

JIS

JAPANESE INDUSTRIAL STANDARD

General Rules for Solenoids
(Plunger Type)

JIS C 4552—1984

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General Rules for Solenoids (Plunger Type)

C 4552-1984

1. Scope

This Japanese Industrial Standard specifies general matters for solenoids intended to operate various mechanisms in electric circuit of single phase a.c. 250 V or less at a frequency of 50 Hz or 60 Hz, or of d.c. 150 V or less.

2. Definitions

For the purpose of this standard the following principal definitions shall apply:

- (1) solenoid A plunger-type electromagnet which transforms electromagnetic energy into mechanical motion in such a manner that a current is passed through the exciting coil of a.c. or d.c. so that the moving iron moves.
- (2) self-holding type solenoid Such solenoid that the moving iron is held as stucked fast to the stationary iron by the attraction force of a permanent magnet which is located in its magnetic circuit.
- (3) rated stroke The guaranteed traveling distance of moving iron for a solenoid.
- (4) rated attraction force The minimum attraction force at any stroke up to the rated stroke when the rated voltage is applied.

Applicable Standards:

JIS C 0704-Insulation Test for Control Gear

JIS C 1302-Insulation Resistance Testers (Battery Operated)

JIS C 1502-Sound Level Meters

JIS C 3306-Polyvinyl Chloride Insulated Flexible Cords

JIS C 3316-600 V Grade Polyvinyl Chloride Insulated Wires for Electrical Apparatus

Reference Standards:

JIS C 4553-DC Solenoids for General Purpose

JIS C 4554-AC Solenoids for General Purpose

- (5) rated power consumption The power consumed by the coil while the moving iron is stuck fast to the stationary iron by applying the rated voltage.
- (6) holding current The exciting current when the rated voltage is applied with the moving iron being held as stuck fast to the stationary iron.
- (7) starting current The exciting current when the rated voltage is applied with the moving iron being held at a position corresponding to the rated stroke.
- (8) stationary iron The fixed part of iron core which forms the magnetic circuit of a solenoid.
- (9) moving iron An iron core which is attracted by a stationary iron core. It is also called as a plunger.
- (10) continuous rating The rating of a solenoid at which the solenoid can be used continuously under a specified condition without exceeding a specified temperature rise limit and violating other limitations.
- (11) short-time rating The rating of a solenoid at which the solenoid can be used for a predetermined short time starting from cold state under a specified condition without exceeding a specified temperature rise and violating other limitations.
- (12) holding force The maximum mechanical load at which the moving iron does not separate from the stationary iron while the rated voltage being applied (for self-holding type, after the current has been interrupted) with the said both irons are stuck fast each other.
- (13) residual attraction The attraction caused by residual magnetism remaining after the current has been interrupted at such state that the moving iron is stuck fast to the stationary iron by applying the rated voltage.
- (14) operating frequency The maximum operating frequencies per 1 min, at which a solenoid can operate repeatedly and consecutively within an extent not to exceed the specified temperature rise limit.

3. Standard Service Condition and Power Source

3.1 Standard Service Condition The standard service condition shall be as follows:

(1) Ambient Temperature

For solenoid of indoor use: -5 to 40°C Provided that the solenoid does not freeze.

For solenoid of outdoor use: -20 to 40°C Provided that the solenoid does not freeze.