

JIS

JAPANESE INDUSTRIAL STANDARD

Electro Magnetic Counters

JIS C 4555—1980

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Electro Magnetic Counters

C 4555-1980

1. Scope

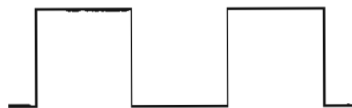
This Japanese Industrial Standard specifies the electromagnetic counters used in the industrial control circuits of not more than 250 V a.c. of 50 Hz, 60 Hz or 50/60 Hz frequency, and of not more than 250 V d.c., hereinafter referred to as the "counters". Read-out counters are not covered by this standard.

2. Definitions

The principal terms used in this standard are as follows:

- (1) integrating electromagnetic counter A count indicator that performs integration with number wheels advanced by the excitation and demagnetization of an electromagnet.
- (2) presetting electromagnetic counter An electromagnetic counter incorporating a microswitch, the switching part of which operates when the count has reached the preset value.
- (3) presetting The act of previously setting a numerical value at which a control is to be performed.
- (4) pulse The d.c. or a.c. voltage and current with a certain time duration, as illustrated in Fig. 1, intermittently applied to the counter to operate.

Fig. 1



For d.c.

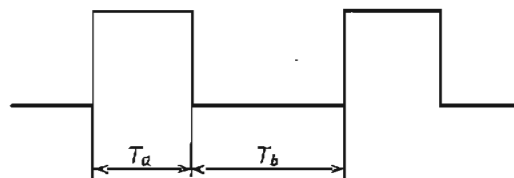


For a.c.

- (5) count The change of indicated number by receiving a pulse.
- (6) miscounting The inconsistency of the count with the number of pulses given.

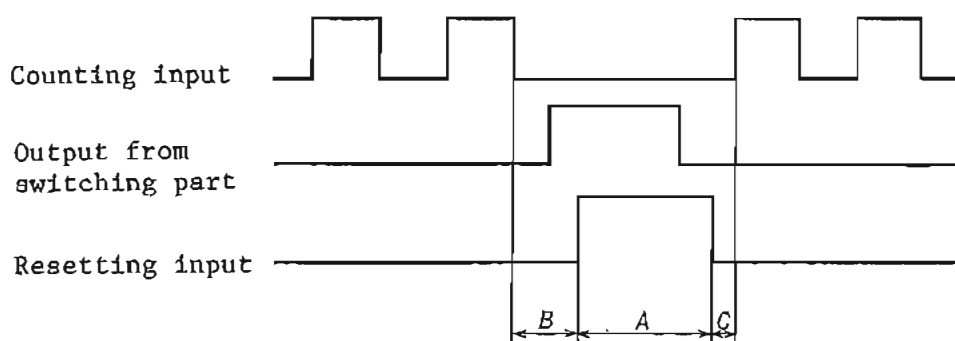
- (7) resetting To reverse the indicator and switching part to the original positions.
- (8) electromagnetic resetting The electromagnetic resetting by applying a reset signal.
- (9) manual resetting The resetting by manual operation.
- (10) automatic resetting The automatic resetting caused when the preset value is reached.
- (11) on-current time The time during which a voltage is applied to the operating circuit.
- (12) rest time The time during which no voltage is applied to the operating circuit.
- (13) making ratio The ratio of the on-current time (T_a) to the rest time (T_b) as illustrated in Fig. 2.

Fig. 2



- (14) resetting time The time required for resetting when a counter is repeatedly operated, as illustrated in Fig. 3.

Fig. 3



A: On-current time for resetting
 B: Fore-rest time for resetting
 C: After-rest time for resetting
 A+B+C: Resetting time

- (15) continuous rating The rating at which the counter can continuously be used under the specified conditions, without causing a temperature rise exceeding the specified limit, and without deviating from other restrictions.
- (16) short-time rating The rating at which the counter can be used for a short time under the specified conditions, starting from cold state, without causing a temperature rise exceeding the specified limit, and without deviating from other restrictions.
- (17) maximum on-current time The maximum value of the on-current time specified in the short-time rating.
- (18) rated insulation voltage The voltage that is taken as the basis for designing insulation and satisfies the insulation distance and withstand voltage.
- (19) highest counting speed The maximum value of counting speed determined within the limits where no miscounting occurs, by sending count signals of the rated voltage under the standard test conditions.
- (20) rated operational voltage The voltage that defines the performance of the counter, in relation to the rated operational current.
- (21) rated thermal current The current that the counter can continuously carry without causing any temperature rise exceeding the specified value, while its switching part is not operated.
- (22) rated operational current The current that can be used under the rated operational voltage and the specified conditions.

3. Standard Conditions in Service and Power Source

3.1 Standard Conditions in Service

- (1) Ambient temperature - 5 to 40°C, Provided the counter is not frozen.
- (2) Relative humidity 45 to 85 %
- (3) Altitude Not more than 2000 m

3.2 Standard Power Source in Service As a standard, a power source of sinusoidal waveform of the rated frequency, for a.c., and a storage battery, for d.c., shall be used. However, for such instruments that cause no trouble in practical characteristics, an a.c. source of nearly sinusoidal waveform, for a.c., and a d.c. source having a ripple component as little as possible (for example, d.c. by three-phase full-wave rectification), for d.c., may be used.

3.3 Allowable Limits of Voltage Variation for Operating Circuit
The limits shall be 85 to 110 % of the rated voltage.

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4. Classification

The counters are classified as given in Table 1.

Table 1

Kind	Division by resetting device	
Integrating electro-magnetic counter	No resetting	
	With resetting	Manual reset
		Electromagnetic reset
		Manual and electro-magnetic reset
Presetting electro-magnetic counter	Manual reset	
	Electromagnetic reset	
	Manual and electromagnetic reset	
	Automatic reset	
	Manual and automatic reset	

5. Ratings

5.1 Rated Insulation Voltages The rated insulation voltages shall conform to Table 2.

Table 2

Unit: V

Rated insulation voltage
60
125
250

5.2 Rated Voltages of Operating Circuits The rated voltages of operating circuits shall conform to Table 3.

Table 3

Unit: V

A.C.	24,	50,	100,	200
D.C.	12,	24,	48,	100

5.3 Rated Frequencies The rated frequencies of a.c. counters shall conform to Table 4.

Table 4

Unit: Hz

Rated frequency
50
60
50/60

5.4 Short-Time Ratings The short time ratings shall conform to Table 5. However, where the time is not specified, the rating shall be understood to express a continuous rating.

Table 5

Short-time rating						
20,	30 (Second)					
1,	2,	3,	5,	10,	15,	30 (Minute)

5.5 Number of Figures The count shall be indicated by Arabic numerals, and the standard of number of figures shall conform to Table 6.

Table 6

Number of figures
4
5
6

5.6 Counting Speeds The counting speeds shall be expressed by the highest counting speeds, which shall conform to Table 7.

Table 7

Counting speed number of times/second	5, 10, 15, 20, 25,
	30, 40, 50, 60, 80,
	100

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5.7 Rated Operational Voltages of Switching Parts The rated operational voltages of switching parts shall conform to Table 8.

Table 8

Unit: V

A.C.	100, 125, 200, 250
D.C.	12, 24, 48, 100

5.8 Rated Thermal Currents of Switching Parts The rated thermal currents of switching parts shall conform to Table 9.

Table 9

Rated thermal current A	1, 2, 3, 5, 7, 10, 15
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5.9 Rated Operational Currents of Switching Parts The rated operational currents of switching parts shall conform to Table 10.

Table 10

Rated operational current A	0.1, 0.2, 0.3, 0.4, 0.5, 0.7, 1, 2, 3, 4, 5, 6, 7, 8, 10
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5.10 Endurance The endurance shall be as given in Table 11.

Table 11

Classification	Endurance number of operation (10 ⁴)							
Endurance of counting	100,	200,	500,	1000,	2000,	5000,	10000,	20000
Endurance of resetting	1,	2,	5,	10,	20,	50,	100,	200
Endurance of switching part	1,	2,	5,	10,	20,	50,	100	

6. Construction

6.1 Construction in General The counter shall be made of materials of good quality and shall meet the following requirements:

- (1) In the regularly mounted condition as specified, moving parts operate making little noise and smoothly, and the switching part, if provided, operates smoothly and makes perfect electrical contact.