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KES

Distributor with a Built-in Crank Angle Sensor

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Contents

1. Purpose
2. Scope of Application
3. Report of Evaluation Result
4. Definition of Terminology
5. Specification Indicated in Drawings
6. Evaluation Standard
7. Evaluation Method
8. Alteration of Specification
9. Indication Method on Drawings
10. Quoted Standards

Appendix



1. Purpose

This standard aims at securing proper quality by standardizing specification.

Remark: This standard and the drawing communicate together our requirements.

2. Scope of Application

This standard specifies automobile's distributor with a built-in crank angle sensor for electronic advance (hereinafter referred to as the "distributor")

3. Report of Evaluation Result

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

4. Definition of Terminology

- (1) Output voltage: The output voltage of the crank angle sensor built in the distributor.
- (2) Normal-working temperature range: The range of ambient temperature at which the device shall satisfy the performance specified in the drawing.
- (3) Storage temperature range: The range of ambient temperature at which the device may be left. However, when the device is placed at the normal working temperature range after being left at the storage temperature range, the device shall satisfy its performance specified in the drawing.

(4) Abbreviations

- T_1 : The lowest value of storage temperature
 T_2 : The lowest value of normal-working temperature
 T_3 : The highest value of normal-working temperature
 T_4 : The highest value of storage temperature
 N : The highest rotating number of normal-working distributor
 dw : Angular acceleration of the distributor at N rpm
 SGT signal : Angle pulse signal
 SGC signal : Base pulse signal

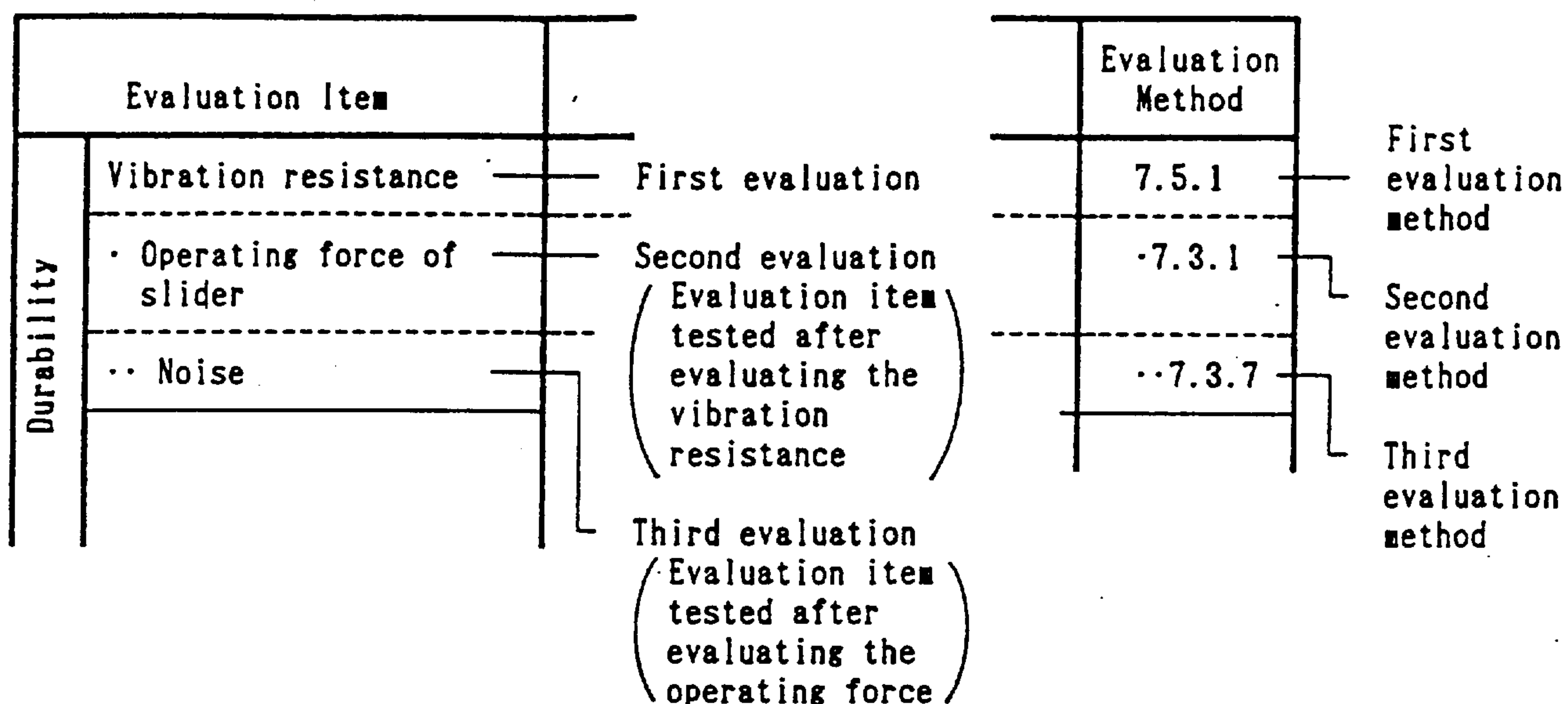
5. Specification Indicated in Drawings

- (1) Output voltage
- (2) Output impedance (direct current resistance)
- (3) Number of output pulses (base pulse, angle pulse)
- (4) Output pulse phase relation
- (5) Voltage to withstand
- (6) Spark advance range
- (7) Normal-working temperature range : $T_2 - T_3$ ($^{\circ}\text{C}$)
- (8) Storage temperature range : $T_1 - T_4$ ($^{\circ}\text{C}$)
- (9) Attaching position of nameplate
- (10) Actual load or equivalent
- (11) Classification symbols and vibration direction of log sweep vibration durability test
- (12) Rotating number of normal-working engine : N (rpm)
- (13) Angular acceleration of the distributor at N rpm : dw (rad/sec^2)
- (14) Color of lead

6. Evaluation Standard

The evaluation standard of the distributor shall conform to Table 1.

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



Remark 2. The quality rank shall be represented by A, AR, B or C.

The definitions shall conform to KMS Q410001 (Determination and Procedure of Quality Ranking).

Table 1

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Appearance quality	Rust on metal	Within the standard of the minimum-acceptable sample	B	Visual inspection
	Looseness or slackness at caulking and tightening part	Within the standard of the minimum-acceptable sample	A	
	Attaching position of nameplate	To satisfy the requirement specified in the drawing	C	
	Chipping of nameplate	Within the standard of the minimum-acceptable sample	C	
	Crack	Within the standard of the minimum-acceptable sample	A	
	Deformation			
	Coming off or omission of lead	Terminals shall completely fit in couplers.	A	
	Color of lead	To satisfy the requirement specified in the drawing	C	
Performance	Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	Output pulse phase relation		A	7.2.2
	Output impedance		A	7.2.3
	Insulation resistance	1 MΩ or more	A	7.2.4
	Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Durability	High temperature working durability	—	A	7.3.1
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5
	Low temperature working durability	—	A	7.3.2
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5
	Log sweep vibration durability	Cracks or deformation shall be within the standard of the minimum-acceptable sample.	A	7.3.3
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Durability	Angular velocity fluctuation durability	Cracks or deformation shall be within the standard of the minimum-acceptable sample.	A	7.3.4
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5
Strength	Tensile strength of terminal	Looseness, slackness, and deformation at caulking or tightening part and coming off of lead shall be within the standard of the minimum-acceptable sample.	A	7.4.1
	• Output impedance	To satisfy the requirement specified in the drawing	A	7.2.3
	Lock strength of connector	10 kgf {98.0 N} or more		7.4.2
Environmental resistance	High temperature exposure resistance	Cracks or deformation shall be within the standard of the minimum-acceptable sample.	A	7.5.1
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance	Low temperature exposure resistance	Cracks or deformation shall be within the standard of the minimum-acceptable sample.	A	7.5.2
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5
	Thermal shock resistance	Cracks or deformation shall be within the standard of the minimum-acceptable sample.	A	7.5.3
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5
	Moisture resistance	Cracks or deformation shall be within the standard of the minimum-acceptable sample.	A	7.5.4
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance	• Insulation resistance	1 MΩ or more	A	•7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	•7.2.5
	Water resistance	—	A	7.5.5
	• Output voltage	To satisfy the requirement specified in the drawing	A	•7.2.1
	• Output pulse phase relation		A	•7.2.2
	• Output impedance		A	•7.2.3
	• Insulation resistance	1 MΩ or more	A	•7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	•7.2.5
	Salt water resistance	—	A	7.5.6
	• Output voltage	To satisfy the requirement specified in the drawing	A	•7.2.1
	• Output pulse phase relation		A	•7.2.2
	• Output impedance		A	•7.2.3
	• Insulation resistance	1 MΩ or more	A	•7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	•7.2.5

Table 1 (Continued)

Evaluation Item		Evaluation Standard	Quality Rank	Evaluation Method
Environmental resistance.	Chemical resistance	Cracks or deformation shall be within the standard of the minimum-acceptable sample.	A	7.5.7
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5
	Dust resistance	—		7.5.8
	• Output voltage	To satisfy the requirement specified in the drawing	A	7.2.1
	• Output pulse phase relation		A	7.2.2
	• Output impedance		A	7.2.3
	• Insulation resistance	1 MΩ or more	A	7.2.4
	• Voltage to withstand	To satisfy the requirement specified in the drawing	A	7.2.5
	Strong electromagnetic field resistance	(1) For the electromagnetic pickup type crank angle sensor, no phase shift detrimental to use nor distortion of fundamental waveform. (2) For the optical crank angle sensor, ① No erroneous working. ② However, the ripple of the same frequency as the carrier superimposing on the output waveform is permissible.	A	7.5.9