

**DS7100**

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Handrail Scale

# User Manual

**doran**<sup>®</sup>

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## **Section 1. Unpacking and Installation**

### **Introduction**

Thank you for purchasing a Doran scale. This product has been designed with the highest level of technology. We are dedicated to deliver a superior product that will provide many years of trouble free service.

As an ISO9000 registered company, Doran Scales is dedicated to delivering products built with strict compliance to our high quality standards. If you have any questions regarding your scale, please contact Doran Scales, Inc.

### **Unpacking**

Carefully remove the scale from the shipping carton. If you notice any shipping damage, notify the shipper immediately. Be sure to retain all shipping materials in case the scale must be shipped elsewhere.

### **Cautions and Warnings**

Your new scale is a durable industrial grade product, but it is also a sensitive weighing instrument. Normal care should be taken when handling and using this product. Improper handling or abuse can damage the scale and result in costly repairs that may not be covered by the warranty. Please observe the following precautions to insure years of trouble free service from your new scale.

- Do not use sharp objects to press any of the buttons.
- Do not transport patients on the scale.
- Do not use the scale if the scale is damaged in any way.
- Do not leave patients unattended on the scale.
- Do not exceed the scale capacity.
- Do not drop objects on the scale.
- When transporting, do not hit other objects, walls or doorframes with the scale.

### **Care & Cleaning**

With reasonable care, this product will last for many years. Here are some tips to care for your scale. Failure to comply with these guidelines may void the warranty.

- Hand clean the scale platform and indicator with a moist cloth.
- Only clean with a mild detergent.
- Do not get water inside the scale platform or indicator.
- Do not use strong solvents or abrasive cleaners as this can damage the touch panel or other plastic parts.
- Do not immerse.
- Examine the scale periodically for damage and wear and tear before use.
- Remove batteries during long periods of non-use.
- Periodically check tower and handrail fasteners for tightness.

## **Moving Scale**

The scale has two wheels at the rear of the scale platform. Grasp the handle at the rear of the scale and tilt the scale back towards you until only the wheels contact the floor. Use these wheels when moving the scale to prevent damage.

## **Assembly Instructions**

Before assembly, ensure you have all the components below. If any items are missing, contact Doran Scales. Please be careful to follow all instructions. Improper assembly may void the warranty. If you notice any shipping damage, notify the shipper immediately. Be sure to retain all shipping materials in case the scale must be shipped elsewhere.

## **Component List**

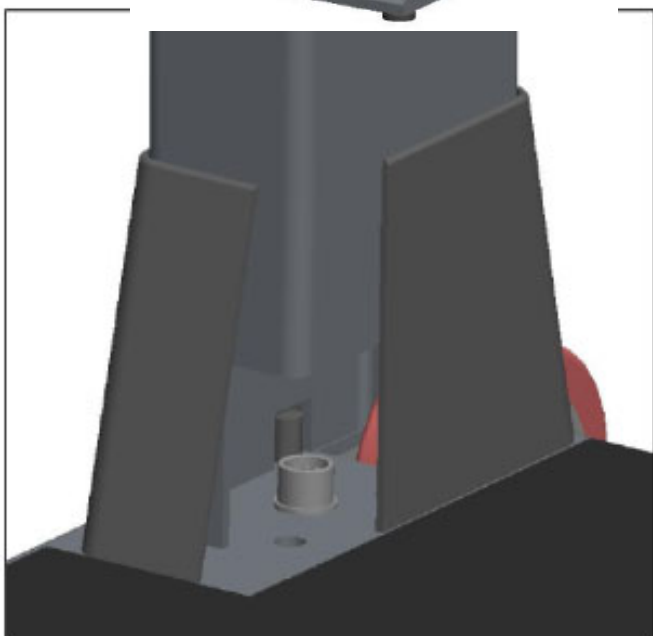
- 1.** Tower
  - 2.** Platform
  - 3.** Indicator
  - 4.** (2) Handrails
  - 5.** (8) Tower Bolts (M6x32)
  - 6.** (2) Handrail Tower Bolts (M6 x 16)
  - 7.** (2) Handrail Platform Bolts (M8 x 20)
  - 8.** (2) Indicator Bolts (M4x12)
  - 9.** (10) M6 Washer
  - 10.** (10) M6 Spring Lock Washer
  - 11.** (2) M8 Washer
  - 12.** (2) M8 Spring Lock Washer
  - 13.** (2) M4 Washer
  - 14.** (2) M4 Spring Lock Washer
  - 15.** (2) M4 Acorn Nuts
  - 16.** Foot (F) and Indicator (I) Nut Adjustment Tool
- 
1. Carefully remove the scale from the shipping carton. Be sure to locate the bag of hardware containing items 5 through 16.
  2. Locate the base of the Tower (1) near the Platform (2). Connect the cable from the base of the Tower (1) to the connector inside the plastic tower receptacle on the Platform (2). Push the connector into place until a click is heard. DO NOT force the connector in place, it is keyed and can only be connected when inserted properly. Tug gently on the cable to ensure a proper connection has been made.

3. Insert the Tower (1) into the Platform (2) blue plastic trim caps. Carefully pull the wire harness from the top of the Tower (1) as the tower is inserted into the blue plastic trim caps to prevent pinching the cable between the Tower (1) and the Scale platform (2).

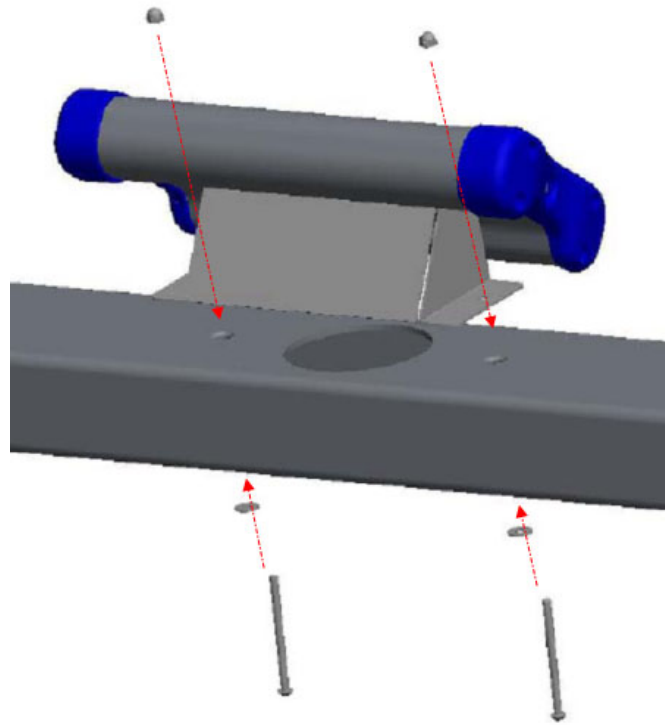


4. Connect the cable at the top of the Tower (1) to the rear of the indicator. Push the connector into place until a click is heard. **DO NOT** force the connectors in place, it is keyed and can only be connected when inserted properly. Tug gently on the cable to ensure a proper connection has been made.

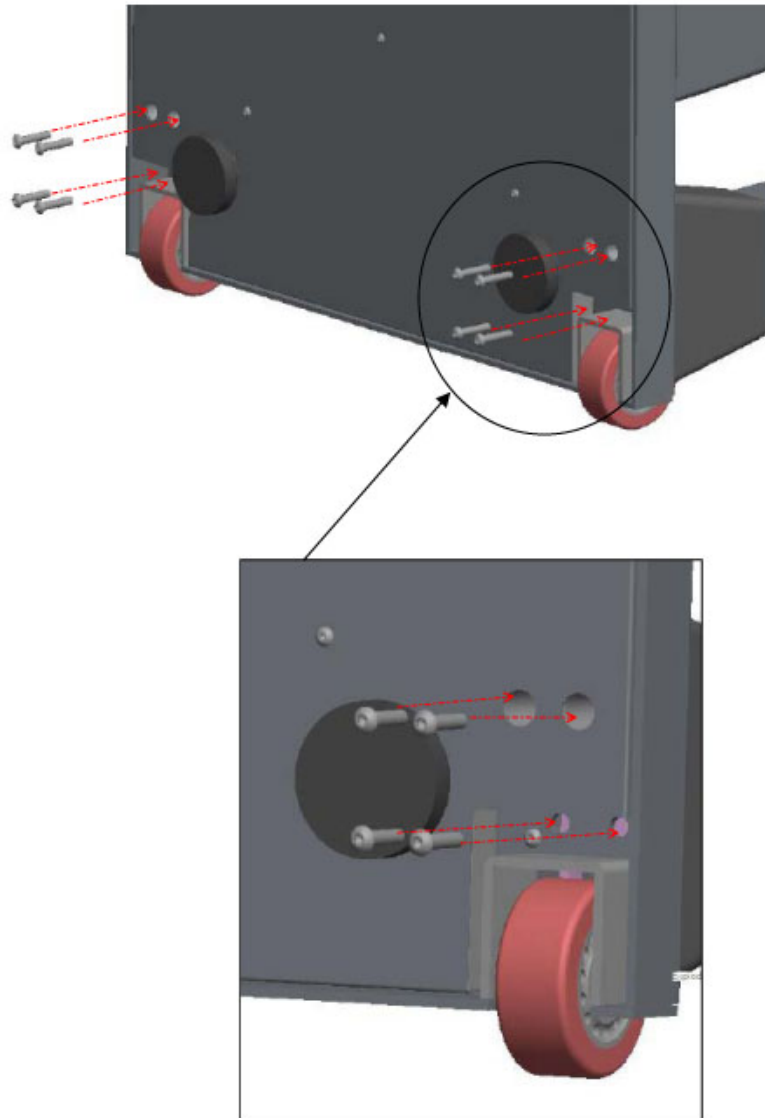
5. Fasten the indicator to the tower using the indicator bolts (8) washer (13) and lock washers (14) from the bottom of the Tower (1). Fasten to



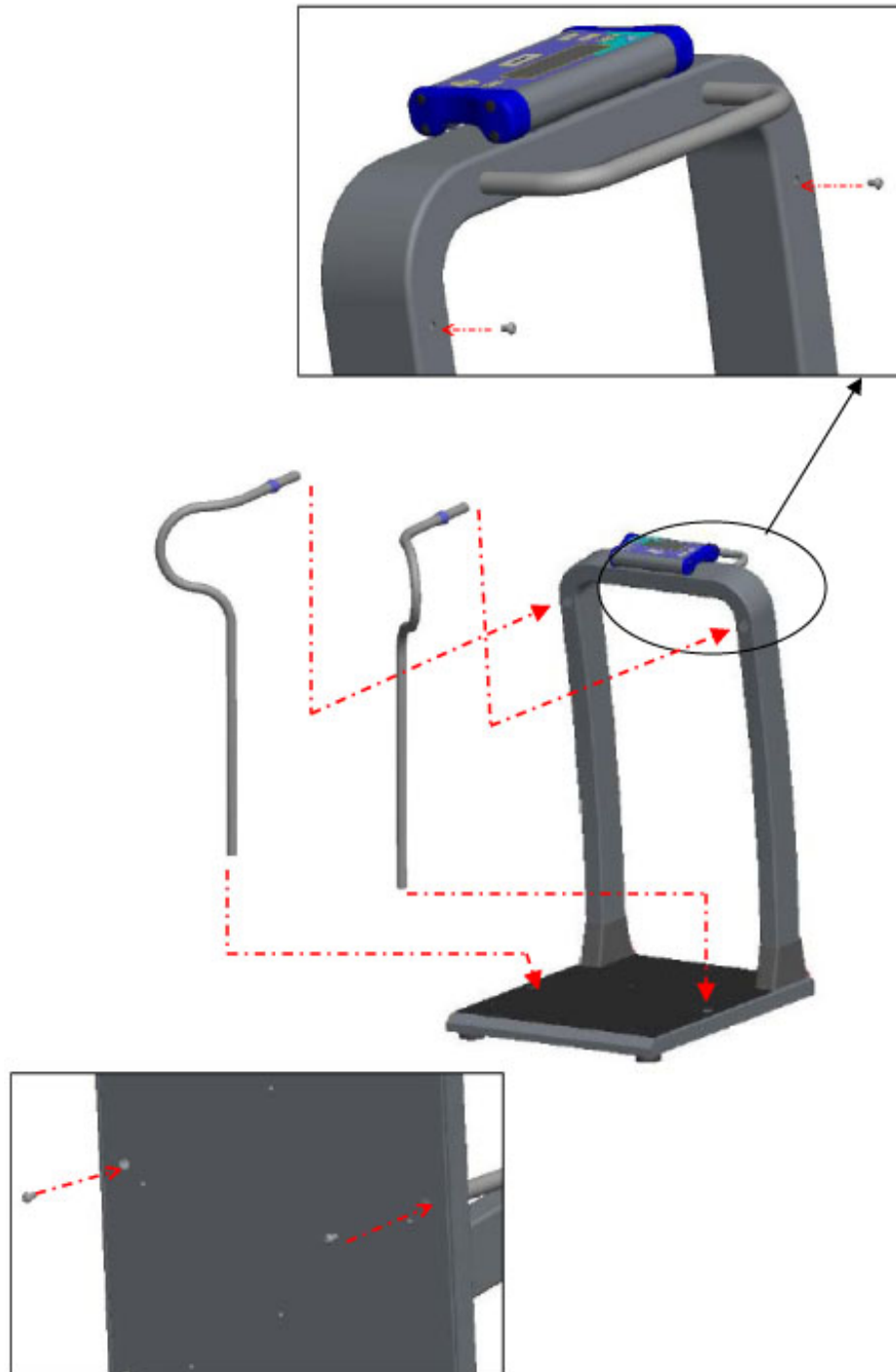
the top of the Tower (1) using the acorn nuts (15). The acorn nuts can be tightened with the Adjustment Tool (16) with the end marked I.



5. Lean the scale backwards so that the Tower (1) is resting on the floor. Insert a lock washer (10) and then a washer (9) onto the tower bolt (5). Insert each bolt but do not tighten completely until all eight bolts are installed.



6. Insert the Handrails (4) into the holes of the Tower (1). Align the bottom of the Handrails (4) into the opening in the rubber pad. Insert the handrail platform bolts (7), lock washer (11) and washer (12) but do not fully tighten. Insert the handrail tower bolts (6), lock washer (9) and washer (10) into the rear of the Tower (1). Once the all handrail bolts are in place, tighten all bolts fully.



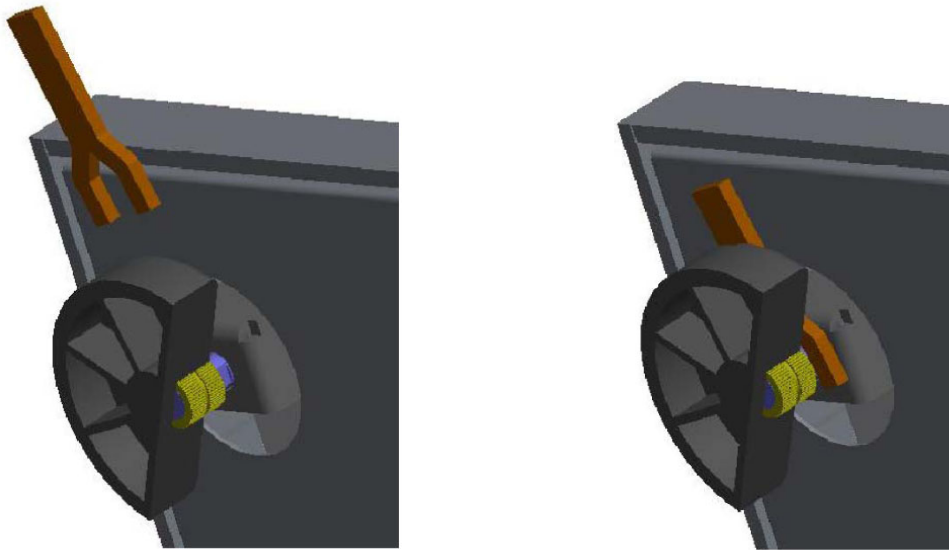


7. Stand on the scale platform and press Zero before weighing patients.

### Leveling Scale

If the scale is to be used in a permanent location, it is recommended to level the scale. Leveling the scale will provide a stable weighing surface and optimal accuracy. To level the platform, use the Foot Adjustment Tool provided with the scale. Insert the wrench into place and twist the foot to change the height while grasping the wrench.

After leveling the scale, press Zero.



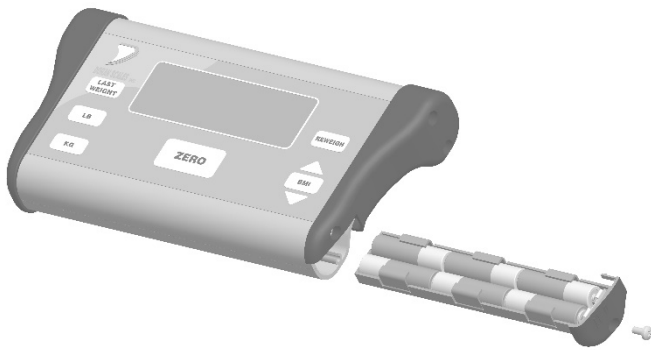
## **Section 2. Battery Operation**

### **Battery Installation**

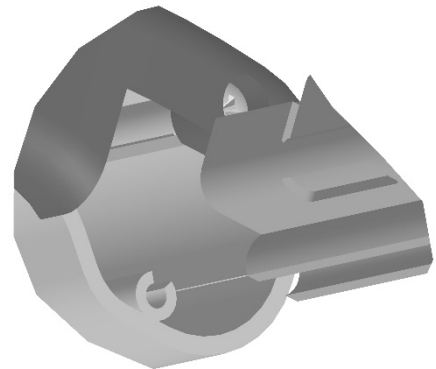
The DS7100 comes with a set of six AA alkaline batteries. These batteries supply two years of typical use with the standard Automatic Shutoff Timer settings.

The batteries can be accessed on the lower right hand side of the indicator. To remove the battery tray, use a Phillips screwdriver to remove the screw holding the battery compartment in place. Completely remove the battery compartment from the indicator and install the new set of batteries. Be sure the batteries are oriented properly.

When reinstalling the battery tray, mate the key at the bottom of the battery tray to the key integral to the metal housing. Gently push and hold the battery tray in place and reinstall the screw to complete the battery tray installation.



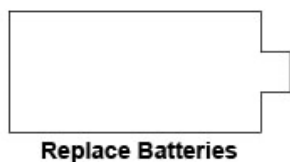
**Fig. 3 Battery Tray Access**



**Fig. 4 Battery Tray Insertion**

### **Battery Indicator**

The battery indicator displays the remaining battery life available. A low battery status is also indicated by two beeps when a weight is held.



### **Section 3. Scale Operation**



**Fig. 3 DS7100 Front Panel**

#### **Display Pushbuttons**

The Model DS7100 controls consist of LAST WEIGHT, LB, KG, ZERO, REWEIGH and BMI buttons. The display is used to provide weight indications and operator messages indicating scale operation.

#### **Power On/Off**

When the patient stands on the scale platform, the indicator will turn on automatically. The indicator has an adjustable Automatic Shutoff Timer that will power down the indicator when not in use.

#### **Zero**

When the zero button is pressed, the scale will be reset to zero weight. This feature can be used to zero out any weight not desired to be part of the patient weight.

#### **Units Select**

Press LB to weigh in pounds and enter BMI height in feet and inches.  
Press KG to weigh in kilograms and enter BMI height in centimeters.  
The current unit will be displayed to the right of the weight digits.

#### **Reweigh**

To reinitiate the weighing process, press REWEIGH. This will allow a weighment to be reinitiated without the patient having to get off the scale platform.

## **BMI**

Once a weight is held, the height of the patient can be entered using the arrow keys above and below the BMI button.

## **Display Annunciators**

The display annunciators will indicate the scale status.

### **Motion**

When the scale platform senses motion, MOTION will be indicated. Once motion ceases, a stable hold reading will be displayed.

### **Center of Zero (→0←)**

Indicates that the scale has an accurate zero reading.

### **Stable Hold**

Indicates a stable weight has been achieved and held on the display. This indicates an accurate weight has been achieved.

### **Average Hold**

Indicates that the weight held on the display is a result of averaging several weights due to excessive motion on the scale platform. The Average Hold weight will be slightly less accurate than a Stable Hold weight.

Displaying an Average Hold weight instead of a Stable Hold weight will speed the weightment process of patients that cannot stand still. The Average Hold weight will differ from the patient's actual weight based upon the severity of the motion caused by the patient while on the scale. Although this weight will be less accurate than a Stable Hold weight, the deviation from the patient's actual weight will be minimal.

The time required for the Average Hold to engage is based upon the Average Aperture parameter. See the Parameter Setup section for configuration instructions.

### **Last Weight**

Last Weight is indicates when a previous weight is being displayed.

### **Battery Indicator**

The battery indicator displays the remaining battery life available. See battery operation section for detailed information.

## **Weighing a Patient**

1. Stand on the scale platform.  
*NOTE: The handrails and indicator tower can be grasped during weighing.*
2. The indicator will automatically turn on and display weight.
3. The indicator will beep and hold the weight on the display until the scale shuts off automatically.

## **Zero Operation**

1. Place item to be zeroed out on the scale platform.
2. Press ZERO. The scale will turn on and display a zero weight. If the item is removed, a negative weight will be displayed.  
*Note: If the scale display automatically shuts off, the new zero point will be saved.*
3. Step onto the scale platform and the patient's weight, less the item's weight will be displayed.
4. To reset the scale to zero, Press ZERO again with the scale platform empty.  
*Note: If the scale zero is not reset with an empty platform, the zero weight will be retained in memory and cause weighing errors for future patients.*

## **BMI Operation**

1. Step onto the scale platform.
2. The display will beep when a stable or average hold weight is achieved.
3. Press BMI. The display will read 5:06, representing 5 feet, 6 inches.
4. To change the value of the flashing digit, press the up and down arrows. When the correct digit is displayed, press BMI to advance to the next digit.
5. When BMI is pressed to accept the rightmost digit, the BMI value will be displayed.

## **Last Weight Operation**

1. Press LAST WEIGHT to display the previously held stable or average hold weight.
2. To display the previous BMI value, press BMI and the previous height is displayed.
3. If the height is not correct, press the up or down arrows and the height value can be edited as described in BMI Operation above.
4. If the height is correct, press BMI and the BMI value will be displayed.
5. To display the weight again, press LAST WEIGHT.

## **Reweigh Operation**

1. With the patient standing on the scale platform, press REWEIGH to reinitiate the weighing process.

## **Section 4. Data Communications**

### **Optional RS-232 Communications Port**

The DS7100 can be equipped with an optional RS-232 communications port. If this option has been installed, the RS-232 connection is located on the left side of the indicator housing. An RS-232 cable is included with the option. Insert the headphone jack style connector into the receptacle on the indicator housing and connect the 9-pin connector to your computer or printer.

*Note: This option will reduce battery life.*

Basic understanding of RS-232 data communications is needed when setting up the DS7100 to communicate with a printer or PC. When setting up an RS-232 communications system, there are two concerns which affect the configuration of that system. These are:

- Baud Rate
- Data Bits and Parity

The baud rate determines how fast the data is sent from the scale. The sending and receiving units must be set to the same baud settings. The typical value is 9600.

The DS7100 is factory set for eight bits, no parity and one stop bit also known as 8n1. The receiving units must be set to 8n1 for proper communications.

### **Optional USB Communications Port**

The D7100 can be equipped with an optional USB communications port. If this option has been installed, the USB connection is located on the left side of the indicator housing. A USB cable is included with the option. Follow the instructions included with the option to install all necessary drivers.

Once the USB driver is installed on your PC, insert the USB connector into the receptacle on the indicator housing and connect the other end of the cable to your computer.

### **Remote Scale Commands**

The scale will respond to the following single letter ASCII commands.

- |   |  |
|---|--|
| W | Initiates transmission of current weight data (if in motion, scale will wait until stable, then print) |
| U | Changes the displayed weight units.  |
| Z | Zeroes the scale (if in motion, scale will wait until stable, then zero)                               |

## “F0” Example

☉ 150.2 lb ␣␣

### Print String Definition for Each Weight Unit:

#### Pounds

STX | POL | WEIGHT | SP | lb | SP | CR | LF

#### Kilograms

STX | POL | WEIGHT | SP | kg | SP | CR | LF

## “F1” Example

☉ 198.6#lb#GRS# 0.0#lb# 69.5#in# 27.1#BMI␣␣

### Print String Definition for Each Weight Unit:

#### Pounds

STX | POL | WEIGHT | # | lb | # | GRS | # | TAREVALUE | # | lb | # | HEIGHTVALUE | # | in | # |  
BMIVALUE | # | BMI | CR | LF

#### Kilograms

STX | POL | WEIGHT | # | kg | # | GRS | # | TAREVALUE | # | kg | # | HEIGHTVALUE | # | cm |  
# | BMIVALUE | # | BMI | CR | LF

## Data String Key

STX (☉) = ASCII 02, non printable character

POL = minus sign for negative weight or a space for a positive weight

WEIGHT = 6 character field

TAREVALUE = 6 character field

HEIGHTVALUE = 6 character field

BMIVALUE = 5 character field

SP = ASCII space

CR (␣) = Carriage return, non printable character

LF (␣) = Linefeed, non printable character

| = Separator for reference, not printed

## **Section 5. Specifications**

Scale Platform Dimensions	20.5" L x 22.5" W x 2" H
Scale Dimensions	25" L x 29" W x 46" H
Wheels	Permanently sealed and lubricated Wheel Material EVA
Power	6 AA Alkaline Batteries Optional AC Adapter (UL, ULc and CE approved)  Two year battery life with 10 second Automatic Shutoff Timer setting
Displayed Units	lb, kg
Capacity	1000 x 0.1 lb 454 x 0.05 kg
Construction	Aluminum Base and Column Aluminum and Plastic Housing
Approvals	CE  2006/95/EC Low Voltage Directive Reference Standard: CENELEC EN 61010-1  2004/108/EC EMC Directive Reference Standard: CENELEC EN 61326
Options	RS-232 Communications USB Communications AC Adapter



## **Section 6. Troubleshooting**

### **General Problem Resolution**

<b>Problem</b>	<b>What to Do or Check</b>
Weight reading will not repeat or scale does not return to zero when weight is removed.	<p>If on carpet, verify the bottom of the platter is not touching the carpet.</p> <p>Person or object other than that being weighed is touching the scale.</p> <p>Verify that there is nothing caught in the platform or interfering with the feet.</p>
Scale overloads before scale capacity is reached.	Verify scale calibration is correct. If problem persists, recalibrate the scale.
Scale will not come to zero when the ZERO button is pressed.	Make sure that the scale is stabilizing (Motion annunciator is off). After pressing the ZERO button, the scale should zero as soon as it becomes stable.
Weight readings are not correct.	<p>Verify the scale calibration with an accurate test weight. If the readings are not correct, recalibrate.</p> <p>Be sure the platform is on a flat surface and all four feet are touching the floor.</p>
Scale drifts off zero.	Check for air currents and/or vibration around the scale.
Scale shuts itself off or will not turn on.	<p>Press the ZERO button to turn on the indicator.</p> <p>Check that new batteries are installed properly in the battery tray.</p> <p>If using an AC adapter, confirm that it is firmly plugged into a functioning wall outlet.</p> <p>Verify the connector at the rear of the indicator is properly installed.</p>

## Error Messages

Error Message	What to Do or Check
Er EP	<p>The setup parameters loaded in nonvolatile memory have become corrupted.</p> <p>Reset all parameter to factory default with the rst parameter.</p>
Er Ad	<p>The A/D communication is not detected. Ensure the cable is connected to the rear of the indicator.</p> <p>If problem persists, internal connectors will need to be checked. Contact Doran Technical Support for assistance.</p>
Err 0	<p>The calibration zero is out of range. This error is displayed after a zero calibration attempt. Remove all weight from the platform and press BMI to perform the zero calibration again.</p> <p>Refer to the Calibration Troubleshooting section for additional information. If this problem persists, contact Doran Technical Support for assistance.</p>
Errsp	<p>The span calibration is out of range. This error is displayed after a span calibration attempt. Place the proper weight on the platform and press BMI to perform the span calibration again.</p> <p>Refer to the Calibration Troubleshooting section for additional information. If this problem persists, contact Doran Technical Support for assistance.</p>
ou ld	<p>The scale is in overload. The load on the scale platform exceeds the scale capacity by more than 105%.</p> <p>Remove excess weight from scale platform. If problem persists, recalibrate. If this problem still persists, contact Doran Technical Support for assistance.</p>
Gs ol	<p>The scale is in an extreme overload condition. The load on the scale platform exceeds the scale capacity by more than 150%.</p> <p>Immediately remove excess weight from scale platform as damage can occur. If this problem persists, recalibrate. If this problem still persists, contact Doran Technical Support for assistance.</p>

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