

## Air Conditioner Efficiency Meter (ACE Meter)

### Introduction

ACE Meter has been designed to evaluate the running performance of window air conditioners installed in residential and commercial establishments by logging basic parameters of the air-conditioner, as its performance deteriorates over time. At present there is no standalone instrument available which can generate the Energy Efficiency Ratio (EER) of an air-conditioner unit.

### Features

- Capable of providing comprehensive health report of the window air conditioners under test on real time basis
- Logging of Air conditioner performance parameters like Air Flow, Supply and Return Air Temperature/Humidity, Energy consumption of the AC unit
- Generation of EER and comparing the same with original EER.
- Facility of data-logging and computer compatibility
- Easy to install and operate



ACE Meter v 1.0 Reporting System  
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**TEST REPORT**

Test Site: AC1\_Room204.  
Make/Model/SN: Voltas/A1/123  
Capacity: 1.5  
Date of Test: 2018-10-17

**Observations**

The test was done @ 33°C ambient temperature.  
The readings were taken @ 22.0, @ 19.0, @ 16.0 (°C) set temperature.  
AC characteristics on basis of available site data are as follows

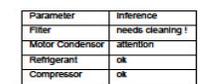
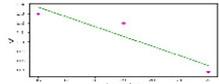
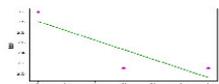
| TR_rated | TR_site | KW_rated | EER_rated | CFM_rated |
|----------|---------|----------|-----------|-----------|
| 1.5      | 0.92568 | 1.8      | 3.00      | 450.0     |

**Test Results using ACE Meter**

| Set_Temp | TR(AC_output) | KW(AC_input) | EER  |
|----------|---------------|--------------|------|
| 22.0     | 0.47          | 0.66         | 2.1  |
| 19.0     | 0.75          | 1.2          | 2.1  |
| 16.0     | 0.82          | 1.3          | 3.19 |

**Results**

Installed AC exceeds Site Area Cooling Load requirements  
AC under test has CFM 240.00 which exceeds set design criteria for 1.5 ton AC.  
Maximum cooling capacity estimated using ACE Meter is 0.85.  
Maximum power consumption estimated using ACE Meter is 1.37.  
At full load operation estimated Energy Efficiency Ratio using ACE Meter is 3.01.  
Best estimated EER for most efficiency for given set temperatures is 2.28 @ 20(°C).



| Parameter       | Inference       |
|-----------------|-----------------|
| Filter          | needs cleaning! |
| Motor Condensor | attention       |
| Refrigerant     | ok              |
| Compressor      | ok              |

**Remarks**

Checked By:

## Specifications

|                                |  |
|--------------------------------|--|
| Temperature Range and Accuracy | : -30 to 95°C, $\pm 1\%$ over the range    |
| Humidity Range and Accuracy    | : 5-95% RH with $\pm 2\%$ accuracy         |
| Air Flow Rate                  | : 0-20 m/s with $< \pm 0.5\%$ accuracy     |
| Electrical Power               | : 1- $\emptyset$ with $< \pm 1\%$ accuracy |
| Display                        | : LCD                                      |
| Supply Voltage                 | : 220 Volts (AC)                           |

## Product Differentials

- Tool-for-Technician for estimating the efficiency of air-conditioner units
- Tool to suggest various options like Maintenance, Retrofit, etc. for Energy Management in Building Management Systems.
- It is known that timely maintenance leads to at least 20% savings in energy cost and can be achieved with the usage of ACE Meter.

## Status

TRL-5: Ready for Technology Transfer

### Air Conditioner Efficiency Meter (ACE Meter)



For further information please contact

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