

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
CSIR-Central Scientific Instruments Organisation
2nd Floor, CSIR-Complex, Library Avenue, Pusa, New Delhi - 110015

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

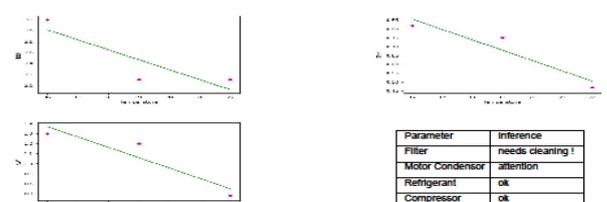
TR_rated	TR_site	KW_rated	EER_rated	CFM_rated
1.5	0.92568	1.8	3.00	450.0

Test Results using ACE Meter

Set_Temp	TR(AC_output)	KW(AC_input)	EER
22.0	0.47	0.68	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 Condenser	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 atleast 20% savings in energy cost and can be achieved with the usage of ACE Meter.

Status

TRL-5: Ready for Technology Transfer

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