

Application Engineering Notes

Storage of Rotron Fans, Blowers and Motors

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STORAGE OF ROTRON FANS, BLOWERS AND MOTORS

INTRODUCTION

Rotron products are often received by the customer well in advance of being put into service. Proper storage techniques can reduce the likelihood of damage to the product and maintain its original as-received condition for optimal service life. In this document we will review our recommended storage practices in addition to discussing the most common storage related failure modes.

For brief periods of time the temperatures listed herein can be exceeded without harm to the unit, such as would be experienced by a Rotron fan in its installed, non-operational state. For this condition, temperature extremes in excess of the values listed herein are permissible provided they are not of extended duration.

PRIMARY STORAGE ISSUES

Rotron fans and blowers are designed for severe conditions but when placed in storage there are two areas of design that should be considered: The lubricants used in the bearings and if electronics are present, the electrolytic capacitors. If left unused, the performance of these two components will actually deteriorate with age in a manner uncommon for similar components experiencing normal use.

BEARINGS & LUBRICANT

All products produced by Rotron use the highest grade bearing grease that, under appropriate storage conditions, will last without significant degradation for up to 5 years. Beyond 5 years there may be a tendency for the grease lubricant to dry out or to degrade by separation of the components making for unsatisfactorily short and unpredictable working life. These aging affects target the volatile compounds of the lubricating oils and can be worsened with conditions such as low humidity, radiation, industrial fumes or a dust-laden atmosphere.

The following conditions have been known to cause a gradual change in lubricant with time and can have an adverse effect on the rated service life of our product:

- a. Evaporation of oil and consequent viscosity increase of grease
- b. Separation of grease constituents due to non-use or excessive periods of storage
- c. Absorption of humidity and resulting hydrolysis of the lubricant's ester components
- d. Foreign material such as industrial fumes rich in sulphur, ozone, etc.
- e. Strong radiation such as ultraviolet light or a slightly radioactive atmosphere
- f. Settling of the solid lubricant at the lowest point resulting in difficult startups

Moisture entering the bearing system can lead to reduced service life. To avoid moisture problems the product should be stored in a clean and dry location, preferably indoors. Outdoor storage may subject the product to variations in temperature and humidity risking condensation on bearing surfaces contaminating the lubricant and encouraging catalytic corrosion of metal surfaces. Since all of Rotron products employ stainless steel bearings and shafts, deterioration of bearings or grease in this respect is diminished but not eliminated.

ELECTROLYTIC CAPACITORS

Electrolytic capacitors are used primarily in the EMI filters incorporated into Rotron's larger products. They may also be found in many of Rotron's ECDC products that may not incorporate EMI filters including modules and some smaller fan drives. It is worth noting that electrolytic capacitors are not typically found in 1/2Ax1, 1/2Ax2, Ax1, Ax2, Propimax 2, Propimax3, and Spartan products and do not exist in AC powered fans.

Fans that do employ electrolytic capacitors may suffer from aging effects attributed to drying of electrolyte or deterioration of aluminum oxide film that formed an internal "plate". Drying results in a loss of capacitance and resulting loss of filtering capability causing out-of-spec current ripple operation. This can result in a failure of the capacitor internally that may, or may not, be evident to the user.

The deterioration of the aluminum oxide film internal to the capacitor results in a higher leakage current within the capacitor that can result in a shortened lifetime or catastrophic failure once the equipment is operated. The deterioration effect is also more pronounced when the capacitor is stored at higher ambient temperatures. It is possible to "recondition" a capacitor suffering from this type of deterioration by applying a rated voltage to the capacitor through a high impedance left present for an extended period of time. However, this may not be a practical field solution. Preferably, periodic operation prevents this deterioration effect. The recommended storage practices described herein should severely reduce or eliminate a storage induced failure mode of the capacitors in these cases.

RECOMMENDED STORAGE PRACTICES FOR ALL PRODUCTS

It is recommended that all products be stored in protective containers, such as their original factory shipping container, that have been well sealed with adhesive tape. The cartons should be stored in a clean indoor area with normal room temperature variations within the ranges listed in this document. Precautions should be taken to ensure that the storage area is not contaminated with industrial fumes, direct sunlight, high ozone levels, or near a radiation source. A controlled environment maintaining a low relative humidity is highly desirable.

When undesirable conditions exist, or shelf-life is highly critical, it is recommended that the product be placed into a polyethylene-lined container with silica gel packets or other desiccant product. Before closing the container, purge the container with a steady stream of dry nitrogen. The container must then be immediately closed and sealed with a tightly fitting cover.

Additionally, it is recommended that the product be placed in a location free from vibration and shock, the presence of which may cause internal bearing surfaces to rub against each other

damaging the bearing system. Bearing damage of this type is not immediately apparent and may reduce the overall service life of the product.

For optimal long-term storage Rotron recommends that the product be operated periodically to ensure that lubricants and electrolytic capacitors are exercised. We recommend one hour of operation each year for all units in storage. Exercising the product in this way will help prevent settlement and separation of the bearing grease, and deterioration of electrolytic capacitors, serving a positive role in extending the life of the product.

STORAGE TEMPERATURES

Unless otherwise specified, the minimum & maximum suggested storage temperatures for Rotron fan and blower products are listed below.

AC Units (storage only)	ECDC Units (storage only)
-54°C to +85°C	-40°C to +40°C



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