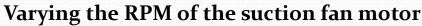
## **Suction Fan**

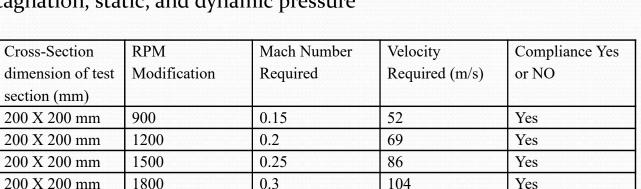
# For Rectangular Channel - Maintenance uniform fluid condition

The suction fan is intended for use in a test section with a rectangular channel configuration under controlled maintenance fluid conditions. The Mach number in the test section is required to be variable.

We shall Varying the RPM of the suction fan motor, method by which the required variation in Mach number will be achieved.



The test section shall have a two sided glass window of 12-15 mm thickness, providing sufficient optical access to do the imaging experiments. It shall have arrangements for measuring stagnation, static, and dynamic pressure measurements.



Note: The cross-sectional dimensions of the test section shall not be less than 150 mm x 150 mm under any circumstances.

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# Dimensions Suction Fan KS/ME/SUCFAN

Total length of the flow channel: 18 ft Working Test section length: 3.6 ft

## **Blower and Drive System**

Motor type: Three-phase squirrel cage Induction motor Power rating: 10-12 HP (as per performance requirement)

Operating voltage: 415 V ±10%, 50-60 Hz

Blower: High-efficiency axial or mixed-flow type with dynamically

balance fan blades

Flow direction: Reversible (forward and reverse) airflow across the

test section

#### **Air Velocity Requirements**

Required velocity range in the test section: 1 to 55 m/s (for airflow)

Airflow shall be uniform and stable across-section of the test area (Turbulence

Intensity preferably around 1% to 2%)

Install honeycomb flow straighteners and fine mesh screens upstream in the channel

#### **Structural and Safety Features**

Outer body of channel with appropriate reinforcement.

Safety guard on the front side.

Anti-vibration pads for the blower (suction Fan) and motor assembly for stability.

### Variable Frequency Drive (VFD)

Capacity: 3 HP, 3-phase

Input voltage: 415V

Output frequency: o-60 Hz

Suitable for smooth motor speed control and direction reversal

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#### KS/ME/SUCFAN

## **Suction Fan**

#### **Airflow Measurement**

Airflow sensor with Pitot tube
Pressure difference of the test section
Flow measurement probe tube diameter (size) less than
2mm.

Measuring range: 0.5 to 110 m/s

Accuracy: ±2%

Repeatability: 0.5%

#### **Temperature Measurement**

Sensor type: T-type thermocouple Measuring range: 5°C to 120°C

Accuracy: ±1%

### **Data Acquisition and Control System**

For controlling motor speed, airflow direction, and real-time measurement test section parameters such as velocity and temperature (Digital display interface for all measured parameters) All parameters shall be viewable on a digital display screen. Control system must be capable of handling and regulating a variable electric heater load of 50-60 kW

## **Inputs to Control System**

type temperature sensors: 4 Nos.

Airflow sensor: 2 No. at the potion of the inlet and outlet of the test section

Heater input power measurement

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#### KS/ME/SUCFAN

# **Suction Fan**

## **Outputs from Control System**

o-10 V analog output: 1 channel 4-20 mA analog output: 1 channel Solid State Relay (SSR): 3 channels

USB 2.0 interface



#### **Software Requirements**

LabVIEW-based software for complete parameter monitoring and control, including motor speed, airflow, direction, temperature and heater operation.

Functionality: Real-time data acquisition, Graphical display of parameters, control of airflow, direction, temperature and heater, data logging and export features



# **Delivery period: 16 weeks**

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