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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Nippon Electric Control Equipment Industries Association (NECA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently, **JIS C 4556:1987** has been replaced with this Standard.

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Electronic counter for industrial use

Introduction

This Japanese Industrial Standard was established in 1987 and firstly revised this time. In the meanwhile, the circumstance of relative standards relating to the electric counter has been globalized, and this Standard has been revised to correspond to this.

The corresponding International Standard has not been established at this point.

1 Scope

This Standard specifies the requirements and the testing methods of the electronic counter (hereafter referred to as "counter") used in the control circuit for industrial use of AC 250 V or under at 50 Hz and/or 60 Hz in frequency, or of DC 250 V or under.

The control circuit for industrial use means the control circuit used for general industries in the environment such as the industrial district, measurement room and laboratory.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For standards with the year indication, only the editions of the indicated year shall be applied and any revisions (including amendments) made thereafter shall not be applied. For those without the indication of the year, the most recent edition (including amendments) shall be applied.

JIS C 0920 *Degrees of protection provided by enclosures (IP Code)*

JIS C 1302 *Insulation resistance testers*

JIS C 2134 *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

JIS C 4003 *Thermal evaluation and classification of electrical insulation*

JIS C 5442 *Test methods of low power electromagnetic relays for industrial control circuits*

JIS C 6950-1 *Information technology equipment — Safety — Part 1 : General requirements*

JIS C 8201-1 *Low-voltage switchgear and controlgear — Part 1 : General rules*

JIS C 60068-1 *Environmental testing Part 1 : General and guidance*

JIS C 60068-2-6 *Environmental testing — Part 2 : Tests — Test Fc : Vibration (si-*

nusoidal)

- JIS C 60068-2-27 *Basic environmental testing procedures Part 2 : Tests, Test Ea and guidance : Shock*
- JIS C 60068-2-78 *Environmental testing — Part 2-78 : Tests — Test Cab : Damp heat, steady state*
- JIS C 60664-1 *Insulation coordination for equipment within low-voltage systems — Part 1 : Principles, requirements and tests*
- JIS C 60695-2-10 *Fire hazard testing — Glow-wire apparatus and common test procedure*
- JIS C 60695-2-11 *Fire hazard testing — Glow-wire flammability test method for end-products*
- JIS C 60695-2-12 *Fire hazard testing — Glow-wire flammability test method for materials*
- JIS C 60695-2-13 *Fire hazard testing — Glow-wire ignitability test method for materials*
- JIS C 61000-4-2 *Electromagnetic compatibility (EMC) — Part 4 : Testing and measurement techniques — Section 2 : Electrostatic discharge immunity test*
- JIS C 61000-4-3 *Electromagnetic compatibility (EMC) — Part 4-3 : Testing and measurement techniques — Radiated, radio-frequency, electromagnetic field immunity test*
- JIS C 61000-4-4 *Electromagnetic compatibility (EMC) — Part 4-4 : Testing and measurement techniques — Electrical fast transient/burst immunity test*
- JIS C 61000-4-5 *Electromagnetic compatibility (EMC) — Part 4-5 : Testing and measurement techniques — Surge immunity test*
- JIS C 61000-4-6 *Electromagnetic compatibility (EMC) — Part 4-6 : Testing and measurement techniques — Immunity to conducted disturbances, induced by radio-frequency fields*
- JIS C 61000-4-8 *Electromagnetic compatibility (EMC) — Part 4 : Testing and measurement techniques — Section 8 : Power-frequency magnetic field immunity test*
- JIS C 61000-4-11 *Electromagnetic compatibility (EMC) — Part 4-11 : Testing and measuring techniques — Voltage dips, short interruptions and voltage variations immunity tests*
- IEC 61554 *Panel mounted equipment — Electrical measuring instruments — Dimensions for panel mounting*
- CISPR 11 *Industrial, scientific and medical (ISM) radio-frequency equipment —*

Electromagnetic disturbance characteristics — Limits and methods of measurement

CISPR 22 *Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement*

3 Terms and definitions

For the purposes of this Standard, the following definitions shall apply.

3.1 electronic counter

counter using the electronic circuit for its counting element

For the electronic counter, there are a preset counter of which the output part is actuated when the count reaches the numerical value set beforehand, and a total counter which does not have the output part.

3.2 rated working voltage of output circuit

voltage used for specifying the electrical durability under the rated working current

3.3 rated working current of output circuit

current used for specifying the electrical durability under the rated working voltage

3.4 rated carry current of output circuit

maximum current continuously applicable to the output part without exceeding the specified limit of temperature rise and without opening/closing the output part

3.5 pulse

wave or waveform of which the amplitude transits from the steady state and continues for a limited time, then returns to the original condition

3.6 making ratio

ratio between H-level time and L-level time or ratio between on-time and off-time of a counting signal

3.7 count

to determine the number of input pulses from outside

3.8 miscount

inconsistency between the input pulse number and the counted number

3.9 maximum counting speed

maximum value of counting speed without miscount at which the output part is securely operated for the preset counter

3.10 reset

to return the counting part and the output part to the state before the initiation of

count

3.11 power source reset

to reset by the break of power source in operation

3.12 external reset

to reset by applying a signal to the terminal for reset

3.13 homogeneous electric field

electric field in which the voltage gradient between poles is constant like the space between two regions of which each radius is larger than the mutual distance

3.14 inhomogeneous electric field

electric field in which the voltage gradient between poles is not constant

3.15 dielectric breakdown

discharge breakdown generated in the solid dielectrics

3.16 flashover

discharge breakdown generated on the surface of dielectrics

3.17 residual voltage

potential difference observed between active output terminals of the counter to which the load current is applied under the specified condition

3.18 leakage current

current that flows the load circuit of a counter in the off-state

3.19 mechanical durability

maximum number of operation times when no load is applied

3.20 electrical durability

maximum number of operations time when load is applied

3.21 output response time

time until the output part is actuated after a count signal is input

4 Ratings and working environment conditions

4.1 Electrical operating conditions

4.1.1 Power source circuit

4.1.1.1 Rated voltage

The recommended value for rated voltage of power source circuit should be as shown in table 1.

Table 1 Recommended value for rated voltage of power source circuit

Unit : V

AC or DC	Rated voltage of power source circuit									
AC	24	42	48	100	110	127	200	220	230	240
DC	12	24	48	60	110	125	220			

4.1.1.2 Permissible voltage range

The permissible voltage range shall be selected from 80 % to 110 %, 85 % to 110 % or 90 % to 110 % of the rated voltage specified in table 1.

4.1.1.3 Rated frequency

The rated frequency of AC power source circuit shall be as shown in table 2.

The permissible variation shall be ± 1 Hz.

Table 2 Rated frequency

Unit : Hz

Rated frequency		
50	60	50/60

4.1.2 Output circuit with contact point

4.1.2.1 Rated working voltage

The recommended value for the rated working voltage of output circuit with contact point should be as shown in table 3.

Table 3 Recommended value for rated working voltage of output circuit with contact point

Unit : V

AC or DC	Rated working voltage of output circuit with contact point									
AC	24	42	48	100	110	127	200	220	230	240
DC	12	24	48	60	110	125	220			

4.1.2.2 Rated working current

The recommended value for the rated working current of output circuit with contact point should be as shown in table 4.

Table 4 Recommended value for rated working current of output circuit with contact point

Unit : A

Rated working current of output circuit with contact point													
0.1	0.2	0.3	0.5	1	2	3	4	5	7	8	10	15	

4.1.2.3 Rated carry current

The recommended value for the rated carry current of output circuit with contact point should be as shown in table 5.

Table 5 Recommended value for rated carry current of output circuit with contact point

Unit : A

Rated carry current of output circuit with contact point													
0.1	0.2	0.3	0.5	1	2	3	4	5	7	8	10	15	

4.1.3 Output circuit without contact point

4.1.3.1 Rated working voltage

The recommended value for the rated working voltage of output circuit without contact point should be as shown in table 6.

Table 6 Recommended value for rated working voltage of output circuit without contact point

Unit : V

AC or DC	Rated working voltage of output circuit without contact point									
AC	24	42	48	100	110	127	200	220	230	240
DC	12	24	48	60	110	125	220			

4.1.3.2 Rated working current

The recommended value for the rated working current of output circuit without contact point should be as shown in table 7.

Table 7 Recommended value for rated working current of output circuit without contact point

Unit : A

Rated working current of output circuit without contact point										
0.005	0.01	0.02	0.03	0.05	0.1	0.2	0.3	0.5	1	

4.1.3.3 Rated carry current

The recommended value for the rated carry current of the output circuit without contact point should be as given in 4.1.3.2.

4.1.4 Counting circuit

4.1.4.1 Counting signal

The preferable counting signal shall be the pulse of making ratio of 1 : 1 as shown in figure 1.

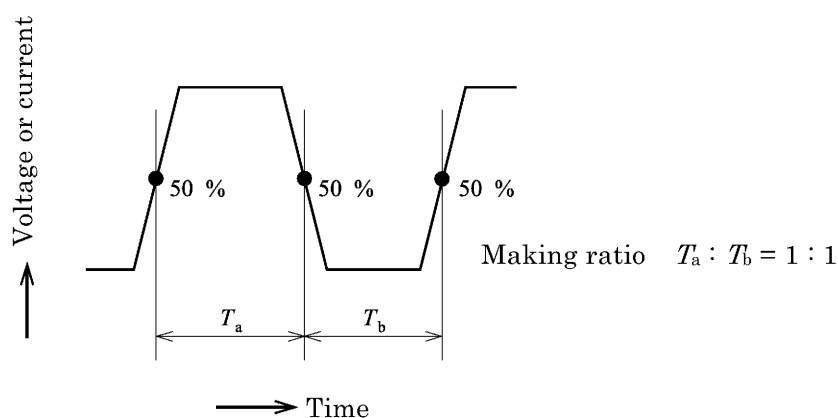


Figure 1 Input waveform of counting signal

4.1.4.2 Type of counting signal

4.1.4.2.1 Voltage input

The recommended value for the voltage input of H level and L level applied between the input terminals should be as shown in table 8.

Table 8 Recommended values for voltage input

Unit : V

	Voltage combination 1	Voltage combination 2
H level	3 to 6	6 to 30
L level	0 to 0.5	0 to 2

4.1.4.2.2 No-voltage input

The specification of no-voltage input shall be the combination A or B shown in table 9.

The values shall be upon the agreement between the parties concerned with delivery.