SRScales®
by SR® Instruments, Inc.

Model SR555

Stand-On Scale System

Operating and Service Manual

Serial Numbers: 1800+

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TABLE OF FIGURES

PACKING CHECKLIST
SR555 Stand-On Scale

√	DESCRIPTION	QUANTITY
	Box 1	
	BASE ASSEMBLY (FIVE (5) SET SCREWS IN PLACE)	1 ea
	MAST	1 ea
	DISPLAY UNIT WITH CABLE (FIVE (5) SET SCREWS IN PLACE)	1 ea
	PACKAGE OF SIX (6) "C" CELL BATTERIES	1 ea
	LOCTITE®	1 ea
	1/8" ALLEN WRENCH	1 ea
	QC INSPECTION SHEET	1 ea
	CALIBRATION CERTIFICATE	1 ea
	WARRANTY CARD	1 ea
	MANUAL	1 ea
	Box 2	
	OPTIONAL HANDRAIL SET WITH HARDWARE	1 ea
	OPTIONAL HEIGHT BAR	1 ea

ASSEMBLY

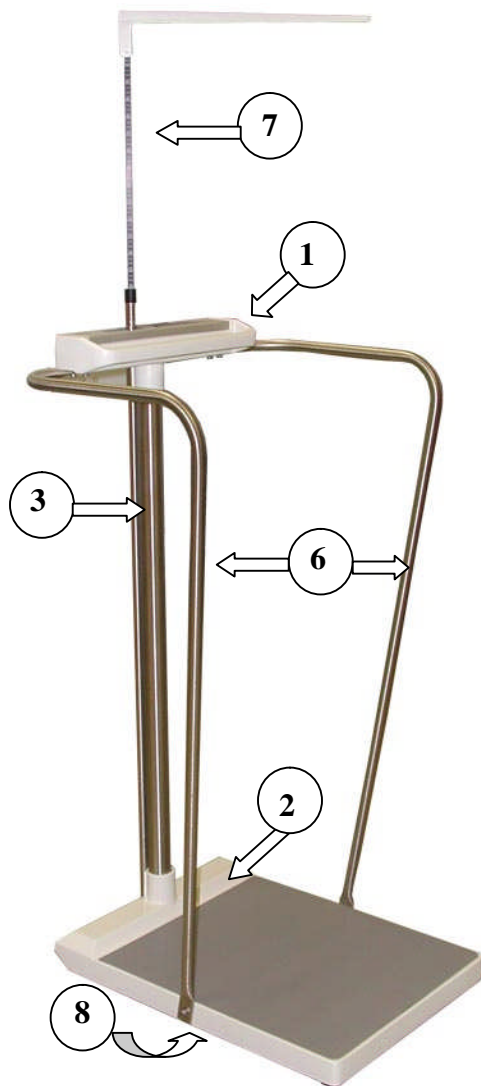| #	PART NAME
1	Display Unit
2	Base Assembly
3	Mast
4	Cable Clamp
5	Display Cable Connector
6	Handrails (optional)
7	Height Bar (optional)
8	Battery Compartment

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

STEP 3: Remove the four (4) set screws from Base Assembly collar and apply a small amount of Loctite® to each. Insert Mast (3) into Base Assembly collar and seat firmly. Re-install set screws in Base Assembly collar and tighten securely.

STEP 4: Feed the display cable down through the Mast and pull out through the Base Assembly.

STEP 5: Remove the set screws from the Display Unit collar. Set the Display Unit squarely on top of the Mast with the display label facing the scale platform. Apply a small amount of Loctite® to the four (4) set screws and reinstall the set screws, tightening securely.

Figure 1: Assembly Diagram

ASSEMBLY cont'd

STEP 6:   (Figure 2) Lay the system on its side and remove the Cable Clamp (4) from the Base Assembly. Attach the Display Cable Connector (5) to its mate in the Base Assembly.

STEP 7:   (Figure 2) **IMPORTANT: Reinstall the Cable Clamp!** Set the display cable into the groove under the Cable Clamp and reinstall the Cable Clamp, leaving just enough slack to alleviate any tension on the Display Cable Connector. Securely tighten the two (2) Cable Clamp screws. Slide the extra cable back up into the Mast. Excess cable MUST NOT contact the floor.
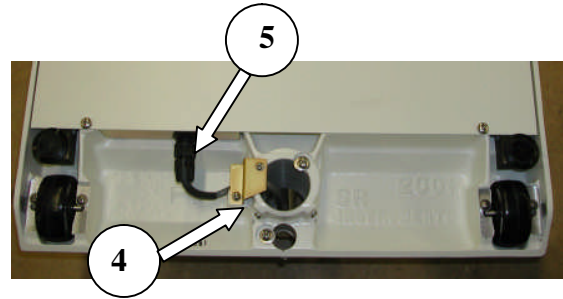
Figure 2: Cable Clamp, Display Cable, Connector, and Set Screws

STEP 8: (Figure 3) Open the Battery Compartment cover and install the six (6) supplied "C" cell batteries as indicated on the cover diagram. Tightly close the cover.

STEP 9: Return the scale to the upright position.

Figure 3: Battery Compartment Diagram

ASSEMBLY cont'd

INSTALLING OPTIONAL HANDRAILS

STEP 1:   (Figure 4) Attach top of each of the Handrails (6) to the bottom right and left of the Display Unit (1) with the two (2) screws and two (2) split-lock washers on each side and slightly tighten. (Do not tighten all of the way.)

STEP 2:   Attach the bottom of the Handrails to the right and left side of the Base Assembly using one (1) screw and one (1) split-lock washer for each handrail. Tighten all six (6) screws securely.

INSTALLING OPTIONAL HEIGHT BAR

STEP 1:   (Figure 4) Remove the set screw on the back of the Display Unit (1) and in the Base Assembly (2).

STEP 2:   Slide the Height Bar (7) down through the hole in the Display Unit and seat firmly into the Base Assembly. Apply a small amount of Loctite® to the two (2) set screws and reinstall, tightening securely.
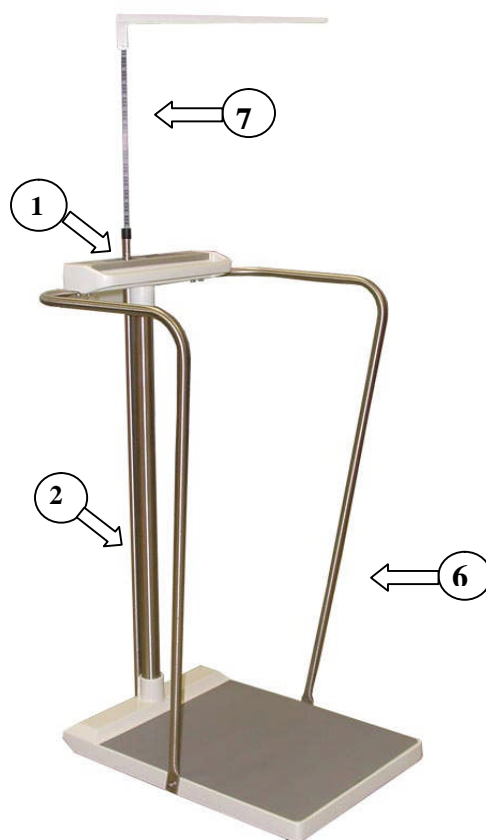
Figure 4: Handrail/Height Bar Diagram

REPLACEMENT PARTS and ACCESSORIES

Part #	Description
SR3070	Handrail Set with assembly hardware
SR3086	Height Bar: Extends from 43 in to 79 in (109 cm to 201 cm)

SYSTEM DESCRIPTION and INTENDED USE

SYSTEM DESCRIPTION

The SR555 Stand-On 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 SR555 to derive its power from six (6) common "C" 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 SR555 Stand-On Scale System is specifically designed for use as a stand-on scale for weighing ambulatory patients. Optional equipment includes a Handrail Set and Height Bar. SR555 Stand-On Scale System is a preferred means of gathering patient weight data of ambulatory patients weighing up to 1000 pounds or 454 kilograms.

> ⚠ **WARNING** ⚠
>
> **DO NOT EXCEED MAXIMUM WEIGHT LIMIT OF 1000 LB / 454 KG**

MAINTENANCE and CLEANING

SR555 Stand-On Scale System is made of powder-coated aluminum casting with stainless steel riser posts. 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.

> ⚠ **WARNING** ⚠
>
> **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.**
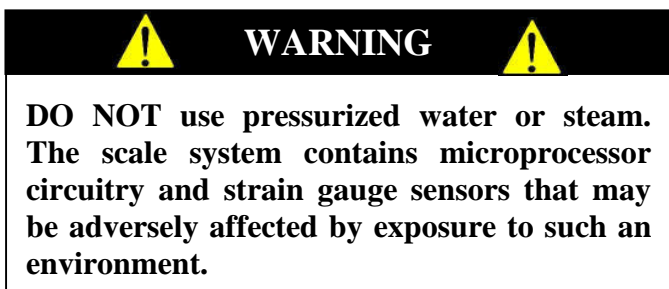
STORAGE and TRANSPORTATION

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 SR555, lower the Height Bar if included, tilt the scale back and wheel to the new location. Lower the platform back down to the floor being careful not to shock the scale.

SPECIFICATIONS

|	
MAXIMUM WEIGHT CAPACITY	1000 lb or 454 kg
PLATFORM SIZE	15 3/4 in x 18 1/2 in (40 cm x 47 cm)
DISPLAY TYPE	16-Character Dot-Matrix LCD
DISPLAY RESOLUTION	0.1 lb/0.1 kg
ACCURACY	0.1% +/- 1 digit of displayed resolution for calibrated range
AUTO ZERO	One button operation
AUTO POWER DOWN	Approximately 35 seconds
HOLD	Stores displayed reading in memory
LAST WEIGHT RECALL	Press hold button to recall last stored displayed reading
AVERAGING	Automatic digital filter
POWER SUPPLY	Six (6) "C" cell batteries Low battery indicator on Display
CALIBRATION	Calibration is traceable to NIST standards.
OPERATING CONDITIONS	Normal operating conditions for this product: Ambient Temperature Range: 68°F to 85°F (20°C to 30°C) Relative Humidity Range: 0%-85% Avoid exposure to high-pressure water or steam.
TRANSPORTATION and STORAGE	Storage and transportation 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

Press box under each icon to activate command
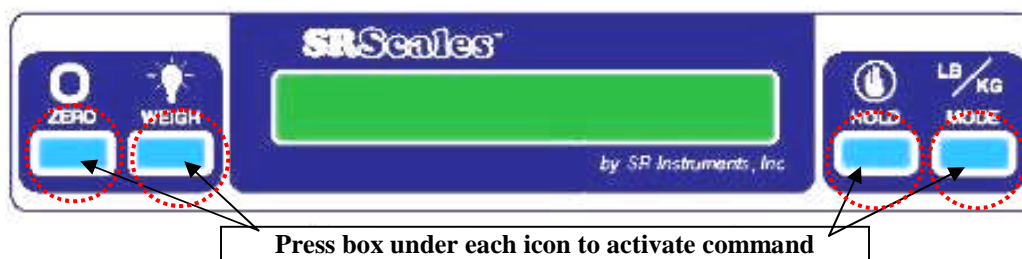
Figure 5: Button Display

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.

BASIC SYSTEM OPERATION

SETTING SYSTEM ZERO

Make sure the scale is free and clear of any obstructions and press the "**ZERO**" button. The displayed message will indicate "**ZEROING**" "**PLEASE WAIT**" "**HANDS OFF**" "**PLEASE WAIT**". Make sure that nothing is in contact with the scale while zeroing the system. In a few seconds, the display will read "**WEIGHT 0.0 LB**" (or **KG**). **Note**: If patient will be using a cane for support on the scale, place the cane on the scale while zeroing the system. This will ensure that the patient's NET weight will be displayed. It is recommended that the system be zeroed prior to each new patient.

After the scale has been set to zero, position the patient on the scale. Display will indicate the patient's weight in either pounds or kilograms

BASIC SYSTEM OPERATION cont'd

CONTINUOUS WEIGH

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

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**".

BATTERY REPLACEMENT

STEP 1:   The display will read "**CHANGE BATTERIES**".

STEP 2:   (Figure 5) Place the scale on its side and open the battery compartment cover located in the bottom of the scale base.

STEP 3:   Remove and replace ALL six (6) "C" cell batteries. Refer to diagram on the battery compartment cover for placement.

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

STEP 5:   Tightly close the cover.

STEP 6:   Zero the system.

Figure 6: Bottom of Scale Base

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, and 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. The SR555 load cell itself has 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.
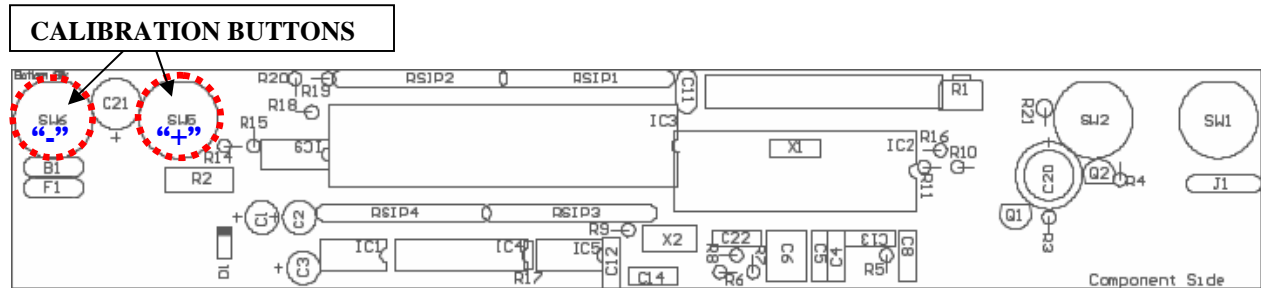

CALIBRATION BUTTONS

Figure 7: 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: (Figure 7) Remove the two (2) screws on the bottom of the display housing. Lift the display panel. The calibration buttons are located on the PC Board.

STEP 2: Press and hold both buttons simultaneously.

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.

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

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.

⚠ 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

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INITIALIZATION PROCEDURE
To be used ONLY IF REPLACING IC5 or if DISPLAY READS DOUBLE

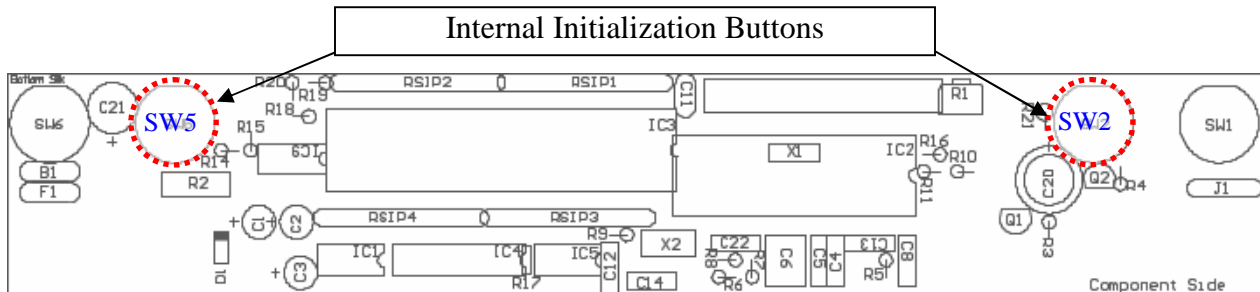</div>

Internal Initialization Buttons

Figure 8: Location of Internal Initialization Buttons

STEP 1:   (Figure 8) Remove the two (2) screws on the bottom of the display housing. The initialization buttons are located internally on the PC Board. Refer to **PC BOARD LAYOUT** (SW2 and SW5).

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.

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⚠ 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 "**WEIGH**" button or remove one battery. Wait five seconds, then re-install the battery and try the "**WEIGH**" 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 plate.
The display shows no reading at all.	Check to ensure batteries are installed correctly (see directions for **BATTERY REPLACEMENT**). Check display cable to make sure it is connected securely.
For additional information or assistance, telephone our Service Hotline: 1-800-654-6360 or e-mail: sri@srinstruments.com	

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**.**

NOTES

SRScales®

By SR®Instruments, Inc.

Precision & Technology in
Perfect Balance ™