

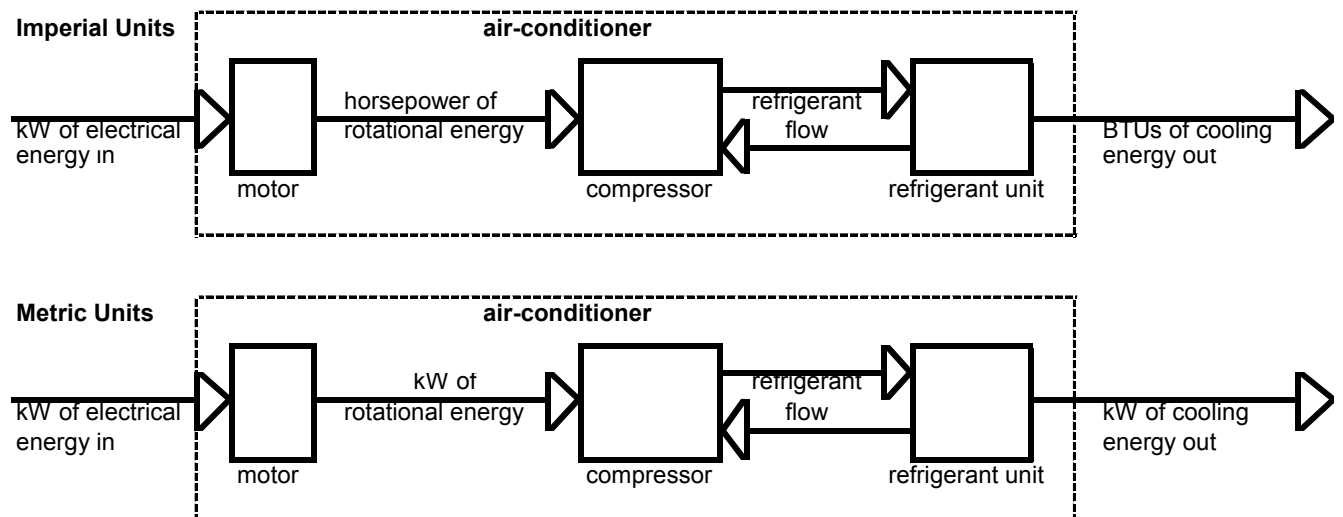


Why using horsepower to describe air-conditioner capacity is misleading

Horsepower (HP) is used to measure engine power under the imperial weights and measures system still used in the USA. It does not measure cooling (or heating) capacity. Under the metric system, kW is used to measure engine power (rotational power), cooling (or heating) capacity and electrical power.

If you are measuring rotational power you can convert HP to kW by multiplying by 0.75. But, this conversion is meaningless for cooling capacity or electrical power. It just converts the power of the motor.

It says nothing about how efficient that motor is at turning the electrical power coming into the motor into rotational power, or how efficient the cooling circuit is at turning the rotational power into cooling power.



When used in relation to air-conditioning, horsepower typically refers to the rotational power of the electric motor which drives the unit's compressor. It says nothing about the efficiency of the compressor or of the other components in the cooling circuit.

A high efficiency cooling circuit may have twice the cooling capacity of a low efficiency one, but they may both have the same size motor. It is easy for manufacturers and retailers to sell consumers a poorly performing air-conditioner if they just quote the HP of the engine.

That's why the Australian standard uses kW of cooling and heating and the energy star ratings are calculated using the Australian standard. Using

anything else doesn't capture the performance of the whole system. If HP was used in the standard it would encourage manufacturers to skimp on the cooling components and Australian consumers would end up paying appreciably more to run their air-conditioners.

Under the standards it is not illegal to quote HP in air-conditioner advertising so long as kW cooling and heating capacity as measured under the standard is also quoted. Manufacturers and retailers can quote any HP figure they like since it is not covered by the standard. AREMA has set in motion the process of having the standard changed so that any use of HP in air-conditioner advertising or reference material is specifically prohibited.

The use of horsepower to describe an air-conditioner's capacity dates back to pre-metric times when most domestic air-conditioners had motors, compressors and refrigeration circuits of similarly low efficiency and HP was a reasonable proxy for cooling capacity.

That was also in the days before widespread adoption of domestic air-conditioners and before energy star ratings, when there was little commercial advantage to be gained in misrepresenting the capacity of an air-conditioner.

Air-conditioners in the USA are measured using their cooling (or heating) capacity in BTUs versus their electrical power consumption measured in kilowatts (kW). Use of HP is discouraged but if it is used, it must be measured assuming standard efficiencies for the motor, compressor and refrigeration unit.

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For further information contact the Secretariat or go to the AREMA website