Chapter 2 Installation

This section of the manual outlines the installation of the Model 450 series weigh indicators. Please take the time to review these important guidelines and step-bystep procedures.

IMPORTANT:

The Model 450 series weigh indicator do not include an on/off switch and therefore must be installed near a power outlet socket which is easily accessible, in keeping with UL/CSA approval requirements.

INFORMATION IMPORTANT!

Prendre note que les contrôleurs de serie 450 ne sont pas munis d'interrupteurs "Marche / Arrêt". Par conséquent, il devront être installés près d'une source d'alimentation secteur accessible pour demeurer sous les exigences des normes UL/

2.1 **Standard 450 Series Instruments**

Description

Part Number 200450-02003 Model 450, standard enclosure (USA) Model 450, standard enclosure (UK) 200450-03003 Model 450, standard enclosure (OIML) 200450-03103 Model 455, standard enclosure (USA) 200455-02003 Model 455, standard enclosure (UK) 200455-03003

2.1.1 **Table-Top Use**

The Model 450 indicator has been designed with a versatile swivel bracket which permits you to tilt the instrument face to any desired angle. When the indicator is placed on a table, the non-slip rubber feet prevent scratching and slipping across the surface when keys are pressed.

2.1.2 **Permanent Mounting**

The swivel bracket has four mounting holes which also permit the indicator to be securely fastened to a fixed surface. The holes are 0.28" diameter (0.7 mm) to accommodate 1/4" (or M6 metric) fasteners. For details regarding the mounting hole pattern and overall dimensions, refer to other sections in this chapter, table 1 and the Appendix.

Environment Suitability 2.1.3

The standard Model 450 indicator is supplied in a sealed stainless steel enclosure and may be used in a washdown environment. Care must be taken to insure that the AC power socket outlet is properly protected! The keypad is made of silicon rubber. Specifications are available for the reactions of this material to various solvents.

The display window is made from a polycarbonate material. The gasket for the display is a white closedcell polyethylene foam which is resistant to water, detergent, and alcohol. However, the display gasket may be adversely affected by aliphatic and aromatic hydrocarbons.

Model	Enclosure Width	Width with Bracket	Enclosure Height	Height with Bracket or Flanges	Enclosure Depth	Depth with Bracket or Cover
Standard 450	9.38 in 238.3 mm	11.00 in 279.0 mm	6.31 in 160.3 mm	7.27 in 184.2 mm	2.13 in 54.1 mm	3.70 in 93.9 mm
Panel Mount 450	9.80 in 248.9 mm	N/A	6.85 in 173.9 mm	N/A	3.21 in 81.53 mm	N/A
Standard 455	9.38 in 238.3 mm	11.00 in 279.0 mm	8.38 in 212.9 mm	9.00 in 228.6 mm	2.20 in 55.88 mm	3.70 in 93.9 mm

Table 2-1 450 Series Instruments Dimensions



Figure 2-1 Standard Model 450 Rear Panel

The rear panel gasket is made from a PORON (registered trademark) cellular urethane. It is unaffected by mild inorganic acids and bases. It will exhibit modest swelling with oils, greases and other linear hydrocarbons. Strong polar solvents will greatly swell the gasket, possibly reducing its effectiveness.

CAUTION

Any operation which involves opening the enclosure should be performed by qualified service personnel only after disconnecting power! Hazardous voltage is accessible within the enclosure.

AVERTISSEMENT!

Assurez-vous que le cordon d'alimentation secteur du contrôleur de type 450 ou 455 soit toujours débranché avant d'effectuer un travail sur l'appareil.

Tout travail nécessitant l'ouverture de l'appareil devra être effectué par du personnel qualifié après s'être assuré d'avoir débranché l'alimentation secteur afin d'éviter tout contact avec une charge électrique dangereuse provenant de l'intérieur de l'instrument.



Figure 2-2 Standard Model 450 Mounting Holes and Overall

2.1.4 Opening the Standard 450 Series Instrument

The following two procedures describe how to disassemble and reassemble the rear panel for permanent mounting of the standard 450 series indicators.

2.1.5 Removing the Rear Panel

- 1. Remove AC power by unplugging the indicator from the power outlet socket. Make sure the indicator is completely disconnected from the power source. Disconnect any additional umbilical cables from their source connectors.
- 2. Remove the rear panel which is attached to the housing by a quantity of eight "8 mm" hex head screws. Use a #2 Phillips head screwdriver (If applicable). Refer to Figure 2-1 for a view of the rear panel.
- 3. Carefully lift the rear panel from the enclosure and disconnect the switch panel ribbon cable from the main PC board.

2.1.6 Re-installing the Rear Panel

- 1. Reconnect the switch panel ribbon cable and move the rear panel into position. Tighten down the strain relief to insure a firm grip on each cable.
- 2. Mount the rear panel to the instrument and tighten screws until the gasket is compressed enough so that the flange of the rear panel begins to contact the main enclosure. This will ensure the best environmental seal and maximum EMI, RFI and ESD shielding performance. Test the instrument for proper operation.

2.2 Panel Mount Version Model 450 Series Instruments

Description

Part Number

 Model 450, panel mount encl. (USA)
 200450-12003

 Model 450, standard enclosure (UK)
 200450-13003

 Model 450, standard enclosure (OIML)
 200450-13103

The Model 450 series instruments are offered in a panel mount versions. All general setup, calibration, and custom programming operations of the panel-mount versions are *identical* to those of the respective standard versions.

Differences between the standard and panel mount versions are in the enclosure (there is no swivel bracket for panel mount units) and the positioning of both the main printed circuit board and display.

On the standard Model 450 series versions, the component side of the main board faces the display. On the panel-mount versions, the board is rotated 180 degrees so that the component side faces away from the display (and the non-component side faces the same direction as the keypad). This makes servicing easy when the unit is mounted to a panel door or wall.

An optional rear cover is offered to protect the main board and components against physical and electrical damage. A single, second scale multi-scale input card can be mounted to the main board. The international and U.S.A. versions differ in the keypad key functions (keys are defined to perform different functions).

Panel mount versions of the Model 450 series instruments are designed for permanent mounting in washdown environments. Proper installation is needed.

The front and side and cutout dimensions of the Model 450 series panel mount versions are shown in Figure 2-3 through Figure 2-5.

2.2.1 Environmental Suitability

The panel-mount version Model 450 indicators have a sealed stainless steel enclosure, which is ideal in a washdown environment.

WARNING!

Be sure the AC power socket outlet is protected properly!

The keypad is made of silicon rubber. Specifications that describe the reactions of this material to various



Figure 2-3, Model 450 Panel Mount Version Side Dimensions

solvents are available from GSE.

The display window is made from a polycarbonate material. The gasket for the display is a white closedcell polyethylene foam, which is resistant to water, detergent, and alcohol. This gasket, however, might be affected adversely by aliphatic and aromatic hydrocarbons.

The rear panel gasket is made from a PORON cellular urethane. It is unaffected by mild inorganic acids and bases, but it will exhibit modest swelling from oils, greases and other linear hydrocarbons. Strong polar solvents will greatly swell the gasket, possibly reducing its effectiveness.

2.2.2 Installing the Panel Mount Version Model 450 Series Instruments

WARNING!

Make sure the panel-mount version Model 450 series indicator is completely disconnected from the power source before working on it.

Any operation that involves opening the controller enclosure should be performed only by qualified service personnel and only after the power is disconnected! Hazardous voltage is accessible within the enclosure.

- 1. Make a cut out in the panel inside the following height by width dimensions:
 - 6.0 in to 6.25 in x 9.0 in to 9.25 in



mm SHOWN IN PARENTHESIS ()

Figure 2-4. Model 450 Panel Mount Version Front Dimensions



Figure 2-5, Model 450 Panel Mount Version Cutout Dimensions

- 154.4 mm to 158.8 mm x 229 mm to 235 mm The corners are typically 0.1R maximum.
- 2. Remove the 8 hex nuts holding the main board front panel to the back bracket.
- 3. Make sure the gasket remains on the front panel side. When installed, the gasket will be compressed against the front of the enclosure cutout.
- 4. Position the main board front panel inside the cutout making sure the keypad is facing in the correct upright position.
- 5. From the inside of the enclosure apply the back bracket to the opposite side of the main board with the ground lug positioned towards the bottom left just under the transformer.
- 6. Install the 8 hex nuts from the inside of the panel.
- 7. Tighten nuts until they just reach the back panel surface. Then tighten each nut by 3/4 turn to compress the gasket to the front of the panel.

2.2.3 Panel Mount Version Rear Cover

An optional rear cover for panel mount versions of the Model 450 series indicators is offered to protect the main board against physical and electrical damage. Part numbers are shown above. The rear cover can be seen in the side view of the unit in Figure 2-3.

The cover is fastened separately to the back of the unit with four screws. The rear cover enables easy access to the main board. There is no need to remove the entire panel mount unit for servicing.

Two slots are positioned at the bottom of the cover to enable power, load cell, printer, computer, and other wire routing. All wire strain reliefs and terminals should be positioned below or near this area.

The cover is designed so that the serial number, power requirements, and approvals label remain in view Figure 2-3 shows a side view of the panel mount label flange just outside the rear cover. The label is fastened to this flange (The top of the figure shows the side view of the flange).

2.2.4 Opening the Panel Mount Model 450 Series Instruments

- 1. Remove AC power by unplugging the controller from the power outlet socket.
- 2. Disconnect any additional umbilical cables from the respective source connectors.
- 3. Using a #2 cross-tip (Phillips) screwdriver, remove the four 8-mm hex head screws from the optional rear cover, if it is installed.
- 4. Remove or lift the rear cover if it is installed.
- 5. Disconnect the keypad ribbon cable from J3 on the main PC board. See Figure 2-6.
- 6. Install the load cell leads into J1 on the main board. See Figure 2-6 and refer to Section 2.4.

2.2.5 Re-installing the Rear Panel

- 1. Reconnect the keypad ribbon cable to J3 on the main board. See Figure 2-6.
- 2. Move the optional rear cover, if used, into position.
- 3. Mount the rear cover, if used, to the controller with the four 8-mm hex head screws.



Figure 2-6, Panel Mount Model 450 series Main Board

4. Using a #2 cross tip (Phillips) screwdriver, tighten the screws until the gasket is compressed enough so that the flange of the rear panel begins to contact the main enclosure. This will ensure the best environmental seal and maximum electromagnetic interference (EMI), radiofrequency (RFI), and electrostatic discharge (ESD) shielding performance.

- 5. Reconnect any umbilical cables form the respective source connectors.
- 6. Plug the controller into the AC power outlet socket.
- 7. Test the controller for proper operation.

2.3 Connecting the Load Cell

This section provides all the information needed to connect the load cell to any of the GSE series 450 instruments. Note that there are differences in the main board types with respect to the sense lead jumpers.



Figure 2-7, Standard Model 455 Mounting Holes and Overall

Important Note:

For load cells with 6 conductors, two small jumper wires (E2 and E3, next to J1 on the Main PC Board) must be **cut** (PC777 only) or removed for external sensing to be operational. For PC792 and PC800 boards, these are actual removable jumpers. For a complete explanation, refer to the Sense Lead Connections section in this chapter.

2.3.1 Transducer Excitation

2.3.2

The indicator is designed to be connected to any (Wheatstone bridge design) strain-gage based force measuring transducer. The indicator supplies 10 VDC developed from +5VDC and -5VDC referenced to common for the excitation voltage. The maximum excitation supply current available for the load cell(s) is 375 mA which corresponds to the ability to drive the equivalent of quantity eight 350 ohm load cells.

Cable Recommendations

Note:

The PC board mounting nut is also used to establish the earth ground reference for the circuitry on the PC board and thus the nut must always be in place when the instrument is powered up!

A high quality cable having an overall braided shield and 16 to 24 AWG stranded wire is recommended for the connection to the weigh platform. The load cell cable should be routed into the indicator enclosure through the strain relief marked J1 on the rear panel of the indicator. The indicator is supplied with a rubber boot installed into the J1 strain relief to accommodate cables with diameters between 0.158" and 0.22". Larger cables with diameters between 0.231" and 0.394" can be accommodated by removing the rubber boot.

2.3.3 Sense Lead Connections

Four or six lead platforms can be accommodated by the



Figure 2-8 Load Cell Connections (PC777)

indicator. (Refer to Table 2-2, Load Cell Connections.) Six lead cables include an additional two wires for the purpose of sensing the actual excitation voltage at the load cell terminals within the weigh platform. This connection compensates for variations in the resistance of the excitation wiring. If the platform does have six leads, the two jumpers (E2 and E3) next to the J1 connector inside the indicator enclosure should be cut or removed. If the jumpers remain in place, then the sense leads simply act to reduce the resistance of the excitation leads.

2.4 Load Cell Installation

- 1. Strip back the jacket of the weigh platform load cell cable approximately 1.25" from the end of the cable.
- 2. Using a small screwdriver, create an opening in the braided shield, just past the end of the jacket. Pull the wires out of the braided shield.
- 3. Strip back the insulation of each conductor wire 1/4".

Load Cell Function	GSE Platform Color Code		
+ Excitation	Red		
- Excitation	Black		
+ Signal	White		
- Signal	Green		
+ Sense	Red (optional)		
- Sense	Black (optional)		

 Table 2-2
 Load Cell Connections

- 4. Twist the strands of each conductor. To prevent fraying, tin the twisted strands using a soldering iron and solder.
- 5. Loosen the J1 strain relief and route the load



Figure 2-9, Load Cell Connections (removable jumpers) (PC792 and PC800)



the J1 connector or by using a ring terminal (recommended). For optimum shielding effectiveness, keep the length of the shield between the stud and the end of the cable to an absolute minimum! This is important in

- jacket to an absolute minimum! This is important in order to reduce the effects of EMI, RFI, and ESD on the indicator. For convenience, an extra pin is available on the J1 connector as an alternative method of connecting the shield.
- 8. Pull any excess cable back out of the instrument through the strain relief until there is no slack between the shield connection and the strain relief. Tighten down the strain relief securely to insure a firm grip on the cable.

Figure 2-10 Opening the Connector

cell cable through.

6. View the main PC board and locate the lever connector labeled J1. Connect the four or six conductors to the proper terminals as

describedin Table 2-2. Refer to your weighplatformcolor wiring code for proper colorsfor eachconnection. Load cell functions arenoted onthe PC board next to the connector.

- Operate the lever connector by applying a firm direct force to the end of the lever and inserting the lead in place as shown in Figure 2-8 and 2-9
- for the correct main board. A small screwdriver can be used to apply force to the lever. Refer to figure 2-10. Test all connections by pulling lightly on each conductor.
- 7. Connect the load cell shield to the mounting nut labeled SHIELD. A 7 mm socket
- wrench should be used (9/32" is the closest English socket equivalent). The shield should be grounded to the indicator chassis by wrapping it around the PC board mounting stud next to