

GENERAL SPECIFICATION

1. SCOPE

This specification defines the basic requirements for all Brush-less DC Fans manufactured and supplied by **PELKO Motors**. Whenever any discrepancy is found between this General Specification and the individual Approval Sheet, information provided in the later should be final.

2. MECHANICAL

2-1	Dimensions	This device shall have the dimensions as shown in the drawing attached
2-2	Material	a. Motor: Brush-less DC with permanent magnet motor. b. Impeller: Thermoplastic in black color, rated UL94V-0, or as specified. c. Housing: Thermoplastic in black color, rated UL94V-0, or as specified. d. Bearing System: Ball Bearing or Sleeve Bearing.
2-3	Lead Wires	2 wires, certified for use at rated temperature and voltage (+Red/-Black), or as specified.
2-4	Weight & Packing	As per data sheet.

3. ELECTRICAL

3 -1	Rated Voltage	12VDC (or as specified in data sheet)
3 -2	Power Input	See data sheet attached.
3 -3	Tolerances	+/- 10% on rated current and speed.
3 -4	Dielectric Strength	500VAC (1mA) for one minute or 600VAC for 1 second between housing and lead wires.
3 -5	Insulation	More than 100 Mega Ohm between internal stator and lead wires.
3 -6	Protection	This fan shall be locked rotor protected for minimum 72 hours
3 -7	Safety Standards Approvals	UL / CSA / CE (CB certification available to issue various certification listings such as VDE, GS, KEMA, NF, etc.)/TUV
3-8	Reverse Polarity Protection	Circuit is protected when V (+) & GND (-) wire are reversed. Standard feature unless otherwise specified.

4. ENVIRONMENTAL

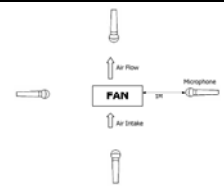
Unless otherwise specified, when subject to the following conditions, devices within this specification shall have no change in appearance, physical dimensions or functionality.

4-1	Operating Temperature	-10°C ~ + 70°C (Humidity: 35% - 65%RH)
4-2	Storage Temperature	-40°C ~ + 90°C (Humidity: 35% - 65%RH)
4-3	Acoustical	This device shall have a maximum noise level as specified in its data sheet, measured 1 meter away from the fan in 4 directions (see figure below).

4-4	Life Expectancy	When operating at 25°C room temperature, this fan shall have a minimum life expectancy of 30,000 hours and 50,000 hours respectively for Sleeve Bearing and Ball Bearing systems. This is a typical figure of life expectancy. The MTBF figure depends primarily on the internal temperature rise of the motor, the running speed and the bearing type, please inquire for the MTBF of the model you are using. Please inquire MTBF figure for a particular model and speed.
4-5	Humidity Test	Per MIL-STD 202 F Method 103B; Life: 96 hours; Humidity: 95%RH; temperature: 40±2°C
4-6	Thermal shock Test	Per MIL-STD 202F Method 107D, Condition D

5. DEFINITIONS OF CHARACTERISTICS

5-1	Power Input	Measured after 30 minutes of continuous operation at rated voltage in free air at an ambient temperature of 25°C.
5-2	Noise Level	Measured in anechoic chamber with background noise level of 12.5dBA and total background noise of 16.8dBA (Including Microphone noise). The fan is to be running in free air and 4 microphones are placed at a distance of one meter to each side of fan (as per picture shown). The dBA value reported is the average of the four measured values.
5-3	Air Flow	Measured by a dual chamber. The values are recorded when the fan speed is stabilized at rated voltage.



6. Quality Plan

6-1	Reliability	Two methods will be used in monitoring reliability during the manufacturing phase.
6-1-1	Early Life Test	This is used as a means of process control aimed at identifying any latent manufacturing problems and determining the effectiveness of "burn-in". Minimum 5 production samples will be "burned in" every week at 50°C (+/- 5°C) for 168 hours.
6-1-2	MTBF, L10 Life Expectancy	We continuously monitor the life expectancy of our motors and fan motors by random selection of 2 sets of 10 random production units from every model which we run. This is a longer-term program aimed at providing data on continuous running at 70°C and 90°C. We follow the L10 graph method, which is generally accepted by the industry to determine the MTBF at 40°C or at 25°C, which represents the minimum life expectancy of our product.
6-2	Incoming Quality Control (IQC)	Inspection of incoming materials includes visual and mechanical inspection, electrical tests and other appropriate testing depending on the types of components. Testing procedures will be in accordance with PELKO Motors Procedure QP-QC-05. Accepted lots will be transferred to warehouse and records will be kept for tracking purposes.
6-3	Process Inspection and Audit	Process Inspection is the responsibility of IQOC and is carried out at selected points in the process. Various charts will be used for controlling the process parameters. When processes are found to be out of control, investigation and corrective actions will be initiated and monitored.
6-4	QA Audit	All units from a continuous production will be audited into lots in accordance with

		the MIL-STD 105E, General Level II, AQL: 0.65%, C=0 . When lots are established the samples will be randomly drawn from each lot for testing. Rejected lots will be re-inspected or re-screened by production through electrical testing or mechanical inspection as appropriate.
6-5	Work Instructions:	Our Production Engineers are responsible to ensure that clearly and completely documented instructions are developed and maintained for use in manufacturing. These shall specify procedures and standards for the performance of activities that would be adversely affected by the lack of such procedures.
6-6	Corrective Action	When discrepancies are found from customer feedback or internal product/process quality control and audits, corrective actions will be initiated and carried out. Details of the corrective action procedure are given in the PELKO Motors Procedure QP-QC-01. Regular meetings are held between associated departments to review statistical data, quality situation, initiate and implement improvement targets and schedules.
6-7	Equipment Calibration	All mechanical measuring instruments, tools and test equipment will be calibrated at specific intervals of time by Production Engineering to ensure accuracy of measurements. Records will be kept which show the equipment location calibration date, due date and other details.
6-8	Training:	Prior to allocation of jobs, all new operators and inspectors will join the orientation program to understand the company, its product and QC system. New operators and inspectors are trained to the company workmanship standards as necessary.