

HOT LINE COIL RESISTANCE & TEMPERATURE METER DAC-HRT-1



DAC-HRT-1 is designed for temperature rise tests of motors, transformers, coils, chokes and etc, under energizing AC voltage. The direct reading of resistance is possible with 4-terminals measurement method, and temperature is automatically calculated from measured resistance values and displayed.

Features

- Automatic Test with PC through RS 232C interface.
- Temperature rise test of coil winding under energizing AC Voltage Max 450V.^(*)
(*) AC Max 700V (sine wave) is available by using an optional adaptor.
- By connecting an optional temperature sensor, ambient temperature is automatically taken in.
- By using an optional selection control box, test channels can be changed automatically, and a sequential measurement of max 10 different objects or test points is possible with DAC-HRT-1.
- By using an optional thermal printer kit, print-out of measured values and temperature conversion values is possible. Also, print-out every given time is available with an interval mode.
- In accordance with JIS 5311 : Testing methods of power transformers for electronic equipment.

Test Specimen

Motors, Transformers, Coils, Chokes and etc.

DAC-HRT-1

HOT LINE COIL RESISTANCE & TEMPERATURE METER

Specifications

- AC Voltmeter : 0-500V (rms)
- Measuring range :
 - 20Ω Range : 0-40.000Ω (50mA dc/0.1W)*
 - 200Ω Range : 20.00-400.00Ω (5mA dc/0.1W)*
 - 2000Ω Range : 200.0-4000.0Ω (500μ A dc/0.1mW)*
 - 20000Ω Range : 2000-40000Ω (50μ A dc/0.1mW)*
- *Testing currents applied to specimen and maximum in wattage.
- Measurement accuracy: ±(0.05%F.S. + 2digits)

- Testing Voltage : AC450V max (50/60Hz)
- Measuring Input Impedance : 200kΩ or more (50/60Hz)
- Minimum Resolution : 1mΩ (20Ω range)
- Interface : RS232C, GP-IB
- Power Source : AC100V-240V±10% 50/60Hz
- Dimensions : W430×H150×D385mm Approx. 18kg
- Option :
 - Temperature Sensor DAC-PT-100
 - Selection Control Box DAC-SCB-2
 - Thermal Printer
 - DC Blocking Capacitors
 - (Capacitor 2A, 7A, 23A, 45A, C-box for single phase/3-phase)
 - Voltage adaptor Model DAC-HVA-3, to apply AC Max 700V

Conversion to temperature

A relationship between electrical resistance and temperature can be expressed as follows.

$$R_t = R_{t_0} \{1 + \alpha_{t_0}(t - t_0)\}$$

R_t = Electrical resistance at $t^\circ\text{C}$

α_{t_0} = Temperature coefficient at $t_0^\circ\text{C}$

R_{t_0} = Electrical resistance at $t_0^\circ\text{C}$

Using the above relationship, temperature can be calculated from the difference in electrical resistance.

Usually, $1/\alpha_0 = 234.5$, where α_0 is the temperature coefficient at 0°C , is used for the conversion to temperature as described in the following formula.

$$t_c = \frac{R_t - R_{t_0}}{R_{t_0}}(234.5 + t_0) + t_0$$

$$\Delta t = t_0 - t_c$$

t_c = Converted temperature (T_c)

Δt = Temperature rise (ΔT)

R_t = Measured electrical resistance (R)

R_{t_0} = Initial resistance (R_0)

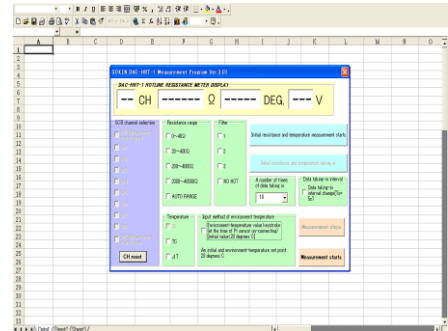
t_0 = Initial temperature (T_0)

Temperature conversion of metal other than copper is also possible by changing the coefficient value.

Auto Calculation Free Software

By using the Software, Measuring Time, Resistance, and Temperature data are saved and displayed in an Excel sheet.

When using the optional DAC-PT100 temperature sensor, an initial temperature is to be read automatically. Also, when using DAC-SCB-2 selection control box, SCB channels can be selected through PC. Time Interval set-up is also possible.



DC Blocking Capacitor

DC Blocking Capacitor must be required for measurement with DAC-HRT-1, so that testing current may not flow into AC line. An appropriate Capacitor must be selected in accordance with testing current, and inserted between the power supply and the specimen.



DC Blocking Capacitor

Option Accessories

■ DC Cut Capacitor Box [Model DAC-CHR-1B](#)

DAC-CHR-1B is one of option Capacitor Boxes which can use by simple connection. Select an appropriate capacitor range in accordance with testing current.

- Built-in Capacitor : Electrolytic Capacitor
- Maximum-allowed-current value : 470 μ F...2A, 4,700 μ F...7A, 47,000 μ F...23A (one-each built in, with protection diode and arrestor)
- Size & weight : W210xH133xD160(mm) Approx. 3kg



Model DAC-CHR-1B

Optional Capacitors for single phase, 3-phase, and large current specification etc, are also available.

■ Thermal Printer

It is possible to print out measured values and temperature conversion values by connecting the printer directly with DAC-HRE-1.

Print-out every given time is available with an interval mode.

- Size & weight W93xH70xD125(mm) Approx. 265g



Thermal Printer

DAC-HRT-1

HOT LINE COIL RESISTANCE & TEMPERATURE METER

■ Temperature Sensor Model DAC-PT-100

Ambient temperature is automatically taken in by connecting the sensor with DAC-HRT-1.

- Temperature measuring range: -50 to 150 °C
- Accuracy : ± 0.5 °C
- Connector type : R05-P6F



■ Selection Control Box Model DAC-SCB-2

By combining DAC-SCB-2 with DAC-HRT-1, a sequential test of max 10 different specimens or test points is available. The initial resistance and initial temperature (ambient temperature) of all selected channels are taken in automatically, and measured value is displayed one by one. By using free software of DAC-HRT-1, those data of each specimen are saved and displayed in an Excel sheet.

- The number of channels : 10 channels
- Testing Power Capacity : AC250V 15A or 450V 10A
- Power Source : AC100V/200V $\pm 10\%$ 50/60Hz
- Size & Weight : W430xH200xD385mm
Approx. 16kg



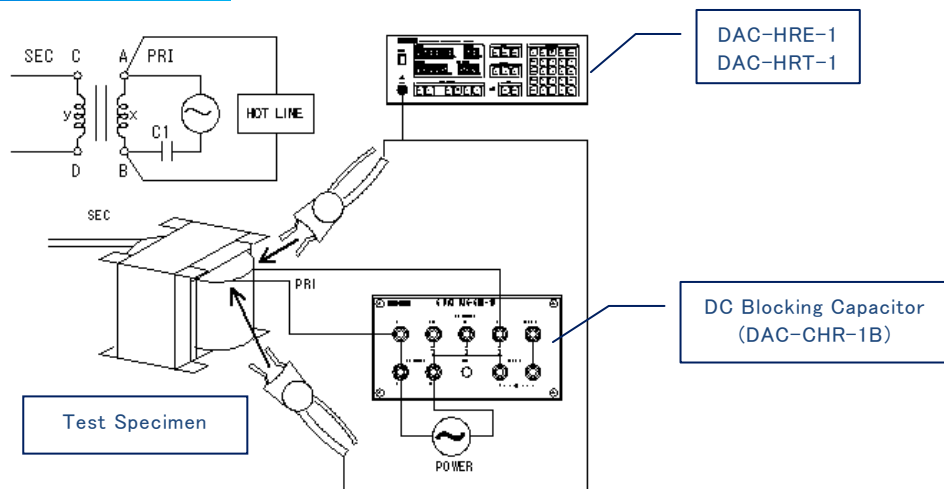
■ Voltage Adaptor Model DAC-HVA-3

By using the optional adaptor, measurement of test voltage at 450 VAC or more is available with Hot Line Measuring Instrument Model DAC-HRE-1/DAC-HRT-1.

- Max test voltage :700VAC (Sine Wave)
- Size & weight :W430xH200xD385(mm)
Approx. 35kg



Connection Diagram



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