

KOREAN INDUSTRIAL STANDARD

Electronic Preset Counters

1. Scope

This Korean Industrial Standard specifies electronic preset counters (hereinafter referred to as the "counters") for use in industrial control circuits of frequencies 60 Hz a.c. 250 V or under and d.c. 250 V or under.

Remark: The electronic preset counters dealt with here are of counting system of addition and/or subtraction, and consist of preset section and control output section.

2. Definitions

The principal terms to be used in this standard shall be as follows.

- (1) Electronic preset counter
A counter using semi-conductor circuits as its counting elements, and its output-part operates when the set numerical value is counted.
- (2) Rated insulation voltage
The voltage which is the reference of insulation design and which satisfies the required insulation distance and withstand voltage.
- (3) Rated working voltage
The voltage under which a counter is capable of working at the rated working current under specified conditions (breaking and making capacity, switching rate and electrical endurance).
- (4) Rated thermal current
The current which can be continuously carried without exceeding the specified value of temperature rise, while the switch is not opened or closed.
- (5) Rated working current
The current under which a counter is capable of working at the rated working voltage under specified conditions (breaking and making capacity, switching rate and electrical endurance).
- (6) Operating power supply circuit
The supply circuit which feeds necessary electric power for operating counters.
- (7) Pulse
Wave or waveform of which amplitude varies from the steady state and continues for a limited time, and then returns to the original condition again.
- (8) Count
To count the number of given pulses.
- (9) Mis-count
Misagreement between the number of counted pulses and the number of given pulses.

Related standards :

- KS C 1210** Basic Environmental Testing Procedures General and Guidance
KS C 0704 Insulation Test for Control Gear
KS C 0903 Vibration Testing Procedure for Electric Machines and Equipment
KS C 0705 Shock Testing Procedure for Electric Machines and Equipment
KS C 1302 Insulation Resistance Testers (Battery Operated)

(10) CPS (Count per Second)

Mark expressing the counting speed, that is the number of count per second.

(11) Maximum counting speed

The maximum counting speed determined by the range where the output-part operates surely without mis-count when a counter is operated.

(12) Count-up

Such condition that the output-part operates due to the number of counts reaches to the set value.

(13) Reset

To return the counting and output-part to the conditions before initiation of count.

(14) Power source reset

To reset by means of opening the operating power supply circuit.

(15) External reset

To reset by means of applying signal to the reset terminals.

3. Standard Service Conditions and Power Supply

3.1 Standard Service Conditions

The standard service conditions are as given below, however freezed or sweated conditions are not included.

(1) Ambient Temperature -5 to 40°C

(2) Relative Humidity 45 to 85%

(3) Altitude 200m or under

3.2 Standard Power Supply

The standard power supply shall be as follows:

(1) Main Power Supply

The use of sinusoidal power supply at rated frequency for A.C. and storage battery for D.C. is the standard. However, for apparatuses which do not cause any trouble in operating characteristics, A.C. power supply of substantially sinusoidal waveform, and D.C. power supply with less ripple may be used.

(2) Permissible Range of Voltage Fluctuation of Operating Power Supply Circuit

The range shall be 85 to 100% of the rated voltage.

4. Class

Classes of counters are as follows:

(1) Addition System

(2) Subtraction System

(3) Addition and Subtraction System

5. Ratings

5.1 Rated Insulation Voltage

The rated insulation voltage shall have either of the values indicated in Table 1.

Table 1

Rated insulation voltage				Unit: V
30	60	125	250	

5.2 Rated Voltage of Operating Power Supply Circuit

The rated voltage of operating power supply circuit shall have either of the values indicated in Table 2.

Table 2

Unit : V

A.C.	24	100	220	
D.C.	12	24	48	100

5.3 Rated Frequency

The rated frequency of a.c. operating power source circuits of counters shall have either of the values indicated in Table 3.

Table 3

Unit: Hz

Rated frequency	
60	

5.4 Output—parts with Contact**5.4.1 Rated Working Voltage of Output—parts with Contact**

The rated voltage shall have either of the values indicated in Table 4.

5.4.2 Rated Thermal Current of Output—parts with Contact

The rated current shall have either of the values indicated in Table 5.

Table 4

Unit: V

A.C.	100	220		
D.C.	24	48	100	200

Table 5

Unit: A

Rated thermal Current				
1	2	3	5	10

5.5 Output—parts without Contact**5.5.1 Rated Working Voltage of Output—parts without Contact**

The rated voltage shall have either of the values indicated in Table 7.

Table 7

Unit: V

A.C.	24	100	220		
D.C.	5	12	24	48	100

5.5.2 Rated Working Current of Output—parts without Contact

The rated current shall have either of the values indicated in Table 8.

Table 8

Unit: mA

A.C.	10	20	30	50	100	200	300	500	
D.C.	5	10	20	30	50	100	200	300	500

5.6 Number of Figures

The number of figures shall be as given in Table 9 in decimal system.

Table 9

Number of figures						
1	2	3	4	5	6	8

5.7 Counting Speed

The counting speed shall be expressed by the maximum counting speed, and shall have either of the values indicated in Table 10.

Table 10

Unit: number of times/sec (Mark CPS)

Counting speed											
10	20	30	100	200	300	500	1000	2000	3000	5000	10000

5.8 Input Signal**5.8.1 Count Signal**

Voltage level of the count signal shall have either of the values indicated in Table 11.

5.8.2 Reset signal

Voltage level of the reset signal shall be as indicated in Table 11, and the minimum values of signal duration shall be either of the values indicated in Table 12.

Table 11

Unit: V

H level	3 to 6	6 to 30
L level	0 to 0.5	0 to 1

Table 12

Unit: ms

Power source reset	100	200	500	1000		
Manual, external reset	2	5	10	20	50	100

6. Performance**6.1 Operation**

When the test of 8.2.2 is carried out, there shall be no mis-count, and the operation of reset and output-part shall be sure.

6.2 Contact Resistance

When the test of 8.2.3 is carried out, the contact resistance between terminals of output-parts with contact shall be 100 mΩ or less.

6.3 Insulation Resistance

When the test of 8.2.4 is carried out, the insulation resistance shall be 20 MΩ or more.

6.4 Withstand Voltage

When the test of 8.2.5 is carried out, the counter shall withstand the test voltage.

6.5 Temperature Rise

When the test of 8.2.6 is carried out, the temperature rise values of various part of counter shall not exceed the values given in Table 13.