
# ELECTRONIC LOADCELL & INDICATOR READOUT BOX

# OPERATION MANUAL

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# SPECIFICATIONS

| | |
|---|---|
| Power Requirements: | 115 VAC 60 Hz (optional 230 VAC 50/60 Hz) powering a 12 VDC 300 mA wall plug-in UL/CSA listed power supply for the Desktop enclosure. 115 VAC 60 Hz (optional 230 VAC 50/60 Hz) at 0.1A for the NEMA 4X enclosure. |
| Battery Operation: | 12 VDC input jack for operation from an external battery<br>12 volt, 1.6 Ah for 8 hours operation |
| Enclosure Size: | Desktop: 8.65" W x 6.5" H x 3" D<br>NEMA 4X: 9.8" W x 7.3" H x 3.2" D |
| Operating Temperature: | 14° to 104° F or -10° to +40° C |
| Display: | 5-digit, 0.6" high, 7-segment red LED |
| Sensitivity: | 0.7uV/graduation (0-3.3 mV/V), Class III |
| Signal Input Range: | 1.0mV min. to 50 mV max. |
| Transducer Excitation: | 8.0 VDC |
| Number of Load Cells: | 8 each, 350 OHM minimum load cells |
| Load Cell Cable Length: | 150' max.; 30' max w/o sense lines |
| Resolution: | 1 part in 20,000 displayed - 1 part in 80,000 internal |
| Capacities: | 1,000 to 10,000 divisions commercial<br>Up to 99,999 divisions noncommercial |
| Graduation Value: | 1, 2 or 5 x 1, 0.1, 0.01 or 0.001 |
| Sample Rate: | 1 to 12 samples per second selectable |
| Auto Zero Range: | 0.5 or 1 through 9 graduations |
| Weighing Units: | Pounds, kilograms, ounces, grams or pounds/kilograms |
| Keyboard: | Membrane type with 21 keys |

### STANDARD FEATURES:

- Keyboard or Push Button Tare
- Gross, Tare, Net Conversion
- Metric Conversion
- Bi-directional Serial Interface
- Dual Preset Weight Comparator or Checkweigher with Outputs
- Auto Shut-Off Feature
- Selectable Sleep Mode
- Selectable Filtering
- Selectable Automatic Power On

### OPTIONAL FEATURES:

- NEMA 4X Enclosure
- External Relay Box for Preset Weight Comparators or Checkweigher (desktop only)
- Internal Relay Board for Preset Weight Comparators or Checkweigher (NEMA 4X only)

# INSTALLATION

The Model 708 Weight Indicating Instrument is available in either a stainless steel desktop enclosure or a stainless steel NEMA 4X wall-mount enclosure. Determine which enclosure version you have and refer to the appropriate section for installation and interconnection.

**AUTO-ON**

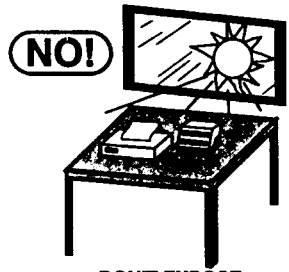
The AUTO-ON jumper J1, when connected, will cause the indicator to power on automatically whenever power is applied to the power input connector. If power is lost momentarily and then reapplied, the indicator will turn on without pressing the ON key. See Figure No. 9 for location.

**INTERNATIONAL/ DOMESTIC JUMPER (J14Intl)**

Install the International/ Domestic jumper, J14, to comply with OIML requirements (see Figure No. 9). With J14 installed, the 708 will perform the following functions:

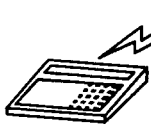
1. A "lamp test" will be performed on power-up.
2. The printout of keyboard tare will be designated as "PT."

Please note the installation precautions.



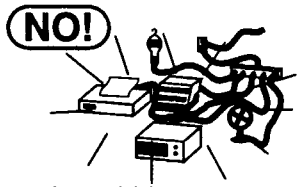

DON'T EXPOSE TO DIRECT SUNLIGHT


DON'T EXPOSE TO TEMPERATURE EXTREMES



PROVIDE ADEQUATE PROTECTION TO MINIMIZE LIGHTNING DAMAGE

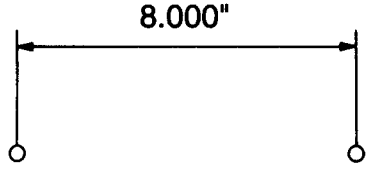

DON'T PLACE IN FRONT OF HEATING/COOLING VENTS




PROVIDE GOOD, SAFE GROUND AND CLEAN AC POWER


KEEP THE AREA AROUND THE SCALE CLEAR TO PROVIDE ADEQUATE AIR CIRCULATION

**DESKTOP ENCLOSURE**




The 708 desktop enclosure may be mounted on a desktop or other smooth, flat, horizontal surface or it may be mounted on a wall. Refer to Figure No. 1 for a layout of the wall-mounting bolts. Regardless of the manner in which the 708 is installed, the location chosen should be free of temperature extremes and water. It should be in a location where the display is easily viewed and is not subject to direct sunlight. The indicator should be mounted such that it is within easy reach of the operator. If wall mounted, make certain that the structure and mounting bolts are of sufficient strength to support the 708.

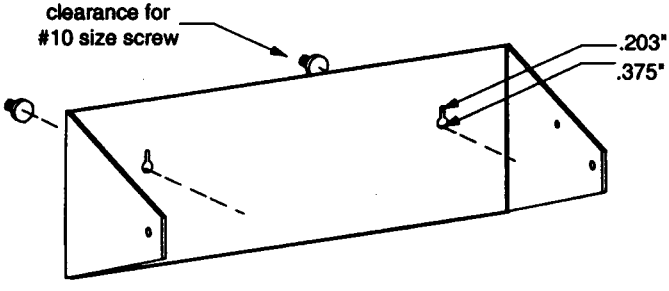



***Figure No. 1***

All terminations to the Model 708 Desktop Weight Indicating Instrument are made at the rear panel of the instrument. Connections for the Load Cell input, the PWC output and the Serial I/O are all made via "D" subminiture connectors while the 12VDC power is connected using a jack connector. Figure No. 2 illustrates the layout of the connector panel.

external load. When selecting the relays make certain that they are of sufficient capacity to drive the external load. A setup selection determines whether the device is on or off below the preset value. Refer to Figure No. 5 for the layout of the PWC Output connector.

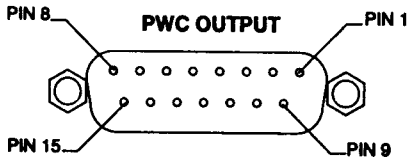



*Figure No. 5*

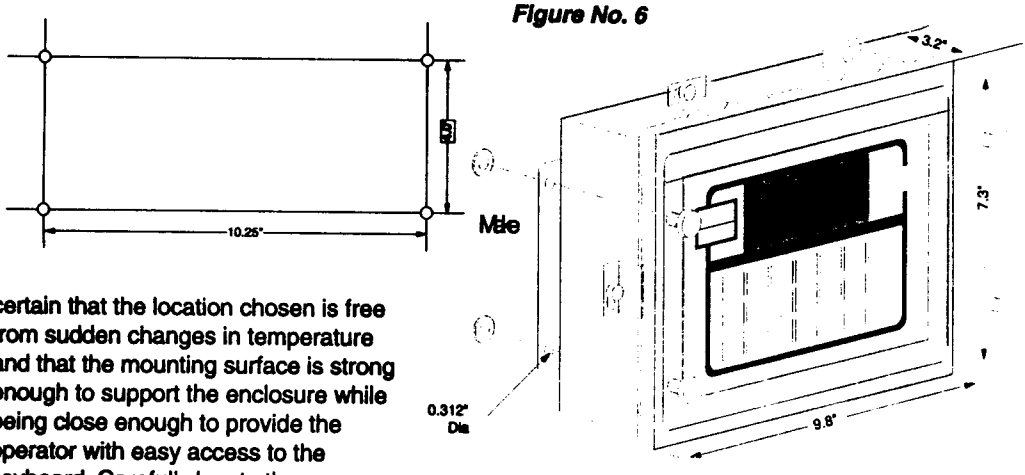
| PIN NO. | FUNCTION |
|---|---|
| 10 | OVER/PWC1 |
| 2 | UNDER/PWC2 |
| 1 | ACCEPT |
| 12 | GROUND |

## NEMA 4X ENCLOSURES

For desk mounting of the 708 in the NEMA 4X enclosure, it is necessary to order separately a "DESK-MOUNT" kit. Refer to Assembly Instruction for Desk-Mount Kit (8539-M097-O1) for mounting instructions.

The Model 708 in a NEMA 4X enclosure is normally mounted on the wall or some other vertical surface. The enclosure is attached to the wall with four (4) bolts. Refer to Figure No. 6 for the hole layout for the NEMA 4X enclosure.

*Figure No. 6*




certain that the location chosen is free from sudden changes in temperature and that the mounting surface is strong enough to support the enclosure while being close enough to provide the operator with easy access to the keyboard. Carefully locate the mounting hole locations on the wall then drill and install the anchor bolts. Attached the enclosure to the wall and securely tighten the retaining bolts.

Continue installation by opening the front cover on the instrument enclosure. Loosen all four (4) retaining screws and rotate each of the clips to the side. DO NOT REMOVE THESE SCREWS. Fully open the front cover exposing the internal printed circuit board.

### Load Cell Connection

Loosen the cable gland connector for the load cell cable. This gland connector is located on the bottom of the enclosure on the right-hand side. Refer to Figure No. 7 for an illustration of the connector layout.

Slip the single cable from the load cell or load cell junction box through the gland connector and into the enclosure. Remove 2 inches of the outer insulation jacket then remove 1/4 inch of insulation from each of the wires (either 4 or 6). Refer to Figure No. 8 for an illustration of the proper method of preparing and then connecting wires to the terminal blocks. Once the cable has been properly prepared, connect it to terminal block P4 on the main printed circuit board. Figure No. 9 shows the location of the terminal blocks on the main printed circuit board.

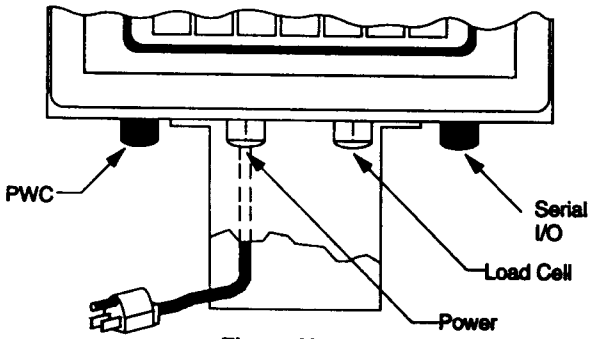



*Figure No. 7*

Locate the one for the load cell and connect the cable as shown. To install a wire in a terminal block, first press down on the release bar for the terminal, insert the wire into the terminal opening then release the bar locking the wire in place. Repeat this procedure until all of the wires and shield have been installed. NOTE! If the load cell cable does not contain sense leads, you must install plug-in jumpers at J2 and J3 to connect the sense inputs to the excitation leads on the PC board. If the load cell cable does contain sense leads, these jumpers must be removed and stored by placing them on one pin only.

**Printer Cable Installation**

Loosen the gland connector adjacent to the power cable gland connector (see Figure No. 7). Remove 2 inches of the outer insulating jacket from the cable then remove 1/4 inch of insulation from each of the wires (see Figure No. 8). These wires are to be connected to terminal block P8 at the bottom edge of the printed circuit board. Refer to Figure No. 9 for the location of this terminal block.

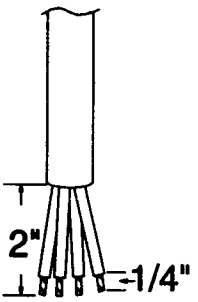
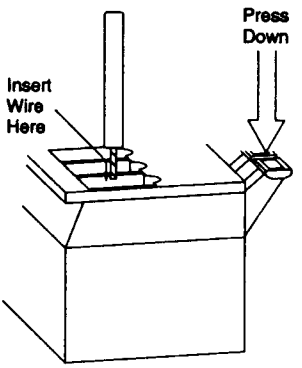



*Figure No. 8*




Terminal

To terminate the wires, first press down on the terminal release bar then insert the wire into the terminal opening and release the bar to lock the wire in place.

## Preset Weight Comparator/Checkweigher Logic Level Output

If you so choose, you may use the logic level outputs from your 708 indicator's preset weight comparators or checkweigher to control peripheral devices used to manage the flow of material or signal when the weight is within preset limits. Note that these outputs are at logic level and cannot drive external devices directly. Solid state relays can be used to accept the logic level output from the 708 and in turn drive the external device.

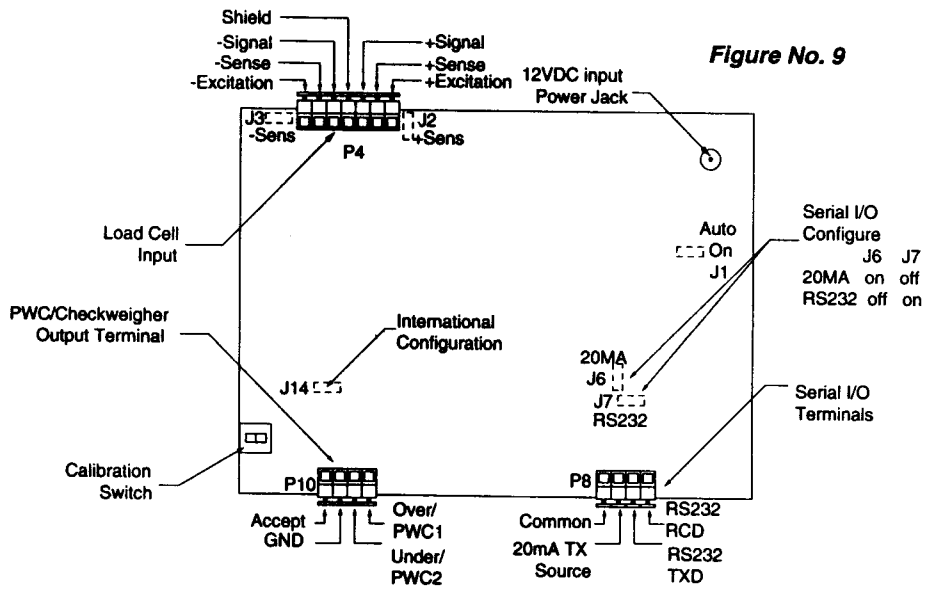



*Figure No. 9*

# KEYPAD FUNCTIONS

The 708 is equipped with a 21-key keypad. The keypad is used to enter commands and data. This section describes each key along with the function it performs. It will be helpful to refer either to Figure No. 12 or to the actual 708 keypad while reading this section.

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

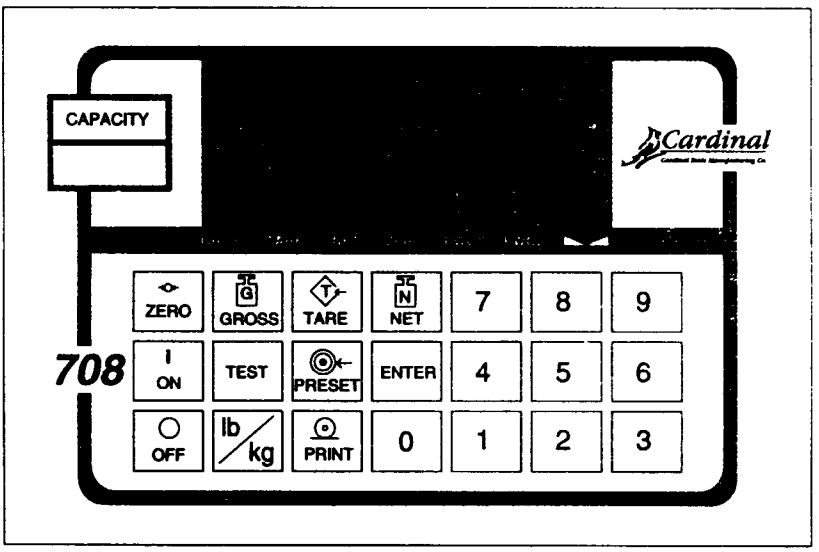



***Figure No. 12***

I
ON

**ON KEY**
Pressing this key applies power to the 708 and turns on the display.

OFF

**OFF KEY**
Pressing this key removes power from the 708 and turns the display off.

ZERO

**ZERO KEY**
This key is used to reset the gross weight to zero. If the gross weight exceeds the preset limit for this key an error message will be displayed when the key is pressed. The zero limit may be set to either 4% or 100% of scale capacity during setup and calibration of the 708.

G
GROSS

**GROSS KEY**
This key is used to return the weight display to the Gross Weight mode.In the gross weight mode, the total of all weight placed on the scale since the display was zeroed is displayed. The GROSS annunciator beneath the display window is turned on to signal the display of gross weight.

T
TARE

**TARE KEY**
This key is used to enter a tare weight of up to four (4) digits and can operate in one of two modes depending on the setup of the 708. If the push button tare feature was selected during the setup of the instrument, pressing this key will cause the 708 to enter the current gross weight as the new tare weight value and automatically enter the net weight mode. The NET annunciator will be turned on to indicate that the 708 is now displaying a net weight. If the push button tare feature was not selected, pressing the TARE key will cause the currently stored tare weight to be displayed and the TARE annunciator will be turned on. The numeric keys may be used to enter a new tare value and the ENTER key pressed to store the new value. Once the new tare value is entered the 708 will automatically enter the Net Weight mode indicated by turning on the NET annunciator.

**NET KEY**


Pressing this key will cause the 708 to enter the Net Weight mode where the weight displayed is the gross weight less the stored tare weight. The NET annunciator is turned on to show that the displayed weight is the net weight. Note that the 708 will only enter the Net Weight mode if a valid tare weight is currently stored.

**TEST KEY**


The TEST key is used to conduct a test of all display and memory elements. The test consists of 4 cycles each lasting 2 seconds:

1. All vertical display segments on (no annunciators).
2. All horizontal display segments on (no annunciators).
3. All annunciators and decimal points on.
4. All display elements off.

**PRESET KEY**


The PRESET key is used to enter the weight values for either the two preset weight comparators or for the checkweigher feature depending on which feature was selected during setup and calibration of the 708. If the Preset Weight Comparator feature was selected, the PWC1 annunciator will flash and the display will show the currently stored value for the number 1 preset weight comparator. If the value displayed is acceptable, press the ENTER key, otherwise, use the numeric keys to enter the new preset value and press the ENTER key. The PWC2 annunciator will now flash and the display will show the currently stored value for the number 2 preset weight comparator. As before, if the value displayed is acceptable, press the ENTER key, otherwise, use the numeric keys to enter the new value and press the ENTER key. If the Checkweigher feature was selected and the PRESET key pressed, the ACCEPT and UNDER annunciators will flash and the preset value for the minimum acceptable weight will be displayed. Press the ENTER key if the displayed value is correct or use the numeric keys and enter the new value and press the ENTER key. The ACCEPT and OVER annunciators will now flash and the display will show the minimum value of weight over the accepted range. As before, if the value shown is correct, press the ENTER key. If the value is incorrect, enter the new value and press the ENTER key to save it. Note that this value must be greater than the accept value. Remember that both the preset weight comparators and checkweigher functions operate on the absolute value of the weight ignoring the polarity. After the second preset value is entered, the 708 will return to normal operation.

**lb / kg KEY**


Pressing this key will change the weighing units to the alternate units of measurement if selected during setup of the instrument. With pounds displayed (lb annunciator turned on) pressing this key will change the weighing units to kilograms (kg annunciator turned on). Note that this feature must be enabled during setup and calibration for this key to be operational.

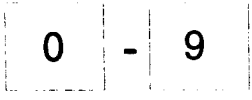
**PRINT KEY**


Pressing this key will initiate the transmission of weight data via the serial I/O 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.

**ENTER KEY**


The ENTER key serves two purposes. First, when reviewing setup parameters, pressing the ENTER key will cause the current setting of the parameter to be displayed. Second, the ENTER key is used to signal the completion of the entry of data and causes the 708 to process the data entered.

**0 THROUGH 9 KEYS**




These keys are used to enter numeric data during the setup and calibration as well as during normal operation of the instrument.

# ANNUNCIATORS

Note that 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. Some annunciators are flashed on and off to signal that the 708 is waiting for an input from the keypad for use by the feature indicated by the annunciator.

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

*GROSS*
The GROSS annunciator is turned on to indicate that the displayed weight is the gross weight which is the total of all weight placed on the scale platform since the display was last reset to zero.

*TARE*
The TARE annunciator is flashed on and off to show that the 708 is in the tare weight input mode and that the new tare weight value should be entered on the numeric keys.

*NET*
The NET annunciator is turned on to show that the displayed weight is the net weight which is the gross weight less the tare weight.

*PWC1*
The PWC1 annunciator is turned on to indicate that the displayed weight is equal to or greater than the weight value stored as preset number 1. Note that this annunciator is active only when the Preset Weight Comparator feature has been enabled.

*PWC2*
The PWC2 annunciator is turned on to indicate that the displayed weight is equal to or greater than the weight value stored as preset number 2. Note that this annunciator is active only when the Preset Weight Comparator feature has been enabled.

*STABLE*
The STABLE annunciator is identified with two small triangular shapes and is turned on when the weight display is stable. This means that the change in successive weight samples is less than the motion limits selected during setup and calibration of the 708.

*UNDER*
The UNDER annunciator is located to the left of the weight display and is used to signal that the displayed weight is less than the minimum value of acceptable weight used in the Checkweigher feature. Note that this annunciator is active only when the Checkweigher feature is enabled.

*ACCEPT*
The ACCEPT annunciator is located just above the weight display and is used to signal that the displayed weight is within the acceptable weight limits for the Checkweigher feature. That is, it is equal to or greater than the minimum acceptable weight and equal to or less than the maximum acceptable weight. Note that this annunciator is active only when the Checkweigher feature has been enabled.

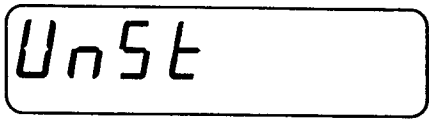
*OVER*
The OVER annunciator is located to the right of the weight display and is used to signal that the displayed weight is equal to or greater than the minimum value of over weight used in the Checkweigher feature. Note that this annunciator is active only when the Checkweigher feature has been enabled.

*lb*
The lb annunciator is located to the right of the weight display and is turned on to show that the displayed weight units of measure is pounds.

*kg*
The kg annunciator is located to the right of the weight display and is used to signal that the units of measurement for the displayed weight is kilograms.

# ERROR CODES

The 708 is equipped with software that detects when an error in operation takes place. The following lists the error code displays supported by the 708 along with their meaning. Should you encounter an error display, please refer to this list for the cause and corrective action.

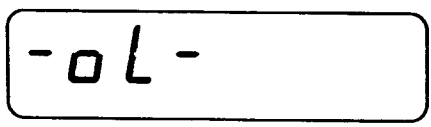



Motion is present when trying to power up, print, zero or perform a push button tare function. CORRECTIVE ACTION: wait for a stable weight display (STABLE annunciator on) before performing these operations.

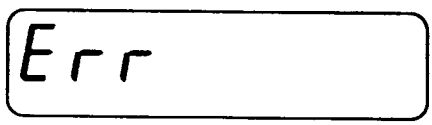

The weight on the scale exceeds the zero range when powering up. CORRECTIVE ACTION: remove the excess load from the scale then press the ZERO key. If the scale has not been calibrated previously, calibration should be completed before attempting further operation.


The scale deadload is less than the zero range when powering up. CORRECTIVE ACTION: replace the scale platform or items normally on the scale when it was calibrated and press the ZERO key. If the scale has not been calibrated previously, calibration should be completed before attempting further operation.


The 708 is attempting to display a positive number greater than 5 digits in length or a negative number of more than 4 digits. CORRECTIVE ACTION: return to the Gross Weight mode and review the Tare value.



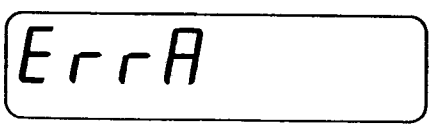

The load on the scale exceeds the scale capacity plus 9 divisions. CORRECTIVE ACTION: remove the over capacity load from the scale platform.




An invalid keypad entry was attempted:

1. PRINT key pressed with a negative weight displayed.
2. TARE key pressed to enter a push button tare value of zero or a negative value.
3. ENTER key pressed to enter a tare weight value that exceeds scale capacity.
4. ENTER key pressed to enter a tare weight value that is inconsistent with the scale's division value. (i.e. attempt to enter a tare value of 123 with scale division value of 5).
5. ZERO key pressed when the gross weight is outside the scale zero weight range.
6. lb/kg key pressed to change to kilograms when the kilogram tare weight value exceeds 4 digits in length.

CORRECTIVE ACTION: determine which of the reasons for the error display is applicable then take the appropriate corrective action.



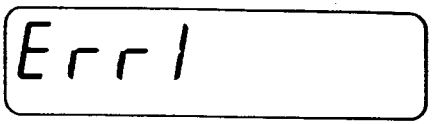

The proper load cell signal is not getting to the signal processing circuit for one or more of the following possible reasons with corrective action:

The load cell output is below the indicator minimum input of 1.0mV. Consult your scale serviceman;

Sense lead jumpers are not installed for four (4) wire load cells. Install both SENS jumpers (see Figure No. 9);

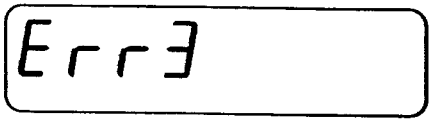
The load cell wiring is incorrect. Check load cell connector wiring;

Load cell or circuit failure. Consult your scale serviceman.

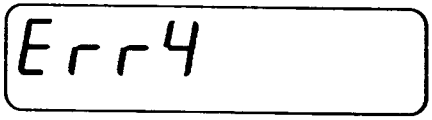



A program checksum mismatch has been detected. CORRECTIVE ACTION:contact your scale serviceman.


A write command to the NOVRAM was attempted while the NOVRAM was in a protected mode (loss of control by program). CORRECTIVE ACTION: contact your scale serviceman.




RAM test failure. CORRECTIVE ACTION: contact your scale serviceman.




NOVRAM failure during startup. CORRECTIVE ACTION: contact your scale serviceman.


NOVRAM response failure. CORRECTIVE ACTION: contact your scale serviceman.

## MAINTENANCE

The maintenance on the Model 708 Weight Indicating Instrument should be limited to an occasional cleaning of the outside of the instrument enclosure. There are no user-serviceable components within the enclosure. To clean the enclosure and keyboard, use a soft cloth dampened with water. If you wish to use a detergent, make certain that it is safe and then use it sparingly. Do not wash the Desktop enclosure. Only the NEMA 4X version of the 708 may be washed down.

# PERFORMANCE SPECIFICATIONS

| Parameter | Units | LOAD CELL CAPACITY ≤ 7500 kg | LOAD CELL CAPACITY ≥ 10000 kg |
|---|---|---|---|
| Rated Output | mV/V ± 0.25% | 2 | 2 |
| Combined Error | %* | < ± 0.05 | < ± 0.1 |
| Non-repeatability | %* | < ± 0.025 | < ± 0.03 |
| Creep (30 minutes) | %* | < ± 0.05 | < ± 0.05 |
| Temperature Effect on Zero Balance | %* / °C | < ± 0.0025 | < ± 0.0025 |
| Temperature Effect on Span | %* / °C | < ± 0.008 | < ± 0.008 |
| Compensated Temperature Range | °C | -10 to +40 | -10 to +40 |
| Operating Temperature Range | °C | -40 to +80 | -40 to +80 |
| Safe Overload | %* | 150 | 150 |
| Ultimate Overload | %* | 300 | 300 |
| Zero Balance | %* | < ± 1 | < ± 1 |
| Input Resistance | Ω ± 30 | 380 | 380 |
| Output Resistance | Ω ± 1.5 | 350 | 350 |
| Insulation Resistance | MΩ @ 100 V | > 5000 | > 5000 |
| Recommended Supply Voltage | V | 10 | 10 |
| Maximum Supply Voltage | V | 15 | 15 |

** WITH RESPECT TO RATED OUTPUT*

**CABLE SPECIFICATIONS** — 4 m - Four core screened, 6mm dia.. with polyurethane outer sheath

*POSITIVE EXCITATION = RED* — *POSITIVE SIGNAL = GREEN*
*NEGATIVE EXCITATION = BLUE* — *NEGATIVE SIGNAL = YELLOW*

## PHYSICAL DIMENSIONS (mm)

| RANGE (kg) | A | B | C | D | E | F | G | H | J | K | L | M | Wt (kg) (Cell) | Wt (kg) (LA90) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 500 | 125 | 84 | 42 | 42 | 13 | M16 x 2 | 102 | 174 | 16 | 193 | 40 | 135 | **3** | **13.6** |
| 1000 to 7500 | 125 | 84 | 42 | 42 | 13 | M24 x 2 | 102 | 174 | 16 | 193 | 40 | 135 | **3.6** | **13.6** |
| 10000 / 15000 | 175 | 110 | 55 | 64 | 21 | none | 148 | 238 | 21 | 243 | 48 | 175 | **8.8** | **22.5** |
| 20000 to 30000 | 175 | 110 | 55 | 64 | 27 | none | 148 | 238 | 21 | 243 | 50 | 175 | **9.3** | **23.6** |