

*Simpson*

**Model 385 3L, V2  
Temperature Tester  
OPERATOR'S MANUAL**





### **About this Manual**

To the best of our knowledge and at the time written, the information contained in this document is technically correct and the procedures accurate and adequate to operate this instrument in compliance with its original advertised specifications.

### **Notes and Safety Information**

This Operator's Manual contains warning symbols which alert the user to check for hazardous conditions. These appear throughout this manual where applicable, and are defined below. To ensure the safety of operating performance of this instrument, these instructions must be adhered to.

 Warning, refer to accompanying documents.

 Caution, risk of electric shock.



This instrument is designed to prevent accidental shock to the operator when properly used. However, no engineering design can render safe an instrument which is used carelessly. Therefore, this manual must be read carefully and completely before making any measurements. Failure to follow directions can result in a serious or fatal accident.

### **Technical Assistance**

SIMPSON ELECTRIC COMPANY offers assistance Monday through Friday 7:30 am to 5:00 pm Central Time. To receive assistance contact Technical Support or Customer Service at (847) 697-2260.

Internet: <http://www.simpsonelectric.com>

### **Warranty and Returns**

SIMPSON ELECTRIC COMPANY warrants each instrument and other articles manufactured by it to be free from defects in material and workmanship under normal use and service, its obligation under this warranty being limited to making good at its factory or other article of equipment which shall within one (1) year after delivery of such instrument or other article of equipment to the original purchaser be returned intact to it, or to one of its authorized service centers, with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on its part, and SIMPSON ELECTRIC COMPANY neither assumes nor authorizes any other persons to assume for it any other liability in connection with the sales of its products.

This Instrument is designed to prevent accidental shock to the operator when properly used. However, no engineering design can render safe an instrument which is used carelessly. Therefore, this manual must be read carefully and completely before making any measurements. Failure to follow directions can result in serious or fatal accident.

**SHOCK HAZARD:** As defined in American National Standard, C39.5, *Safety Requirements for Electrical & Electronic Measuring & Controlling Instrumentation*, a shock hazard shall be considered to exist at any part involving a potential in excess of 30 volts RMS (sine wave) or 42.4 volts DC or peak and where a leakage current from that part to ground exceeds 0.5 milliamperes, when measured with an appropriate measuring instrument defined in Section 11.6.1 of ANSI C39.5.

**NOTE:** The proper measuring instrument for the measurement of leakage current consists essentially of a network of a 1500 ohm non-inductive resistor shunted by a 0.15 microfarad capacitor connected between the terminals of the measuring instrument. The leakage current is that portion of the current that flows through the resistor. The Simpson Model 229-Series 2 AC Leakage Current Tester meets the ANSI C39.5 requirements for the measurement of AC leakage current and can be used for this purpose. To measure DC Leakage current, connect a 1500 ohm non-inductive resistor in series with a Simpson 0-500 DC microammeter and use this as the measuring instrument.

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# 1. INTRODUCTION

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The Simpson 385-3L V2 Temperature Tester, (hereafter referred to as the 385-3L or the Instrument) measures temperatures from -50° F to +70°F (-45°C to +21°C). This Instrument is supplied with one 15 foot general purpose thermistor lead and will accommodate two additional leads so that readings at three different locations can be taken in quick succession. Accuracy is within  $\pm 2^\circ$  F or C for any scale reading. Near the center of the scale, accuracy is within  $\pm 1^\circ$ .

## 1.1 Items And Accessories

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All items and accessories required for the operation of the 385-3L are furnished with each Instrument and listed in Table 1-2.

## 1.2 Safety Considerations

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This Operator's Manual contains cautions and warnings alerting the user to hazardous operating and servicing conditions. This information is flagged by CAUTION or WARNING symbols throughout this publication and is defined on the inside front cover of this manual under SAFETY SYMBOLS. Adhere to these instructions in order to ensure the safety of operating and servicing personnel and to retain the operating conditions of the Instrument.

## 1.3 Technical Data

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Table 1-1 lists the technical data for the Model 385-3L.

*Table 1-1. Technical Data*

<b>Range:</b>	-50°F to +70°F -45°C to +21°C
<b>Accuracy:</b>	$\pm 1^\circ$ F/C @ Center Scale $\pm 2^\circ$ F/C @ Either End

*Table 1-2. Items and Accessories Furnished with this Instrument*

<b>Description</b>	<b>Part No.</b>
Operator's Manual	6-114985
15 Foot Lead and Thermistor	00010
385-3L V2 Temperature Tester	D-12420

*Table 1-3. Additional Accessories*

<b>Description</b>	<b>Part No.</b>
Surface Temperature Probe	00790
Free Air Temperature Probe	00789
30 Foot Lead and Thermistor	00216
50 Foot Lead and Thermistor	00415
100 Foot Lead and Thermistor	00416
150 Foot Lead and Thermistor	00417
Ever-Redy Leather Carrying Case	08073

## **2. INSTALLATION**

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This section contains instructions for the installation and shipping of the 385-3L. Included are unpacking and inspection procedures, warranty, shipping, and operation instructions.

### **2.1 Unpacking And Inspection**

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Examine the shipping carton for sign of damage before unpacking. Unpack and inspect the Instrument for possible damage in shipment. If damage is noted, contact the carrier and supplier before using the Instrument. Check that all furnished items and accessories are included (Table 1-2).

Save the shipping carton and packing materials for future storing and shipping of the Instrument.

### **2.2 Warranty**

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The Simpson Electric Company warranty policy is printed on the inside front cover of this manual. Read it carefully before requesting a warranty repair. For all assistance, including help with the Instrument under warranty, contact the nearest Authorized Service Center. If necessary, contact the factory directly, give full details of any difficulty and include the Instrument model number, serial number (at the back of the Instrument) and date of purchase. Service data or shipping instructions will be mailed promptly. If an estimate of charges for non-warranty or other service work is required, a maximum charge estimate will be quoted. This charge will not be exceeded without prior approval.

### **2.3 Shipping**

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Pack the Instrument carefully and ship it prepaid and insured.

### **2.4 Operation Instructions**

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The Instrument may be operated in a horizontal or vertical position.

### 3. CONTROLS, CONNECTORS & INDICATORS

The 385-3L has five Functions. Each Function is described in Table-3. Numbers on Table 3-1 correspond with each numbered Function on Figure 3-1. Before attempting any operation of this Instrument, become familiar with each Function. Practice readings will avoid mistakes and prolong the life of the Instrument.

#### 3.1 Front Panel

The following paragraphs will describe, with the aid of Figure 3-1, the principal controls of the 385-3L.



Figure 3-1. Panel Front

Table 3-1. Controls, Connectors, & Indicators

<b>1. Zero Adjusting Screw:</b>	If pointer is off zero, adjust screw slowly clockwise or counter-clockwise until the pointer is exactly over the black diamond symbol, (extreme left side of the dial).
<b>2. Probe Connectors:</b>	These provide connections for the probes used with the 385-3L
<b>3. Function Switch:</b>	This is a three position switch: OFF, READ, and ADJ. It is used to select the proper mode for accurate readings.
<b>4. Control Adjustment Screw:</b>	Use a screwdriver to turn this control. It is used when the function switch is in the ADJ mode.
<b>5. Probe Selector:</b>	A three-position switch used to select the proper mode when taking a temperature reading.

## 4. OPERATION

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Before proceeding with the operation of the 385-3L, review the shock hazard definition printed at the front of this manual.

This section of the manual contains information required to use and operate the 385-3L in a safe and proper manner.

### 4.1 Safety Precautions

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The 385-3L should only be used by personnel qualified to recognize shock hazards shock and trained in the safety precautions required to avoid personal injury.



1. Do not work alone when making measurements of circuits where a shock hazard may exist. Notify another person that you are, or intend to make such measurements.
2. Locate all voltage sources and accessible paths prior to making measurement connections. Check that the equipment is properly grounded and that the right rating and type of fuse(s) is installed. Set the Instrument to the proper range before power is applied.
3. **Remember:** Voltages may appear unexpectedly in defective equipment. An open bleeder resistor may result in a capacitor retaining a dangerous charge. Turn off power and discharge all capacitors before connecting or disconnecting test leads to and from the circuit being measured.
4. Hands, shoes, floor, and workbench must be dry. Avoid making measurements under humid, damp, or other environmental conditions that could affect the dielectric withstanding voltage of the test leads or Instrument.
5. Do not come into contact with any object which could provide a current path to the common side of the circuit under test or powerline ground. Always stand on a dry insulated surface capable of withstanding the voltage being measured, or that could be encountered.

### 4.2 Test Probes

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The Simpson Test Probe (00790) is recommended when surface temperature measurements are to be made. When free air ambient temperature measurements are to be made, the Simpson Test Probe (00789) is recommended.

### 4.3 Preparation For Use

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1. Plug the probes into connections marked 1, 2, and 3 on top of the Instrument.
2. With the function switch OFF, it should be at the black diamond on the scale. If it does not, correct the reading by turning the zero adjusting screw



- on the face of the Instrument cover.
3. Set the function switch to the ADJ position; the Instrument should read 32°F. If it does not, correct the reading by turning the slotted adjusting control (located below the Simpson trademark). When it becomes impossible to correct the reading to 32°F, replace the battery (paragraph 5.1).

## 4.4 Temperature Measurements

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Use extreme caution around electrical equipment. The thermistor probe tip might inadvertently make electrical contact with a “live” circuit. The metallic probe part could also become “live” and present a shock hazard to the user. Do not use the probe in such a case until the electrical power is known to be off. Once power is applied; avoid contact with the Instrument or cable. Be sure the circuit is de-energized before removing the probe.

1. Locate probes at the points where temperature readings are desired.
2. When measuring air temperature, allow several minutes for the temperature of the probe sensing element to stabilize before taking a reading. Liquid temperatures can be read within a few seconds after complete immersion of the probe body. The general rule is to allow time for the probe to attain the temperature of the object being measured.
3. Set function switch to the READ position.
4. Set the probe selector switch to the position selected for the first reading, then read temperature.
5. Set probe selector switch to other positions being used and take rapid, successive readings as often as desired.
6. When readings are completed, return function switch to the OFF position. It is not necessary to disconnect leads from the tester.



Do not use probe in acids or other solutions which will damage the brass shell or the plastic cord.



These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

## **5. SERVICING INSTRUCTIONS**

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This section will describe the necessary procedures needed to effectively service this Instrument.

### **5.1 Battery Replacement**

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Replace the battery only if unable to adjust reading to 32°F as in paragraph 4.3, item 3. To replace the standard "C" size flashlight battery, remove the four screws on the bottom of the case which holds the lower panel in place. Slide the lower panel away from the Instrument cover about 1/32 inch to release stop on top edge of panel, then lift the panel free of the case to gain access to the battery. (Use insulated type batteries only.)

### **5.2 Calibration**

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If the Instrument is known to require calibration, or if the accuracy of the calibration should be checked, proceed as follows:

1. With the function switch OFF, check for a reading of -50°F. If necessary, correct reading with zero adjusting screw on the face of the Instrument.
2. Set the function switch to the READ position.
3. Using an ice point reference source take a temperature reading.
4. If the reading is not exactly 32°F, turn the slotted adjusting control below the Simpson logo until the meter indicates 32°F, exactly.
5. Turn the function switch to the ADJ position. The meter should still indicate 32°F.

### **5.3 Care**

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1. Immediately clean all spilled materials from the Instrument and wipe dry. If necessary, moisten a cloth with soap and water to clean plastic surfaces.
2. Whenever possible, avoid exposure or usage in areas which are subject to temperature and humidity extremes, vibration or mechanical shock, dust or corrosive fumes or strong electrical or electromagnetic interferences.
3. Monthly Care: Verify Instrument calibration by performing operational checks using known value sources. If the need for calibration is indicated, contact the nearest Authorized Service Center.
4. Annual Care: It is recommended that the Instrument be returned annually for a complete overall check and calibration.
5. Storage: When the Instrument is not in use, store it in a location free from temperature extremes, dust and corrosive fumes, and mechanical vibration or shock.

### **5.4 Replacement Parts**

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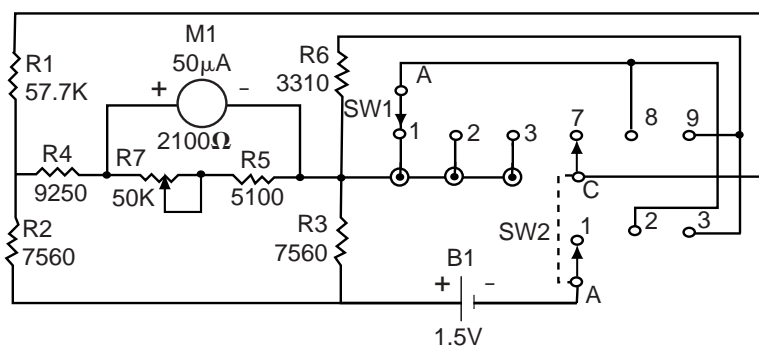
Table 5-1 lists parts in order of their reference designators and indicates their description. (Refer to Table 1-2 for Items and Accessories Furnished With This Instrument.)

To obtain replacement parts, address order to the nearest Authorized Service Center. Refer to paragraph 2.2. for ordering instructions.

Table 5-1. Replacement Parts List

Ref. Sym.	Description	Part No.
R1	Resistor, 57.7k $\Omega$ , $\pm 0.5\%$	1-119734
R2,R3	Resistor, 7.56k $\Omega$ , $\pm 1\%$	1-119735
R4	Resistor, 9.25k $\Omega$ , $\pm 1\%$	1-119736
R5	Resistor, 5.1k $\Omega$ , $\pm 5\%$	5-119351
R6	Resistor, 3.31k $\Omega$ , $\pm 0.5\%$	6-114951
R7	Potentiometer, 50k $\Omega$ , $\pm 20\%$	6-114974
S1	Switch, Probe Selector	6-114965
S2	Switch, Function Selector	6-114966
M1	Meter, 0-50 DC $\mu$ A	10-865868
	Knob Function & Probe Selector	3-260180
	Set Screw, Knob	1-114178

Figure 5-1. Wiring Diagram



**NOTES:**

- Unless specified, resistors are in Ohms
- Switches show in extreme counter clockwise
- SW1 Probe selector
- SW2 Function selector

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