

Green Innovation

NuAire® BioSafety Cabinets with Energy Saver Technology

save time, money, and energy.



Best Products, Best Performance, Best Protection

Now With
warranty
5
year
including filters



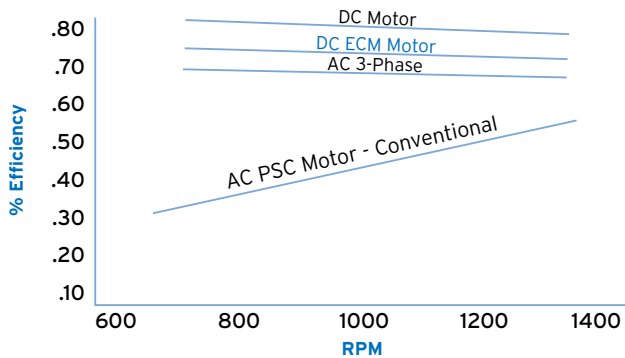
Energy Saver Technology in NuAire® Biological Safety Cabinets

Harnessing the Efficiency of DC ECM Technology

NuAire® has committed to using new affordable technologies that will save time, money, and energy. Our Biological Safety Cabinets are now designed to insure laboratory professionals the best performance in the most demanding environments. Besides the continual use of our existing technologies, each biological safety cabinet employs the new DC ECM (Electronically Commutated Motor) technology that is based on a brushless DC (Direct Current) permanent magnet design. When properly designed and engineered into a biological safety cabinet, the DC ECM motor improves performance and offers greater efficiencies than the previously used AC Permanent-Split-Capacitor (AC PSC) motor.



Fan Motor Efficiency



The higher RPM represents the filter loading from particulates in the laboratory. As the filter loads, the RPM increases, motor efficiency decreases for the DC, DC ECM, and the AC-3 Phase motors. The efficiency of the AC PSC motor increases, but never reaches the efficiency of the other three types of motors.

Energy Costs	AC PSC (conv)	DC ECM	DC	AC/3-Phase
Watts	564	299	163	414
KW	.564	.299	.163	.414
KW-HR	4927	2612	1424	3617
* Multiply times .09 per KWH				
Annual Cost	\$443.43	\$235.09	\$128.16	\$325.53

4 Foot Type A2 BSC that runs 24/7 (8736 hours per year) plus the energy required to control the laboratory ventilation by adding the rejected heat

* U.S. DOE Average Cost

Filter Loading Capacity

- Filter Size / Amount of Media
- Motor / Fan Function
- Percent increase in total load capacity*
 - 50% - (NSF requirement) (3 Years)
 - 85% - DC (4 Years)
 - 180% - AC PSC (7 Years)
 - 250% - DC ECM (10 Years)
 - 250% - AC 3-Phase (10 Years)

* Percent increase testing based on NSF/ANSI 49, ANNEX A.12 motor/blower performance test methods.

The Exciting Advantages of Using NuAire

NuAire incorporates the best of our existing technology and the best of the new DC ECM technology to give you a better VALUE – lower energy costs, longer filter life, and reduced noise and vibration. NuAire uses the largest HEPA filters with the most pleats per square inch; the TouchLink™ airflow control system; internal exhaust damper; and individually selected, optimally determined forward-curved fans for each model size/width. We are the only manufacturer to give you the best performance, quality, reliability, service and cost saving technologies.

Noise	AC PSC	DC ECM	DC	AC 3-Phase
Airflow (Design)	N/C	N/C	N/C	N/C
Fan (RPM)	1100-1700	800-1400	1400-2200	800-1400
Motor (Harmonics)	Yes	No	No	No

Vibration	AC PSC	DC ECM	DC	AC 3-Phase
Airflow (Design)	N/C	N/C	N/C	N/C
Fan (RPM)	Higher	Lower	Higher	Lower

Conclusions

AC PSC - Alternate Current, Permanent-Split-Capacitor Motor

Although they require more electrical energy to operate, these “classic” types of motors used with forward curved fans are reliable, more economical in terms of material cost, and always a good option when a cabinet will not be frequently used.

DC - Direct Current Motor

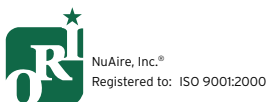
DC motors when used with backward incline impellers and forward curved fans require lowest energy to operate, however they run at a higher RPM (more potential vibration) and offer less horse power as used with in the design limitations of a BSC. Typically multiple motors and fans are required to achieve the necessary air flows using a separate DC power supply and integrated digital control system. Depending upon the size of the HEPA filters and the operating conditions where the cabinet is used, filter load capacity (HEPA filter life), may be reduced significantly. In some cases filters may need to be changed 2 - 3 times more frequently compared to cabinets using other motor technology.

AC 3-Phase - Alternate Current, Three (3) Phase Motor

AC 3-Phase motors when used with forward curved fans require low energy to operate and run at a lower potential RPM compared to DC and classic AC PSC motors. They are not quite as efficient as either DC or DC-ECM style motors and require a separate control system (variable frequency drive) to regulate the motor, but offer greater horsepower. Depending upon the size of the HEPA filters and the operating conditions where they cabinet is used, filter load capacity (HEPA filter life) is still very good.

DC ECM - Direct Current, Electronically Commutated Motor

DC ECM motors when used with forward curved fans require lower energy to operate and run at lower potential RPM compared to DC and classic AC PSC motors. This motor offers greater horse power and uses an integrated digital control system. When used with larger HEPA filters and a fan that is sized correctly for the width/volumetric size of the cabinet, the DC ECM motor offers the optimum design performance in terms of energy costs, filter load capacity (HEPA filter life), and the lowest possible noise and vibration. This type of motor may also be used to upgrade existing cabinets with classic AC PSC motor technology to realize future energy savings.



- NU-440 (Class II Type A2)
- NU-480 (Class II Type A2)
- NU-427 (Class II Type B1)
- NU-430 / 435 (Class II Type B2)

The TOUCHLINK™ is an easy-to-use touch screen LCD which will operate and display all system functions. On / off functions for fluorescent and germicidal ultraviolet lights, blower motor, and interior outlets. Monitors high / low limits for downflow, inflow, and sliding window position. The password protected TOUCHLINK™ also contains a unique date/clock display and timer function which can be used as a laboratory timer, to set purge cycles, outlet timer, UV light timer, auto-run timer, night setback, or weekend turn-off. The TOUCHLINK™ also contains diagnostic functions for a NSF trained service technician or certifier.



nitecare™ - A unique system initiated by the window closure, will reduce motor/blower operational airflow to conserve energy while maintaining work zone sterility.

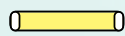
intelliflow™ - Fast, Accurate, Reliable, Dual Thermistor Airflow Sensors powered by TSI, Inc. manufacturer of the same sensor technology used in certification instruments designed to assure BSC optimal performance.



User Interface Icons



Blower



UV

UV Light



FL

Flourescent Light



Outlet



Timers



Menu

Historical Fact: In the early 1970's NuAire® was awarded the first contract to design and manufacture the first modern day Biological Safety Cabinet to meet the U.S. National Institutes of Health Specification NIH-O3-112c entitled "Laminar Flow Biological Safety Cabinet!". Since that time, NuAire® has grown substantially and now manufactures a wide range of Laminar Air Flow Systems including but not limited to Class I, Class II, and Class III Biological Safety Cabinets. NuAire® has continued to expand with many new systems that include CO₂ Incubators, Ultra-Low Freezers, Vivarium Equipment, Barrier Isolators, Polypropylene Fume Hoods and Casework.





Energy Saver Technology in NuAire® Biological Safety Cabinets

Typical 4ft. Class II, Type A2 BSC
w/ 8" Access Opening

	NuAire®	NuAire®	BSC A	BSC B
<u>Motor Type</u>	DC/ECM	AC/PSC (Original)	AC 3Ø	DC
<u>8 hrs/day, 5 days/week (2,000 hrs/year)</u>				
Kilowatt/hour/year	598	1128	828	326
\$0.09/kwh	\$54	\$102	\$75	\$29
<u>24 hrs/day, 7 days/week (8,736 hrs/year)</u>				
Kilowatt/hour/year	2612	4927	3617	1424
\$0.09/kwh	\$235	\$443	\$326	\$128
<u>15 Year Life Cycle Costs</u>				
Avg. number of Filter Changes*	1 Filter Set	2 Filter Sets	1 Filter Set	3 Filter Sets
Number of Motors to Replace**	1 Motor	1 Motor	1 Motor	2 Motors
Estimated Total Cost of HEPA Filters	\$715	\$1,430	\$715	\$2,145
Total Cost of Decon/Certification	\$450	\$900	\$450	\$1,350
Cost of Motors/Power Supplies/Fan Control	\$650	\$420	\$725	\$2,544
Utility Costs (Based on 2,000 hrs/yr over 15 years)	\$810	\$1,530	\$1,125	\$435
Total Cost of Ownership	\$2,625	\$4,280	\$3,015	\$6,474

* Estimate (See Filter Load Capacity on Preceding Page)

** Estimate based on historical information.



For more information please visit www.nuaire.com or call 1.800.328.3352

Disclaimer: This example is for illustrative purposes only and should not be deemed a representation of future performance or a guarantee of any kind. Information is based on internal performance data obtained through NuAire® testing and information provided by motor, blower, HEPA filter manufacturers, and independent service technicians.