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# **SR Scales**<sup>®</sup>

by **SR**<sup>®</sup> Instruments, Inc.

**Model  
SR725 / SR725L**



**Wheelchair Scale System**

## **Operating and Service Manual**

*Serial Numbers: 4068+*

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## PACKING CHECKLIST SR725

### Wheelchair Scale System

√	DESCRIPTION	QUANTITY
	BASE ASSEMBLY: 32 in x 32 in (81 cm x 81 cm) WITH ATTACHED MAST PIPE AND RAMP	1 ea
	DISPLAY UNIT	1 ea
	PACKAGE OF SIX (6) "D" CELL BATTERIES	1 ea
	CALIBRATION CERTIFICATE	1 ea
	WARRANTY CARD	1 ea
	MANUAL	1 ea

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## PACKING CHECKLIST SR725L

### Wheelchair Scale System

√	DESCRIPTION	QUANTITY
	BASE ASSEMBLY: 32 in x 36 in (81 cm x 91 cm) WITH ATTACHED MAST PIPE AND RAMP	1 ea
	DISPLAY UNIT	1 ea
	PACKAGE OF SIX (6) "D" CELL BATTERIES	1 ea
	CALIBRATION CERTIFICATE	1 ea
	WARRANTY CARD	1 ea
	MANUAL	1 ea

## ASSEMBLY

**STEP 1:** Unpack the scale system and check parts against the **PACKING CHECKLIST**. If there are any missing or damaged parts, please call the Service Hotline at: 1-800-654-6360.

**STEP 2:** Verify that the serial number on the Display Unit (1) matches that on the Base Assembly (3).

#	PART NAME
1	Display Unit
2	Mast Pipe
3	Base Assembly
4	Mast Wing Nut
5	Battery Compartment Cover
6	Ramp
7	Ramp Locking Pin
8	Transport Wheels

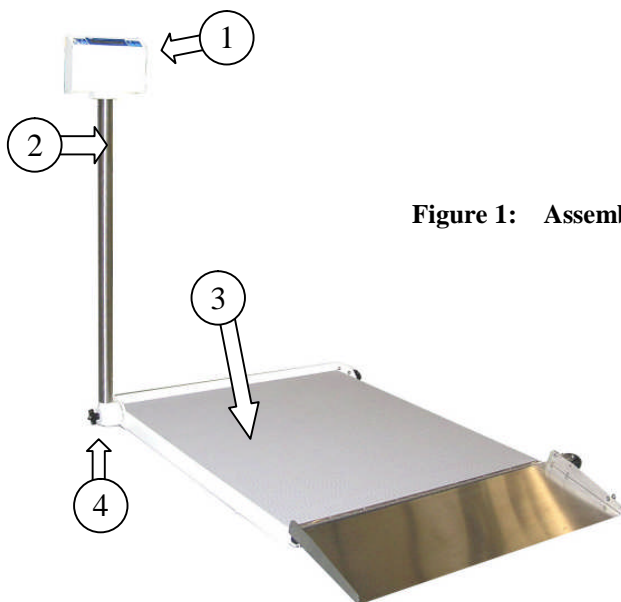


Figure 1: Assembly Diagram



Figure 2: Display Unit Cable Connection

**STEP 3:** (Figure 1) Lay the Base Assembly (3) with the attached Mast Pipe (2) on the floor.

**STEP 4:** Loosen the Mast Wing Nut (4) to unlock the Mast Pipe. Pull the Mast Pipe out and away from the scale to free it from the internal locking pin and swing it up until the Mast Pipe is perpendicular to the platform. Gently push the Mast Pipe against the Base Assembly, engaging it in the lock position.

**STEP 5:** Tighten the Mast Wing Nut to secure the Mast Pipe in place.

**STEP 6:** (Figure 2) Connect the display cable (pre-installed in Mast Pipe) into its mate located in the base of the Display Unit. Secure the connection by giving the attached lock ring a 1/4 turn to the right.

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## ASSEMBLY Cont'd



Figure 3: Display Unit

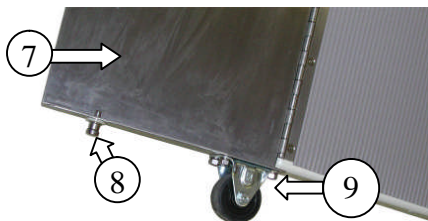
**STEP 7:** (Figure 3) Insert the mast pipe into the display post mount assembly. Tighten the 10-32 x 3/8” Phillips screw(s) and 1/4” x 20 x 3/8” Phillips screw (5).

**STEP 8:** Unscrew and remove the Battery Compartment Cover (6). Install the six (6) “D” cell batteries as indicated on the plastic battery cradle. Replace the cover (Figure 4).



Figure 4: Battery Cover Display Unit

**STEP 9:** Adjust leveling feet, located in each of the four corners of the underside of the Base Assembly, to ensure that the scale will sit level on the floor. **Note:** Leveling feet must be in place to operate the scale properly.



**STEP 10:** (Figure 5) Open Ramp (7) by releasing the Ramp Locking Pin (8) located on the right side of the Ramp near Transport Wheel (9).

Figure 5: Ramp Locking Pin

## REPLACEMENT PARTS and ACCESSORIES

Part #	Description
CA3066	Display Label
FKDK57	Mast Wing Nut
MF1956	Leveling Foot Spacer
FK2284T52	Leveling Foot

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## SYSTEM DESCRIPTION and INTENDED USE

### SYSTEM DESCRIPTION

The SR725 Wheelchair Scale System employs the latest in microprocessor and load cell technology to provide accurate and repeatable weight data. Four (4) identically matched transducers are strategically placed to ensure an accurate representation of the patient's weight.

The low power microprocessor circuitry allows the SR725 Wheelchair Scale System to derive its power from six (6) common "D" cell batteries that will provide up to 10,000 weight readings before needing replacement. This eliminates the need for an external battery charger or the danger of an AC power supply cord on a portable scale.

The patient's weight is displayed on a 16-character dot matrix LCD. With a push of a button, weight data may be viewed, in either pounds or kilograms, with a displayed resolution of 0.1 for each.

### INTENDED USE

The SR725 Wheelchair Scale System is designed for use as a weighing system for non-ambulatory wheelchair bound patients. Maximum weight capacity must not exceed 1000 pounds or 454 kilograms, combined patient/wheelchair gross weight.



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## MAINTENANCE and CLEANING

The Display Unit for the SR725 Wheelchair Scale System is made of a powder-coated aluminum. Exercise caution when cleaning the display window as it is made of clear polyester and can be scratched by abrasive cleaners. Mild soap and water is recommended for general cleaning and disinfecting.

 <b>WARNING</b> 
<b>DO NOT use pressurized water or steam. The scale system contains microprocessor circuitry and strain gauge sensors that may be adversely affected by exposure to such an environment.</b>

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## STORAGE and TRANSPORTATION

### STORAGE

If storing this equipment for periods longer than three (3) months, remove the batteries. To maintain proper operation of this instrumentation, storage and transport conditions should not vary outside the following conditions: Relative Humidity 0% to 85%, Ambient Temperature 14°F to 122°F (-10°C to +50°C).

### TRANSPORTATION

To transport the scale, fold Ramp (see Figure 4) into the closed position and lock with the Ramp Locking Pin. Loosen the Mast Wing Nut (Figure 5). Lift the Mast Pipe Assembly away from the scale to free it from the internal locking pin, and swing into position, parallel with the platform. Ensure that the internal locking pin engages into the lock position. Tighten the Mast Wing Nut to secure the Mast Pipe Assembly in position. Hold the Mast Pipe Assembly close to the Mast Wing Nut and roll the scale to the new location.

See **ASSEMBLY** for detailed instructions to re-assemble the scale system. When placing the scale system in the new location, care should be taken not to shock the unit. Lift the scale up and onto the Transport Wheels.

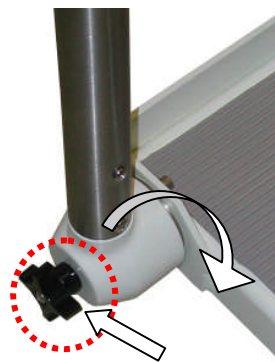


Figure 6: Mast Wing Nut

## SPECIFICATIONS

<b>MAXIMUM WEIGHT CAPACITY</b>	1000 lb or 454 kg
<b>PLATFORM SIZE</b>	SR725: 32 in x 32 in (81 cm x 81 cm) SR725L: 32 in x 36 in (81 cm x 91 cm)
<b>DISPLAY TYPE</b>	16-Character dot matrix LCD
<b>DISPLAY RESOLUTION</b>	0.1 lb/0.1 kg
<b>ACCURACY</b>	0.1% +/- 1 digit of displayed resolution for calibrated range
<b>AUTO ZERO</b>	One button operation
<b>AUTO POWER DOWN</b>	Approximately 35 seconds
<b>HOLD</b>	Stores displayed reading in memory
<b>LAST WEIGHT RECALL</b>	Press "HOLD" button to recall last stored displayed weight
<b>AVERAGING</b>	Automatic digital filter
<b>POWER SUPPLY</b>	Six (6) "D" cell batteries
<b>CALIBRATION</b>	Calibration is traceable to NIST standards
<b>OPERATING CONDITIONS</b>	Normal operating conditions for this product: Ambient Temperature Range: 68°F to 85°F (20°C to 30°C) Relative Humidity Range: 0% to 85% Avoid exposure to high-pressure water or steam.
<b>TRANSPORT and STORAGE</b>	Storage and transport conditions should not vary outside the following conditions: Relative Humidity 0% to 85%, Ambient Temperature 14°F to 122°F (-10°C to +50°C). Remove batteries if storing longer than three (3) months.

## BUTTON FUNCTIONS

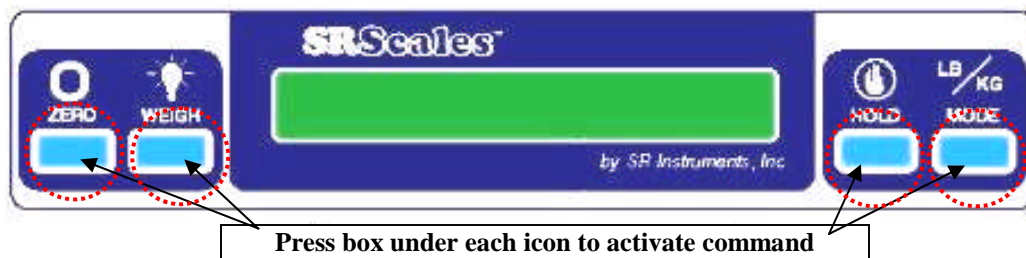


Figure 7: Button Display

### ZERO



The “ZERO” button is used to zero the system before placing a patient onto the scale system. When pressed, the display message will indicate “ZEROING” “PLEASE WAIT” “HANDS OFF” “PLEASE WAIT”. Ensure that nothing is in contact with the weighing surface during this procedure. The display will read “WEIGHT 0.0 LB” (or KG).

### WEIGH



The “WEIGH” button wakes up the display and shows the patient’s weight if it should Auto Power Down before the weighing process is done.

### HOLD



The “HOLD” button freezes the displayed weight and stores it away in memory. Press “HOLD” to store the weight into memory. To recall last weight reading, press “HOLD”.

### LB/KG MODE



Weight data may be viewed in either pounds or kilograms. Pressing the “LB/KG MODE” button allows the operator to toggle between the two readings. Both pounds and kilograms are displayed in a resolution of 0.1.

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## BASIC SYSTEM OPERATION

### SETTING SYSTEM ZERO / DETERMINING WHEELCHAIR WEIGHT

Make sure the scale system is free and clear of any obstructions and press the “ZERO” button. The displayed message will indicate “ZEROING” “PLEASE WAIT” “HANDS OFF” “PLEASE WAIT”. Ensure nothing is in contact with the scale system while zeroing. In a few seconds, the display will read “WEIGHT 0.0 LB” (or KG).

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## BASIC SYSTEM OPERATION cont'd

**STEP 1:** Place the empty wheelchair (with any blankets or pillows that the patient may have with them) on the scale platform. Then press the zero button.

**NOTE:** The display will shut off after 35 seconds. The zero (TARE) will still be stored in memory.

**STEP 2:** Remove the wheelchair from the platform. Place the patient in the wheelchair.

**STEP 3:** Wheel the patient with wheelchair onto the platform. Press the weigh button. The display will show the patient's weight only.

### CONTINUOUS WEIGH MODE

In this default mode, the weighing surface remains active. Press the "**HOLD**" button once to lock the displayed reading and store it in memory as the "last weight" for recall later if needed.

### AUTO-HOLD MODE

This mode is for patients unable to remain still for the weighing procedure. It locks, stores, and displays the patient's weight as soon as the "**WEIGH**" button is pressed once. **Note:** No weight will be displayed until the button is pressed.

To enable this mode before zeroing the system, press and hold the "**HOLD**" button for approximately five (5) seconds until the display reads "**AUTO-HOLD ENABLED**".

To return to CONTINUOUS WEIGH mode when finished, press and hold the "**HOLD**" button for approximately five (5) seconds until the display reads "**CONTINUOUS WEIGH**".

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## BATTERY REPLACEMENT

**STEP 1:** The display will read "**REPLACE BATTERY**".

**STEP 2:** (Figure 8) Unscrew the panel screw on the Battery Compartment Cover (8) and remove the battery compartment cover.

**STEP 3:** Remove and replace ALL six (6) "D" cell batteries. Refer to diagram in the battery compartment for placement.

**STEP 4:** Press the "**WEIGH**" button to confirm display is working.

**STEP 5:** Secure the battery cover using the panel screw.

**STEP 6:** Zero the system.



**Figure 8: Battery Compartment Cover Panel Screw**

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## THEORY OF OPERATION

SR Instruments patient weighing systems are digital scales. Strain-gauge force cells convert the force of an applied weight into an analog signal. This signal is amplified by an operational amplifier and converted to a digital signal by an analog to digital converter. The digital signal is transferred to a micro-controller where it is filtered, converted to appropriate units, and displayed on a liquid crystal display.

Strain-gauge force cells each contain four strain gauges mounted in a full Wheatstone-bridge configuration. These bridges convert the physical movement of the force cell, due to the applied mass on the system, into minute changes in electrical resistance. These changes in resistance produce a voltage difference across the Wheatstone-bridge, which is amplified by the operational amplifier. The amplifier is configured to current sum the output of each cell, with potentiometers serving to adjust the sensitivity (voltage out per unit of weight applied) of each bridge. The offset potentiometer produces a small current, which nulls the output of the amplifier for an unloaded system.

The output of the operational amplifier is digitized by the analog to digital converter. The converter integrates the analog signal onto the integrating capacitor over a short interval. The integrating capacitor is then discharged at a rate proportional to the reference voltage applied to the converter. The residual voltage on the integrating capacitor is then multiplied by a factor and again discharged at a rate proportional to the reference voltage. The residual voltage from this discharge is again multiplied by a factor and again discharged. The time taken to discharge the capacitor is proportional to the voltage from the operational amplifier, which is proportional to the applied load on the force cells. The time is stored as a binary number in the analog to digital converter and is transferred to the micro-controller when the conversion is complete.

The micro-controller averages and filters the digital output of the analog to digital converter, subtracts the value saved during the system zero operation and scales the filtered output, then displays the result on the liquid crystal display. The micro-controller performs a rolling average of data for continuous weigh and, for AutoHold, the micro-controller averages the data before locking in on the reading. If the data variance is greater than 0.1% in the AutoHold mode, the micro-controller will reset the filter and start a new averaging period.

The micro-controller can be placed in a calibration mode, where the system can be re-calibrated. In the calibration mode, the result of the weigh operation is scaled to match the value by adjusting the “up” and “down” calibration buttons. This new calibration factor is then stored in the non-volatile memory.

## CALIBRATION

**! IMPORTANT !**

**CALIBRATION CHECK** Qualified service personnel only should perform this procedure. Load cells have no user serviceable components and should not be tampered with for any reason. Re-calibration is generally not required, but should be verified periodically to ensure accuracy. The recommendation for calibration check is at least once every 12 months, or as individual maintenance policy requires.

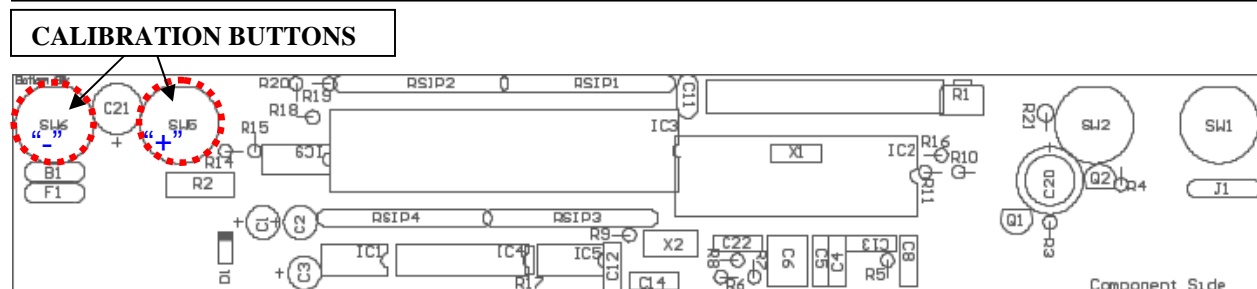


Figure 9: Calibration Button Diagram

**NOTE:** Ensure that nothing is in contact with the scale system during this procedure. Remove hands from the system when noting the displayed calibration results.

**STEP 1:** Remove the right-hand end-cap to access the PC Board. The calibration buttons are located on the right side of the PC Board.

**STEP 2:** (Figure 9) Press and hold both buttons simultaneously (SW5 and SW6).

**STEP 3:** The display will read “**HOLD TO CAL**” as the right hand digit counts down to enter the CAL mode.

**STEP 4:** When in the CAL mode, press the “**ZERO**” button to zero the display.

**STEP 5:** Place a known calibrated weight, traceable to NIST, onto the weighing surface and compare it to the displayed reading. **Note:** DO NOT USE barbell weights or calibrate to a mechanical scale.

**STEP 6:** Use the “-” or “+” button to make corrections to the displayed weight. The displayed value should be within 0.1% of the calibrated weight, plus or minus 1 digit of reading.

**STEP 7:** When settings are completed: Press the “**HOLD**” button to SAVE the settings or press the “**WEIGH**” button to CANCEL. Both choices will EXIT the CAL mode.

CALIBRATION TOLERANCE TABLE		
LOW LIMIT	APPLIED LOAD	HIGH LIMIT
99.9	100.0	100.1
199.8	200.0	200.2
299.7	300.0	300.3
399.6	400.0	400.4
499.5	500.0	500.5
599.4	600.0	600.6
699.3	700.0	700.7
799.2	800.0	800.8
899.1	900.0	900.9
999.0	1000.0	1001.0

**! CAUTION !**

The integrated circuits and semiconductors on the printed circuit boards may be damaged by electrostatic discharge (ESD). Be sure to use proper handling precautions at all times.

## INITIALIZATION

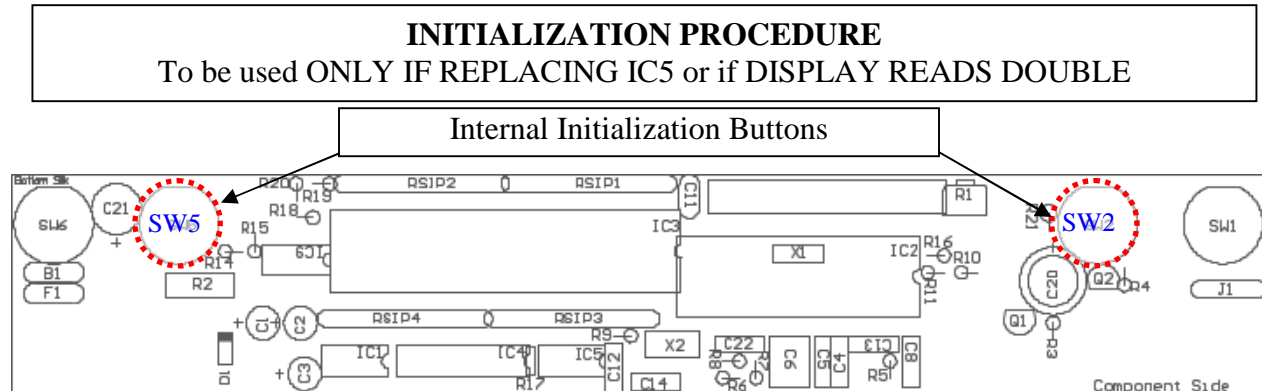


Figure 10: Location of Internal Initialization Button

**STEP 1:** Remove both end-caps to access the PC Board. The initialization buttons (SW2 and SW5) are located internally on the PC Board (Figure 10).

**STEP 2:** Simultaneously press buttons indicated to initialize the system. The display will read, “**HOLD TO INIT**”, and count down from 9 to 0. When the initializing is complete, the display will read, “**INITIALIZING**” and then return to the WEIGH mode.

**STEP 3:** Follow the **CALIBRATION** procedure.

**⚠ CAUTION ⚠**

**The integrated circuits and semiconductors on the printed circuit boards may be damaged by electrostatic discharge (ESD). Be sure to use proper handling precautions at all times.**

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## TROUBLESHOOTING

SYMPTOM	REASON/CORRECTIVE ACTION
The characters only appear on half of the display.	Press the “ <b>WEIGH</b> ” button or remove one battery. Wait five seconds, then re-install the battery, and try the “ <b>WEIGH</b> ” button again.
The display lights appear to work, but do not respond to button activation.	Button may not have “bounced” back up after being pressed. Remove the faceplate and inspect buttons. Make sure the rubber “boot” is not sitting too high. Re-attach the plate.
The display shows no reading at all.	Check to ensure batteries are installed correctly (see directions for <b>BATTERY REPLACEMENT</b> ). Check display cable to make sure it is connected securely.
<p style="text-align: center;"><b>For additional information or assistance, telephone our Service Hotline: 1-800-654-6360 or e-mail: <a href="mailto:sri@srinstruments.com">sri@srinstruments.com</a></b></p>	

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## WARRANTY

### FOUR YEAR LIMITED WARRANTY

Each **SR**Scales® system is manufactured with high quality components. SR Instruments, Inc. warrants that all new equipment will be free from defects in material or workmanship, under normal use and service, for a period of four (4) years from the date of purchase by the original purchaser. Normal wear and tear, injury by natural forces, user neglect, and purposeful destruction are not covered by this warranty. Warranty service must be performed by the factory or an authorized repair station. Service provided on equipment returned to the factory or authorized repair station includes labor to replace defective parts. Goods returned must be shipped with transportation and/or broker charges prepaid. SR Instruments, Inc.'s obligation is limited to replacement of parts that have been so returned and are disclosed to SR Instruments, Inc.'s satisfaction to be defective. The provisions of this warranty clause are in lieu of all other warranties, expressed or implied, and of all other obligations or liabilities on SR Instruments, Inc.'s part, and it neither assumes nor authorizes any other person to assume for SR Instruments, Inc. any other liabilities in connection with the sale of said articles. In no event shall SR Instruments, Inc. be liable for any subsequent or special damages. Any misuse, improper installation, or tampering, shall void this warranty.

### DAMAGED SHIPMENTS

Title passes to purchaser upon delivery to Transportation Company. Any claims for shortage or damage should be filed with the delivery carrier by purchaser.

### RETURN POLICY

All products being returned to SR Instruments, Inc. require a Return Goods Authorization number (RGA). To receive an RGA, call our Technical Service Team at 716-693-5977 or toll-free in the USA and Canada at 800-654-6360.

When inquiry is made, please supply model and serial numbers, purchase order, if the scale was bought on contract, and reason for return.

Generally, deleted, damaged, and outdated merchandise will not be accepted for credit. A minimum restocking charge of 15% will be assessed on return of current merchandise.

All returns are to be shipped FREIGHT PREPAID to: SR Instruments, Inc., 600 Young Street, Tonawanda, NY 14150.

### RESTOCKING FEE

- **15% fee** for any scale that has been opened and used
- **10% fee** for any scale returned that has been ordered incorrectly or refused delivery with no model change
- **5% fee** if an error in ordering has been made and a different model exchanged
- **No fees** will be charged if the scale is returned because of an error on the part of SR Instruments, Inc.
- **No returns** accepted after 60 days.

# **SR**Scales®

By **SR**® Instruments, Inc.

**Precision & Technology in  
Perfect Balance®**