Highlighting innovative design features
and useful application information for
Thermo Scientific Biological Safety Cabinets

smart notes

design and innovation

Thermo SCIENTIFIC

BIOLOGICAL SAFETY CABINETS

SMART NOTE

Q A

Why should you select a Class II Biological Safety Cabinet (BSC) with a DC motor over one with an AC motor?

Traditional BSCs using AC motors require inefficient triacs and potentiometers to vary speed and waste energy. DC motors provide safer BSC performance and reduced environmental impact by consuming less energy.

A BSC equipped with a DC motor does more with less.
BSCs require the use of fans with adjustable speed to maintain airflow while compensating for HEPA filter loading. Traditional BSCs with AC motors control fan speed by causing the motor to slip. BSCs with DC motors control speed directly yielding energy savings of 70 to 90%.

outstanding energy efficiency
innovative DC motor design

Yesterday's Outdated Design

Traditional AC motors in BSCs are built to operate at a certain speed based on their construction and the standard frequency of the supply current. They slow down when necessary by electrically reducing the force at the motor so it slips. The electricity is reduced by chopping the current, wasting energy and releasing heat. The reduction needed to make the motor slip wastes even more energy.

Today's Innovative Approach

Thermo Fisher Scientific was the first manufacturer to incorporate DC motor technology into BSC design in 2002. DC motors do not rely on the frequency of the alternating current to set their speed. More efficiently designed, our BSC's DC motor increases and decreases the speed and force needed with the supplied current. A DC motor **turns at only the proper speed and force required to push the right amount of air** through new HEPA filters. As the filters load, the DC motor adjusts to turn at higher speeds with more force to push that same amount of air through the loaded (higher resistance) filters.

The front sash can be closed to operate with reduced speed in the Night Set-Back mode. Night Set-Back mode maintains containment and cleanliness in the BSC work area with even lower energy consumption.

Check the Watts – Not all cabinets have outstanding energy efficiency:

Select a Thermo Scientific BSC and save on average $5,000 over the life of the BSC*

	4 foot models				6 foot models			
	Thermo Scientific 1300 Series A2 DC-ebm Motor	**Competitor A 3-Phase AC Motor**	**Competitor B DC-ECM Motor**	**Competitor B AC/PSC Motor**	**Thermo Scientific 1300 Series A2 DC-ebm Motor**	**Competitor A 3-Phase AC Motor**	**Competitor B DC-ECM Motor**	**Competitor B AC/PSC Motor**
Window Aperture	8 inch	8 inch	8 inch	10 inch	8 inch	8 inch	8 inch	10 inch
Operational Mode Power Requirements (W)	180	432	299	564	360	660	518	714
Maintenance/ Reduced Flow Mode Power Requirements (W)	70	192	199	464	120	240	418	614
Total Cost of Energy – 2000 hrs. of annual operation (8 hrs/day, 5 days/wk) with remainder in maintenance mode	$140.52	$364.57	$378.52	$716.00	$258.28	$496.27	$650.16	$940.26
Annual pounds of CO_2 emissions based on use as described above	1327	3443	3575	6789	2439	4687	6140	8880

*All figures above obtained from publications by the manufacturer and are for comparison purposes only. This data has not been independently verified and actual field performance may vary. *Assumes 12.6 cents per kW-hr for average retail price to CA commercial customers for YTD ending February 2011. Includes cooling costs based on Seasonal Energy Efficiency Rating (SEER) of 10. Emissions calculated using 1.19 lbs CO_2/kWh from APPA generation and emissions data for 2000. http://www.eia.doe.gov/*

Contact your Thermo Scientific BSC representative to learn how BSCs with DC motors reduce the total operating cost and the environmental impact of your BSC population while maintaining the integrity of your work.

Learn more about our energy efficient BSCs designed with DC motors at www.thermoscientific.com/bsc

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