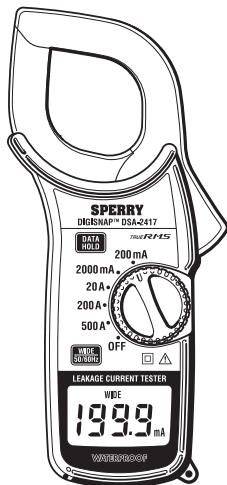


7/05

FORM#352

OPERATING INSTRUCTIONS



ALL WEATHER DIGITAL LEAKAGE CURRENT TESTER

DSA-2417


A.W. SPERRY INSTRUMENTS INC.

The Professional's Choice®

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1. Safety Warnings

- This instruction manual contains warnings and safety rules which must be observed by the user to ensure safe operation of the instrument and retain it in safe condition. Therefore, read these operating instructions thoroughly and completely before using the instrument.
- The symbol  on the instrument means that the user must refer to the relevant section of this instruction manual for safe operation of the instrument.
- Pay particular attention to all WARNINGS and CAUTIONS in this instruction manual. WARNING indicates warnings to avoid electrical shock and CAUTION indicates cautions to avoid damage to the instrument.

- 1. Do not open the battery compartment cover when making measurements.**
- 2. Always inspect your instrument and accessories for any sign of damage or abnormality before every use. If any abnormal conditions exist (eg. cracked cases, display not reading, etc.), do not attempt to carry out any measurements.**
- 3. Never ground yourself when conducting electrical tests. Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, shoes, rubber mats, or any approved insulating material.**
- 4. Never make measurements on a circuit above 600V AC.**
- 5. Never exceed the maximum allowable input of any function when making measurements.**
- 6. Always set the Power/Frequency Selector Switch to the OFF position after use.**
- 7. The transformer jaws are made of metal and their tips are not insulated. Be especially careful about the hazard of possible shorting where the equipment under test has exposed metal parts.**

- 8. Do not make measurements in an explosive atmosphere (i.e. in the presence of flammable gasses or fumes, vapor or dust).**
- 9. Calibration and repair of any instrument should only be performed by qualified and trained service technicians. Do not attempt calibration or service unless another person capable of rendering first aid and resuscitation is present.**
- 10. Do not install substitute parts or perform any unauthorized modification of the instrument. Return the instrument to your distributor or authorized service center for service and repair to insure that safety features are maintained.**
- 11. The instrument must be used by a competent, trained person and operated in strict accordance with the instructions. A.W.Sperry Instruments Inc. will not accept liability for any damage or injury caused by misuse or noncompliance with the instructions or safety procedures. It is essential to read and understand the safety rules contained in the instructions. They must be observed when using the instrument.**
- 12. Do not expose the instrument to the direct sun, extreme temperature of more than 50°C or dew fall.**
- 13. When not in use for a long period of time, place the instrument in storage after removing the batteries from it.**
- 14. Use a damp cloth and detergent for cleaning the case of the instrument. Do not use abrasives or solvents.**

2. Features

- DSA-2417 offers True RMS measurement capability.
- Designed for measurements of AC leakage and AC current with five ranges from 200mA to 500A. AC 200mA range provides a high resolution of 0.1mA.
- Least affected by external magnetic field.
- Provides dual frequency responses of fundamental 50/60 Hz only or up to 1 kHz. The frequency response of up to 1 kHz permits measurements of current with harmonics superimposed on the fundamental frequency. High frequency current from appliances such as inverters, switching regulators etc. can therefore be measured.
- Data hold function to allow for easy readings in dimly lit or hard-to-reach locations.
- Large easy-to-read LCD display
- Automatic power off within 30 minutes to conserve battery life.
- Designed to international safety standard(IEC348).

3. SPECIFICATIONS

• AC current ranges

at $23 \pm 10^\circ\text{C}$, 85% relative humidity

Ranges		Accuracy	
		Frequency Selector Switch	
		WIDE(40Hz ~ 1kHz)position	50/60Hz position
200mA	0-199.9mA	$\pm 1.0\% \text{ rdg} \pm 4 \text{ dgt}$ (50/60Hz)	$\pm 1.5\% \text{ rdg} \pm 6 \text{ dgt}$
2000mA	0-1999mA	$\pm 3.0\% \text{ rdg} \pm 4 \text{ dgt}$ (40Hz ~ 1kHz)	
20A	0-19.99A	$\pm 1.5\% \text{ rdg} \pm 4 \text{ dgt}$ (50/60Hz)	$\pm 2.0\% \text{ rdg} \pm 6 \text{ dgt}$
200A	0-199.9A	$\pm 3.5\% \text{ rdg} \pm 4 \text{ dgt}$ (40Hz ~ 1kHz)	
500A	0-500A	$\pm 2.0\% \text{ rdg} \pm 4 \text{ dgt}$ (50/60Hz) $\pm 4.0\% \text{ rdg} \pm 4 \text{ dgt}$ (40Hz ~ 1kHz)	$\pm 2.5\% \text{ rdg} \pm 6 \text{ dgt}$

Operating System: Dual Integration

Sensing: True RMS sensing

Digital Display: 3-1/2 digit liquid crystal display with maximum reading of 1999

Overrange Indication: Numeral "1" on the highest digit flashes

Response Time: Approx.2 second

Sample Rate: Approx. three times per second

Data Hold: For all ranges. In Data Hold mode, "H" symbol is displayed on the digital display

Low Battery Indicator: "B" symbol is displayed on the digital display.

Storage Temperature and Humidity: $-10^\circ\text{C} \sim 50^\circ\text{C}$ at 75% max. relative humidity without condensing

Operating Temperature: $0 \sim 40^\circ\text{C}$

Power Source: one 6F22(DC9V) battery or equivalent

Current Consumption: Approx. 4 mA

Auto Power Off: Automatically turns power off in approx. 30minutes after the instrument is powered

Insulation Resistance:	10M Ω min. at 1000V between electrical circuit and housing case, and electrical circuit and transformer jaws
Withstand Voltage:	3700V AC for 1 minute between electrical circuit and housing case as well as electrical circuit and transformer jaws
Conductor Size:	Approx. 40 mm diameter max.
Dimensions:	209(L) \times 96(W) \times 45(D)mm
Weight:	450g approx. (battery included)
Accessories:	6F22 battery Carrying Case Instruction manual

4. INSTRUMENT LAYOUT

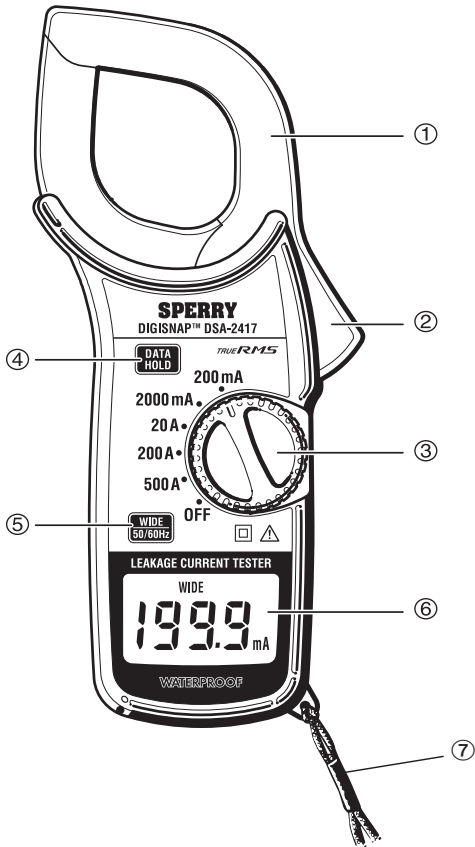


Fig.1

① **Transformer Jaws**

Pick up current flowing through the conductor.

② **Jaw Trigger**

Operates the transformer jaws. Press to open them.

③ **Power/Range Switch**

Selects ranges. Also, turns power on. Always turn the switch to off after use.

④ **Data Hold Push Button**

Push to freeze a reading and push again to release it. In Data Hold mode, "H" is displayed on the digital display.

⑤ **Frequency Selector Switch**

Selects frequency response of 50/60Hz or up to 1kHz WIDE.

⑥ **Digital Display**

Function symbols and decimal point are displayed according to the Range Switch position.

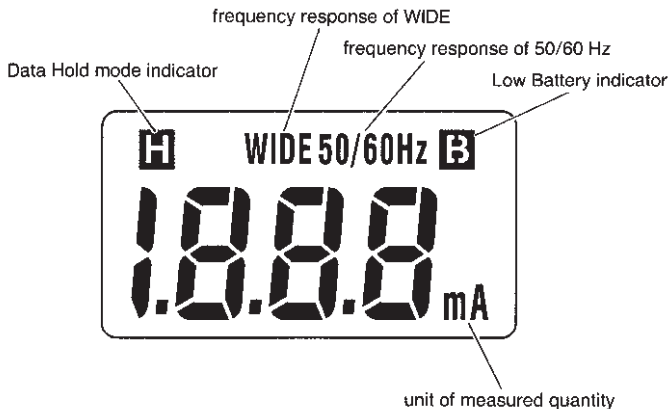


Fig.2

⑦ **Safety Hand Strap**

5. PREPARATIONS FOR TESTS

 **WARNING**

Always inspect your instrument and accessories for any sign of damage or abnormality before every use. If any abnormal conditions exist (eg. cracked cases, display not reading, etc.), do not attempt to conduct any tests.

5-1 Battery Check

To check the battery voltage set the Power/Range Selector Switch to OFF position. If the display is clear without symbol “B” showing, battery voltage is OK. If the display blanks or “B” is indicated, replace the battery according to section 7 for Battery replacement.

NOTE

The instrument automatically turns power off approximately 30 minutes after it is turned on. Therefore the display may be blank with the Power/Range Selector Switch set to On position. To operate the instrument, set the switch back to OFF position and then ON position.

5-2 Data Hold Switchn

If the Data Hold Switch is pressed in (DATA HOLD mode), Press to release it. Otherwise, the display remains frozen. When the instrument is in DATA HOLA mode, “H” symbol is indicated on the display.

6. OPERATING INSTRUCTIONS

6-1 Current Measurements

 **WARNING**

- Do not make measurements where the potential is greater than 600V AC. This may cause shock hazard and damage to the instrument or equipment under test.
- The Transformer Jaws are made of metal and their tips are not insulated. Be especially careful about the hazard of possible shorting where the equipment under test exposed metal parts.
- Do not open the battery compartment cover when making measurements.

 **CAUTION**

- Take sufficient care to avoid shock, vibration or excessive force when handling the instrument. Otherwise, precisely adjusted Transformer Jaws will be damaged.
- When Transformer Jaws do not fully close, never try to close them by force, but make them free to move and try again. If a foreign substance is stuck in the jaw tips, remove it. If the jaw tips have been deformed, correct so that each tip is properly aligned. Otherwise, the jaws will be damaged and warranty may not cover the repair cost.

NOTE

- When making current measurements, keep the Transformer Jaws fully closed. Otherwise, accurate measurements cannot be taken. Maximum conductor size is 40mm in diameter.
- When measuring larger current, the Transformer Jaws may buzz. This is not a fault and does not affect the accuracy either.

- (1) Set the Range Switch to the desired “A” or “mA” position.
- (2) Select the desired frequency response, WIDO or 50/60 Hz, with the Frequency Selector Switch. (see section 6-2 for Frequency Selector Switch)
- (3) Press the Trigger to open the Transformer Jaws and clamp onto conductor or conductors as shown in Fig.3. Take the reading on the a display . (This method also permits measurements of leakage current flowing through earthing conductors and very small current.)

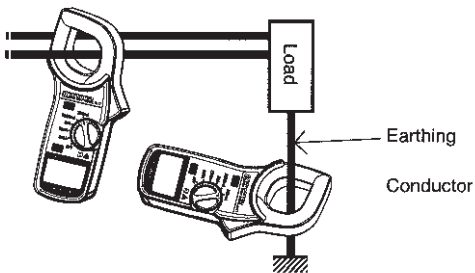


Fig.3

CAUTION

Do not exceed maximum allowable current on each current range. (see section 3 for Specifications)

NOTE

- For more accurate measurements, place the conductor at the center of the closed jaws.
- When measuring current on a line or a grounded wire, clamp onto one conductor only.

(4) When measuring out of balance leakage current, clamp onto all conductors except a grounded wire as shown in Fig. 4.

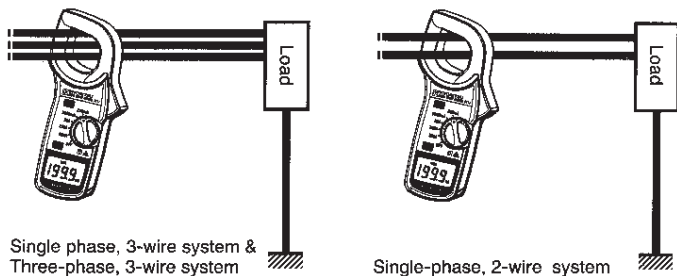


Fig.4

6-2 Frequency Selector Switch

Model 2417 measures AC currents of:

- (1) 50/60 Hz fundamental frequency only with the Frequency Selector Switch set to the 50/60 Hz position("50/60Hz" is indicated on the display), or
- (2) 40Hz to 1kHz with the Frequency Selector Switch set to the WIDE position("WIDE" is indicated on the display)

Frequency response of 40 Hz to 1 kHz permits measurements of current with harmonics superimposed on the fundamental frequency. High frequency current from appliances such as inverters, switching regulators etc. can therefore be measured.

NOTE

- **DSA-2417 has a very good frequency response due to the electrical property of the transformer jaws used for the instruments. Therefore, it measures AC current of not only 50 Hz or 60 Hz fundamental wave form but also of higher frequencies and harmonics superimposed on the fundamental frequency when present in the circuit under test. To eliminate the effect of noise from the high frequency and measure AC current of 50Hz or 60Hz fundamental frequency, a filter circuit is incorporated into DSA-2417 which works when the frequency selector switch is set to the 50/60Hz position. It is designed to attenuate frequencies starting from around 100Hz with an attenuation characteristic of approx. -24dB/octave (signal strength declines to one sixteenth of that at the initial frequency when it doubled). Recently there has been increased usage 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 not trip. In such a case the instruments may not give current readings with the frequency selector switch at the 50/60 Hz position. Therefore, it is necessary to make current measurements with the switch at the "WIDE" position. When in doubt as to the presence of high frequencies and harmonics that affect AC current measurements, take current readings with the switch at the 50/60Hz and "WIDE" positions respectively and then compare the results obtained.**

6-3 Data Hold

Push the Data Hold Switch Button to freeze the reading. “H” symbol is displayed on the digital display to indicate that the instrument is in Data Hold mode.

Push the button again to exit from Data Hold mode.

6-4 Automatic Power Off

DSA-2417 automatically turns power off in approx. 30 minutes after it is turned on. To operate the instrument, set the Frequency Selector Switch back to OFF position and then ON position.

7. BATTERY REPLACEMENT

7-1 When to replace the battery

- (1)When “B” symbol is displayed on the digital display.
- (2)When the digital display does not read with the Power/Range Selector Switch set to ON position.

7-2 Battery replacement

- (1)Set the Power /Range Selector Switch to OFF position.
- (2)Unscrew and remove the battery compartment cover as shown in Fig. 5.
- (3)Replace the battery with a new 9 V battery type 6F22 or equivalent, observing correct polarity.
- (4)Screw the battery compartment cover.

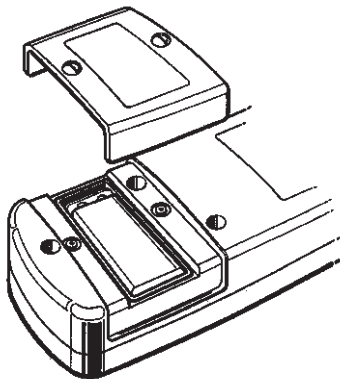


Fig.5

⚠ WARNING

Never replace the battery during measurement.

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. These A.W. Sperry snap-arounds are internationally accepted by craftsmen and servicemen for their unmatched performance. All A.W. Sperry's snap-around instruments are unconditionally warranted against defects in material and workmanship under normal conditions of use and service; our obligation under this warranty being limited to repairing or replacing free of charge, at A.W. Sperry snap-around instrument that malfunctions under normal operating conditions at rated use.¹

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 the name of the distributor, with a copy of your invoice from whom the unit was purchased, clearly identifying the model number and date of purchase.

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

¹The 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.

MEMO

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