Cardinal®

Cardinal Scale Manufacturing Co.

Model 185 and 185B
WEIGHT INDICATOR
INSTALLATION and TECHNICAL MANUAL

TABLE OF CONTENTS

SERIAL NUMBER _____

DATE OF PURCHASE _____

PURCHASED FROM _____

_____

_____

_____

RETAIN THIS INFORMATION FOR FUTURE USE

PRECAUTIONS

Before using this indicator, read this manual and pay special attention to all "NOTIFICATION" symbols:

⚠ **IMPORTANT**   ⚡ **ELECTRICAL WARNING**   **STATIC SENSITVE**

FCC COMPLIANCE STATEMENT

This equipment generates uses, can radiate radio frequency, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been designed within the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user will be responsible to take whatever measures necessary to correct the interference.

You may find the booklet "How to Identify and Resolve Radio TV Interference Problems" prepared by the Federal Communications Commission helpful. It is available from the U.S. Government Printing Office, Washington, D.C. 20402. Request stock No. 001-000-00315-4.

PROPER DISPOSAL

When this device reaches the end of its useful life, it must be properly disposed of. It must not be disposed of as unsorted municipal waste. Within the European Union, this device should be returned to the distributor from where it was purchased for proper disposal. This is in accordance with EU Directive 2002/96/EC. Within North America, the device should be disposed of in accordance with the local laws regarding the disposal of waste electrical and electronic equipment.

It is everyone's responsibility to help maintain the environment and to reduce the effects of hazardous substances contained in electrical and electronic equipment on human health. Please do your part by making certain that this device is properly disposed of. The symbol shown to the right indicates that this device must not be disposed of in unsorted municipal waste programs.

CAUTION

CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

ATTENTION: RISQUE D'EXPLOSION SI LA BATTERIES EST REMPLACE'E PAR UN TYPE INCORRECT. REJETEZ LES BATTERIES UTILISE'ES SELON LES INSTRUCTIONS.

DISCLAIMER

While every precaution has been taken in the preparation of this manual, the Seller assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from use of the information contained herein. All instructions and diagrams have been checked for accuracy and ease of application; however, success and safety in working with tools depend to a great extent upon the individual accuracy, skill and caution. For this reason, the Seller is not able to guarantee the result of any procedure contained herein. Nor can they assume responsibility for any damage to property or injury to persons occasioned from the procedures. Persons engaging the procedures do so entirely at their own risk.

SPECIFICATIONS

Power Requirements: Model 185:	100 to 240 VAC 50/60Hz 12 VDC 1 A wall plug-in UL/CSA listed AC power adapter (Cardinal part number 8400-0182-0A)
Model 185B:	Six "AA" Alkaline, 2700mAh Ni-MH, or Ni-Cad batteries (not included) *OR* 100 to 240 VAC 50/60Hz 12 VDC 1 A wall plug-in UL/CSA listed AC power adapter (Cardinal part number 8400-0182-0A)
Construction:	IP66 ABS indicator enclosure with versatile stainless-steel wall or desktop mounting bracket
Operating Environment:	Temperature: 14 to 104 ºF (-10 to +40 ºC) Humidity: 90% non-condensing (maximum)
Weight Display:	Six-digit, seven-segment, 1.0" (25mm) high, backlit green LCD
Load Cell Excitation:	5.0 VDC
Signal Input Range:	0mV min. to 40mV max.
Number of Load Cells:	Up to 4 at 350 Ohm minimum resistance
Load Cell Cable Length:	1500 feet (450 meters) maximum with sense lines 30 feet (9 meters) maximum without sense lines
Division Value:	1, 2 or 5 x 10, 1, 0.1, 0.01, 0.001

Sensitivity:
   NON-COMMERCIAL
   NTEP
   OIML
	
	0.4uV/e
	1.2uV/e (Class III/IIIL)
	1.2uV/e (Class 3)

Scale Divisions:
   NON-COMMERCIAL
   NTEP
   OIML
	
	100 to 100,000
	100 to 6,000 (Class III/IIIL)
	100 to 6,000 (Class 3)

Internal Resolution:	1 part in 16,777,216
Tare Capacity:	Scale Capacity
Sample Rate:	10 samples per second
Auto Zero Range:	0.5 or 1 through 9 divisions
Weighing Units:	Pounds (lb), Ounces (oz), Kilograms (kg), Grams (g)
Keypad:	7-key Membrane type
Keys:	ON/OFF, ZERO, TARE/↵, NET/GROSS, UNITS/◄, FN/▲, PRINT
Standard I/O:	(1) bi-directional RS-232
Standard Features:	Piece Counting, Millivolt Display Diagnostic Function
Enclosure Dimensions:	7.7" W x 4.7" H x 2.6" D (19.6 cm W x 11. 9 cm H x 6. 6 cm D)

Net Weight:
         Model 185:
         Model 185B:
	
	2.3 lb (1.04 kg)
	2.5 lb (1.13 kg)

Shipping Dimensions:	13" L x 11" W x 8" H (33 cm L x 28 cm W x 20.3 cm H)

Shipping Weight:
         Model 185:
         Model 185B:
	
	3.2 lb (1.45 kg)
	3.4 lb (1.54 kg)

Country of Origin:	USA
Certifications:	NTEP: Certificate No. 18-075 Measurement Canada: Approval No. AM-6109 OIML: Certificate No. R-76/2006-A-DK2-18.04 EU Type-Examination: Certificate No. 0200-NAWI-03187

SITE PREPARATION REQUIREMENTS

The Model 185 and 185B Weight Indicators are precision weight indicating instruments. As with any precision instrument, it requires an acceptable environment to operate at peak performance and reliability. This section is provided to assist you in obtaining such an environment.

Environmental

The Model 185 and 185B Weight Indicators meet or exceed all certification requirements within a temperature range of 14 to 104 °F (-10 to +40 °C).

In order to keep cooling requirements to a minimum, the indicator should be placed out of direct sunlight, and the area around the indicator kept clear to provide adequate air circulation.

Do not place the indicator directly in front of a heating or cooling vent. Such a location will subject the indicator to sudden temperature changes, which may result in unstable weight readings.

Make sure the indicator has good, clean AC power, and is properly grounded. In areas subject to lightning strikes, additional protection to minimize lightning damage, such as surge suppressors, should be installed.

Electrical Power

The Model 185 and 185B Weight Indicator have been designed to operate from a 100 to 240 VAC 50/60Hz 12 VDC 1 A wall plug-in UL/CSA listed AC power adapter (Cardinal part number 8400-0182-0A).

- The socket-outlet supplying power to the indicator should be on a separate circuit from the distribution panel and dedicated to the exclusive use of the indicator.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.
- The wiring should conform to national and local electrical codes and ordinances, and should be approved by the local inspector to assure compliance.
- On installations requiring 230 VAC power, **it is the responsibility of the customer** to have a qualified electrician install the proper power adapter plug that conforms to national electrical codes and local codes and ordinances.
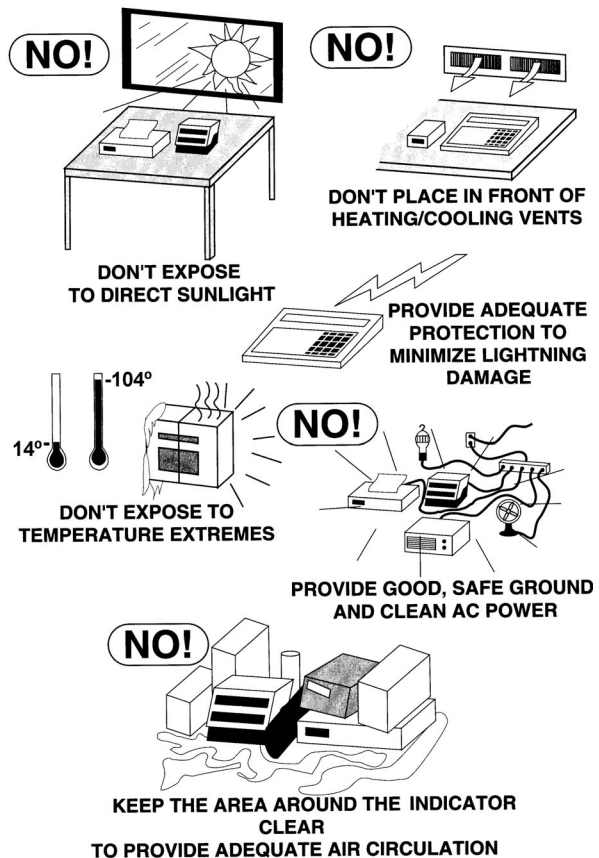
Electrical Noise Interference

To prevent electrical noise interference, make certain all other wall outlets for use with air conditioning and heating equipment, lighting or other equipment with heavily inductive loads, such as welders, motors, and solenoids are on circuits separate from the indicator. Many of these disturbances originate within the building itself and can seriously affect the operation of the indicator. These sources of disturbances must be identified and steps must be taken to prevent possible adverse effects on the indicator. Examples of available alternatives include isolation transformers, power regulators, uninterruptible power supplies, or simple line filters.

Transient Suppression

The following recommendations will help to reduce transients:

- Always use shielded cables to connect signal wires to the weight indicator.

- Connect the cable shield (indicator end only) to a ground point inside the indicator. Keep wires that extend beyond the shield as short as possible.

- Do not run load cell or signal cables from the weight indicator along side or parallel to wiring carrying AC power. If unavoidable, position the load cell and signal cables a minimum of 24" (~60 cm) away from all AC wiring.

- Always use arc suppressors across all AC power relay contacts.

- Use zero voltage switching relays, optically isolated if possible.

RFI Immunity

The operation of sensitive electronic equipment can be adversely affected by RF (Radio Frequency) radio transmissions. Digital weight indicators are one such type of equipment. Radio transmissions come from things like hand-held radio transmitters and cell phones. One symptom of RFI (Radio Frequency Interference) in a digital weight indicator is weight indication instability during a radio transmission.

Cardinal digital weight indicators are designed with special grounding and RFI shielding to achieve a high degree of immunity to common RFI. To maximize the digital weight indicator's immunity to radio transmissions, follow these guidelines:

1. ALWAYS use shielded cable for all I/O (Input/Output) connections to the digital weight indicator.

2. NEVER operate any radio transmitter within 6 feet (~2 meters) of the weight indicator.

3. NEVER connect un-terminated serial, digital, or analog I/O cables to the internal printed circuit boards of the digital weight indicator.

4. KEEP the intended external I/O device connected to I/O cables entering the digital weight indicator.

5. ALWAYS connect the shield of the shielded cable to the indicator back panel gland connector or other closest ground terminal inside the indicator.

6. ALWAYS connect the shield of the shielded I/O cable at the indicator end only. Leave the shield unconnected at the I/O device.

INSTALLATION

Unpacking

Carefully remove the indicator from the shipping carton and inspect it for any evidence of damage that may have taken place during shipment. Keep the carton and packing material for return shipment if it should become necessary. The purchaser is responsible for filing all claims for any damages or loss incurred during transit.

> **Should your indicator come already installed on a scale, the following installation information does not apply to you.**

Mounting

The Model 185 and 185B indicators are housed in an ABS IP66 wall or desk-mount enclosure. The gimbal may be mounted on a desktop or other smooth, flat, horizontal surface or may be mounted on a wall. Refer to Figure No. 1 for a layout of wall-mounting bolts.

Clearance for #10 (5 mm) size screw

Figure No. 1

2.00" (5.1 cm)

6.25" (15.88 cm)
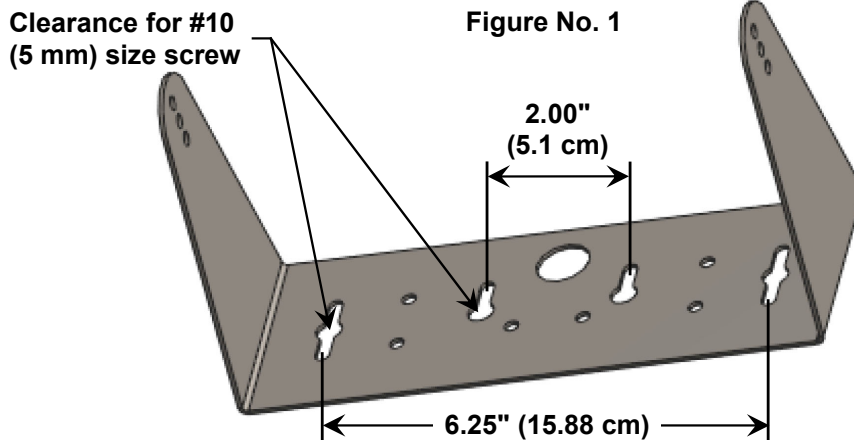
NOTE: Your gimbal may only have two mounting holes, spaced 6.00" (15.24 cm) apart.

If wall mounted, make certain the mounting surface is strong enough to support the indicator. The mounting location should be where the display is easily viewed while being close enough to provide the operator easy access to the keypad. Carefully lay out the mounting hole locations, then drill and install the anchor bolts. Attach the gimbal to the wall and securely tighten the retaining bolts.

AC Power Adapter   **Load Cell Connector**   **Serial Port Connector**

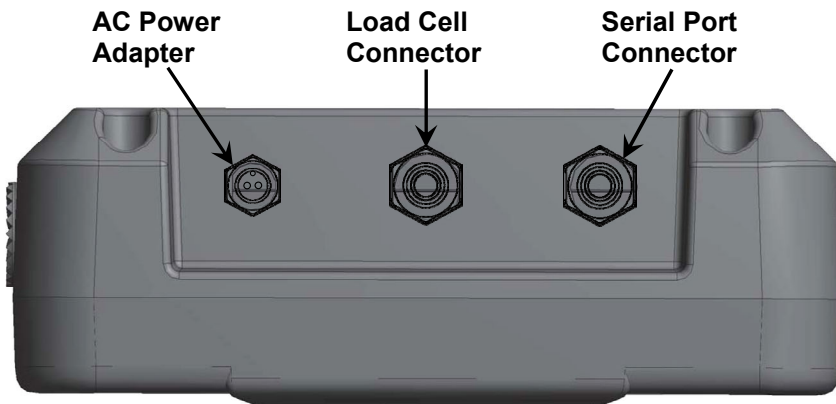**Figure No. 2**

AC Power Adapter

To power the Model 185 or 185B using the 12 VDC wall plug-in AC power adapter, connect the plug from the adapter into the power jack on the bottom panel of the indicator and then plug the power adapter into the proper electrical outlet. Refer to Figure No. 2. On models requiring 230 VAC, it is the customer's responsibility to obtain the correct power adapter plug.

NOTE: The following sections (Batteries, Battery Status, Low Battery Indicator, Battery Charging, and Battery Installation/Replacement) only apply to the Model 185B Weight Indicator.

Batteries

The Model 185B indicator can use 6 "AA" size Alkaline, 2700mAh NiMH, or Ni-Cad batteries (*not included*). You must first obtain and install the batteries before operations can begin. Batteries are contained in a battery holder inside the indicator. Access is via removing the back panel from the main housing.

CAUTION! When operating the Model 185B from Alkaline, NiMH, or Ni-Cad batteries, all six (6) batteries must be of the same type. They must all be Alkaline, all NiMH, or all Ni-Cad. **DO NOT** mix Alkaline, NiMH, and Ni-Cad batteries.

IMPORTANT! The AC power adapter is also used to recharge the batteries, when the Model 185B is operated from rechargeable batteries. The indicator will detect the type of battery installed and only charge if they are a rechargeable type battery.

To determine battery chemistry, the Model 185B will send a charge into all types of batteries for less than 1 second. During this time, the charge indicator will scroll as if the batteries are being charged. This is normal and is not harmful to the Alkaline batteries.

NOTE: Once Alkaline batteries are detected, the chemistry detection is stopped and Alkaline batteries are assumed to be installed until the indicator is completely powered off and back on.

Battery Status

The Model 185B indicator will operate for up to 70 hours (with one 350-ohm load cell) on new Alkaline batteries or 2700mAh NiMH batteries depending on the condition of the batteries (from new to about 500 recharges). Note that due to the lower milliamp hour capacity of Ni-Cad batteries, the operating time will be less. The battery bar graph on the display indicates the battery capacity in 4 steps:
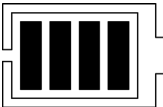
4 segments - the full battery capacity is available,
3 segments - the battery is at 75% of capacity,
2 segments - the battery is at 50% of capacity,
1 segment: - the battery is at 25% capacity.

Low Battery Indicator

When the battery voltage drops too low for accurate weighing, the Model 185B indicator will show $LobAt$ briefly, and then shut off. You will be unable to turn the indicator back on until the Alkaline batteries have been replaced or if using NiMH or Ni-Cad batteries, the AC power adapter is connected to the indicator to recharge the batteries.

Battery Charging

To recharge the NiMH or Ni-Cad batteries, the AC power adapter must be connected to a power outlet and plugged into the indicator. Note that when the AC power adapter is connected to the indicator and is charging the batteries, the charge level status bars will scroll. It will take approximately 8 to 10 hours to fully recharge the batteries. Charging the batteries for more than 10 hours *will not* damage them.

NOTE: The Model 185B indicator may be operated while the batteries are charging.

Battery Installation/Replacement

⚠ **IMPORTANT! If changing from Alkaline batteries to rechargeable batteries, be sure to completely power off the indicator first. If this step is not performed, the batteries will not charge.**

To install or remove the batteries, the following steps should be followed:

1. Make sure the AC power adapter is unplugged.

2. Remove the indicator from the mounting bracket and turn the indicator over so that the display is facing away from you.

3. Remove the four (4) Phillips screws securing the back panel to the main housing.

4. To install or replace the batteries, lift the rear panel from the main housing and turn it over so the back is facing away from you, exposing the battery holder.

5. Next, insert a flat blade screwdriver between either side of the battery holder and the battery strap, and then gently pry outward to remove the battery strap.

6. If installing new batteries, proceed to step 7. If replacing the batteries, remove all 6 batteries from the battery holder and then proceed to step 7.

7. Install the 6 new "AA" size batteries in the battery holder, noting the polarity markings located in the battery holder. Refer to Figure No. 3 below.

8. After placing all 6 batteries in the holder, turn the main housing over (display facing up) and press the **ON/OFF** key.

9. If the display turns on, the batteries have been installed correctly. If not, check for one or more improperly positioned batteries.

10. Next, on the rear panel, place one end of the battery strap under the edge of the battery holder. Lower the other end of the battery strap, and press down until it snaps in place.

11. Make certain no cables or wires are exposed between main housing and rear panel, and then place the rear panel onto main housing.

12. Secure the rear panel to the main housing with the four (4) Phillips screws removed earlier, torqueing them to 20 inch-pounds (2.26 newton-metre). The Model 185B is ready for normal operations.
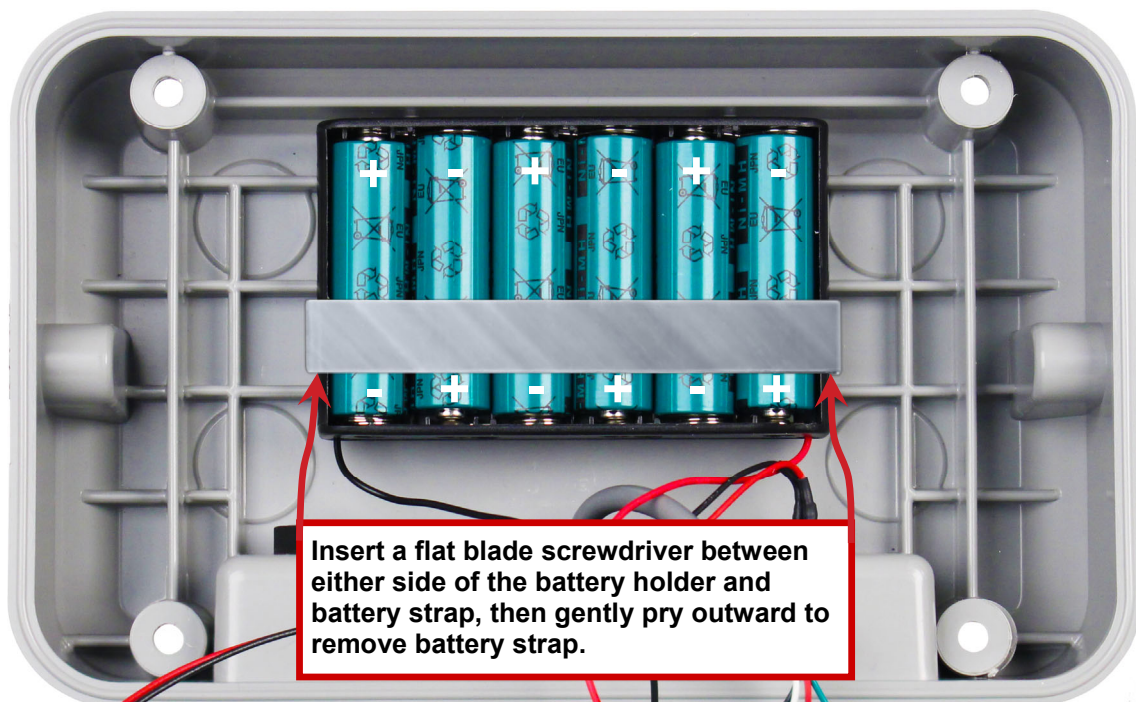

Insert a flat blade screwdriver between either side of the battery holder and battery strap, then gently pry outward to remove battery strap.

Figure No. 3

Load Cell Cable Connection

The following instructions describe the load cell connection through a standard gland connector. Refer to Figure No. 2 for illustration of connector layout.

1. Remove the four (4) Phillips screws securing the back panel to main housing, and then loosen the center gland connector for the load cell cable. Refer to Figure No. 2 for illustration of connector layout.

2. Slip the single cable from the load cell or load cell junction box through the gland connector and into the enclosure.

3. Remove 2" (50mm) of the outer insulation jacket, then remove 1/4" (6mm) of insulation from each of the 4 wires and shield (without sense leads) or 6 wires and shield (with sense leads). Refer to Figure No. 4.

4. Connect each of the wires to terminal block P2 referring to labels on circuit board for terminal connections. Refer to Figure No. 5 for terminal block location.

5. To terminate a wire, first press down on release bar for the terminal, insert wire into terminal opening then allow release bar to return to its original position, locking wire in place. Repeat procedure until all of wires are in place.

6. Attach the included tubular snap-on ferrite core to the outer insulation jacket inside the enclosure near the end of the jacket. Make sure sufficient pressure is applied to completely latch the core to the cable. See Figure No. 6.

2"/50mm

1/4"/6mm

Figure No. 4

Press Down Here

Insert Wire

Figure No. 5

Tubular Snap-on Ferrite Core

Load Cell Cable
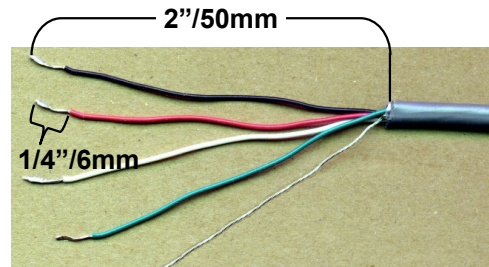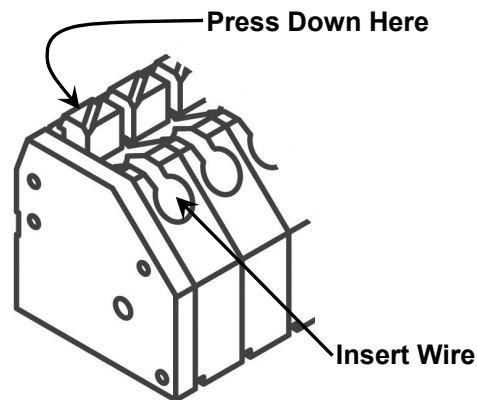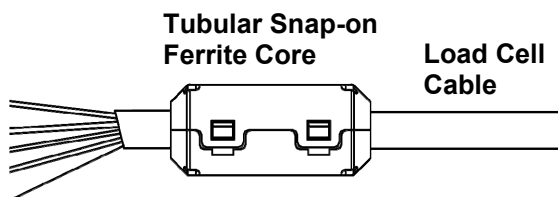
Figure No. 6

LOAD CELL TERMINAL BLOCK P2

TERMINAL NO.	Function	TERMINAL NO.	Function
1 – +EXC	+ EXCITATION	5 – -SIG	- SIGNAL
2 – +SEN	+ SENSE*	6 – -SEN	- SENSE*
3 – +SIG	+ SIGNAL	7 – -EXC	- EXCITATION
4 – SHLD	SHIELD (Connect the load cell cable shield wire here).		

* NOTE: If the sense leads are NOT used, you must install plug-in jumpers at J1 and J2 adjacent to the terminal block. These jumpers attach the sense leads to the excitation leads. If sense leads ARE used (as in motor truck scales), these plug-in jumpers should be positioned on one plug-in pin only or removed and stored for later use (see Figure No. 9).

Load Cell Connections with Over 30 Feet of Cable

For installations with over 30 feet (9 meters) of cable between the indicator and the load cells, sense wires should be used. The sense wires must be connected between the +SENS, -SENS terminals on the indicator and the +EXCITATION, -EXCITATION wires of the load cells or the +SENS, -SENS terminals of the load cell trim board or the section seal trim board.

Scale End Load Cell Cable Ferrite Core

The included round snap-on ferrite core must be attached to the load cell cable near the scale end of the cable. The ferrite core must be attached to the cable with one turn as shown in Figure No. 7. Wrap the load cell cable around one side of the core, and then snap it closed. Make sure sufficient pressure is applied to completely latch the core to the cable.

Back of Scale →

Round Snap-on Ferrite Core

Front View Round Snap-on Ferrite Core

Load Cell Cable

Wrap one turn of load cell cable around ferrite core.
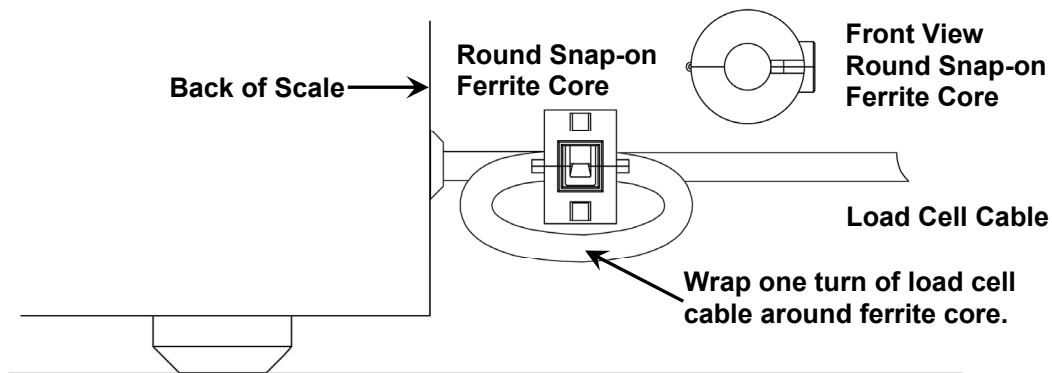
Figure No. 7

Serial I/O Cable Installation

The Model 185 and 185B may be connected to a printer to record weight and associated data or it may be connected to a remote display or to a computer for transmission of weight data. The weight data, may be transmitted on demand (pressing the **PRINT** key or on receipt of a command from the computer). Refer to the Setup, SIO Serial I/O section of this manual.

1. Remove the four (4) Phillips screws securing the back panel to main housing, and then loosen the right gland connector for the serial cable. Refer to Figure No. 2 for illustration of connector layout.

2. Slip the serial cable through the gland connector and into the enclosure.

3. Remove 2" (50mm) of the outer insulation jacket then remove 1/4" (6mm) of insulation from each of the wires (refer to Figure No. 4).

4. Connect each of the wires to the Serial Data terminal block (P6) referring to Figure No. 9 for terminal block locations.

5. To terminate, make sure the terminal screw is backed off enough, insert the wire into the opening, then tighten the screw. Repeat the procedure until all of the wires are in place.

Tighten Screw

Insert Wire
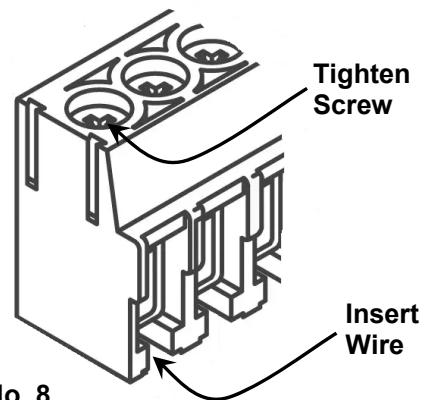
Figure No. 8

Main PCB and Jumpers

NOTE: Loosen the four captive screws securing the rear housing to the front housing, and remove the rear housing to access the jumpers.
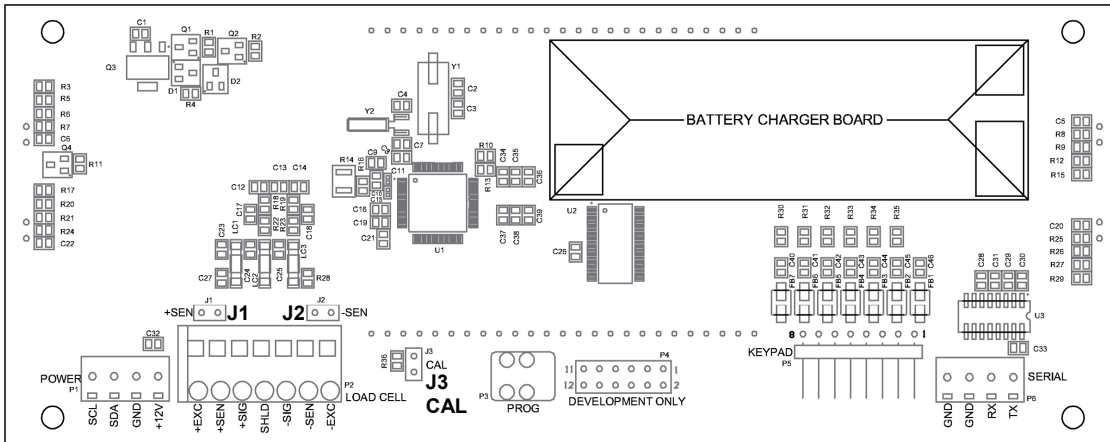
Figure No. 9

J3 - CALIBRATION JUMPER

Jumper J3 must be installed to operate the indicator. To begin the setup and calibration procedure, J3 must be removed and re-installed with the indicator powered on.

J1 and J2 - SENSE JUMPERS

If sense leads are NOT used, you must install plug-in jumpers at J1 and J2 (adjacent to the P2 connector). These jumpers attach the sense leads to the excitation leads. If sense leads ARE used, these plug-in jumpers should be positioned on one plug-in pin only or removed and stored for later use.

Re-Installing the Rear Panel

After all terminations have been made:

1. Remove the excess cable from the indicator enclosure and securely tighten each of the cable gland connectors.

   • Do not over-tighten these connectors but make certain they are snug.

   • **DO NOT USE TOOLS!** Finger-tighten only!

2. Make certain no cables or wires are exposed between the main housing and rear panel, and then place the rear panel onto the main housing.

3. Secure the rear panel to the main housing with the four (4) Phillips screws removed earlier, torqueing them to 20 inch-pounds (2.26 newton-metre).

KEYPAD FUNCTIONS

The Model 185 and 185B Weight Indicators are equipped with a 7-key keypad. The keypad is used to enter commands and data into the indicator. This section describes each key along with its normal function. It is helpful to refer to the actual indicator while reading this section.
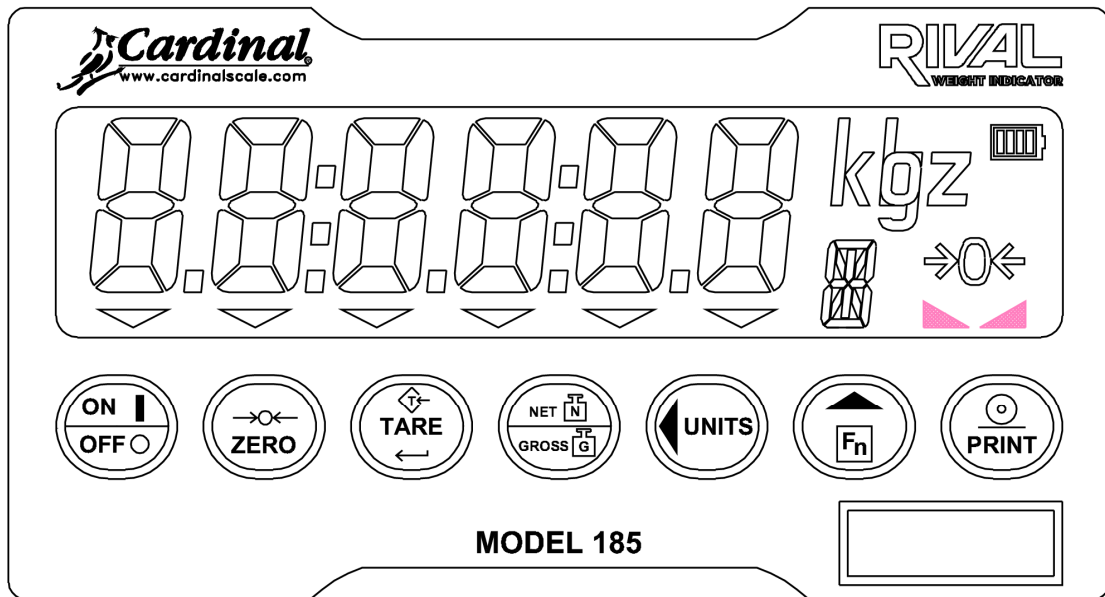
Figure No. 10

⚠ **The membrane keypad is not to be operated with pointed objects (pencils, pens, fingernails, etc.). Damage to keypad resulting from this practice is NOT covered under warranty.**

ON/OFF

Pressing this key when the indicator is off will apply power to the indicator.

Pressing this key when the indicator is on will turn the indicator off.

The following key functions are available if the 185 or 185B are functioning as a weight indicator and not as a remote display.

ZERO

Pressing this key will perform a zero-load adjustment. The adjustment will not take place unless the weight display is stable. There is a setup option to limit the amount of adjustment to plus or minus two percent of scale capacity.

TARE ↵ (Enter)

Pressing this key will set the tare weight to the current gross weight. The display indication will switch to net weight display mode if the tare weight is not zero. The weight display must be stable for the operation to occur.

NET/GROSS

If the tare weight is greater than zero, pressing this key will toggle between the gross and net weight display modes.

UNITS/◄ (Left Arrow)

If more than one weighing unit was selected in setup, pressing this key will toggle between the selected weighing units.

Fn/▲ (Up Arrow)

If the tare weight is greater than zero, pressing this key followed by the **TARE** key will briefly display the tare weight.

See the **PIECE COUNT**, **SETUP REVIEW**, and **DISPLAY MILLIVOLTS** sections for other uses for this key.
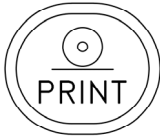
PRINT

If continuous serial output was not selected in setup, pressing this key will initiate the transmission of ASCII data via the serial port.

NOTE: The indicator will not respond to the print command unless the weight display is stable. If the gross weight is being displayed, only the gross weight will be printed. If the net weight is being displayed, the gross, tare, and net weights will be printed.

ANNUNCIATORS

The Model 185 Weight Indicator is equipped with annunciators that are turned on to indicate that the display is in the mode corresponding to the annunciator label or that the status indicated by the label is active. This section describes each annunciator.

Symbol	Name	Description
→0←	ZERO	This annunciator is turned on to indicate that the weight displayed is within ± 1/4 division of true zero.
◢◣	STABLE	The stable annunciator will be on when the weight is stable to within the limits established during setup.
G	GROSS	This annunciator is turned on to show that gross weight is displayed. Gross weight will be displayed when no tare weight is stored.
n	NET	This annunciator is turned on when the displayed weight is Net weight (Gross weight less Tare weight).
T	TARE	This annunciator is turned on to show that the displayed weight is the tare weight.
lb	pounds	This annunciator is located to the right of the weight display and is turned on to show that the displayed weight unit is pounds.
oz	ounces	This annunciator is located to the right of the weight display and is turned on to show that the displayed weight unit is ounces.
kg	kilograms	This annunciator is located to the right of the weight display and is used to indicate that the displayed unit of weight measurement is kilograms.
g	grams	This annunciator is located to the right of the weight display and is used to indicate that the displayed unit of weight measurement is grams.
C	COUNT	This annunciator shows that the display is in the Count mode, and the value displayed is in pieces (the count quantity) and not weight.
F	FINE SPAN	This annunciator shows that the indicator is in the Fine Span Adjustment mode of setup.
▮▮▮▮	Battery Status	The battery status indicator will be displayed on the Model 185B when batteries are installed. The number of bars indicates the level of charge. Note that as the battery approaches full discharge, the outline of the battery will start to flash. **NOTE:** When the AC power adapter is connected to the indicator and is charging the batteries, the charge level status bars will scroll.

SETUP AND CALIBRATION

Your 185 or 185B Weight Indicator has been thoroughly tested and calibrated before being shipped to you. If you received the indicator attached to a scale, calibration is not necessary. If the indicator is being connected to a scale for the first time or recalibration is necessary for other reasons, proceed as indicated.

Calibration of the indicator is accomplished entirely by the keypad. To enter setup and calibration, the calibration jumper must be removed and re-installed while the indicator is on. The calibration jumper is located on the main printed circuit board. Refer to Figure No. 11 for the location of the jumper. Loosen the four (4) Phillips screws securing the rear housing to the front housing, and remove the rear housing to access the calibration jumper.
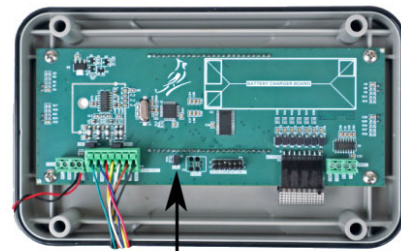
During the setup and calibration process, it will be necessary to enter operational parameters via the indicator's keypad.

Calibration Jumper

Figure No. 11

- When a prompt for a value is displayed, press the **TARE ↵** key to display the current setting.
- Pressing the **TARE ↵** key will cause the data entered or displayed to be retained and the indicator to advance to the next prompt.
- The functions of numeric keys are replaced by using the **UNITS/◄** and the **Fn/▲** keys.
- The cursor location is identified by the blinking character and can be advanced to the left to the next position by pressing the **UNITS/◄** key.
- Pressing the **Fn/▲** key will change the blinking character to the next value. Continue to press this key to "toggle" between the different available values for the setup parameter.
- Pressing the **Fn/▲** key when a setup parameter (not a parameter value) is displayed, will "backup" to the previous prompt.

⚠ **The membrane keypad is not to be operated with pointed objects (pencils, pens, fingernails, etc.). Damage to keypad resulting from this practice is NOT covered under warranty.**

Begin Setup and Calibration:
1. With the rear panel removed and the indicator ON, remove the calibration jumper J3.
2. The 5EtUP prompt will be displayed.
3. Re-install the calibration jumper and press the **TARE ↵** key.
4. The rd iSP: prompt will be displayed.
5. The indicator is now ready for setup and calibration.

rd iSP: (Remote Display)
This setting will turn the 185 or 185B indicator into a remote display using the serial port. If the 185 or 185B is connected to a Cardinal 200 series indicator, it becomes a functional remote keypad and display.

Press the **TARE ↵** key to view the current setting. To keep the current setting, press the **TARE ↵** key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE ↵** key to select the displayed value and proceed to the next prompt.

Available values are:

YES	no
Remote Display Function Enabled	Remote Display Function Disabled

If rd iSP: YES is selected, an additional prompt, tYPE: will be displayed.

ㄸㄴㄹㄷ: (Remote Serial Data Type)
This setting selects the format of data received at the serial port in remote display mode.

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

> 0 = SMA - No remote key presses transmitted
> 1 = SB-400 - Transmits remote key presses
> 2 = SB-200 - Transmits remote key presses
> 3 = Toledo Short - No key presses transmitted
> 4 = Toledo Long - No key presses transmitted
> 5 = Rice Lake IQ355 - No key presses transmitted

After selecting the Remote Serial Data Type, the next prompt displayed will be bAud:. Proceed to the bAud: (Serial Port Baud Rate) section to configure the baud rate, parity, and stop bits for the remote display function.

USA: (Domestic or International)
This is the prompt to select whether the indicator is used in the USA (domestic) or outside the USA (international).

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

USA: YES (Domestic)	USA: no (International)
Overcapacity status is on when Gross weight is greater than 104% of capacity.	Overcapacity status is on when Gross weight is greater than capacity plus 9 divisions.
Zero range is up to capacity when trL:no.	Zero range is limited to plus or minus 2% of capacity.
Piece counting is disabled if LFt:YES.	Piece counting is enabled
Power up zero is limited to plus or minus 20% of capacity.	

LFt: (Legal For Trade)
Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

YES	no
Legal For Trade	Not Legal For Trade

NOTE: When both LFt:YES and USA:YES:
   Piece count operation will be disabled.

NOTE: When both LFt:no and USA:YES:
   Piece count operation will be enabled.

Unit 1: (Weighing Unit 1)
Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

    1 = lb (Pounds)   2 = kg (Kilograms)   3 = oz (ounces)   4 = g (Grams)

Int: (Interval Setting)
Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are 1, 2, 5, 10, 20, or 50.

dPP: (Decimal Point Position)
Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

    0 = XXXXXX   1= XXXXX.X   2 = XXXX.XX   3 = XXX.XXX

CAP: (Capacity)
Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, use the **Fn/▲** and **UNITS/◄** keys to enter a new value. When the desired value is displayed, the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are 1 through 999999.

Unit2: (Weighing Unit 2)
Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

    0 = Disabled   1 = lb (Pounds)   2 = kg (Kilograms)   3 = oz (ounces)   4 = g (Grams)

⚠️ **NOTE:** The selection for *Unit2* cannot be the same as *Unit 1*. In addition, for some settings of *int* (interval) and *dPP* (decimal point position), not all unit combinations are available.

$CRL\,z$ (Calibration)

With the display showing $CRL\,z$, press the **TARE ↵** key. The display will show no. If the scale has already been calibrated and you do not wish to calibrate again, press the **TARE ↵** key to keep the current calibration.

To begin calibration, press the **Fn/▲** key to select YES, and then press the **TARE ↵** key. The display will show $CRL\,1z$.

$CRL\,1z$ – First Calibration Weight

This is the first of two calibration weights. This weight could be ZERO (NO LOAD) or the TEST WEIGHTS (TEST LOAD).

- Press the **TARE ↵** key.

- Use the **UNITS/◀** and the **Fn/▲** keys to set the display to the weight on the scale platform.

- Make sure the platform is stable, and then press the **TARE ↵** key.

- Starting at the left and advancing right, a series of dashes will appear on the display. The dashes will then disappear, starting at the left and proceeding to the right. The display will change to show $CRL\,2z$.

$CRL\,2z$ - Second Calibration Weight

This is the second of two calibration weights. If the first weight was ZERO (NO LOAD), then this weight must be the TEST WEIGHT (TEST LOAD). If the first weight was the TEST WEIGHT (TEST LOAD), then this weight must be ZERO (NO LOAD).

- Press the **TARE ↵** key.

- Use the **UNITS/◀** and the **Fn/▲** keys to set the display to the weight on the scale platform.

- Make sure the platform is stable, and then press the **TARE ↵** key.

- Starting at the left and advancing right, a series of dashes will appear on the display. The dashes will then disappear, starting at the left and proceeding to the right. The display will change to show $trAz$.

> ⚠ **IMPORTANT! During the time the dashes are appearing on the display, make sure the loaded (or empty) scale is stable.**

$trAz$ (Zero Tracking Range)

Zero tracking range is a value in scale divisions that will be automatically zeroed off.

Press the **TARE ↵** key to view the current setting. To keep the current setting, press the **TARE ↵** key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE ↵** key to select the displayed value and proceed to the next prompt.

Available values are 0 (disables zero tracking), 0.5, or 1 through 9.

NOTE: In Legal For Trade applications, the Zero Tracking Range should be set in accordance with weights and measures regulations.

`ᴛʀʟ:` (± 2% Zero Range)

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

`ᴛʀʟ:ꓱЅ`
Zero range limited to plus or minus 2% of scale capacity

`ᴛʀʟ:ᴨᴏ`
Zero range up to capacity of scale (no limit)

`ᴜᴨЅ:` (Motion Range)

The motion range is the amount of weight change in scale increments allowed before the unstable indication occurs.

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, use the **Fn/▲** and **UNITS/◄** keys to enter a new value. When the desired value is displayed, the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are 1 through 99.

NOTE: In Legal For Trade applications, the Motion Range should be set in accordance with weights and measures regulations.

`ЅC:` (Stable Count)

The stable count sets the number of consecutive samples, which must be within the motion range before the stable annunciator is turned on.

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, use the **Fn/▲** and **UNITS/◄** keys to enter a new value. When the desired value is displayed, the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are 0 through 255.

`Fʟᴛ:` (Digital Filter Level Selection)

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

0 = Minimal Filter   1 = Moderate Filter   2 = Heavy Filter   3 = Custom Filter

NOTE: If `Fʟᴛ:Ɜ` (Custom Filter) is selected, two additional prompts will be displayed.

`F:` (Filter Level)

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, use the **Fn/▲** and **UNITS/◄** keys to enter a new value. When the desired value is displayed, the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are 1 through 99.

Where:

1 = least amount of filtering

99 = greatest amount of filtering

b r : (Break Range)

The break range is difference in divisions between consecutive samples, which will turn filtering off. Filtering will resume when the difference between samples is less than the break range. A smaller value for break range will result in a display that is more responsive to changes in weight.

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, use the **Fn/▲** and **UNITS/◄** keys to enter a new value. When the desired value is displayed, the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are 0 (disables break range) through 99.

C AL 9C : (Calibration Location Gravity Constant)

This is the acceleration of gravity value of the location where the scale was calibrated.

NOTE: Set to zero (0) if gravity constants are not going to be used.

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, use the **Fn/▲** and **UNITS/◄** keys to enter a new value. When the desired value is displayed, the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Consult the factory Tech Support for the appropriate value to enter. Note that if a nonzero value is entered, then an additional prompt will appear.

o P 9C : (Operating Gravity Constant)

This is the acceleration of gravity value for the location where the scale will be operated.

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, use the **Fn/▲** and **UNITS/◄** keys to enter a new value. When the desired value is displayed, the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Consult the factory Tech Support for the Acceleration of Gravity value for your location.

P U0 : (Power-Up Zero Feature)

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to save it.

Available values are:

YES   no
Automatic Re-Zero on Power-Up   No Re-Zero on Power-Up

ASH : (Automatic Shutoff)

Automatic Shutoff will automatically turn the indicator off (when it is not in use) after a period of inactivity. To turn the indicator back on you must press the **ON/OFF** key.

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are 0 (automatic shutoff disabled) through 9.

bAUd: (Serial Port Baud Rate)
Press the **TARE ↵** key to view the current setting. To keep the current setting, press the **TARE ↵** key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE ↵** key to select the displayed value and proceed to the next prompt.

Available values are:

12 = 1200 Baud	24 = 2400 Baud	48 = 4800 Baud
96 = 9600 Baud	19 = 19.2k Baud	38 = 38.4k Baud

PrtY: (Serial Port Parity)
Press the **TARE ↵** key to view the current setting. To keep the current setting, press the **TARE ↵** key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE ↵** key to select the displayed value and proceed to the next prompt.

Available values are:

0 = NONE (No Parity)   1 = Odd Parity   2 = Even Parity

> ⚠ **NOTE: When using the 185 or 185B as a Remote Display, selecting Odd or Even parity for the 185 or 185B serial port, requires the local indicator to be set to send 7 Data Bits.**

StoP: (Serial Port Stop Bits)
Press the **TARE ↵** key to view the current setting. To keep the current setting, press the **TARE ↵** key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE ↵** key to select the displayed value and proceed to the next prompt.

Available values are:

1 = One stop bit   2 = Two stop bits

- If you selected rdiSP:YES (Remote Display Function Enabled), then the setup process is complete. The indicator will return to the weight display mode. Remove power from the indicator and re-assemble for use.

- If you selected rdiSP:no (Remote Display Function Disabled), then the setup process will continue with the Cont: prompt.

Cont: (Continuous Output Serial Port)
Press the **TARE ↵** key to view the current setting. To keep the current setting, press the **TARE ↵** key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE ↵** key to select the displayed value and proceed to the next prompt.

Available values are:

YES
   Continuous Output

no
   No Continuous Output

- If you selected Cont:YES (Continuous Output), then the tYPE: prompt will be displayed.

- If you selected Cont:no (No Continuous Output), then the next prompt will be EoP (End-of-Print Line Feeds).

Ⱪ⅄ᑭℇ: (Continuous Output Format)

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, press the **Fn/▲** key to scroll through the available values. When the desired value is displayed, press the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Available values are:

      0 = SMA   1 = SB-400

ℇₒᑭ: (End-Of-Print Line Feeds)

At the end of a data transmission to a printer, the indicator can transmit a pre-selected number of line feed commands to space the paper in the printer to the desired position for withdrawal or for the next print.

Press the **TARE** ↵ key to view the current setting. To keep the current setting, press the **TARE** ↵ key again. Otherwise, use the **Fn/▲** and **UNITS/◄** keys to enter a new value. When the desired value is displayed, the **TARE** ↵ key to select the displayed value and proceed to the next prompt.

Allowable values are 0 through 99.

Setup and Calibration Completed

The setup and calibration process have been completed. The indicator will reset and then display weight. Remove power from the indicator and re-install the rear panel.

Re-Installing the Rear Panel

After the setup and calibration process has been completed:

1. Remove the excess cable from the indicator enclosure and securely tighten each of the cable gland connectors.

    • Do not over-tighten these connectors but make certain they are snug.

    • **DO NOT USE TOOLS!** Finger-tighten only!

2. Make certain no cables or wires are exposed between the main housing and rear panel, and then place the rear panel onto the main housing.

3. Secure the rear panel to the main housing with the four (4) Phillips screws removed earlier, torqueing them to 20 inch-pounds (2.26 newton-metre).

FINE SPAN ADJUSTMENT

⚠ **NOTE: The** ƒ-span **mode requires a load of at least 10% of the scale capacity be on the platform before adjustments can be made.**

ƒ-span (Fine Span Adjustment)

If the indicator _is_ _not_ in setup mode:

1. With the indicator ON, remove the rear panel, and then remove the calibration jumper J3.
2. The setup prompt will be displayed.
3. Re-install the calibration jumper, and press the **TARE ↵** key.
4. The rd isp: prompt will be displayed.
5. Press the **TARE ↵** key until the cal: prompt is displayed.
6. Remove and re-install the calibration jumper again.
7. The display will change to the ƒ-span prompt.
8. Press the **TARE ↵** key.
9. The display will change to show the scale weight. The ƒ annunciator will be on to indicate Fine Span Mode.
10. Apply a TEST LOAD of at least 10% of the scale capacity.
11. If the displayed weight does not match the TEST LOAD weight, press the **Fn/▲** key to increase the displayed weight or the **UNITS/◄** key to decrease the displayed weight.
12. Press the **TARE ↵** key to return to the cal: prompt.

If the indicator _is_ in setup mode:

1. Press the **TARE ↵** key until the cal: prompt is displayed.
2. Remove and re-install the calibration jumper J3.
3. The display will change to the ƒ-span prompt.
4. Press the **TARE ↵** key.
5. The display will change to show the scale weight. The ƒ annunciator will be on to indicate Fine Span Mode.
6. Apply a TEST LOAD of at least 10% of the scale capacity.
7. If the displayed weight does not match the TEST LOAD weight, press the **Fn/▲** key to increase the displayed weight or the **UNITS/◄** key to decrease the displayed weight.
8. Press the **TARE ↵** key to return to the cal: prompt.

SETUP REVIEW

Some operational parameters may be changed without having to enter the setup and calibration mode.

To Enter Setup Review:

1. Press the **Fn/▲** key followed by the **ZERO** key.

2. The indicator will show the *PUO* prompt.

3. Refer to the Setup and Calibration section for information on how to change parameters.

The parameters in the setup review will be processed in the following sequence:

PUO:	Enable or Disable automatic zero on power up.
ASH:	Disable or select number of minutes for automatic shutoff timer.
bAUd:	Select baud rate for serial port.
Prty:	Select serial port parity
StoP:	Select stop bits for serial port
Cont:	Enable or Disable the continuous output.
tYPE:	Select continuous output type
EoP:	Select the number of End of Print linefeeds printed.

⚠ **IMPORTANT! Changes to the RS232 control settings *bAUd:*, *Prty:*, or *StoP:* requires power cycling (turning the indicator off and back on) to take effect.**

SERIAL DATA FORMATS

Weight-On-Demand

If the Continuous Output for the serial port was not selected, *Cont:no*, then a computer connected to the serial port can send a request for the 185 to transmit weight data. This is known as Weight-On-Demand. There are two formats for weight on demand: ENQ and SMA weight request.

ENQ Format

The host computer sends:

ENQ - (hex 05)

The 185 will respond:

\<s\>\<xxxxxx\>\<d\>\<_\>\<uu\>\<_\>\<m\>\<_\>\<cc\>\<_\>\<cr\>

where:

s =	Sign	"-" = negative, " " (space) for zero and above
xxxxxx.xxx =	Weight	Six digits
d =	Decimal point	Embedded in the weight, if enabled in setup
_	Space	
uu =	Units	LB, KG, OZ, or G^, ^ = space
m =	Mode	G for gross or N for net
cc =	Weight Status	OC for overcapacity
		MO for unstable
		CZ for center of zero
		EE for weight not displayed, or two spaces
cr =	Carriage Return	(hex 0D)

SMA Format

The host computer sends:

\<lf\> W \<cr\>

The 185 will respond:

\<lf\>\<s\>\<r\>\<n\>\<m\>\<f\>\<xxxxxx.xxx\>\<uuu\>\<cr\>

where:

lf =	Line Feed	(hex 0A)
s =	Flag	Z for center of zero
		O for overcapacity
		U for negative overcapacity
		e for weight not displayed, or space
r =	Range	1 (single range)
n =	Mode	G for gross, N for net
m =	Motion	M for motion, space for stable
f =	Custom Flag	Always a space
xxxxxx.xxx =	Weight	ten digits, including decimal point, right justified
uuu =	Units	lb^, kg^, oz^, or g^^, ^ = space
cr =	Carriage Return	(hex 0D)

Continuous Output

If the Continuous Output for the serial port was selected $Cont = YES$, then the 185 will transmit weight repeatedly. The format is determined by the setting of the $type =$ parameter:

        0 = SMA   1 = SB-400

SMA Format

      <lf><s><r><n><m><f><xxxxxx.xxx><uuu><cr>

where:

lf =	Line Feed	(hex 0A)
s =	Flag	Z for center of zero
		O for overcapacity
		U for negative overcapacity
		e for weight not displayed, or space
r =	Range	1 (single range)
n =	Mode	G for gross, N for net
m =	Motion	M for motion, space for stable
f =	Custom Flag	Always a space
xxxxxx.xxx =	Weight	ten digits, including decimal point, right justified
uuu =	Units	lb^, kg^, oz^, or g^^, ^ = space
cr =	Carriage Return	(hex 0D)

SB-400 Format

      <s><xxxxxx><d><_><uu><_><m><_><cc><_><cr>

where:

s =	Sign	"-" = negative, " " (space) for zero and above
xxxxxx.xxx =	Weight	Six digits
d =	Decimal point	Embedded in the weight, if enabled in setup
_	Space	
uu =	Units	LB, KG, OZ, or G^, ^ = space
m =	Mode	G for gross or N for net
cc =	Weight Status	OC for overcapacity
		MO for unstable
		CZ for center of zero
		EE for weight not displayed, or two spaces
cr =	Carriage Return	(hex 0D)

PIECE COUNTING

The piece-counting feature can be used to convert weight into the number of pieces on the scale.

NOTE: This function is not available when *LFt:YES* (Legal-For-trade) and *USA:YES* (Domestic) has been selected in setup.

To enter count mode:

1. Press the **Fn/▲** key twice.

2. If the average piece weight has been previously calculated, the display will show the number of pieces on the scale.

3. If an average piece weight has not been previously calculated, the display will change to *Add: 5*.

4. To change the sample size, press the **Fn/▲** key repeatedly to scroll through the following sample sizes: 5, 10, 25, 50, and 75.

5. Alternatively, press the **UNITS/◄** key and a digit will begin to flash. Press the **Fn/▲** key to change the digit. Press the **UNITS/◄** key to select a different digit to change.

6. Add the selected quantity of pieces to the scale and press the **TARE ↵** key.

7. The average piece weight will be calculated and the display will change to show the count of pieces on the scale.

To calculate a new average piece weight:

1. Press the **Fn/▲** key.

2. The display will change to *Add: 5*.

3. To change the sample size, press the **Fn/▲** key repeatedly to scroll through the following sample sizes: 5, 10, 25, 50, and 75.

4. Alternatively, press the **UNITS/◄** key and a digit will begin to flash. Press the **Fn/▲** key to change the digit. Press the **UNITS/◄** key to select a different digit to change.

5. Add the selected quantity of pieces to the scale and press the **TARE/Enter** key.

6. The display will change to show the count of pieces on the scale.

- Press the **PRINT** key to transmit the number of pieces through the serial port.

- Press the **NET/GROSS** key to return to weight display mode.

ERROR CODES

The Model 185 Weight Indicator is equipped with software that indicates when an error in the operation takes place. The following, lists the error codes displayed by the indicator along with their meaning. Should you encounter an error code please refer to this list for the cause.

Error	Cause (A.) and Corrective Action (B.)
Ad Err	**A.** Analog to digital circuit has failed. **B.** Consult scale service representative.
CALbtn	**A.** Displayed on power-up if the calibration jumper has been removed from the PC board. **B.** Replace calibration jumper.
ConF ig	**A.** Calibration required. **B.** Calibrate the scale with test weights.
ErrA H	**A.** The analog input is off scale at the upper end of the input range. **B.** Check wiring and load cell.
ErrA L	**A.** The analog input is off scale at the lower end of the input range. **B.** Check wiring and load cell.

Error	**A.** Attempt to perform an illegal function:
	   1. Attempting to zero scale when there is motion present or the scale is over capacity.
	   2. Attempting to zero scale when Gross weight is out of ± 2% Zero Range (trL:YES).
	   3. Attempting to print when scale is over capacity.
	   4. Attempting to tare scale when there is motion present or the Gross weight is below zero or over capacity.

oCAP	**A.** The load on the scale exceeds the capacity of the scale. **B.** Remove the excess load.
-oF-	**A.** The indicator is trying to display a positive number greater than 99,999 or a negative number greater than -99,9999. **B.** Return to Gross weight mode and review the Tare weight. Might indicate incorrect calibration.
UnSt	**A.** Motion is present on power up, while attempting to zero the weight display, or when a print was initiated. **B.** Wait for a stable weight indication.
LobAt	**A.** This message is used with the battery operation in the Model 185B to indicate the battery voltage is too low for accurate weighing and will turn ON briefly before shutting off the indicator. **B.** You will be unable to turn the indicator back on until the Alkaline batteries have been replaced or if using Ni-Cad or NiMH batteries, the AC power adapter is connected to recharge the batteries.
- - - - - -	Remote display function is enabled and no serial data is detected.
oFF	Displayed to indicate the 185 and 185B are turning off.

MILLIVOLTS DISPLAY

As a diagnostic function, the Model 185 Weight Indicator can display the millivolts reading at the load cell input. To display millivolts, proceed as follows:

1. Press the **Fn/▲** key followed by the **UNITS/◄** key.

2. The indicator will show the millivolts reading.

3. Press the **TARE ↵** key to return to the weight display.

EVENT COUNTERS

The Cardinal Model 185 Weight Indicator has been designed with a Category 1 Audit Trail type of security seal with two event counters. One counter is for calibration parameters and one is for configuration parameters. Each event counter can log up to 10,000 events. The data is maintained in non-volatile memory and can be viewed by a Weights and Measures inspector.

The calibration event counter ($CAL=$) will increase by one when Setup mode is exited after changing any calibration parameter (for example, fine span adjustment).

The configuration event counter ($CFG=$) will increase by one when Setup mode is exited after changing any of the following parameters:

USA	Domestic or International
LFt	Legal For Trade
$Unit1$	Weighing Units 1
Int	Interval Setting
dPP	Decimal Point Position
CAP	Capacity
$Unit2$	Weighing Units 2
trA	Zero Tracking Range
trL	± 2% Zero Limit
UnS	Motion Range
SC	Stable Count
FLt	Digital Filter Level
F	Filter Level
br	Break Range

To Display the Event Counters:

1. With the indicator ON, press the **Fn/▲** key.
2. The display will show $Fn=$.
3. Press the **NET/GROSS** key.
4. The display will change to show $CAL=$.
5. Press the **TARE ↵** key.
6. The display will change to show the calibration event counter.
7. Press the **TARE ↵** key.
8. The display will change to show $CFG=$.
9. Press the **TARE ↵** key.
10. The display will change to show the configuration event counter.
11. Press the **TARE ↵** key.
12. The indicator will return to the normal weight display.

SECURITY SEAL INSTALLATION

If your metrology laws require the use of physical sealing, a lead and wire security seal can be installed on the Model 185 and 185B Weight Indicators to prevent access to the calibration jumper (located on the main printed circuit board) from being removed and re-installed to enter setup and calibration thereby preventing unauthorized access to the calibration adjustments.

NOTE: In order to install the lead and wire security seal, two enclosure screws must be replaced with two locking screws. They are available from the Cardinal/Detecto Parts Department. The part numbers are:

8400-0179-08, 185 LOCKING SCREW, (2) REQUIRED

To install a lead and wire security seal, follow the steps provided and refer to Figures No. 12, and 13 below for details on the installation of the seal.

1. Remove two of the round-head machine screws securing the back enclosure to the front enclosure.

2. Replace the two screws removed with the 185 Locking Screws.

3. Make certain the 185 Locking Screws are securely tightened before proceeding.

4. Thread the sealing wire through the hole in the 185 Locking Screws.

5. Pull the wire tight and install the lead seal.

6. The 185 Locking Screws cannot be removed without damaging the lead wire seal.
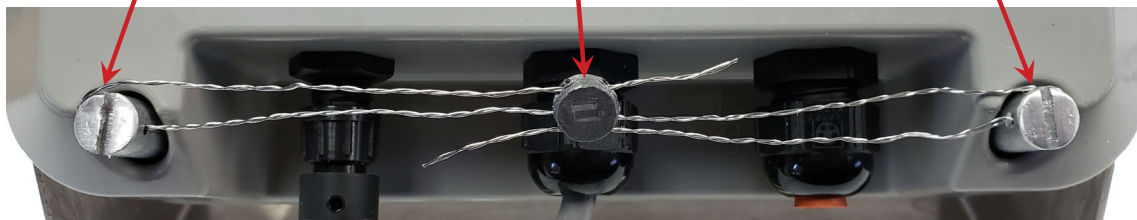
Figure No. 12

Figure No. 13

BEFORE YOU CALL FOR SERVICE

The Model 185 and 185B Weight Indicator has been designed to provide you with years of trouble-free operation. However, should you experience a problem, please refer to the troubleshooting guide below before you call for service. The following describes several types of symptoms along with suggested remedies.
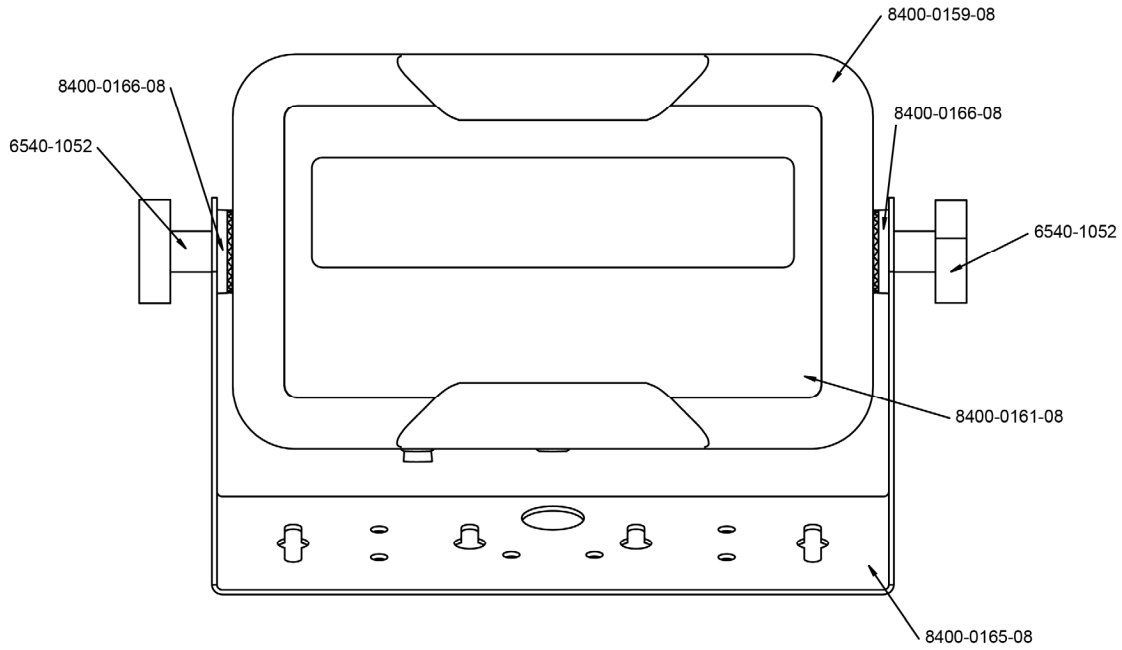
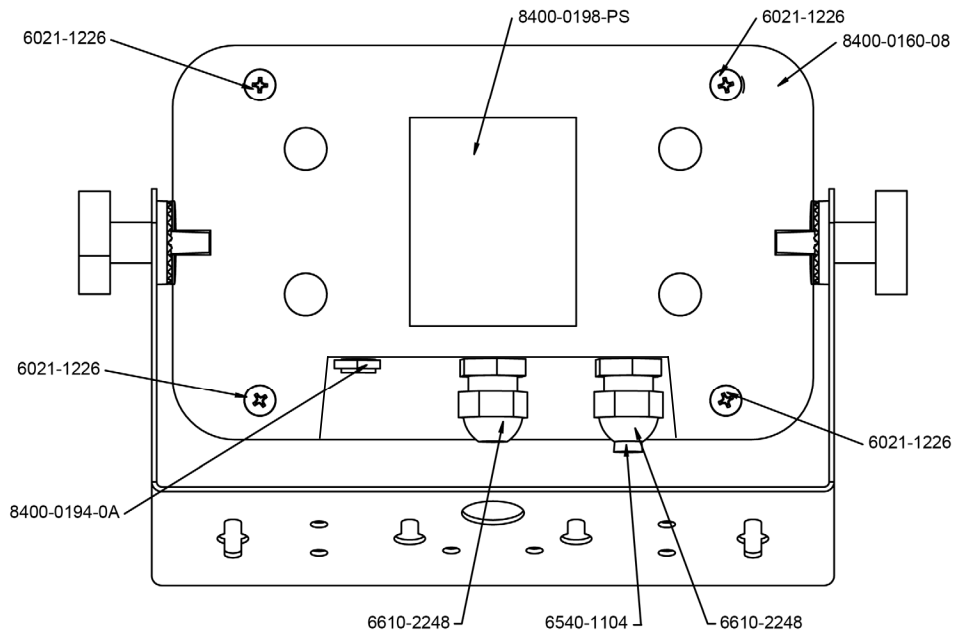| PROBLEM	POSSIBLE SOLUTIONS
Display does not turn on	AC operation: Is the AC power cord fully inserted into the wall receptacle? Check wall receptacle for proper AC power. Try another electrical appliance in the same receptacle, does it work? Check the circuit breaker. Has there been power failure? Battery operation: Check if battery is installed correctly. Is battery discharged? Replace or recharge.
Rechargeable type batteries will not charge	If changing from Alkaline batteries to rechargeable batteries, be sure to completely power off the indicator first. If this step is not performed, the batteries will not charge.
Incorrect weight displayed	Has the indicator been calibrated? Make sure that the scale platform isn't touching an adjacent object. Check the load cell connector wiring. If using four (4) wire load cells, make sure the sense lead jumpers (J1 & J2) are installed. Have proper operation procedures been followed?
Indicator will not display weight	Refer to Error Codes section and make certain that the o𝖢𝖠𝖯 message is not displayed. If so, and the scale is not loaded, perform the calibration sequence.

CARE AND CLEANING

- **DO NOT** submerge indicator in water, pour or spray water directly on indicator.
- **DO NOT** use acetone, thinner or other volatile solvents for cleaning.
- **DO NOT** expose equipment to temperature extremes.
- **DO NOT** place equipment in front of heating/cooling vents.
- **DO** clean the indicator with a damp soft cloth and mild non-abrasive detergent.
- **DO** remove power before cleaning with a damp cloth.
- **DO** provide clean AC power and adequate protection against lightning damage.
- **DO** keep the surroundings clear to provide clean and adequate air circulation.
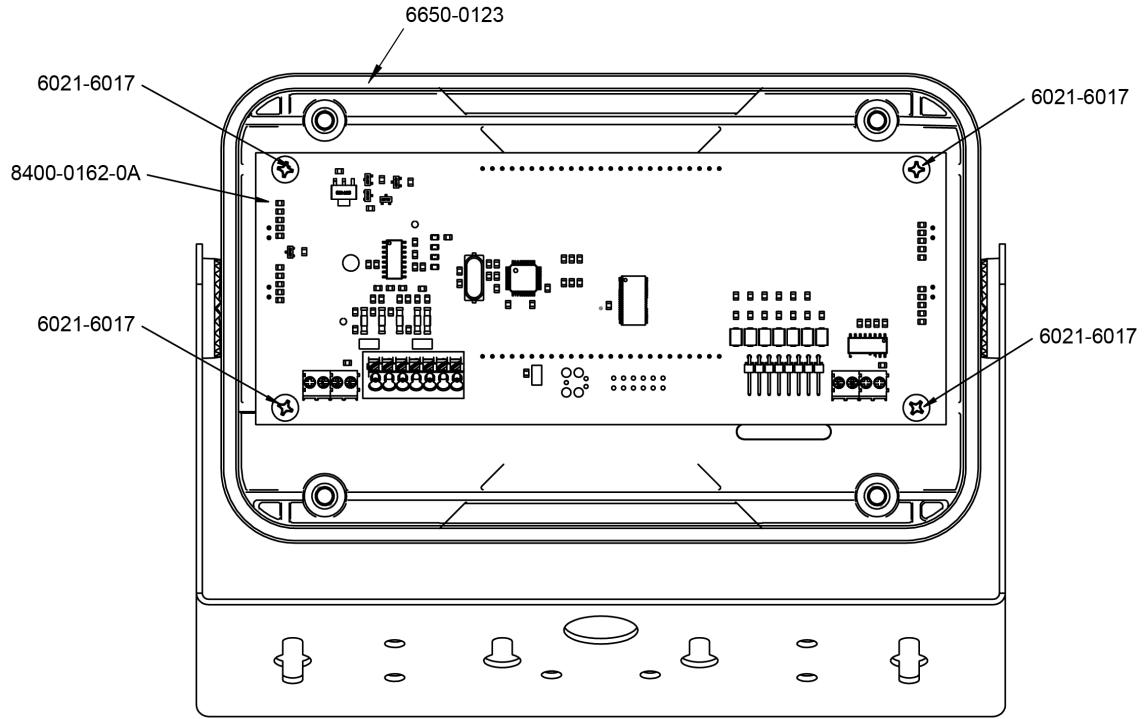
PARTS IDENTIFICATION – 185

185 Front Panel View

8400-0159-08

8400-0166-08

6540-1052

8400-0166-08

6540-1052

8400-0161-08

8400-0165-08

185 Back Panel View

8400-0198-PS

6021-1226

6021-1226

8400-0160-08

6021-1226

6021-1226

8400-0194-0A

6610-2248

6540-1104

6610-2248

185 Front Inside View

6650-0123

6021-6017

8400-0162-0A

6021-6017

6021-6017

6021-6017

185 Parts Identification

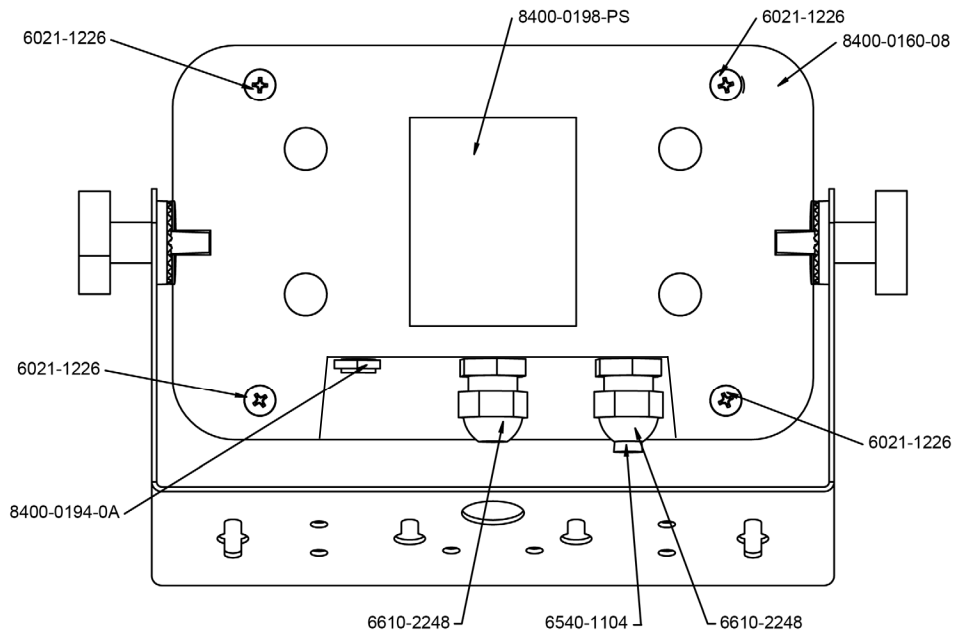| ITEM	QTY.	DESCRIPTION
8400-0160-08	1	ENCLOSURE, REAR, 185 INDICATOR
8400-0159-08	1	ENCLOSURE, FRONT, 185 INDICATOR
8400-0165-08	1	GIMBAL, 185
8400-0166-08	2	185 HIRTH JOINT PLASTIC, 1"DIA, 15 DEG. STEPS
6540-1052	2	ENCLOSURE KNOB 1.25 DIA W/10-32X1/2 STUD
6650-0123	1	O-RING 7 1/4 ID X 3/32 #168
6610-2248	2	CONN GLAND .187-.312 GRIP .599 MTG BLK UL APPROVED
6540-1104	1	HOLE PLUG, 0.343" X 0.187" X 1" LG, SILICONE RUBBER
8400-0162-0A	1	PC BOARD 185 CONTROLLER
6021-6017	4	SCW ROUND-HEAD BLUNT S.S. SHEET METAL #6X.25
6021-1226	4	SCW ROUND-HEAD MACHINE-SCW 10-32X1.25
8400-0161-08	1	KEYPAD, MODEL 185
8400-0183-0A	1	185 DC POWER CABLE ASSEMBLY
8400-0198-PS	1	SERIAL NUMBER TAG
8400-0182-0A*	1	185 POWER SUPPLY ASSEMBLY, 12V/1A, 100-240VAC INPUT
6650-0021*	1	FERRITE SPLIT/CLAMP ON CORE 190 OHMS@100MHZ, 5mm ID, 13mm OD, 25.5mm L
6650-0024*	1	FERRITE SPLIT/CLAMP ON CORE 120 OHMS @ 100MHZ, 0.591in ID, 1.134in OD, 0.606in L

* NOT SHOWN

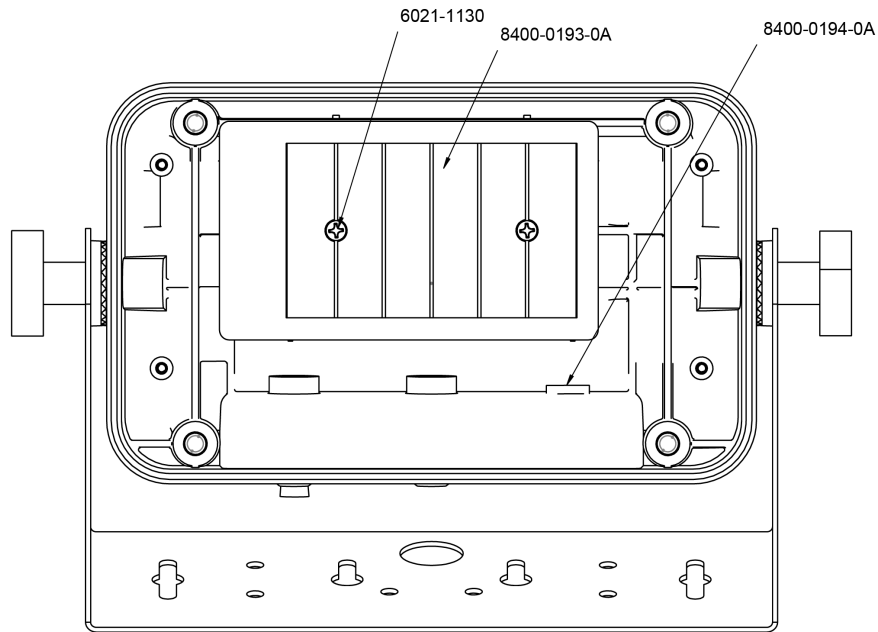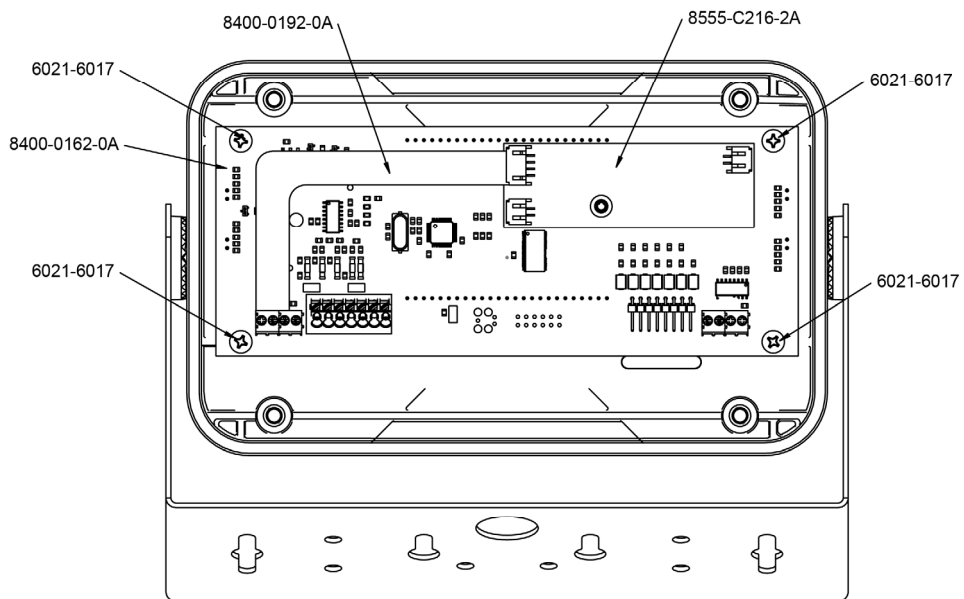# PARTS IDENTIFICATION – 185B

185B Front Panel View
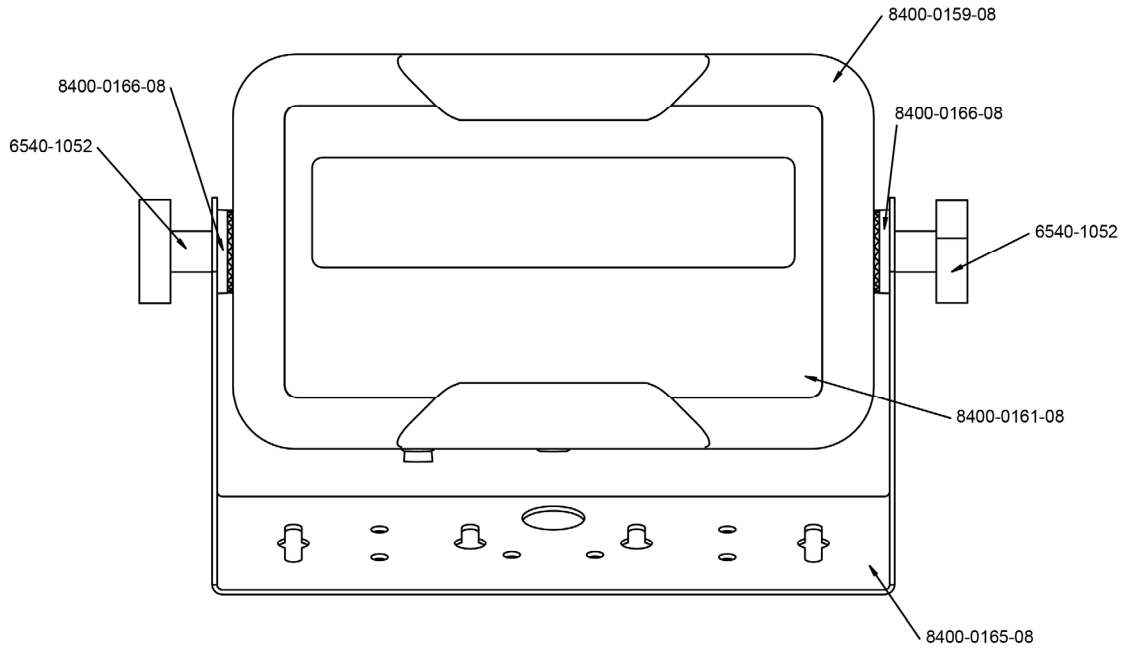
185B Back Panel View

185B Front Inside View

6021-1130
8400-0193-0A
8400-0194-0A

185B Back Inside View

8400-0192-0A
8555-C216-2A
6021-6017
6021-6017
8400-0162-0A
6021-6017
6021-6017

185B Parts Identification

ITEM	QTY.	DESCRIPTION
8400-0160-08	1	ENCLOSURE, REAR, 185 INDICATOR
8400-0159-08	1	ENCLOSURE, FRONT, 185 INDICATOR
8400-0165-08	1	GIMBAL, 185
8400-0166-08	2	185 HIRTH JOINT PLASTIC, 1"DIA, 15 DEG. STEPS
6540-1052	2	ENCLOSURE KNOB 1.25 DIA W/10-32X1/2 STUD
6650-0123	1	O-RING 7 1/4 ID X 3/32 #168
6610-2248	2	CONN GLAND .187-.312 GRIP .599 MTG BLK UL APPROVED
6540-1104	1	HOLE PLUG, 0.343" X 0.187" X 1" LG, SILICONE RUBBER
6021-6017	4	SCW ROUND-HEAD BLUNT S.S. SHEET METAL #6X.25
6021-1226	4	SCW ROUND-HEAD MACHINE-SCW 10-32X1.25
8400-0161-08	1	KEYPAD, MODEL 185
8400-0193-0A	1	BATTERY HOLDER POWER CABLE, 185B
8400-0162-0A	1	PCBOARD 185 CONTROLLER
8400-0194-0A	1	185B DC POWER CABLE ASSEMBLY
8555-C216-2A	1	PCB ASSY 185B BATTERY CHARGER
6021-1130	2	SCW FLAT-HEAD. MACHINE-SCW 06-32x.250
8400-0192-0A	1	CHARGER TO CONTROLLER POWER CABLE, 185B
8400-0182-0A*	1	185 POWER SUPPLY ASSEMBLY, 12V/1A, 100-240VAC INPUT
6650-0021*	1	FERRITE SPLIT/CLAMP ON CORE 190 OHMS@100MHZ, 5mm ID, 13mm OD, 25.5mm L
6650-0024*	1	FERRITE SPLIT/CLAMP ON CORE 120 OHMS @ 100MHZ, 0.591in ID, 1.134in OD, 0.606in L

* NOT SHOWN

STATEMENT OF LIMITED WARRANTY

WARRANTY TERMS

Cardinal Scale Manufacturing Company warrants the equipment we manufacture against defects in material and workmanship. The length and terms and conditions of these warranties vary with the type of product and are summarized below:

PRODUCT TYPE	TERM	MATERIAL AND WORKMANSHIP	LIGHTNING DAMAGE See note 9	WATER DAMAGE See note 7	CORROSION See note 4	ON-SITE LABOR	LIMITATIONS AND REQUIREMENTS
WEIGHT INDICATORS	90 DAY REPLACEMENT ---------- 1 YEAR PARTS	YES	YES	YES	YES	NO	1, 2, 3, 5, 6 A, B, C, D
LOAD CELLS (Excluding Hydraulic)	1 YEAR	YES	YES	YES	YES	NO	1, 2, 3, 5, 6 A, B, C, D
HYDRAULIC LOAD CELLS (When purchased with Guardian Vehicle Scale)	LIFE	YES	YES	YES	YES	90 DAYS	1, 5, 6, 8 A, B, C, D
HYDRAULIC LOAD CELLS (When purchased separately)	10 YEARS	YES	YES	YES	YES	NO	1, 5, 6, 8, 9 A, B, C, D
VEHICLE SCALE (Deck and Below Excl. PSC Series)	5 YEARS	YES	YES	YES	YES	90 DAYS	1, 2, 3, 5, 6 A, B, C, D, E
PSC and LSC SCALE STRUCTURES (Deck and Below)	3 YEARS	YES	YES	YES	YES	90 DAYS	1, 2, 3, 5, 6, 11 A, B, C, D
GUARDIAN FLOOR SCALES	10 YEARS	YES	YES	YES	YES	NO	1, 2, 3, 5, 6, 9, 10 A, B, C, D
ALL OTHER CARDINAL PRODUCTS	1 YEAR	YES	YES	YES	YES	NO	1, 2, 5, 6 A, B, C, D, E
REPLACEMENT PARTS	90 DAYS	YES	YES	YES	YES	NO	1, 2, 4, 5, 6 A, B, C, D
IN-MOTION VEHICLE SCALES	1 YEAR	YES	YES	YES	YES	90 DAYS	1, 2, 5, 6 A, B, C, D
SOFTWARE	90 DAYS	YES	N/A	N/A	N/A	NO	1, 6 B, C, D

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Webb City, MO 64870

06/13
Printed in USA
315-WARRANTY-CAR-K

APPLICABLE LIMITATIONS AND REQUIREMENTS

1. This warranty applies only to the original purchaser. The warranty does not apply to equipment that has been tampered with, defaced, damaged, or had repairs or modifications not authorized by Cardinal or has had the serial number altered, defaced or removed.
2. This warranty is not applicable to equipment that has not been grounded in accordance with Cardinal's recommendations.
3. This equipment must be installed and continuously maintained by an authorized Cardinal dealer.
4. Applies only to components constructed from stainless steel.
5. This warranty does not apply to equipment damaged in transit. Claims for such damage must be made with the responsible freight carrier in accordance with freight carrier regulations.
6. Warranty term begins with date of shipment from Cardinal.
7. Only if device is rated NEMA 4 or better or IP equivalent.
8. Lifetime warranty applies to damages resulting from water, lightning, and voltage transients and applies only to the hydraulic load cell structure itself (does not include pressure transducers, rubber seals, o-rings, and associated wiring).
9. 10 Year prorated warranty on hydraulic load cells.
10. 1 Year warranty for scale structure.
11. PSC models' warranty coverage applies only to agricultural installations on farms up to 3,000 acres (LSC models not limited in this manner).
12. Load cell kits MUST be installed in accordance with Cardinal Scale instructions. Failure to follow these instructions will void the warranty.

EXCLUSIONS

A.) This warranty does not include replacement of consumable or expendable parts. The warranty does not apply to any item that has been damaged due to unusual wear, abuse, improper line voltage, overloading, theft, fire, water, prolonged storage or exposure while in purchaser's possession or acts of God unless otherwise stated herein.

B.) This warranty does not apply to peripheral equipment not manufactured by Cardinal. This equipment will normally be covered by the equipment manufacturer's warranty.

C.) This warranty sets forth the extent of our liability for breach of any warranty or deficiency in connection with the sale or use of our product. Cardinal will not be liable for consequential damages of any nature, including but not limited to loss of profit, delays or expenses, whether based on tort or contract. Cardinal reserves the right to incorporate improvements in material and design without notice and is not obligated to incorporate said improvements in equipment previously manufactured.

D.) This warranty is in lieu of all other warranties expressed or implied including any warranty that extends beyond the description of the product including any warranty of merchantability or fitness for a particular purpose. This warranty covers only those Cardinal products installed in the forty-eight contiguous United States and Canada.

E.) This warranty does not cover paint coatings due to the variety of environmental conditions.

F.) Do not cut load cell cables on load cells returned for credit or warranty replacement. Cutting the cable will void the warranty.

G.) Software is warranted only for performance of the functions listed in the software manual and/or the Cardinal proposal.

H.) The software warranty does not cover hardware. Warranties on hardware are provided from the hardware vendor only.

I.) The software warranty does not cover interfacing issues to non-Cardinal supplied hardware.

J.) The software warranty does not include automatic software upgrades unless purchased separately.

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