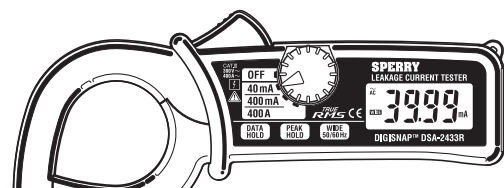


OPERATING INSTRUCTIONS



TRUE RMS

DIGITAL LEAKAGE CURRENT TESTER

DSA-2433R

A.W. SPERRY INSTRUMENTS INC. The Professional's Choice®

1. SAFETY WARNINGS

This instrument has been designed and tested according to IEC Publication 61010: Safety Requirements for Electronic Measuring Apparatus.

WARNING

- Read through and understand instructions contained in this manual before starting using the instrument.
Save and keep the manual handy to enable quick reference whenever necessary.
Be sure to use the instrument only in its intended applications and to follow measurement procedures described in the manual.
Be sure to understand and follow all safety instructions contained in the manual.

Not following the above instructions may cause injury, instrument damage and/or damage to equipment under test.

The symbol Δ indicated on the instrument means that the user must refer to related parts of the manual for safe operation of the instrument.

- Δ DANGER is reserved for conditions and actions that are likely to cause serious or fatal injury.
Δ WARNING is reserved for conditions and actions that can cause serious or fatal injury.
Δ CAUTION is reserved for conditions and actions that can cause minor injury or instrument damage.

Following symbols are used on the instrument and in the instruction manual. Attention should be paid to each symbol to ensure your safety.

- Refer to the instructions in the manual.
This symbol is marked where the user must refer to the instruction manual so as not to cause personal injury or instrument damage.
Indicates an instrument with double or reinforced insulation.
Indicates that this instrument can clamp on bare conductors when measuring a voltage corresponding to the applicable Measurement category, which is marked next to this symbol.
Indicates AC (Alternating Current).

Δ DANGER

- Never make measurement on a circuit having potential of 300VAC or greater.
Do not attempt to make measurement in the presence of flammable gases.
The transformer jaws are made of metal and their tips are not completely insulated.
Never attempt to use the instrument if its surface or your hand is wet.
Do not exceed the maximum allowable input of any measurement range.
Never open the battery compartment cover when making measurements.
Never fry to make measurement if any abnormal conditions, such as broken Transformer jaws or case is noted.
The instrument is to be used only in its intended applications or conditions.

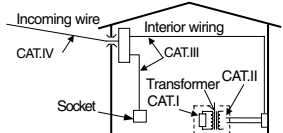
Δ WARNING

- Never attempt to make any measurement, if any abnormal conditions are noted, such as broken case, cracked test leads and exposed metal parts.
Do not install substitute parts or make any modification to the instrument.
Do not try to replace the batteries if the surface of the instrument is wet.
Always switch off the instrument before opening the battery compartment cover for battery replacement.

Δ CAUTION

- Make sure that the range selector switch is set to an appropriate position before making measurement.
Do not expose the instrument to the direct sun, extreme temperatures or dew fall.
Be sure to set the range selector switch to the "OFF" position after use.
Always use a damp cloth and detergent for cleaning the instrument.
Do not use abrasives or solvents.

Measurement categories (Over-voltage categories)
To ensure safe operation of measuring instruments, IEC61010 establishes safety standards for various electrical environments, categorized as CAT I to CAT IV, and called measurement categories.



- (1) Set the Range Selector Switch to the desired position.
(2) Normal measurement (See Fig.1,2): Press the jaw trigger to open the transformer jaws and close them over one conductor only.
(3) Measuring out of balance leakage current (See Fig. 3): Clamp onto all conductors except a grounded wire.

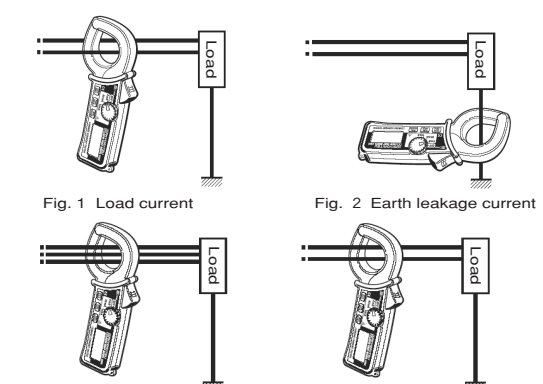


Fig. 3 Measuring out of balance leakage current

6-2 How to Use Frequency Selector Button

When high frequencies from such equipment as inverters are present in the circuit under test, the instrument measures AC current of not only 50Hz or 60Hz of fundamental frequency but also of these high frequencies and harmonics.

To eliminate the effect of such high frequency noise and measure AC current of 50Hz or 60Hz of fundamental frequency, a "high-cut" filter circuit is incorporated into the instrument which works when "50/60Hz" frequency response is selected with the Frequency Selector Button.

When the Frequency Selector Button is pressed, "50/60Hz" mark is shown on the left side of the display. When the Frequency Selector Button is pressed again, frequency response is switched to WIDE with "WIDE" mark shown on the display.

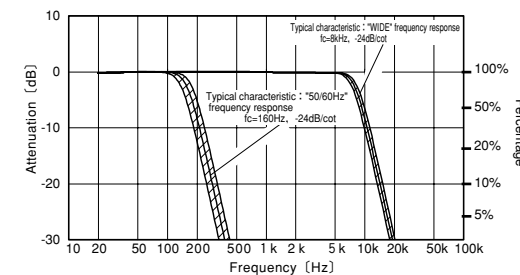


Fig.4 KEW SNAP 2433R Frequency Characteristic

Note: Characteristic of -24dB/octave means that signal magnitude declines to about one sixteenth of that at the initial frequency when frequency doubles.

- WIDE (20Hz - approx. 8 kHz): Permits measurement of currents of fundamental frequencies as well as currents of high frequencies generated by such equipment as inverters.
50/60Hz (20-approx.160Hz): Filters out high frequency currents and measures current of fundamental frequency only.

Recently there has been increased use of power through inverters, switching regulators, etc. When the high frequency noise from such appliances leaks or flows into the ground through capacitors not filtering completely, the earth leakage breaker may trip even though there is no "actual" leakage.

Take current readings with the 50/60Hz and WIDE frequency responses respectively to make effective use of the Frequency Selector Button.

6-3 Peak Current Measurement

- (1) Set the Range Selector Switch to the desired position.
(2) Select "WIDE" or "50/60Hz" with the Frequency Selector Button.
(3) With the transformer jaws clamped onto the conductor under test, press the Peak Hold Button to set the instrument to the peak measurement mode.

2. FEATURES

- Digital clamp tester for AC leakage measurement.
Accurate true-RMS reading of AC current with distorted waveform.
Least affected by external magnetic field, providing wide measuring range from very small to large currents.
Designed to safety standard IEC 61010-2-032: over-voltage category CAT. III, 300V and pollution degree 2.
Tear drop shaped jaws for ease of use in crowded cable areas and other tight places.
Data hold function to allow for easy readings in dimly lit or hard-to-reach locations.
Provides filtering function to remove high frequency generated by such equipment as inverters.
Peak hold function to allow for measurement of current variation as short as 10msec.
Auto-power-off function prevents unnecessary power consumption.
Dynamic range of 4200 counts full scale.
Large easy-to-read LCD display with letter height of 13mm.
Operation confirming beeps.
Insulation barrier at the tip of transformer jaws for improved safety.

3. SPECIFICATIONS

Table with 3 columns: Range, Resolution, Accuracy. Rows for 40mA, 400mA, and 400A ranges.

- CF(Crest factor) ≤3(45~65Hz, less than 600A Peak)
Counts equal to or less than 3 counts are corrected to zero.
Accuracy-insured Frequency range of 50/60Hz mode is 50/60Hz.

Conversion method: Rms value detection
Operativity-insured: Sequential comparison
Display: Liquid crystal display with maximum reading of 4200

- Low battery warning: "BAT" mark appears on the display
Overrange indication: "OL" appears on the display when upper limit of measuring range is exceeded
Response Time: Approx. 2 seconds
Sample Rate: Approx. 2.5 times per second
Accuracy-insured: 25°C ±5°C, relative humidity 85% or less (without condensation)
Temperature and Humidity Ranges: 0-40°C, relative humidity 85% or less (without condensation)
Operating Temperature and Humidity Ranges: 2000m or less above sea level (indoor use)
Storage Temperature and Humidity Ranges: -20-60°C, relative humidity 85% or less (without condensation)
Operable altitude: Two 1.5V R03 (AAA) batteries
Power Source: Approx. 21mA
Current Consumption: Approx. 24 hours
Auto-power-off Function: Turns power off about 10 minutes after the last switch operation

- (4) The display reads 1/2 of the peak current value.
(5) After peak measurement, press the Peak Hold Button to return to the normal measurement mode.
Note: When leakage current is measured in the peak measurement mode, the reading may change if the transformer jaws are opened and closed.

7. OTHER FUNCTIONS

7-1 Auto-Power-Off Function

This is a function to prevent the instrument from being left powered on and conserve battery power. The instrument automatically turns off about 10 minutes after the last switch or button operation.

7-2 Date Hold Function

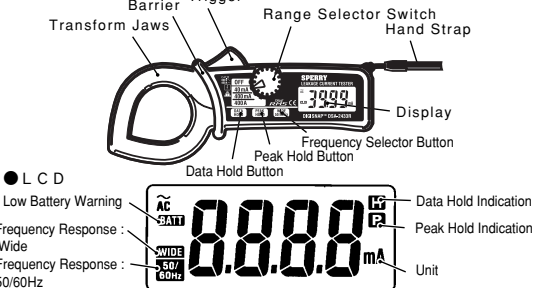
This is a function to freeze the readings on the display. When the Data Hold Button is pressed once, the current reading is held even though current under test varies.

- Safety Standard: IEC 61010-1, IEC 61010-2-032, EMC, EN61326, EN55022, EN61000-4-2, EN61000-4-3.
Overload Protection: 370VACrms (50/60Hz) for 1 minute between metal part of transformer jaws and housing case.
Insulation Resistance: 480AAC max. for 10 seconds.
Conductor Size: Approx. 40mm in diameter max.
Dimensions: 165(L) x 81(W) x 32(D)mm.
Weight: Approx. 270g including batteries.
Accessories: Two R03 (AAA) batteries, Carrying case, Instruction manual.

Reference

Effective Value (RMS)
Most alternating currents and voltages are expressed in effective values, which are also referred to as RMS (Root-Mean-Square) values.
The effective value is the square root of the average of square of alternating current or voltage values.

4. INSTRUMENT LAYOUT



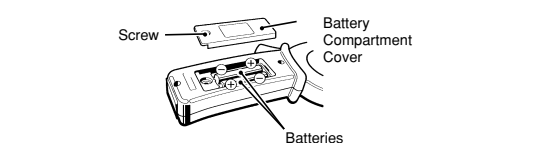
- Low Battery Warning: "BAT" mark appears on the display
Frequency Response: Wide (50/60Hz)

8. BATTERY REPLACEMENT

WARNING
In order to avoid possible shock hazard, always set the Range Selector Switch to the OFF position before trying to replace the batteries.

CAUTION
Do not mix new and old batteries.
Install batteries in the orientation as shown inside the battery compartment, observing correct polarity.

- When the battery voltage warning mark "BATT" is shown on the top left corner of the LCD, replace the batteries.
(1) Set the Range Selector Switch to "OFF."
(2) Loosen the battery-compartment-cover-fixing screw on the lower back of the instrument.
(3) Replace the batteries with two new R03 (AAA) 1.5V batteries.
(4) Put the battery compartment cover back in place and tighten the screw.
Note: For use for a long period of time, use alkaline batteries (LR03).



5. PREPARATIONS FOR MEASUREMENT

5-1 Checking Battery Voltage
Set the Range Selector Switch to any position other than the OFF position. If the marks on the display is clearly visible without "BATT" mark showing, battery voltage is OK.

NOTE
When the instrument is left powered on, the auto-power-off function automatically shut the power off. The display blanks even if the Range Selector Switch is set to a position other than the OFF position in this state.

5-2 Checking Switch Setting
Make sure that the Range Selector Switch is set to the appropriate range. Also make sure that data hold function is not enabled.

6. OPERATING INSTRUCTIONS

6-1 Current Measurement

- In order to avoid possible shock hazard, never make measurement on circuits having a potential of 300VAC or greater.
The transformer jaws are made of metal and their tips are not completely insulated.
Never make measurement with the battery compartment cover removed.
When measuring current is 300A or more (400Hz or more), be sure to stop measuring within 5 minutes.

Δ CAUTION

- Take sufficient care to not to apply shock, vibration or excessive force to the jaw tips.
When a foreign substance is stuck in the jaw tips or they cannot properly engage, the transformer jaws do not fully close.
The maximum size of a conductor to be tested is 40mm in diameter.
When measuring large current, the transformer jaws may buzz.
This has no effect on the instrument's performance or safety.
Sensitive transformer jaws are used for Leakage clamp meter.
Because of the characteristics of transformer jaws which can be opened and closed, it is impossible to eliminate the interference of external magnetic field completely.

Lifetime Limited Warranty

The attention to detail of this fine snap-around instrument is further enhanced by the application of A.W. Sperry's unmatched service and concern for detail and reliability.

Replacement procedure

Securely wrap the instrument and its accessories in a box or mailing bag and ship prepaid to the address below. Be sure to include your name and address, as well as the name of the distributor, with a copy of your invoice from whom the unit was purchased.

A.W.SPERRY INSTRUMENTS INC.
ATT: Customer service dept.
2150 Joshua's Path, Suite 302,
Hauppauge, NY 11788

The warranty is not applicable if the instrument has been: misused, abused, subjected to loads in excess of specifications, has had unauthorized repair or has been improperly assembled or used.

*Note: Recommended calibration interval should not exceed one year. Calibration service charges are not covered terms and conditions of warranty.

A.W. SPERRY INSTRUMENTS INC.
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