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JIS

# JAPANESE INDUSTRIAL STANDARD

# Insulation resistance testers

## JIS C 1302-1994

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In the event of any doubt arising,
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# Insulation resistance testers C 1302-1994

1. Scope This Japanese Industrial Standard specifies portable direct-reading insulation resistance testers of pointer type and digital type with a rated measuring voltage not exceeding 1000 V incorporating batteries therein (hereafter referred to as "insulation resistance testers").

Remarks: The following standards are cited in this Standard:

JIS C 0911 Vibration testing procedure for electric machines and equipment

JIS C 0912 Shock testing procedure for electric machines and equipment

2. Definitions For the purpose of this Standard, the following definitions apply:

(1) measuring terminal voltage The voltage between line terminal and earth terminal (hereafter the both terminals are called "measuring terminals").

(2) rated measuring voltage This means the voltage intended to be supplied by an insulation resistance tester. The nominal value is indicated on the insulation resistance tester.

(3) no-load voltage The voltage across measuring terminals when the terminals are opened.

(4) rated measuring current The current at which an insulation resistance tester can supply the rated measuring voltage.

(5) short-circuit current The current which flows through the measuring terminals when they are short-circuited.

(6) effective maximum indication The maximum indication within an extent where the accuracy of an insulation resistance tester is ensured. This is indicated on the insulation resistance tester.

(7) effective measuring range That part of measuring range within which the accuracy stated in this Standard is guaranteed. In pointer type testers, the range of resistance values from $\frac{1}{1000}$ to a scale value of 1, 2, 5 or an integral power of 10 multiple thereof near $\frac{1}{2}$ of the effective maximum indication is called the first effective measuring range, and the range of resistance values over the above to the effective maximum indication and indications close to zero are called the second effective measuring range (refer to Attached Fig. 1). In digital type testers, this is the ranges stated as "first effective measuring range" and "second effective measuring range" in the insulation resistance tester.

(8) central indication The indication nearly at the center of the scale with a resistance value of 1, 2, 5 or an integral power of 10 multiple thereof, and approximately equal to $\frac{1}{50}$ of the effective maximum indication (for pointer types, refer to Attached Fig. 1).

(9) scale spacing Spacing between the centers of adjacent scale marks in pointer type testers. In a scale of arc form, the spacing on the arc which passes the center of the shortest scale marks.

(10) scale length The length between the scale marks at both ends measured along the scale in pointer type testers. In a scale of arc form, it is measured as the length of arc which passes the centers of the shortest marks.

In the case of multi-scale instruments, it is expressed as the length of the longest scale among the scales.

(11) effective range of battery The voltage range of accommodated batteries at which the performances of the insulation resistance tester are satisfactory.

## 3. Classification

3.1 Classification by type of display Insulation resistance testers are classified into pointer type and digital type according to types of display.

3.2 Classification by rated measuring voltage and effective maximum indication Classification by rated measuring voltage and effective maximum indication shall be as shown in Table 1 or Table 2. Multi-rated testers shall have combination of the rated measuring voltages given in Table 1 or Table 2.

Table 1. Classification of pointer type testers

| Rated measuring voltage (d.c.) V | 25 | | 50 | | 100 | | 125 | | 250 | | 500 | | | 1 000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective maximum indication MΩ | 5 | 10 | 5 | 10 | 10 | 20 | 10 | 20 | 20 | 50 | 50 | 100 | 1 000 | 200 | 2 000 |

Table 2. Classification of digital type testers

| Rated measuring voltage (d.c.) V | 25 | | 50 | | 100 | | 125 | | 250 | | 500 | | 1 000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective maximum indication MΩ | 1 | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 500 | 1 000 | 2 000 | 3 000 | 4 000 | |

## 4. Performances

4.1 Tolerance and allowable range The tolerance and allowable range of insulation resistance testers shall be as stated below when the deviations are checked in accordance with the methods of 6.2.

(1) Tolerance on resistance measurement The tolerances on resistance measurement shall be ± 5 % in the first effective measuring range, and ± 10 % in the second effective measuring range. For insulation resistance testers with a tolerance less than ± 5 %, the tolerance shall be marked on the body or in the performance table.