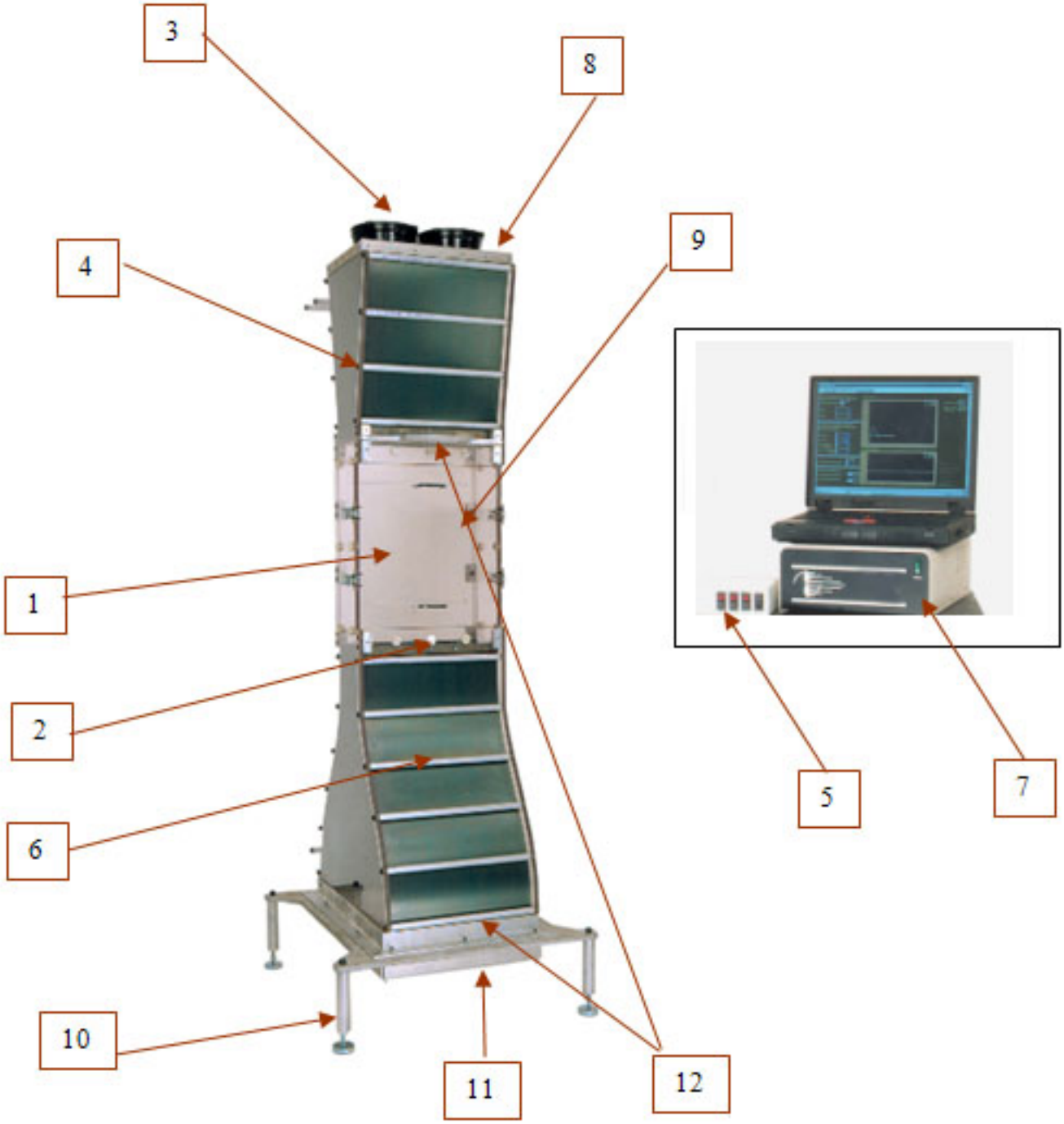


Figure 1: The WT-3106 System Components

SYSTEM OPERATION

General Testing:

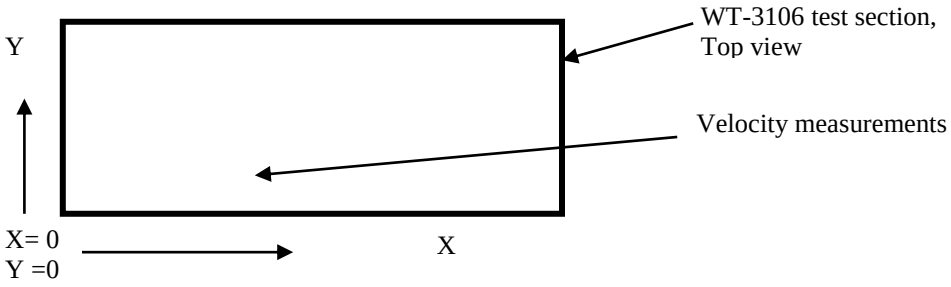
1. Release the clamps on front door to have access to the test section.
2. Mount your specimen (e.g., component, PCB or heat sink) in the test section.
3. Clamp the door back on the WT-3106.
4. Place flow measurement instrument in the instrument port.
5. Connect the fan cable to the controller box.
6. Connect the fan controller box to a DC power supply or wind tunnel controller.
   Important Note: Voltage to the fans cannot exceed 24 Volts-DC.
7. Adjust voltage until desired flow rate is attained.

Component and Heat Sink Testing:

1. Release the clamps on front door to have access to the test section.
2. Mount your component(s) in the test section.
3. Clamp the door back on the WT-3106.
4. Connect the fans to a variable DC power supply. Voltage to the fans cannot exceed 24 Volts-DC. Adjust voltage until desired flow level is attained.
5. Insert the velocity and temperature probes into the instrument ports provisioned in upstream of the test section.
6. Turn on the power supplies and start the experiment.

VELOCITY PROFILE

Velocity distribution at the inlet of the test section of the WT-3106 was obtained for 3 different velocities. The TVS-1100 (a hot wire anemometer) system was used to map out the velocity profile at the inlet of the test section. The velocity was measured at 5 points in the x direction and at 17 points in the Y direction. The nominal velocities were chosen as 200, 300 and 600 ft/min.



X (inch)	Y(inch)	Velocity – nominal velocity, 150 (ft/min)	Velocity – nominal velocity, 450 (ft/min)
9	0.5	130	438
9	1	148	449
9	2	149	449
9	3	150	449
9	4	149	449
9	5	148	449
9	5.5	130	438

Velocity Profile in the Y direction and at midsection of the X direction

X (inch)	Y(inch)	Velocity – nominal velocity, 150 (ft/min)	Velocity – nominal velocity, 450 (ft/min)
0.5	3	138	438
1	3	140	448
2	3	142	448
3	3	142	448
4	3	142	448
5	3	142	448
6	3	142	448
7	3	142	448
8	3	142	448
9	3	142	448
10	3	142	448
11	3	142	448
12	3	142	448
13	3	142	448
14	3	142	448
15	3	142	448
16	3	142	448
17	3	140	448
17.5	3	138	438

Velocity Profile in the X direction and at midsection of the Y direction

MADE IN USA

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

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2. Model and serial number of the product, and
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