VENTILATION SIMULATOR

STANDARD OPERATING PROCEDURE (SOP) FOR OPERATING THE VENTILATION SIMULATOR MACHINE FOR FANS AND VENTILATION FLOW ANALYSIS PURPOSES

LOCATION - FACILITY	MOSELEY MORAMORO
SUBDIVISION	MINING – OK TEDI LABORATORY
REVISED EDITION	1ST EDITION
REVIEW DATE	1ST JULY 2022
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STANDARD OPERATING PROCEDURE (SOP)

FOR OPERATING VENTILATION SIMULATOR

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NOTE

USAGE POLICIES & INSTRUCTIONS

- This equipment can only be operated upon approval from either the Laboratory Manager or a Technical Officer, or operated with the assistance or supervision of a technical officer.

- Strict compliance to operating procedures and safety requirements is required to operate this equipment. No Exceptions for substandard practices!

- If this equipment is acting unusual while operating STOP IMMEDIATELY! Please REPORT this malfunction to the Technical Officer and discuss the severity of the fault before proceeding or tag-out as faulty equipment.

- Any accidental damage to equipment or incidents encountered while operating this equipment must be reported immediately.

EQUIPMENT DETAILS

Ventilation Simulator Machine

Purpose:

This SOP ensures that the operator may operate this equipment appropriately according to the operating procedures to get reliable output without damages to the equipment or causing injuries to the operator. The Ventilation Simulator is used to conduct simulations for underground fan behavior and air flow analysis.

This Ventilation Simulator machine is composed of fans connected in series and parallel and a main frame which is a cylindrical duct with anemometers and manometers installed along the ventilation duct to measure the air flow.

Hazards:

- Eye protection (safety glasses) against dust blown into your eyes
- Footwear (safety boots) for equipment components and tools falling on to the foot.

Safety Requirements:

Personal Protective Equipment (PPE)

1. Safety glasses
2. Safety boots
3. Industrial Hardware Clothing (Reflector ware)

Tools & Materials Required:

Recommended Test Specimens

1. Dust Screen
2. Dust Screen

Test Specimen Prepared

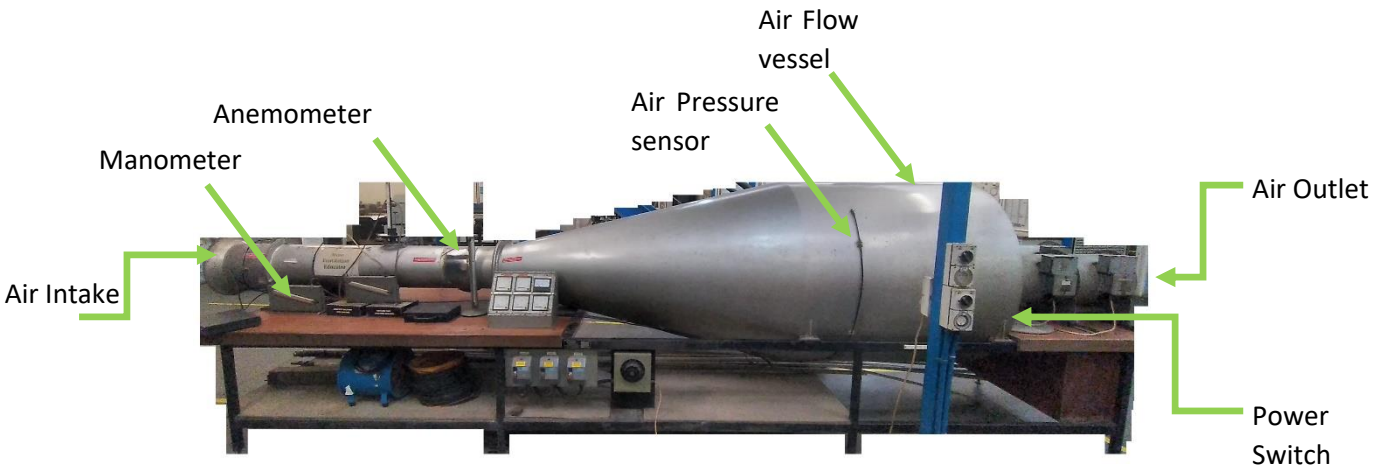
1. Atmospheric Air

Specifications

FANS CAPACITY – POWER REQUIREMENTS

No	Specifications	Capacities
1	Single Fan Voltage	240 Volts
2	Single Fan Amps	1.2 Amps – 2.2 Amps
3	Double Fan Voltage	240 Volts
4	Double Fan Amps	1.2 Amps – 2.2 Amps
5	Anemometer	m/s
6	Manometer	1 Atmosphere = 1 Bar
7	Barometer	1 Atmosphere = 1 Bar
8	2.5 mm Dust Filter Screen	
9	2.0 mm Dust Filter Screen	
10	1.0 mm Dust Filter Screen	

Compositions

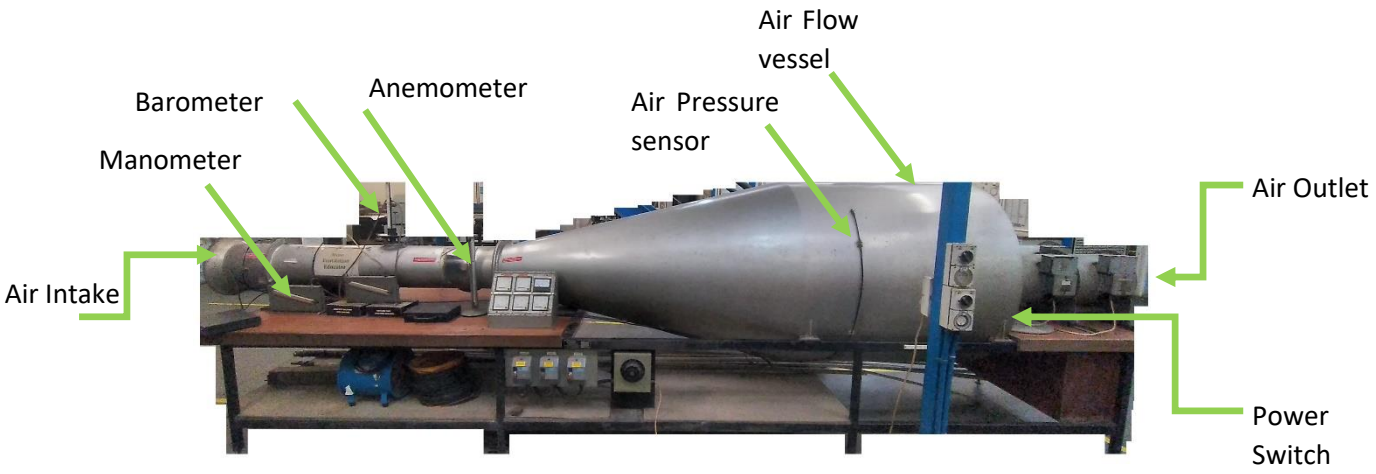


SETTING UP

Setting-Up Procedures

Setting up equipment

Before operating the equipment there are few things of the equipments that needs to be set up before it can be operated.



1) Barometer (Air Pressure – Atmospheric)
   A barometer is traditionally an instrument used to measure atmospheric pressure. The pressure is indicated by the height of a liquid column in a vertical tube, the tube being oriented in the direction opposite gravity. Ensure the dial is showing existing surrounding atmospheric pressure

2) Manometer (Air Pressure – Fan)
   A manometer is a laboratory instrument which is used to determine the pressure difference between two locations.

   This is used primarily for flow rate measurements, as the pressure difference across a flow restriction can be directly related to the flow velocity by a relation called Bernoulli's Equation.

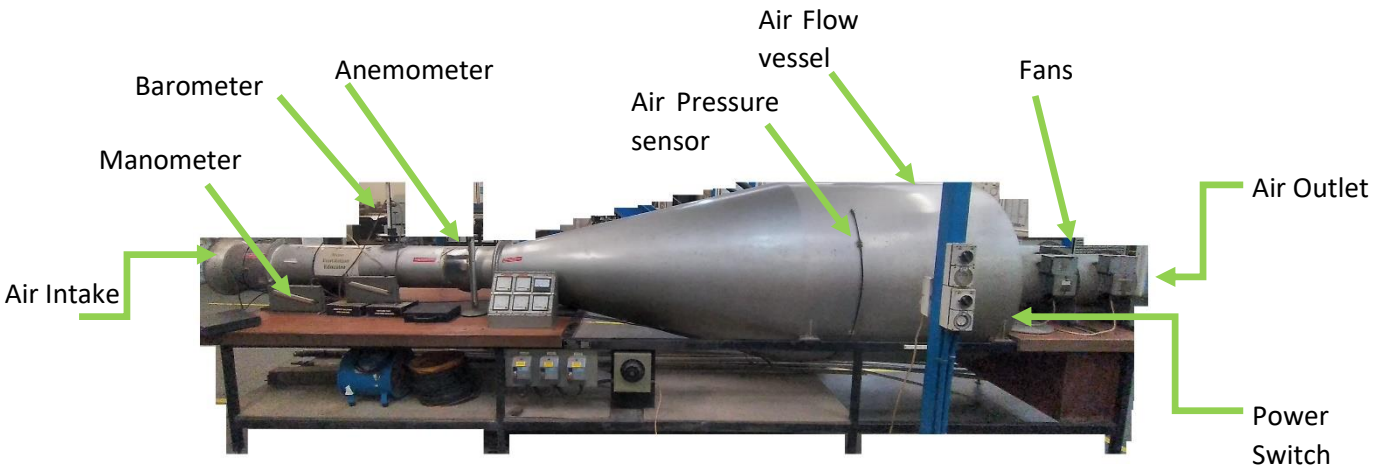
3) Anemometer (Air Flow Speed)
   An anemometer is an instrument that measures wind speed. This type of anemometer has a spinning wheel. The stronger the wind blows, the faster the wheel rotates. The anemometer counts the number of rotations, which is used to calculate wind speed.

OPERATING PROCEDURE

Operating Procedures

Operating Fan

To operate the ventilation simulator follow the equipment set up procedures below to set up the equipment before proceeding onto operating the fans



Operating Single Fan – Fan #1

(1) For single fan of the ventilation simulator follow the equipment set up procedures below to set up the equipment before proceeding onto operating the fan
(2) Record the airflow reading from the Anemometer
(3) Record the Atmospheric pressure from the Manometer
(4) Record the Barometric pressure from the Barometer
(5) Record Current (A) used to run the fan Amps
(6) Record Voltage (V) used to run the fan Volts

Operating Dual Fans in Series – Fan #1 & Fan #2

(1) For dual fans of the ventilation simulator operated in Series follow the equipment set up procedures below to set up the equipment before proceeding onto operating the fan
(2) Increase Power Supply Intake to run two fans
(3) Switch “On” Fan starting switch for Fan #1
(4) Switch “On” Fan starting switch for Fan #3
(5) Record the airflow reading from the Anemometer
(6) Record the Atmospheric pressure from the Manometer
(7) Record the Barometric pressure from the Barometer
(8) Record Current (A) used to run the fan Amps
(9) Record Voltage (V) used to run the fan Volts

Operating Dual Fans in Parallel – Fan #2 & Fan #3

(1) For dual fans of the ventilation simulator operated in Series follow the equipment set up procedures below to set up the equipment before proceeding onto operating the fan
(2) Increase Power Supply Intake to run two fans
(3) Switch “On” Fan starting switch for Fan #2
(4) Switch “On” Fan starting switch for Fan #3
(5) Record the airflow reading from the Anemometer
(6) Record the Atmospheric pressure from the Manometer
(7) Record the Barometric pressure from the Barometer
(8) Record Current (A) used to run the fan Amps
(9) Record Voltage (V) used to run the fan Volts