



180 and 180EU WEIGHT INDICATOR INSTALLATION and TECHNICAL MANUAL



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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
SENSITIVE**

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 tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed 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.



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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 largely 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:

180	100 to 240 VAC 50/60Hz 12 VDC 1A wall plug-in UL/CSA listed AC power adapter, (Cardinal part number 6800-1045 USA Plug)
180EU	100 to 240 VAC 50/60Hz 12 VDC 1A wall plug-in UL/CSA listed AC power adapter, (Cardinal part number 6800-1045 USA Plug), (Cardinal part number 6805-0003 US to EURO plug adaptor), (Cardinal part number 6805-0004 US to British/UK plug adaptor).

Enclosure Type: 304 Stainless Steel wall or desk-mount

Enclosure Size: 7.70" W x 3.77" H x 1.28" D (196mm W x 96mm H x 33mm D)

Weight: 2.1 lb

Operating Environment: Temperature: 14 to 104 °F (-10 to +40 °C)
Humidity: 90% non-condensing (maximum)

Display: Six digit, seven segment, 0.56" (14mm) high, high-intensity red LED

Transducer Excitation: 8 VDC

Signal Input Range: -0.6 mV/V to +3 mV/V

Number of Load Cells: up to 4 each 350Ω

Load Cell Cable Length: 30 feet maximum

Division Value: 1, 2, 5, 10 or 20 x 1, 0.1, 0.01, 0.001

Sensitivity, Maximum: 1.28 uV/division displayed

Resolution: 5,000 divisions Approved
10,000 divisions Non-Approved

Sample Rate: 1 to 16 samples per second, selectable

Auto Zero Range: 0 to 18 by 0.5 divisions

Weighing Units: Pounds, Kilograms, Ounces

Keypad: Color coded Membrane type, 6 keys

Standard I/O: (1) bi-directional RS232

EUROPEAN DECLARATION OF CONFORMITY

Manufacturer: Cardinal Scale Manufacturing Company
P O Box 151
203 East Daugherty
Webb City, Missouri 64870 USA

Telephone No. 417 673 4631
Fax No. 417 673 5001

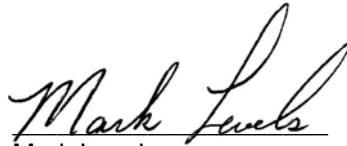
Product: Non-automatic Weight Indicating Instrument
Model Numbers 180EU
Serial Number EXXXYY-ZZZ
where XXX = day of year
YY = last two digits of year
ZZZ = sequential number

The undersigned hereby declares, on behalf of Cardinal Scale Manufacturing Company of Webb City, Missouri, that the above-referenced product, to which this declaration relates, is in conformity with the provisions of:

Council Directive 2006/95/EC Low Voltage Directive
Test Report Number 0206-1 Cardinal Scale Mfg. Co.

Council Directive 90/384/EEC (20 June, 1990) on the Harmonization
of the Laws of Member States relating to non-automatic Weighing
Systems as amended by:
Council Directive 93/68/EEC (22 July, 1993)
Certificate of EU Type Approval Number: DK 0199.115

The Technical Construction File required by this Directive is maintained at the corporate headquarters of Cardinal Scale Manufacturing Company, 203 East Daugherty, Webb City, Missouri.



Mark Levels
Quality Assurance Administrator

SITE PREPARATION REQUIREMENTS

The Model 180 and 180EU Weight Indicators are precision weight indicating instruments. As with any precision instrument, they require 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 180 and 180EU Weight Indicators meets or exceeds 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 to provide adequate air circulation, keep the area around the indicator clear.

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.

Insure that 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 180 and 180EU indicators have been designed to operate from a 100 to 240 VAC 50/60Hz 12 VDC 1A wall plug-in UL/CSA listed AC power adapter (Cardinal part number 6800-1045).

- 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.



SITE PREPARATION REQUIREMENTS, CONT.

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.
- Secure the cables in the cable clips provided inside the 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" away from all AC wiring.
- Always use arc suppressors across all AC power relay contacts (see recommendations at http://www.paktron.com/pdf/Quencharch_QRL.pdf).
- 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 2 meters (~6ft.) 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 interring 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 180 and 180EU indicator may come mounted on a column or you may choose to mount it on a desktop or wall. Refer to Figure No. 1 for illustrations of the mounting bracket. Two (2) holes are located in the mounting bracket for attachment to the wall. This bracket may be removed or left in place for desktop use.

Regardless of how and where you mount indicator, it should be in a safe area where it will not be in the way of normal traffic. The location chosen should be free of temperature extremes and water, is not subject to direct sunlight and should be mounted where the display is easily viewed and within easy reach of the operator.

If wall mounted, make certain the structure and mounting bolts are of sufficient strength to support the indicator. The mounting bracket should be securely fastened to the wall so it cannot break loose.

The indicator may be mounted on a desktop or other smooth, flat, horizontal surface or it may be mounted on a wall using two (2) #10 screws placed 6.25 inches apart on the wall. Refer to Figure No. 1.

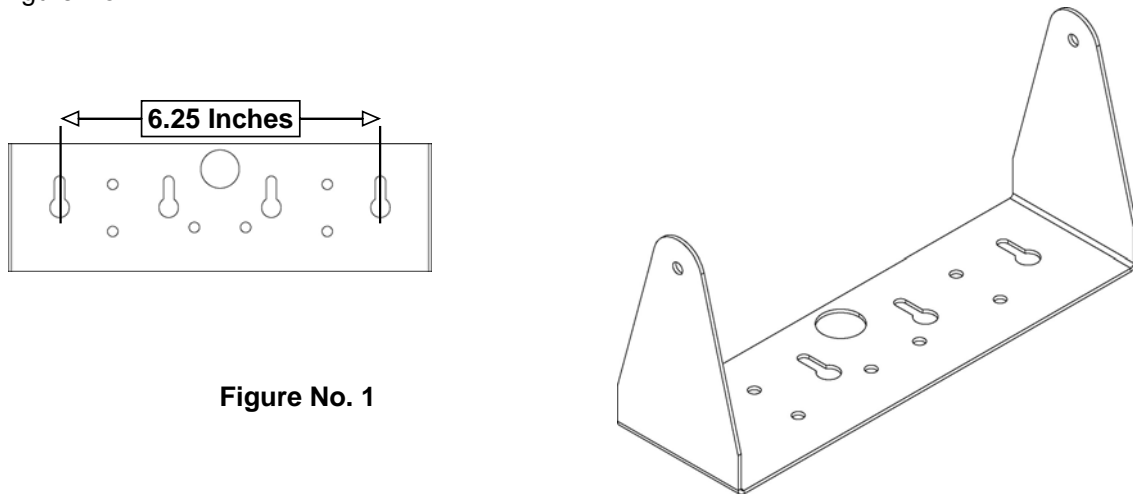


Figure No. 1

Interconnections

All input, output and power connections to the 180 and 180EU indicator are made on the bottom panel of the indicator. Connections for the Load Cell input and the RS-232 Serial port are made via 9-pin "D" shaped sub-miniature connectors. The 12VDC, 1 Amp wall plug-in UL/CSA listed AC power adapter is connected using a power jack. Figure No. 2 illustrates the layout of the bottom connector panel of the indicator.

AC Power Adapter

To power the 180 and 180EU using the 12VDC 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.

INSTALLATION, CONT.

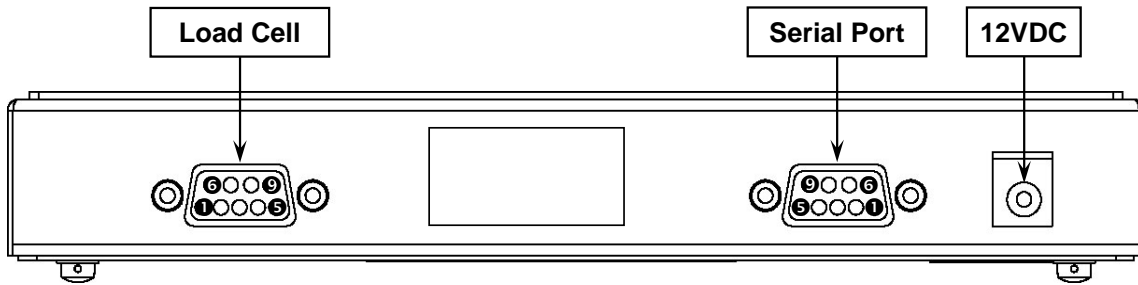



Figure No. 2

Load Cell Connection



WARNING! Disconnect any external load cell power supply before connecting the load cells to the indicator. Failure to do so will result in permanent damage to the indicator.

The load cell is connected to the 180 and 180EU indicator via a DE-9P connector on the bottom of the indicator. Refer to Figure No. 2 and the table below for pin identification of the connector. Make certain the pins are correctly identified before soldering a wire to them. Make certain that the connector retaining screws are used to hold the load cell cable connector securely to the scale input board.

LOAD CELL CONNECTOR DE-9S

<u>PIN NO.</u>	<u>Function</u>	<u>PIN NO.</u>	<u>Function</u>
1	+ EXCITATION	6	- EXCITATION
2	- SIGNAL	7	+ SIGNAL
3	NC	8	NC
4	-SENSE	9	+SENSE
5	SHIELD		

MATING CONNECTOR INFORMATION

<u>DESCRIPTION</u>	<u>ITEM</u>	<u>Cardinal Part #</u>
CONNECTOR	DE9-P	6610-2379
CONNECTOR SHELL	C883010001	6610-1131

Load Cell Connection with up to 30 Feet of Cable

For installations with up to 30 feet of cable between the indicator and the load cells, sense wires should be used. The sense wires must be connected between the +SENSE and the -SENSE terminals on the indicator and the +EXCITATION and the -EXCITATION wires of the load cells or the +SENSE and -SENSE terminals of the load cell trim board or the section seal trim board. For the indicator to utilize the sense wires, the sense jumpers must be open.



NOTE: An installation with over 30 feet of cable between the indicator and load cells is not recommended.

INSTALLATION, CONT.

Serial Port Cable Installation

The 180 and 180EU indicator 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 Figure No. 2 and the table below to identify the pins used.

<u>PIN NO.</u>	<u>Function</u>	<u>PIN NO.</u>	<u>Function</u>
1	NC	5	GND
2	RXD	6	NC
3	TXD	7	NC
4	NC		

The serial port can be configured during the setup and calibration procedure or during the setup review operation. Note that it is possible to select the operation of the serial port as well as select the baud rate using either method.

Main PCB and Jumpers

NOTE: Remove the back panel to access the jumpers and ISP connector.

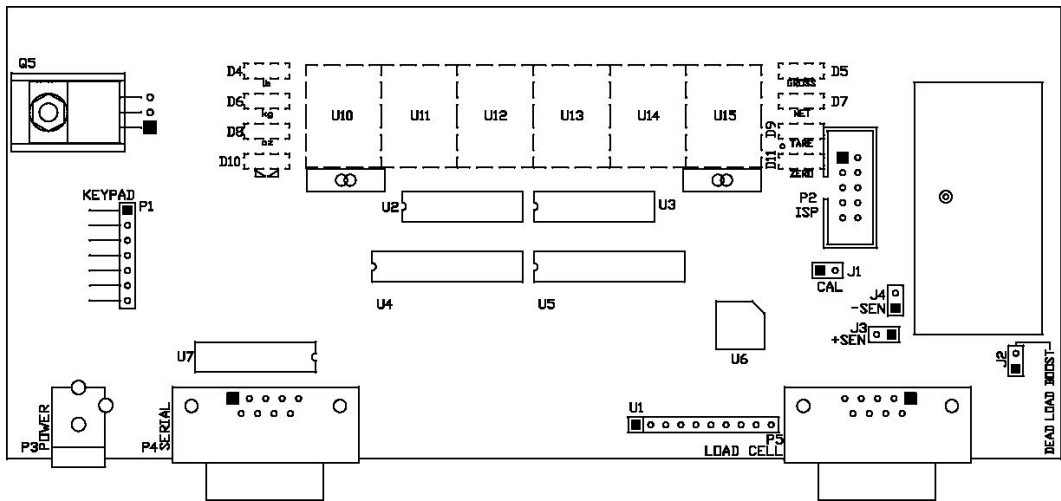


Figure No. 3

J1 - CALIBRATION JUMPER

Jumper J1 must be installed to operate the indicator. To begin the setup and calibration procedure, J1 must be removed and re-installed with the indicator powered on.

J2 - DEAD LOAD BOOST JUMPER

For very low dead loads (less than 10% of the combined load cell capacity), connect the dead load boost jumper J2 on the printed circuit board.

J3 and J4 - SENSE JUMPERS

If sense leads are NOT used, you must install plug-in jumpers at J3 and J4 (adjacent to the P1 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.

P2 - ISP (IN SYSTEM PROGRAMMING) CONNECTOR

This connector is used for firmware updates using your computer.

KEYPAD FUNCTIONS

The 180 and 180EU indicators are equipped with a 6-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.

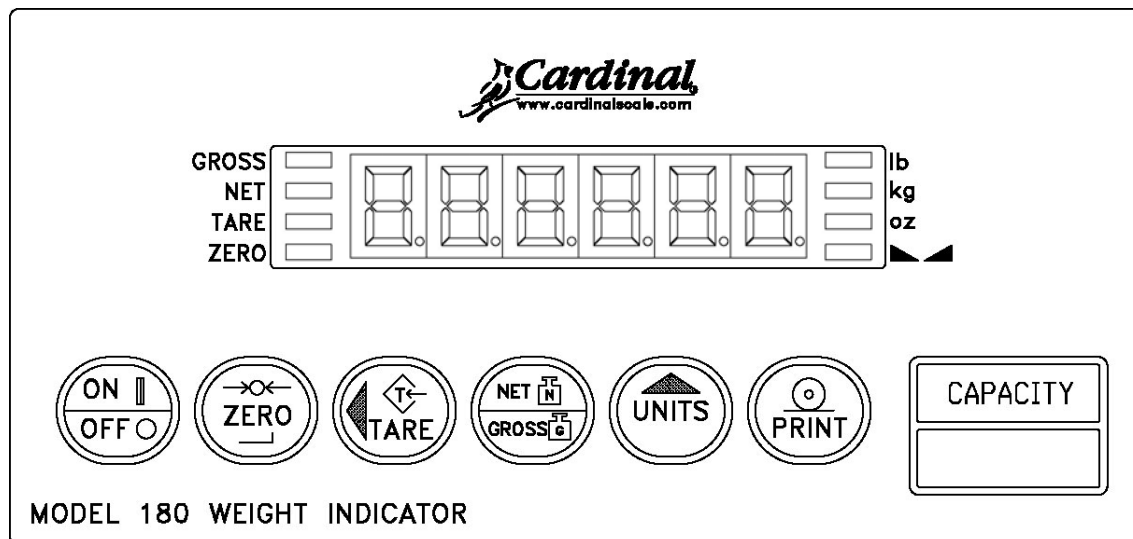


Figure No. 4



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 KEY

This key performs two functions. Pressing it when the indicator is off will apply power to the indicator. If the indicator is already on, pressing this key will turn the indicator off.

ZERO (→0←/↵) KEY

Pressing this key will cause an immediate zeroing of the weight display up to the selected limit of 4% or 100% of the scale's capacity. This selection is made during the setup and calibration of the indicator. Note the indicator will not respond to this command unless the weight display is stable.

TARE/◀ LEFT ARROW KEY

Pressing this key alone will store the current gross weight as the new tare weight and the weight display will change to the net weight display mode (Net annunciator will turn on). During setup and calibration, this key is used to select the digit to change.

NET/GROSS KEY

This key is used to toggle between the Net and Gross weight modes. The selected mode is indicated by turning on the appropriate annunciator on the display. Note that if no valid tare weight has been entered, pressing this key will cause a momentary *not ARE* display error and the indicator will remain in the Gross weight mode.

UNITS/▲ UP ARROW KEY

This key is used for several functions. In normal operation, this key is used to select the units in which the weight is to be displayed. The available units of measure (*unit 1* and *unit 2*) are selected in setup. The available units include pounds, kilograms and ounces. Note that not all combinations are supported. During setup and calibration, this key is used to increment the value.

KEYPAD FUNCTIONS, CONT.

PRINT

Pressing this key will initiate the transmission of weight data via the serial port unless the continuous data output feature was enabled during setup and calibration or setup review. Note, that if the continuous data output feature was selected, this key will be disabled.

NOTE: The indicator will not respond to the Print command unless the weight display is stable. If displaying gross weight, the only weight printed is gross weight. If displaying net weight, the gross, tare, and net weights are printed.

The 180 and 180EU indicators include support for one visual ticket. Visual tickets are designed by the PC based programs Visual Print or nControl and then downloaded to the indicator. It also has a standard ticket that will print if a Visual ticket is not found. The standard ticket prints Gross, Tare and Net on three lines. **NOTE:** When the **PRINT** key is held on power-up, the Visual ticket is erased and the indicator will use the standard ticket.

```
#2
100.00 lb G
20.00 lb T
80.00 lb N
```

SAMPLE TICKET

ANNUNCIATORS

Annunciators 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. The annunciators flash on and off to indicate that the indicator is waiting for input from the keypad for the mode indicated by the flashing annunciator. Refer to Figure No. 4 for the location of the annunciators.

GROSS

This annunciator is turned on to show that gross weight is displayed. Gross weight will be displayed when no tare weight is stored.

NET

This annunciator is turned on to show that the displayed weight is the net weight (gross weight less tare weight).

TARE

This annunciator is turned on to show that the displayed weight is the tare weight.

ZERO

This annunciator is turned on to indicate that the weight displayed is within +/- 1/4 division of the center of zero.

lb

This annunciator is located to the left of the weight display and is turned on to show that the displayed weight unit is pounds.

kg

This annunciator is located to the left of the weight display and is used to indicate that the displayed unit of weight measurement is kilograms.

oz

This annunciator is located to the right of the weight display and is turned on to show that the displayed weight unit is ounces.

(STABLE)

This annunciator is turned on when the weight display is stable. When off, it means that the change in successive weight samples is greater than the motion limits selected during setup.

SETUP AND CALIBRATION

Your 180 or 180EU 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. 3 for the location of the jumper. You may gain access to this jumper by removing the four screws securing the rear panel.

During setup and calibration, it is necessary to enter values using the indicator's keypad. When a prompt is displayed on the indicator, press the **ZERO/ENTER** key to view the current setting. To retain the current setting and proceed to the next prompt, press the **ZERO/ENTER** key again. To change a setting, press the **UNITS/UP ARROW** key to scroll through and select a new value. After a new value has been selected, press the **ZERO/ENTER** key to save it and advance to the next prompt. Note that some setup prompts have values with two or more digits. The blinking character is the position to be changed and can be advanced to the next position by pressing the **TARE/LEFT ARROW** key. Pressing the **NET/GROSS** key when a setup parameter is displayed, will "backup" to the previous prompt. When a parameter value is displayed, pressing the **NET/GROSS** key will return to the beginning of the 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 J1.
2. The *SEtUP* prompt will be displayed.
3. Re-install the calibration jumper.
4. The *rd ,SP=* prompt will be displayed.
5. The indicator is now ready for setup and calibration.

rd ,SP= (Remote Display)

This setting will turn the 180 indicator into a remote display using the serial port. If the 180 is connected to a Cardinal 200 series indicator, it becomes a functional remote keypad and display.

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

YES

Remote Display Function Enabled

NO

Remote Display Function Disabled

If *rd ,SP= YES* is selected, an additional prompt, *tYPE=* will be displayed.

SETUP AND CALIBRATION, CONT.

TYPE: (Remote Serial Data Type)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable 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, data 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 **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

USA: YES (Domestic)
Cap + 4% to OC

USA: NO (International)
Cap + 9 grads to OC
4% Zero Limit
Lamp test on power up
Disables Oz's

Unit 1: (Weighing Unit 1)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

- 1 = Pounds Only
- 2 = Kilograms Only
- 3 = oz (ounces)

Int: (Interval Setting)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 1, 2, 5, 10 or 20.

dPP: (Decimal Point Setting)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

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

SETUP AND CALIBRATION, CONT.

CAP: (Capacity)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 1 through 999,999.

Unit 2: (Weighing Unit 2)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

0 = Disabled 1 = Pounds Only 2 = Kilograms Only 3 = oz (ounces)



NOTE: The selection for **Unit 2** cannot be the same as **Unit 1**. In addition, dependent upon the selection for **Unit 1** and the interval and decimal point settings, not all unit combinations are available.

CAL: (Calibration)

With the display showing **CAL:**, press the **ZERO/ENTER** key. The display will change to show the current setting **no**. If the scale has been previously calibrated and you wish to skip calibration and proceed to the **ERR:** (Zero Tracking Range) prompt, press the **ZERO/ENTER** key and the previous calibration will be retained.

To begin calibration, press the **UNITS/UP ARROW** key to select **YES** and then press the **ZERO/ENTER** key. After pressing the **ZERO/ENTER** key, the display will change to **LOAD:**.

LOAD: (Load Calibration Weight)

With the display showing **LOAD:** perform the following steps:

1. Make certain the scale platform is empty and free of debris.
2. Place the desired amount of calibrated test weights on the scale platform. A minimum of 50% of scale's capacity is required. However, 70% to 100% is recommended.
3. Press the **ZERO/ENTER** key.
4. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, determine the exact amount of test weight placed on the scale platform and then using the **UNITS/UP ARROW** key and the **TARE/LEFT ARROW** key scroll through and select the test weight amount.
5. Verify that the numbers selected are the same as the amount of the test weight and then press the **ZERO/ENTER** key.
6. Starting at the left and proceeding right, a series of dashes will appear on the display. The dashes will then disappear, starting at the left and proceeding right, after which the display will proceed to the next prompt.

SETUP AND CALIBRATION, CONT.

UnLoRd: (Unload Calibration Weight)

After a moment, the display will change to *UnLoRd*.

1. Remove the test weights from the scale platform and then press the **ZERO/ENTER** key.
2. Starting at the left and proceeding right, a series of dashes will appear on the display. The dashes will then disappear, starting at the left and proceeding right, after which the calibration factor will be saved and the display will proceed to the next prompt.



IMPORTANT! During the time the dashes are appearing on the display, insure that the loaded (or empty) scale is stable.

tR: (Zero Tracking Range)

Zero tracking range is a value in scale divisions that will be automatically zeroed off. Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 1 through 18 (1 to 9 divisions by 0.5 divisions). Select 0 (zero) to disable zero tracking.

UnS: (Motion Range)

Motion range is the number of divisions of change permitted before indicating unstable. Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable range values are 1 through 9 divisions.

FL: (Digital Filter Level Selection)

Your indicator will arrive with factory filter settings of 1 = Minimal. *Please check with Tech Support before changing filter level, break range and sample rate.*

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

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

NOTE: If 3 = Custom Filter is selected, two additional prompts will be displayed.

F: (Filter Level)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 1 (least amount of filtering) to 99 (greatest amount of filtering).

br: (Break Range)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 1 to 99 which correspond to the number of division changes to break out of filtering.

SETUP AND CALIBRATION, CONT.

5r = (Sample Rate)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are a minimum of 1 sample per second to a maximum of 16 samples per second in one sample per second intervals.

PU0 = (Power-Up Zero Feature)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

455 Automatic Re-Zero on Power-Up 00 No Re-Zero on Power-Up

RSH = (Automatic Shutoff)

The Automatic Shutoff feature will turn the indicator off after a period of approximately 1 to 9 minutes of inactivity to prolong battery life. You must press the **ON/OFF** key to turn indicator back on.

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 0 through 9 with 0 disabling Automatic Shutoff.

bAUd = (Serial Port Baud Rate)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

12 = 1200 Baud	24 = 2400 Baud	48 = 4800 Baud
96 = 9600 Baud	19 = 19.2k Baud	38 = 38.4k Baud
76 = 76.8k Baud		

Pr t Y = (Serial Port Parity)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

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

b , t S = (Serial Port Data Bits)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 7 or 8.

SETUP AND CALIBRATION, CONT.

StoP: (Serial Port Stop Bits)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 1 or 2.

- If you selected *rd ,SP:* **YES** (Remote Display Function Enabled), the setup process has been completed. The indicator will reset and then display weight. Remove power from the indicator and re-assemble for use.
- If you selected *rd ,SP:* **no** (Remote Display Function Disabled), the next prompt displayed will be *Cont:*.

Cont: (Continuous Output Serial Port)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

YES	no
Continuous Output	No Continuous Output

- If you selected *Cont:* **YES** (Continuous Output), an additional prompt, *tYPE:* will be displayed.
- If you selected *Cont:* **no** (No Continuous Output), proceed to the *EoP* (End-of-Print Line Feeds) prompt.

tYPE: (Continuous Output Format)

Press the **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are:

0 = SMA	1 = SB-400	2 = UPS WorldShip (emulates Fairbanks 70-2453-4)
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EoP: (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 **ZERO/ENTER** key to view the current setting. If the value displayed is acceptable, press the **ZERO/ENTER** key again. Otherwise, press the **UNITS/UP ARROW** key to scroll through and select a new value and then press the **ZERO/ENTER** key to save it and proceed to the next prompt. Allowable values are 0 through 99.

Setup and Calibration Completed

The setup and calibration process has been completed. The indicator will reset and then display weight. Remove power from the indicator and re-assemble for use.

FINE SPAN ADJUSTMENT



NOTE: The F-SPAN mode requires a load of 10% of Capacity be on the scale before adjustments can be made.

F - SPAN (Fine Span Adjustment)

To enter Fine Span Adjustment:

1. Remove the calibration jumper when the *CAL* prompt is displayed in setup.
2. The display will change to the *F - SPAN* prompt.
3. Re-install the calibration jumper and then press the **ZERO/ENTER** key to enter Fine Span Adjustment.
4. After pressing the **ZERO/ENTER** key, the display will change to show the amount of the test weight and the annunciators will alternately flash off and on i.e. (all ON, weighing unit off, then all OFF, weighing unit ON).
5. Press the **UNITS/UP ARROW** key to increase the span OR press the **NET/GROSS** key to decrease the span.
6. Press the **ZERO/ENTER** key to zero the scale.
7. Press the **PRINT** key to return to the *CAL* prompt.

SETUP REVIEW

The 180 and 180EU indicators allow several operational parameters to be reviewed and changed as necessary without having to enter the setup and calibration mode.

To Enter Setup Review:

1. If indicator is on, press **ON/OFF** key.
2. Display will show *OFF* and the indicator will turn off.
3. Press and hold **ZERO/ENTER** key and then press **ON/OFF** key.
4. Indicator will display model number and software revision and then display *PU0* prompt.
5. With display showing *PU0*, release **ZERO/ENTER** key.
6. Refer to instructions listed in Setup and Calibration section for information on how to change parameters.

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

<i>PU0</i> =	Enable or Disable automatic reset of weight display to zero on power up.
<i>ASH</i> =	Disable or select number of minutes for automatic shutoff timer.
<i>BAUD</i> =	Select baud rate for serial port.
<i>PRTY</i> =	Select serial port parity
<i>BITS</i> =	Select number of data bits
<i>STOP</i> =	Select stop bits for serial port
<i>CONT</i> =	Enable or Disable the continuous output.
<i>TYPE</i> =	Select continuous output type
<i>EOP</i> =	Select the number of End Of Print linefeeds printed.

SERIAL DATA FORMATS

Weight-On-Demand

If the Continuous Output Serial Port was not selected, $[Unit = 0]$ (0=NO) and the 180 is connected to a computer, it will transmit a single set of weight data each time the computer sends an ENQ (hex 05) or a SMA weight request (W). This is known as Weight-On-Demand. Examples and explanation of the data formats are shown below.

The host device (computer) sends:

ENQ - (hex 05)

The 180 will respond:

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

where:

s =	Sign	"-" = negative, " " (<i>blank</i>) = positive
xxxxxx.xxx =	Weight	Six digits
d =	Decimal point	Added to string if enabled in setup
uu =	Units	tn, lb, l/o, oz, t, kg, g
m =	Mode	G = Gross, N = Net
cc =	Weight Status	OC = overcap CZ = center of zero MO = motion ee = weight not currently being displayed
cr =	Carriage Return	(hex 0D)

SMA Weight-On-Demand

The host device (computer) sends:

<lf> W <cr>

The 180 will respond:

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

where:

lf =	Line Feed	
s =	Flags	Z= center of Zero, O = Over cap, E = zero Error, e = weight not currently being displayed
r =	Range	1, 2, 3, ...
n =	Mode	G = Gross
m =	Motion	M = Motion, " " (<i>blank</i>) = no motion
f =	Custom	Custom flag
xxxxxx.xxx =	Weight	Ten digits (includes decimal point). Weight is right justified.
uuu =	Units	lb [^] , kg [^] , oz [^] , g [^] (^ = space)
cr =	Carriage Return	(hex 0D)

SERIAL DATA FORMATS, CONT.

Continuous Output

If the Continuous Output Serial Port was selected `Cont = 1` (1=YES), the 180 will transmit weight data continuously. If connected to a remote display or terminal, the weight data will be continuously shown. Examples and explanation of the data formats are shown below.

NOTE: If you selected `Cont = YES` (Continuous Output), an additional prompt, `TYPE =` will be displayed to select the output data format. Available formats are:

0 = SMA **1 = SB-400** **2 = UPS WorldShip**
 (emulates Fairbanks 70-2453-4)

If **SMA** is selected, the data will be transmitted in the following format:

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

where:

lf =	Line Feed	
s =	Flags	Z= center of Zero, O = Over cap, E = zero Error, e = weight not currently being displayed
r =	Range	1, 2, 3, ...
n =	Mode	G = Gross
m =	Motion	M = Motion, " " (<i>blank</i>) = no motion
f =	Custom	Custom flag
xxxxxx.xxx =	Weight	Ten digits (includes decimal point). Weight is right justified.
uuu =	Units	lb [^] , kg [^] , oz [^] , g [^] (^ = space)
cr =	Carriage Return	(hex 0D)

If **SB-400** is selected, the data will be transmitted in the following format:

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

where:

s =	Sign	"-" = negative, " " (<i>blank</i>) = positive
xxxxxx.xxx =	Weight	Six digits
d =	Decimal point	Added to string if enabled in setup
uu =	Units	tn, lb, l/o, oz, t, kg, g
m =	Mode	G = Gross, N = Net
cc =	Weight Status	OC = overcap CZ = center of zero MO = motion ee = weight not currently being displayed
cr =	Carriage Return	(hex 0D)

SERIAL DATA FORMATS, CONT.

If **UPS WorldShip** is selected, the data will be transmitted in the following format:

xxxx.xx lb uu<cr><lf><eot>

where:

xxxx.xx	=	weight suppressed zeros with decimal point
lb	=	weigh units
uu	=	weigh mode/motion indicator: GR = Gross weight stable, gr = gross weight in motion NT = Net weight stable, nt = net weight in motion
cr	=	carriage return
lf	=	last field
eot	=	end of transmission

NOTE: The following Serial Port settings are required to communicate with the UPS WorldShip software:

bAud = 96 (9600 Baud)

Parity = 1 (Odd Parity)

bits = 7

stop = 2

Pressing the PRINT Key

Pressing the **PRINT** key will initiate the transmission of weight data via the serial port and send a "paper release command" (ESC Q) unless the continuous data output feature was enabled during setup and calibration or setup review. If the continuous data output feature was selected, the **PRINT** key will be disabled.

NOTE: The indicator will not respond to the Print command unless the weight display is stable. If displaying gross weight, the only weight printed is gross weight. If displaying net weight, the gross, tare, and net weights are printed.

SAMPLE TICKET

100.00 lb G
20.00 lb T
80.00 lb N

CALIBRATION SEAL INSTALLATION

If your 180 or 180EU Weight Indicator is used in a commercial application, it must be tested and sealed by your local weights and measurements official. The indicators have been designed to accept a lead and wire security seal to prevent unauthorized access to the calibration adjustments. Refer to Figure No. 5 for details on the installation of the seal.

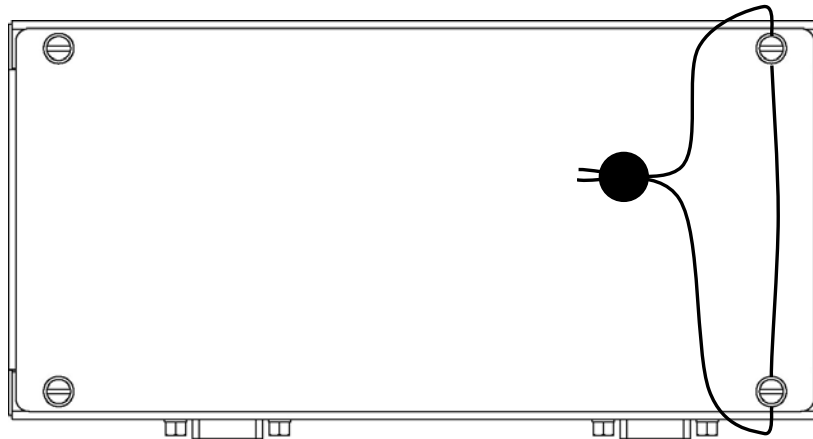


Figure No. 5

ERROR CODES

The 180 and 180EU indicators are equipped with software that indicates when an error in the operation takes place. The following lists the error codes displayed by the indicators along with their meaning. Should you encounter an error code, please refer to this list for the cause.

Display	Meaning
<i>UnSt</i>	Motion is present while attempting to perform one of the following operations: Power Up Zero or Zero Weight Display
<i>nuRL id</i>	The UNITS key was pressed in an attempt to perform a “unit” conversion that is not allowed.
<i>notArE</i>	Attempting to switch to Net mode without a tare value.
<i>Error</i>	General error, invalid keypad entry was attempted.
<i>CONF i9</i>	Indicates improper stored calibration data, calibration is necessary.
<i>CRLbt0</i>	Will be displayed on power-up if the calibration jumper has been removed from the PC board.
<i>Ad Err</i>	The analog to digital circuit has failed. Consult the scale service representative.
<i>ErrR L</i>	The load cell input is below the range of the indicator.
<i>ErrR H</i>	The load cell input is above the range of the indicator.
<i>oCAP</i>	Scale weight exceeds scale capacity
<i>-oF-</i>	Attempting to display a negative number greater than -99,999 or a positive number greater than 99,999
<i>oFF</i>	Displayed to indicate the 180 or 180EU is turning off.
<i>- - - - -</i>	Remote display function is enabled and no serial data is detected.

BEFORE YOU CALL FOR SERVICE

The 180 and 180EU indicators have 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	Make certain the AC power adapter is fully inserted into the wall receptacle. Check the 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?
Incorrect weight displayed	Has the indicator been calibrated? Insure that the scale platform is not touching an adjacent object. Check the load cell connector wiring. Have proper operation procedures been followed?
Indicator will not display weight	Refer to Error Codes section and make certain that the oC RP message is not displayed. If so, and the scale is not loaded, perform the calibration sequence.

CARE AND CLEANING

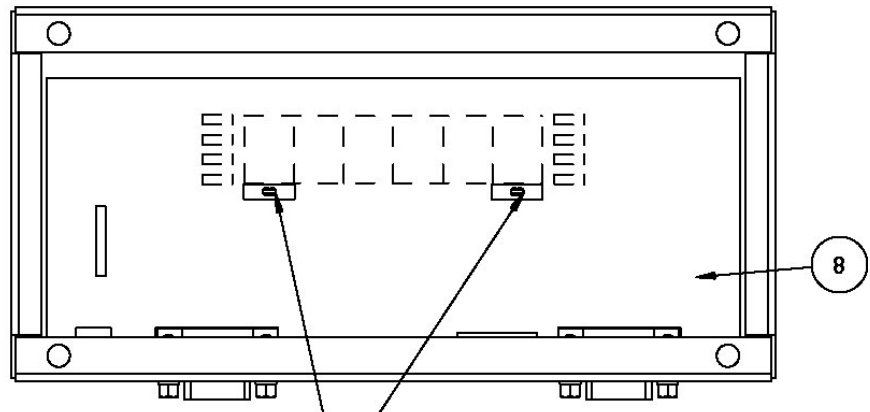
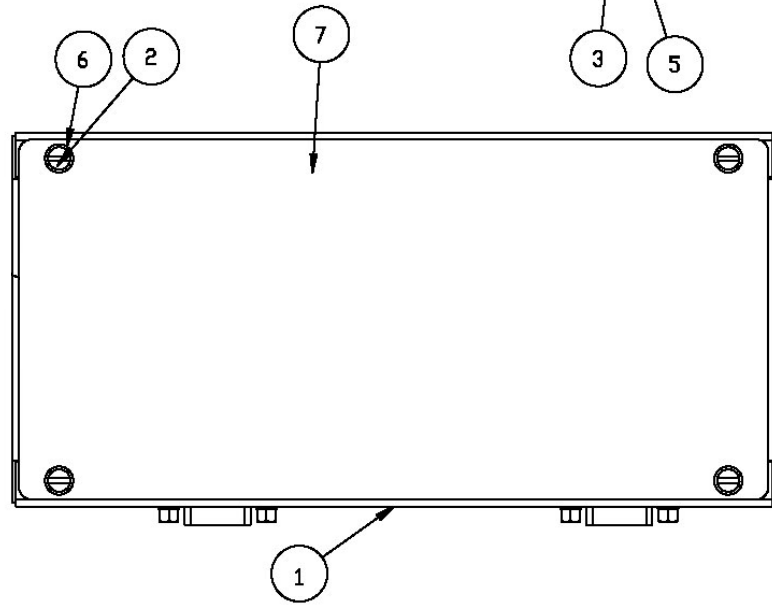
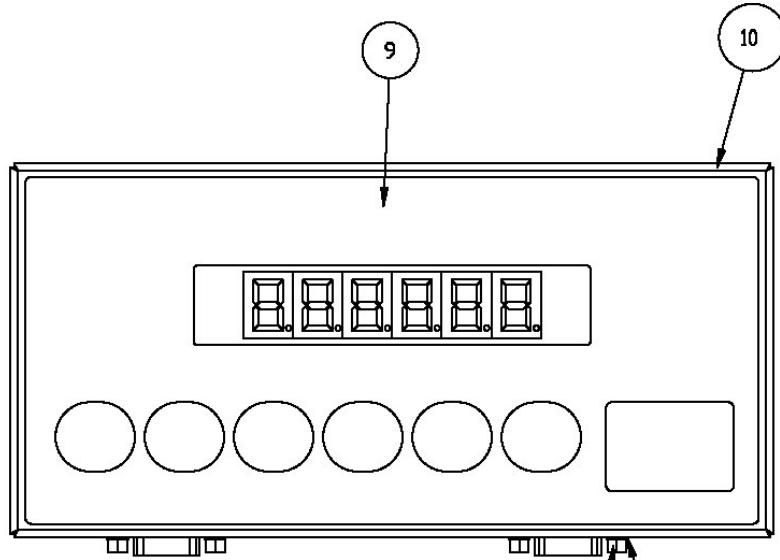
- **DO NOT** submerge indicator in water, pour or spray water directly on indicator.
- **DO NOT** use acetone, thinner or other volatile solvents for cleaning.
- **DO NOT** expose equipment to temperature extremes.
- **DO NOT** place equipment in front of heating/cooling vents.
- **DO** clean the indicator 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 LIST

ITEM	QTY	PART NO.	DESCRIPTION
1	1	593GR986	SERIAL TAG
2	4	6021-2071	SCW FILLISTER #6-32 x .250 S.S.
3	4	6610-2000	JACK SOCKET
5	4	6680-0052	WASHER LOCK #4 Z/P
6	4	6680-1006	WASHER LOCK INT. TOOTH #6 S.S.
7	1	8555-B353-08	REAR PANEL
8	1	8555-D351-0A	PCB ASSEMBLY 180 CONTROLLER
9	1	8555-D352-08	180 KEYPAD
10	1	8555-D355-08	FRONT PANEL
*	1	6800-1045	AC ADAPTER 100-240VAC/12VDC @ 1 AMP
*		6805-0003	US TO EURO PLUG ADAPTOR
*		6805-0004	US TO BRITISH/UK PLUG ADAPTOR

* NOT SHOWN

PARTS IDENTIFICATION, CONT.



TWIST TABS TO RETAIN PC BOARD

