



EFFECT OF PRECOOLER ON THE CONSUMPTION OF WINDOW AIR CONDITIONER

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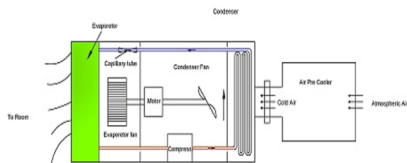
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ABSTRACT During summer season, while atmospheric temperature is more than 45c. Performance of condenser of window air conditioner decreases and greater amount of worked consume to run compressor. Finally increasing consumption of electricity. Window air conditioners cooled with precooled air improves heat transfer in condenser increases and due to this power consumption reduce due to the difference of temperature. The ambient temperature is decreased and the effect of the phenomenon is decrease in power consumption.

KEYWORDS :Precooler, performance of Air conditioner, power consumption, Air duct.

I.INTRODUCTION.

Window-air conditioners are usually used to cool homes. Research programs in order to improve the performance of window-air-conditioners by enhancing heat transfer rate in the condenser. In this system air is cool outside the window air conditioner, and this cooled air fed over the condenser tubes. Due to this greater amount of heat rejected from refrigerant vapor and low condensation pressure is obtain which in turn increase cop of air conditioner. Air is pre cooled in a device, Air is pre cooled in a device, in which atmospheric air is directly contact with water which comes from top of the device in fine droplets. Due to contact between air-water, air is cooled and passes to air conditioner. Practical performance shows that, by this arrangement reduces power consumption and improving performance of air-conditioner.

II.METHODOLOGY

Window air conditioner of 1 ton capacity is purchased from market which has compressor motor is of 1hp and working refrigerant is R22 is used. Slot is made on window of room. Duct is made from G.I. sheet for suction of air inside hot side of window air conditioner through air pre-cooler. After fixing of duct on sides of outside box of window air conditioner the pre-cooler is attached at one side of hot region box. Pump use to lift water in pre-cooler is connected to energy meter for power supply, and window air conditioner also connected to same energy meter so, total power use for operation can be read from same energy meter. Here total power is sum of power use to run pump and to run compressor of window air conditioner. While operation done with pre-cooler switch ON the switch for pump so total power can be read from energy meter. While operation done without air-pre cooler switch OFF the pump power supply switch. Run window air conditioner for half hour to obtain steady condition. Take outside air reading of DBT, WBT, and RH.Measure area of air outlet through cold air enters inside room. With use of anemometer take number of reading for air velocity enters inside room.

III.RESULTSANDDISCUSSIONS**OBSERVATION TABLE WITHOUT PRE-COOLER**

SR NO	DBT	WBT	DBT	WBT	HUMIDITY	HUMIDITY	POWER	COP
	Initial	initial	final	final	% initial	% initial	W	
1	24	18	18	13	44%	46%	1400	2.67
2	24	19	19	14	44%	45%	1400	2.5
3	25	18	17	13	45%	45%	1400	2.56

OBSERVATION TABLE WITH PRE-COOLER

SR NO	DBT	WBT	DBT	WBT	HUMIDITY	HUMIDITY	POWER	COP
	Initial	initial	final	Final	% initial	% initial	W	
1	24	18	17	12	44%	46%	1200	3.34
2	24	19	18	13	45%	46%	1200	3.75
3	25	18	17	14	45%	45%	1200	3.6

Observing the readings above we have the dbt and wbt readings and the humidity readings and the considerable power which has been observed. Upon calculating the parameters the power and the consumption of the power under the precooler has reduced to considerable amount each time of the observation. Upon calculating the COP of the system every time the COP has been noted to be improved for the precooler setup observations.

The power required to run the window air conditioner is decreased to 10% of then required when it is ambient temperature and the precooler decreases the required power for the same conditions of the setup of the experiment.

IV. Conclusion

The power required to run the window air conditioner is decreased to 10% of then required when it is ambient temperature and the precooler decreases the required power for the same conditions of the setup of the experiment. The power consumption decreases and the setup decreases the consumption of power.

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