

Electric Fan

KES

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Remark



1. Scope of Application

This standard specifies electric cooling fan for automobile(hereinafter referred to as the "electric fan").

2. Purpose

This standard aims at securing proper quality by standardizing specifications.

Remark: This standard and a drawing communicate together Kia's requirements.

3. Report of Evaluation Result

The quality evaluation result at each stage from development to mass production shall be submitted to Kia according to the Appendix.

4. Definition of Terminology

None

5. Specifications Indicated in Drawings

- (1) Air volume
- (2) Static pressure
- (3) Current
- (4) Number of revolutions
- (5) Rated voltage
- (6) Unbalance
- (7) Noise
- (8) Attaching relation between fan and radiator
- (9) Indicated status in an Automobile (¹)

Note (¹): Suppliers and Kia may separately adjust the supporting condition of electric fan in an automobile.

6. Evaluation Standard

The evaluation standard of an electric fan shall conform to Table 1.

Remark 1: The way of reading evaluation items and methods in Table 1 shall conform to the following example.

Example:

Evaluation Item		Evaluation Method	
Durability	Vibration resistance	First evaluation	7.5.1 — 1st evaluation method
	• Operating force of slider	Second evaluation (Evaluation item tested after evaluating the vibration resistance)	• 7.3.1 — 2nd evaluation method
	•• Noise		•• 7.3.1 — 3rd evaluation method
		Thired evaluation (Evaluation item tested after evaluating the operating force)	

Remark 2. The quality rank shall be represented by A, AR, B or C.
The definitions shall conform to KMS Q410001 (Defermination and Procedure of Quality Ranking).

Table 1

Evaluation Method		Evaluation Standard	Evaluation Rank	Evaluation Method
Per- for- mance	Air volume	Shall be the air volume or more indicated in the drawing	B	7.2.1
	Static pressure	Shall be the static or more pressure indicated in the drawing	B	7.2.2
	Current	Shall be the current or less indicated in the drawing	B	7.2.3
	Number of fan revolution	Shall be the number of revolutions or less indicated in the drawing	B	7.2.4
	Safety	Shall obtain an approval of engineering dept. of Kia.	C	7.2.5
	Motor earth performance	Earth performance inside the motor shall be 0.05V Max.	B	7.2.6
	Strength of lead wire	Shall have break-down, looseness removal, or separation of solder	B	7.2.7
	Slip torque of fan hub	No slip	B	7.2.8
	Unbalance (fan + motor)	Shall be the value or less indicated in the drawing	B	7.2.9
	Noise	Shall be the value or less indicated in the drawing	C	7.2.10
Dura- bili- ty	Life (only for 1 stage working electric fan)	Shall function well after test	B	7.3.1
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	•• Current	The current after the durability shall not increase by 15% or more from that before the test.	B	•• 7.2.3

Table 1 (continued)

Evaluation Method		Evaluation Standard	Evaluation Rank	Evaluation Method
Durability	High temperature working durability (only for 1 stage working electric fan)	Shall have no noise during the test shall function well after test	B	7.3.2
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	•• Current	The current after the durability shall not increase by 15% or more from that before the test. 1. Shall have no trace of trouble 2. Shall have no trace of burning or flame at insulator on armature wire. All insulator shall function well without contact with yoke. 3. Shaft journal shall be covered with oil film. 4. Shall have no separation of race or other trouble that reduces bearing function.	B	•• 7.2.3
	High temperature working durability (only for 2 stage working electric fan)	Shall have no noise during the test shall function well after test	B	7.3.3
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	•• Current	The current after the durability shall not increase by 15% or more from that before the test. 1. Shall have no trace of trouble 2. Shall have no trace of burning or flame at insulator on armature wire. All insulator shall function well without contact with yoke.	B	•• 7.2.3

Table 1 (continued)

Evaluation Method		Evaluation Standard	Evaluation Rank	Evaluation Method
Durability	··Current	3. Shaft journal shall be covered with oil film. 4. Shall have no separation of race or other trouble that reduces bearing function.	B	··7.2.3
	Dry working durability (only for 2 stage working of electric fan)	Shall have no noise during the test	B	7.3.4
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	··Current	The current after the durability test shall not increase by 15% or more from that before the test.	B	··7.2.3
	Repetition fatigue	The fan shall not make on angle of 30° with the shaft. No visual damage on the fan.	B	7.3.5
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	··Current	The current after the durability test shall not increase by 15% or more from that before the test.	B	··7.2.3
	Vibration resistance	Shall function well after test	B	7.3.6
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	··Current	The current after the durability test shall not increase by 15% or more from that before the test.	B	··7.2.3
	Impact resistance at low temperature	Shall function well after test	B	7.3.7

Table 1 (continued)

Evaluation Method		Evaluation Standard	Evaluation Rank	Evaluation Method
Durability	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	•• Current	The current after the durability test shall not increase by 15% or more from that before the test.	B	•• 7.2.3
	Water resistance	Shall function well after test	B	7.3.8
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	•• Current	The current after the durability test shall not increase by 15% or more from that before the test.	B	•• 7.2.3
	Cold-heat cycle durability	Shall function well after test	B	7.3.9
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	•• Current	The current after the durability test shall not increase by 15% or more from that before the test.	B	•• 7.2.3
Corrosion Resistance	Corrosion resistance of the outside	Shall function well after test	B	7.4.1
	• Air volume	The air volume after the durability test shall not be reduced by 5% or more from that before the test.	B	• 7.2.1
	•• Current	The current after the durability test shall not increase by 15% or more from that before the test.	B	•• 7.2.3

7. Evaluation Standard

7.1 Common evaluation standard

7.1.1 Standard atmospheric conditions for testing

Unless otherwise specified, the standard atmospheric condition for testing shall be a standard temperature condition of 20°C ($20 \pm 15^{\circ}\text{C}$), class 15 and a standard humidity condition of 65% ($65 \pm 20\%$), class 20 as specified in KS A 0006 (Standard Atmospheric Conditions for Testing).

Unless the tolerance of temperature is specified, temperature condition of class $50 \pm 5^{\circ}\text{C}$ in KS A 0006 shall be applied.

7.2 Performance

7.2.1 Air volume

(1) Put an electric fan into a test chamber as shown in Fig. 1.

Static pressure and air volume in the test chamber shall be possible to be measured.

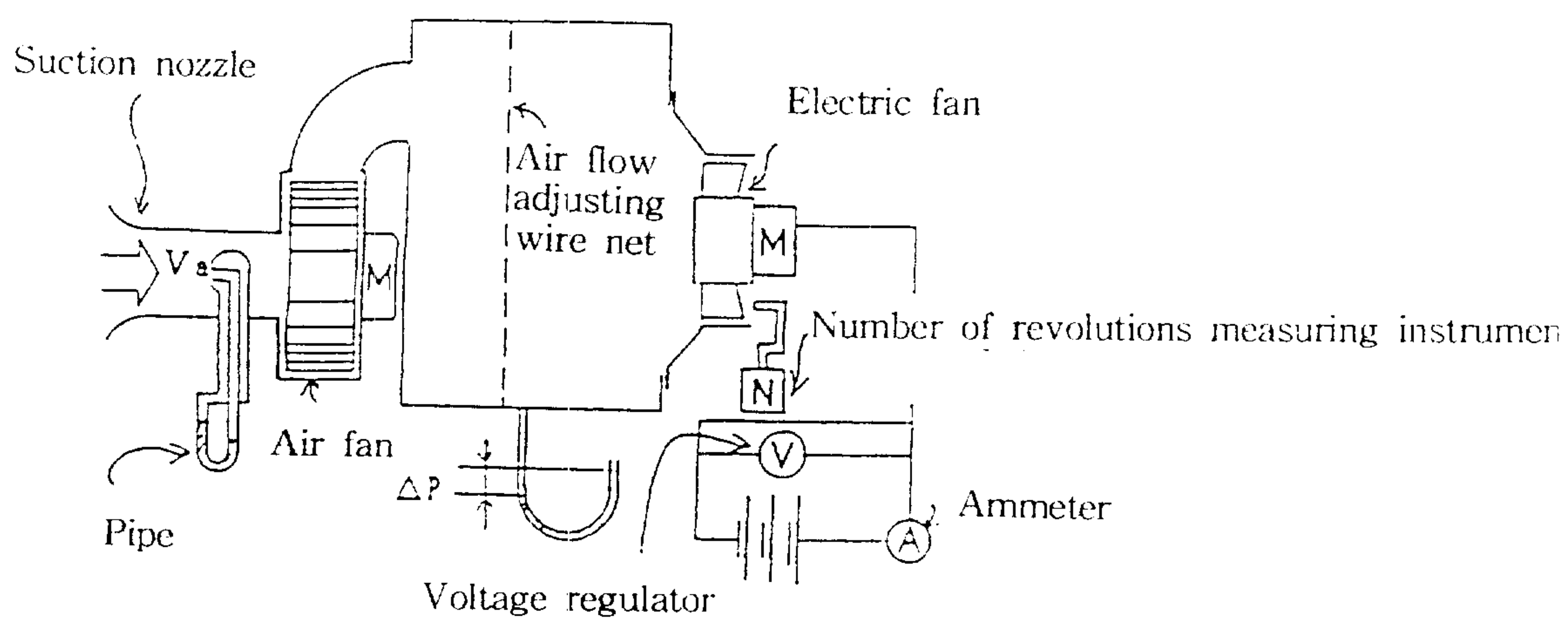


Fig. 1