

**INSTALLATION & OPERATION
MANUAL**

D300

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Chapter 1

Introduction

Model D300 Numeric Digitizer is a microprocessor-based indicator for use on a single weigh platform.

Microprocessor	8051 derivative.	
Clock	18 MHz.	
Power Supply	SMPS with EMI/RFI filter and Spike Suppressor.	
A/D Converter	Sigma Delta Type 24 Bit ADC.	
Conversion Speed	20Hz.	
Load Cell Excitation	8V @ 300mA (8 load cells of 350 ohms)	
Signal/Unit weight	1microvolt to 3-micro volts.	
Key Board	4 Key calibrations Keyboard.	
Display	6-digit red 7 Segment display for Weight display & other parameters.	
Remote Display Port	9 pin D shell female connector for Optional 1/2"/ 1" 6 digit red LED display.	
Indications	Buzzer for fault and data entry.	
Fuse	F1 fuse Two, 2A for AC power in.	
Protection	<ul style="list-style-type: none"> a. RFI/EMI filter for input power. b. Spike Suppressor for input transients. 	
Input Voltage	90 V to 270 V AC @ 50 Hz/ 60 Hz	
Power Consumption	10 VA (approx.).	
Environment	Operating Temp	10 ⁰ to +55 ⁰ Celsius.
	Humidity :	0 to 95% relative humidity non-condensing.
Mechanical	Dimensions:	200mm (W) 80mm (H) 200mm (D).

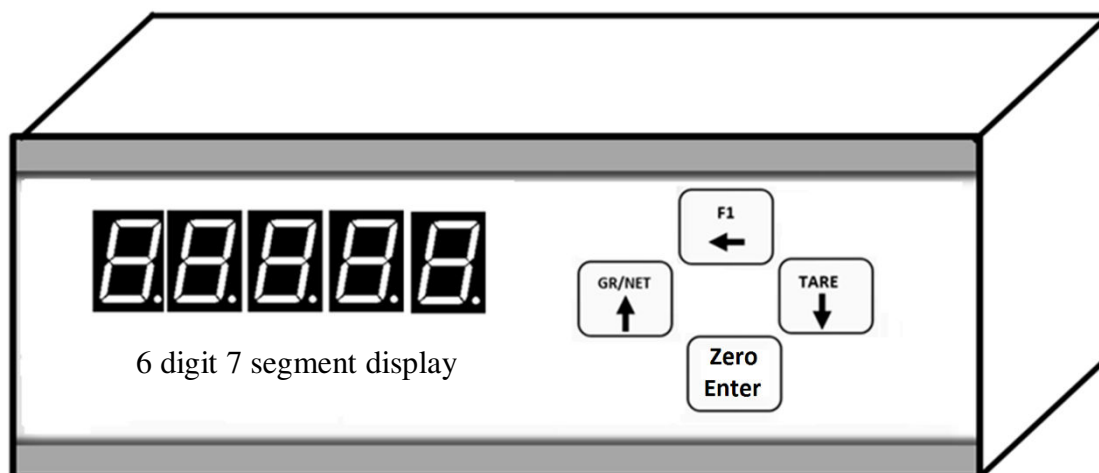


Fig . Front panel D300

- F1 = Shift Key
- GR/NET = Gross/Net Key
- Tare = Tare Key
- Enter = Enter key

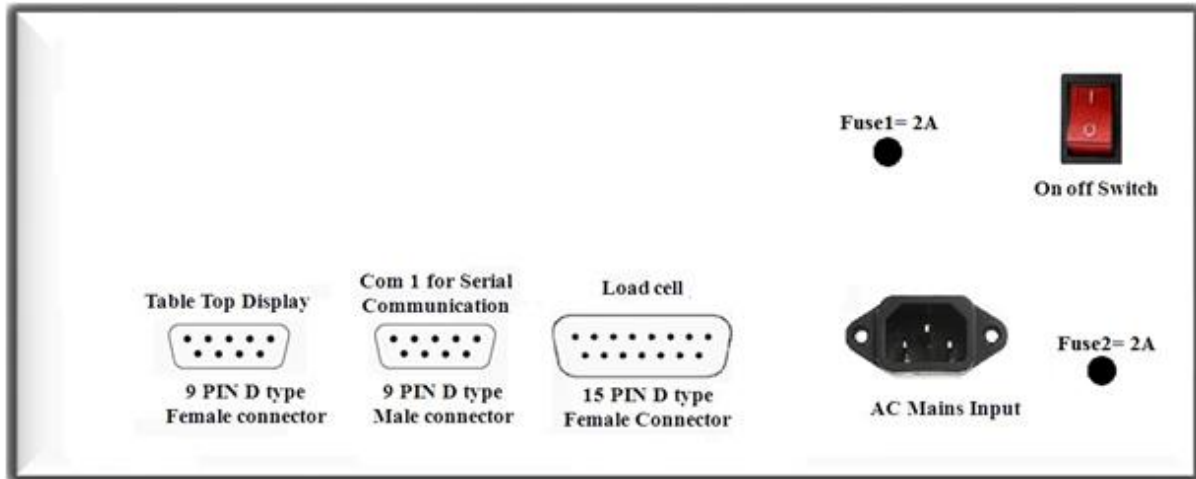


Fig. Rear panel of the D300

Features

Model D300 is a Controller based indicator, which provides solution for weighbridge application on public and industrial weighbridges. Various hardware and software features incorporated in D300 are as follows:

1. Calibration
2. Weight display
3. Facility to connect remote wireless display.
4. Data entry through Keypad.

Note: All the above given features are explained below in detail.

Power supply

Internal power supply of D300 is switch mode power supply (SMPS). Two, 2A fuse is provided for AC power supply. The rated AC supply is 90 V to 270 V AC 50 Hz./ 60 Hz. Before connecting power to the digitizer D300, ensure that the input voltage is within specified range. When the instrument is switched 'ON', the display will show '-PASS-'.

Mains Connection

- Ensure a proper earth connection to digitizer D300 . The Earth connection should be connected through the three terminal power supply point provided on the rear panel.
- Check voltage difference between Earth and Neutral terminal. It should be less than 2 volts AC. If this voltage difference is greater, it results in unstable process variable reading.
- Check for proper supply voltage before making connection to the D300 .

Input

The system accepts input in the form of voltage signal in millivolts range from load cell; the system is capable of handling load of 8 load cells of 350ohms each. Keyboard port is provided for connecting an optional 16 keys keyboard at the rear panel.

Output

Remote display can be run, by using remote display port.

Keyboard

Front Panel Keys:

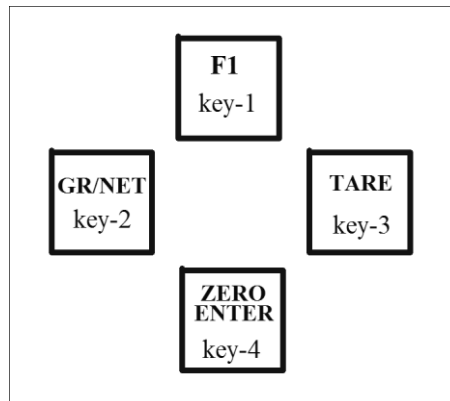


Fig.2 Front Panel keys.

Display:

1. 6-digit bright Red seven Segment LED display is provided at the Front panel, for display of current weight present on the platform & display the set parameters value during the installation x-zfe procedure.
2. Remote Display port (9-pin D-type connector) is provided at the back panel for connecting the other display. When weight on the platform is Zero, then it display current Time, else show present weight in the platform.

Chapter 2

General installation and description

To achieve fast, accurate & reliable installation:

To achieve fast, accurate & reliable installation, the sequence of operation should be as explained in steps below,

- Step1: Connect the load cells properly and switch on the indicator, indicator may show **Adc Error ..!!!**
- Step2: Perform Adjust dead load procedure (key1, key2, key4, 100), this will adjust dead load and indicator will show 0 kg weight.
- Step3: Check the load-cell connections by procedure (key3, key4 and enter). After entering into this procedure put test weights one by one in increasing order, the displayed “Tc:” value should increase.
If the displayed value is decreasing on increasing the weight on the platform, it means load cell connections are reverse, interchange the wires of signal+ and signal- to correct the problem.
- Step4: Roughly calibrate by using any weights (key1, key2, 12345).
- Step5: Check the performance by flicker test (key1, key2, key4, 131).
- Step6: If the performance is found to be “Flicker Lowest/low/normal”, then proceed to next step. If flicker is found to be high/highest then check the indicator with load cell simulator and then remove the structure error if any.
- Step7: Remove corner error
- Step8: Calibrate properly with known weights (key1, key2, 12345).
- Step9: Check the calibration (key1, key3, 12347).
- Step10: Observe actual loading, unloading, performance on weight and on empty platform to view stability of weight and stability of zero weight display.
- Step 11: After completing Successful calibration, view the calibration data (key1, key2, key4, 20050 for display) and note down the readings V1 and V2. These values should be noted and kept safely. In case of calibration disturb on site due to electrical spikes etc., re-entering these values will restore the calibration. (key1, key2, key4, 20060 for entry)

Before starting any process, read this installation manual thoroughly.

2-1) Installation:

2-1a) Electrical wiring conditions:

Provide true earth connection at AC mains input to indicator, which is normally drawn from “Electrical Earthing Pit”, located near the installation site. The x-zfe quality of “True Earth” connection will decide the level of electrical noise filtering. If the “True Earth” connection is provided from a good source, there will be high immunity from electrical noise present in the environment near the installation site. This will ensure stable and accurate performance of the indicator.

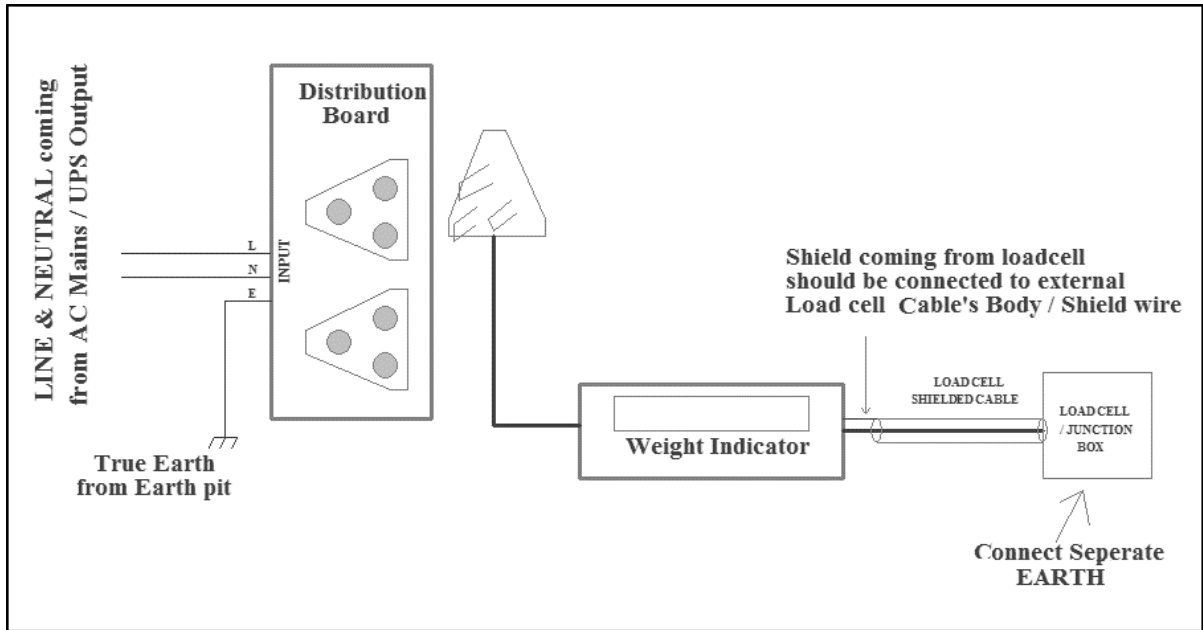


Fig.3 Electrical wiring connections.

2-1b) Know Your Load cells:

Load cells are transducers for converting mechanical weight load into proportional electrical signal. They require excitation voltage (Normally 7V DC) and give signal output proportional to the applied weight on the platform. There are normally 4 wires for load cells. They are designated as follows:

- 1) Excitation + ve,
- 2) Excitation – ve
- 3) Signal Out + ve
- 4) Signal Out – ve

A fifth wire known as shield wire encapsulates these 4 wires. This shield wire is made of special grade tinned copper with a “net” like configuration. The shield wire helps in blocking the electrical noise from surroundings & thus prevents any distortion of signals coming from the load cells to indicator. The shield wire of load-cell assembly has to be connected to shield wire of indicator’s load cell cable.

The table below will help to understand load cell connections with indicator according to color coding. Popular Load cells used in the field are listed in TABLE-I below,

TABLE-I

WARNING: Refer below table-I for making connection of load cells. When making load cells connections, please ensure that the INDICATOR is in off condition. Otherwise it may lead to permanent damage of the indicator.

MAKE	MODEL	TYPE	EXC+	EXC-	SIG+	SIG-	GROUND
Sensotronics	65058	Double Ended Shear Beam	RED	BLACK	GREEN	WHITE	SHIELD
Sensotronics	97001	Compression type	RED	BLACK	GREEN	WHITE	SHIELD
ADI Artech	20210	S- type	RED	BLACK	GREEN	WHITE	SHIELD

ADI Artech	90310	Compression type	GREEN	BLACK	WHITE	RED	SHIELD
Flintec	RC3	Rocker/ Compression type	GREEN	BLACK	WHITE	RED	SHIELD
Revere	SCP-M	Compression type	GREEN	BLACK	WHITE	RED	SHIELD
Indicator's External Connector:			BLUE	BLACK	YELLOW	RED	SHIELD
Connect to indicator load cell port at:			Pin no. 5	Pin no. 7	Pin no. 2	Pin no. 11	Body of indicator

The example connection scheme below (Figure-4) describes the connection of ADI Artec load cell with indicator with the help of small external load cell cable, provided with connector.

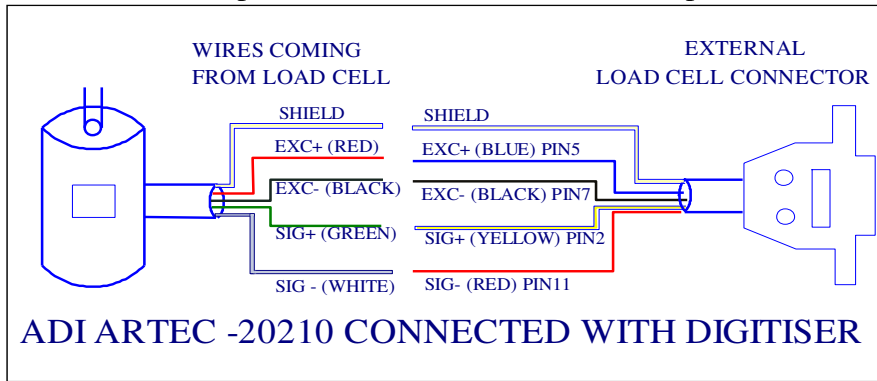


Figure-4 Connection of load cell with indicator

After making proper connections of the wires coming from load cells to the load cell external cable, plug in the connector to the rear panel load cell port of indicator, power should be applied only after this connection is made.

2-1c) Using Junction box:

To connect four/six/eight load cells of a weighing structure to indicator, use load cell summation box (junction box). To make proper connections, connect wires coming from each load cell to one of the input of junction box. Take proper care for making correct connections, if required, take help of above Table-I. While connecting the load-cells to junction box the most important thing to remember is that the load cells fitted in front of each other on the long span, should be connected in front of each other on the junction box. The figure-5 below illustrates proper placement and connection of load cells:

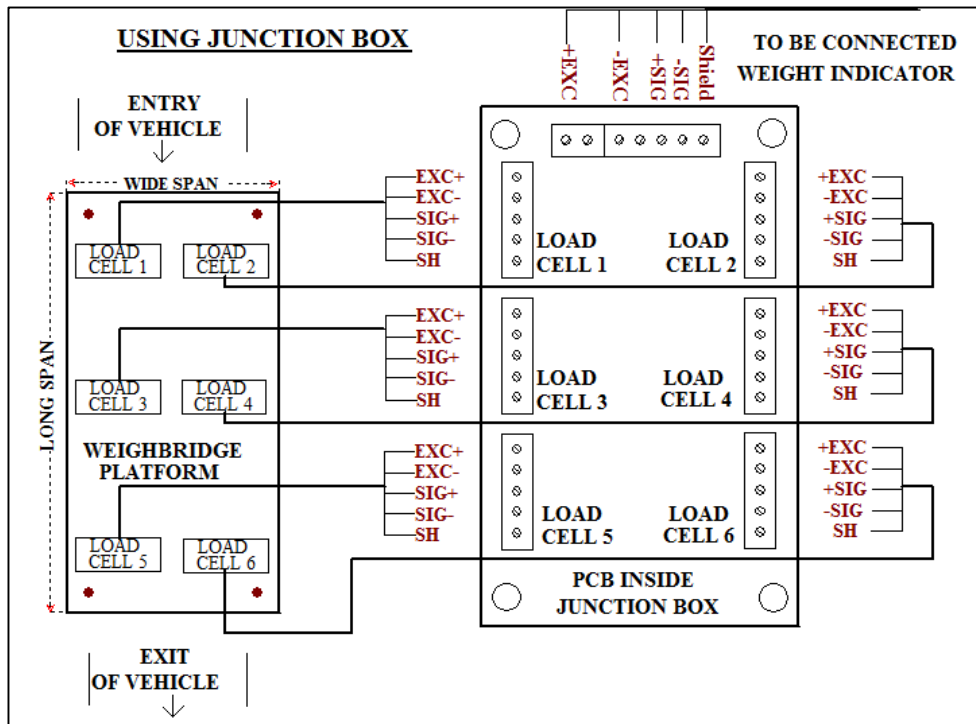


Fig.5 Placement and connection of load cells

2-1d) Check the working of the Load Cell (Excitation voltage):

Are the load cells getting proper excitation voltage? This check is not a regular exercise in each installation; use these details only in case of problem.

All the steps explained in the installation x-zfe sequence have been done carefully, but the display is continuously showing “ADC OR” or the flickering is still present. If you face such a problem, then check the excitation voltage coming from the indicator.

Excitation voltages are coming from pin 5 (7V) and pin 7 (0V) of 15pin load cell connector of indicator. Make sure that pin 5 is +ve compared to pin 7.

2-1e) Checking the working of the Load Cell (Signal voltage):

If the calibration is completed, but at the end of calibration, indicator showed a message “Check gain” then check the signal strength coming from the load cells.

Signal voltages are made available to indicator on pin 2 and pin 11 of the 15pin load cell connector. Check the parameters entered for calibration like maximum capacity, division size etc. If at the time of calibration, the engineer has placed a very small weight on the platform and entered a large value through keyboard, this problem will be caused. If so re-calibrate with proper values and weights.

2-2) Calibration Locking:

“Machine Parameters”, “Actual Calibration”, and “Smart calibration” of D300 , are hardware protected. There is switch provided on the board AE7473 known as “CAL Switch” in the form of jumper. When the switch or jumper is in open condition then setting of Machine Parameters, Actual Calibration and Smart calibration can be set or changed number of times. But when this “CAL Switch” or jumper is closed then these features cannot be work and get locked. The parameter cannot be changed until the switch is open again.

Whenever the D300 is switched ON and “CAL Switch” or the position of jumper is closed then the indicator works according to the last calibrated values.

The position of jumper is JP2 or “CAL Switch” on D300 pcb.

2-3) Description of terms used in Machine Parameter setting:

The **MACHINE PARAMETERS**, which can be programmed, are the Maximum Scale Capacity, Test loads as CAL1; CAL2; CAL3, Decimal Point, Division Size, Auto Zero Tracking Function, Five Zero on Zero Weight.

2-3a) Maximum Scale Capacity: The Maximum Scale Capacity is defined as the value of the maximum load, which can be weighed by the digitizer D300. If any weight below Maximum Scale Capacity is placed on the platform, the weight upgrade will be in multiples of Division Size. Division size can be specified by “div”. “MCAP” signifies Maximum Scale Capacity. **It should be noted that the Maximum Scale Capacity should always be in multiple of “10”. i.e. the last digit has to be a zero.**

While entering the Maximum Scale Capacity value through keyboard, enter the weight by presuming the existence of decimal point in the display without actually punching the point.

2-3b) Division Size: Division Size is the lowest weight value, which will be displayed on the display during the operation of weighing. Division Size will be the lowest weight value that can be displayed. The weight upgrade will be in terms of Division Size. The value of Division Size can be programmed as 1, 2, 5, 10, 20, 50, 100, and 200. This is as per the Weights and Measure Law prevailing in the country. “diV” signifies Division Size.

2-3c) Decimal Point: Decimal Point is the value of number of digits on the right side of the point on display. If the value of Decimal Point is specified as zero, then there will be no decimal point on the display. If the value of Decimal Point is specified as 1, then there will be one digit to the right side of point on the display (example 100.2). If the value of Decimal Point is specified as 2, then there will be two digits to the right side of point on the display (example 10.02). If the value of Decimal Point is specified as 3, then there will be three digits to the right side of point on the display (example 1.002).

During the process of machine parameter settings, enter the values of “MCAP”, and “Five Zero on Zero Weight” by presuming the existence of Decimal Point in the display without actually punching the Point. Example –

- a. If “10.50” is to be entered then just enter “1050” (the Decimal Point value will be specified as 2 in this case).
- b. If “0.005” is to be entered then just enter “5” (the Decimal Point value will be specified as 3 in this case).
- c. If “3.5” is to be entered then just enter “35” (the Decimal Point value will be specified as 1 in this case).

2-3d) Auto Zero Tracking (AZT)Width: Auto Zero Tracking Width is that value around which the zero of the machine will be tracked and set to zero for display. If during the course of weighing, some debris is left on the structure, this will generate some value on weight display and the machine will not return to zero after the weight platform is emptied. By the use of AZT function, the machine is returned to zero for a limited width, which is specified during the process of machine parameter setting. The suggested normal value is “1” or “2”. In exceptional cases, higher values can also be used.

2-3e) Five Zero on Zero Weight: This feature is provided for display the zero weight on the platform. Whenever ZERO key is pressed or TARE key is pressed to tare weight on the platform, then display shows zero weight. If five zero is to be displayed at zero weight, then enter '1'. Enter '0' if only single zero is to be displayed at zero weight. This feature is depending on the position of Decimal Point. If for example the Decimal Point value is '2', then at zero weight on the platform display shows weight '000.00'.

2-4) Description of terms used in actual calibration using test weights:

2-4a) Number of Steps: In the process of 'actual calibration using test weights' the digitizer D300 is first informed of the Number of Steps that the calibration will be performed. The Number of Steps of calibration is the number of different test loads that will be applied on the machine to correct the non-linearity error due to factors like Load Cells or Mounting Assembly. If for example the Number of Steps is entered as '2' then actual calibration procedure has to be repeated two times. Different test load has to be applied each time. It should be noted that the digitizer D300 would accept the loads only in ascending order. The last loaded weight has to be more than the previously loaded weight. If this is not followed, error will be generated. The MAXIMUM VALUE of Number of Steps of calibration is '3'.

2-4b) Clear Platform Condition: The digitizer should display zero, when no weight is placed at display. To calibrate zero weight, the platform should be cleared of all the debris or any residual weight and only the structure weight should be on the platform. This condition is known as Clear Platform Condition. During calibration, the digitizer will read the Load Cell signal at this point and store the value as scale zero reference for all weight calculation.

2-4c) CAL 1: CAL1 is the known test weight, which will be the first calibrating weight. During calibration procedure, when the display shows CAL1, then CAL 1 should be kept on the platform and its known numeric value should be entered in D300 using keyboard.

While entering the weight value through keyboard, enter the weight by presuming the existence of Decimal Point in the display without actually punching the point. Example –

- a. If "10.50" is to be entered then just enter "1050" (the Decimal Point value will be specified as 2 in this case).
- b. If "0.010" is to be entered then just enter "10" (the Decimal Point value will be specified as 3 in this case).
- c. If "3.0" is to be entered then just enter "30" (the Decimal Point value will be specified as 1 in this case).

It should be noted that the loaded weight should always be in multiple of "10". i.e. the last digit has to be zero. This is internal software check for entering any weight irrespective of Division Size.

2-4d) CAL2: When the Number of Steps for calibration is set as 2, the calibration procedure has to be repeated with second test weight, this second test weight is known as CAL2. When the calibration procedure is repeated, display shows CAL 2, the test weight 2 has to be placed on the platform and its numeric value should be entered in D300 using keyboard. The value of CAL 2 should be more than CAL1. While entering the weight value through keyboard, enter the weight by presuming the existence of Decimal Point in the display without actually punching the point. Example –

- a. If "10.50" is to be entered then just enter "1050" (the Decimal Point value will be specified as 2 in this case).

- b. If “0.010” is to be entered then just enter “10” (the Decimal Point value will be specified as 3 in this case).
- c. If “3.0” is to be entered then just enter “30” (the Decimal Point value will be specified as 1 in this case).

It should be noted that the loaded weight should always be in multiple of “10”. i.e. the last digit has to be zero. This is internal software check for entering any weight irrespective of Division Size.

2-4e) CAL3: When the Number of Steps for calibration is set as 3, the calibration procedure has to be repeated with third test weight, this third test weight is known as CAL3. When the calibration procedure is repeated, display shows CAL 3, the test weight 3 has to be placed on the platform and its numeric value should be entered in D300 using keyboard. The value of CAL 3 should be more than CAL1 and CAL 2. While entering the weight value through keyboard, enter the weight by presuming the existence of Decimal Point in the display without actually punching the point. Example –

- c. If “10.50” is to be entered then just enter “1050” (the Decimal Point value will be specified as 2 in this case).
- d. If “0.010” is to be entered then just enter “10” (the Decimal Point value will be specified as 3 in this case).
- e. If “3.0” is to be entered then just enter “30” (the Decimal Point value will be specified as 1 in this case).

It should be noted that the loaded weight should always be in multiple of “10”. i.e. the last digit has to be zero. This is internal software check for entering any weight irrespective of Division Size.

2-5) Description of term ‘Ending Calibration’:

Calibration ends after the complete procedure of calibration is carried with specified Number of Steps for calibration. As the calibration ends, the display shows, ‘CALovr’ and the calibration data gets saved. Sometimes, it is needed to end the calibration, without performing all the programmed steps. The condition arises when the steps are programmed as 2 or 3 but the error free calibration is achieved only after step1. Then besides performing next two steps, calibration is ended with End Calibration procedure. The calibration data thus get saved.

2-6) Description of terms used in calibration result:

The stability of the weight display during actual working condition will depend on proper calibration performed. To judge the quality of the calibration performed, a facility is provided whereby the calibration result is displayed. The result shows the following factors:

1. **System Capacity “SCAP”:** System Capacity or the Actual Scale Capacity that will be achieved after the calibration process is completed. This is the maximum weight that can be displayed on the platform without exceeding the AD converter limit of the internal circuit. If “SCAP” value is less than “MCAP” then the scale cannot achieve the weight value of “MCAP” and the AD converter will be saturated before this. If “SCAP” is more than the “MCAP” then the weight display is locked at “MCAP” even if the internal circuit of AD converter is not saturated. It means that on this condition “MCAP” can be increased if desired.
2. **Test-Counts Per Division “tCPd”:** Test Count Per Division of displayed weight is the gain of the system achieved. For stable weight display, this value should be more than 2.5. If this value is very high then stability will also be high but the System Capacity

“SCAP” above will be low. If this low value of “SCAP” is not a limitation then do not recalibrate. If “tCPd” value falls below 2.5 then there may be flicker on the weight display.

2-7) Description of Smart calibration and terms used in smart calibration:

Many times the complete procedure for calibration with test weights becomes very cumbersome. This is especially true for situations where there is only very minor correction in calibration to be performed. Example if the actual weight on platform is 5000 kg and the calculated weight by digitizer D300 appears as 5010 kg. In such situation only a minor correction factor has to be incorporated without going through the cumbersome process of calibration using test weights. For such situations, the digitizer D300 has provision of ‘SMART CALIBRATION’. In this procedure, we have to initiate the process of SMART CALIBRATION, feed the wrong displayed weight (5010 kg in this case) and then feed the correct weight (5000 kg in this case). This completes the process of SMART CALIBRATION. For future weight calculation the digitizer D300 will calculate the correction factor from above calculation and will apply that correction factor to all calculated weight. For the process of SMART CALIBRATION it is recommended to keep the platform in empty condition.

1. **Old weight:** The Old weight is that, which is displayed by D300 and needs to be corrected. For example the known weight on the platform is 1000 but the display shows 995. Then ‘995’ has to be fed in place of old weight.
2. **New weight:** The New weight is that, which is to be displayed in place of faulty weight. For example the known weight on the platform is 1000 but the display shows 995. Then 1000 has to be fed in place of new weight.

Note: While entering the Old weight and New weight value through keyboard, enter the weight by presuming the existence of decimal point in the display without actually punching the point.

2-8) Description of term ‘Weight Display at Power On’:

This option is available to select either zero weight on ‘Power On’, or actual weight on ‘Power On’ the system. Whenever the D300 is switched on, any weight on the platform is displayed as its actual value, if the ‘Power On’ option is set to 1. If the option is set as 0, then 4% weight of Maximum Scale Capacity 2 can be zeroed at the time of switching on the system.

2-9) Description of keys used in operation by using 4keys keyboard:

The weighing operation is performed by using the keys described below,

2-9a) TARE key: TARE key provided on front panel is used to tare the weight on the platform. Press TARE key to tare the weight & the display will show zero weight on the platform. Any weight kept on the platform after taring off will be the net weight. Example: A container is placed on the platform, to fill the actual material. The container weight has to be tared, to view the net weight of the material during weighing.

2-9b) ZERO key: ZERO key is provided on front panel, to zero the weight on the platform. Press ZERO key to zero the weight. Only 4% weight of Maximum Scale Capacity can be zeroed. This is as per the Weights and Measure Law prevailing in the country. Example: Some residual weight is lying on the platform. Press ZERO key to zero the debris weight before starting weighing of actual material.

2-9c) GROSS/NET key: Gross/Net key is provided on front panel. This is a toggle key for viewing gross weight and net weight on the display.

2-10) Description of term ‘Averaging Test Counts’:

Averaging test count feature is provided to avoid fluctuations in weight. This feature can control the averaging of sensed weight samples. By keeping averaging factor to a value above 1, the stability of weight increases. Keeping the higher value will show the slow processing of weight.

2-11) Displaying Calibration Data:

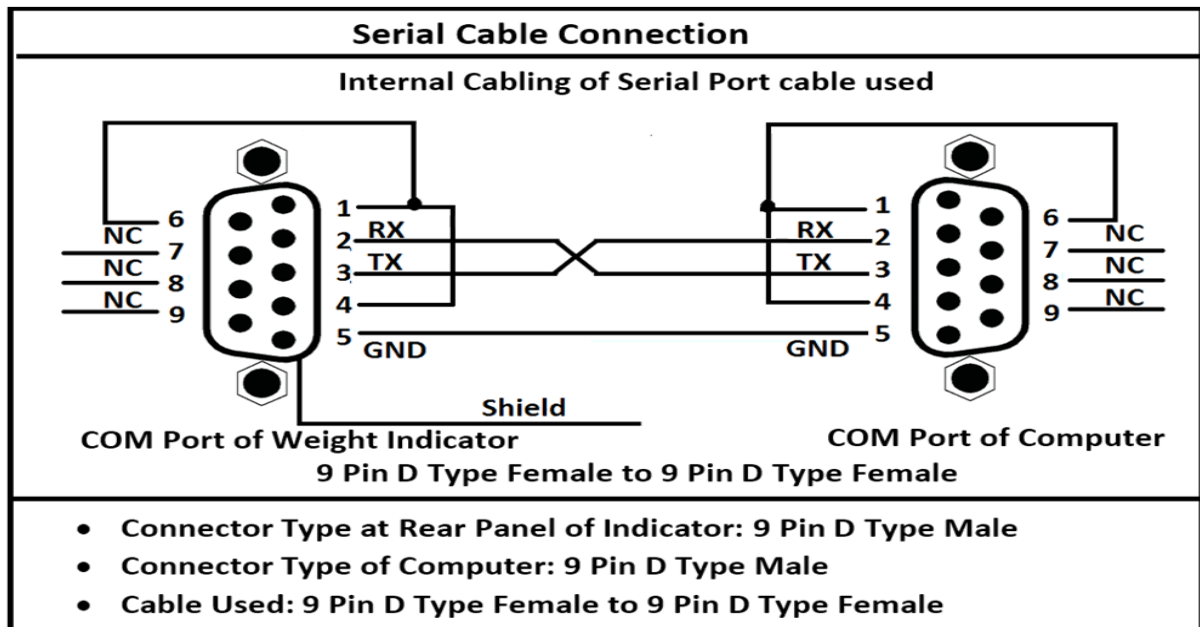
By using this feature, Engineer can note down the calibration data values after successful calibration. This data should be written in a secure place so that, in case the calibration gets disturbed, it can be restored without performing actual calibration.

2-12) Restoring Calibration (Calibration data re-entering):

In case of calibration disturbed fault, the calibration can be re-stored by entering the previously noted values of cal data.

2-13) Description of term ‘Serial Communication’:

Serial communication is possible in D300; the weight data is transmitted using communication port provided on back panel. Different types of serial strings are provided as per field requirement. The serial string can be selected in the field as per the requirement.

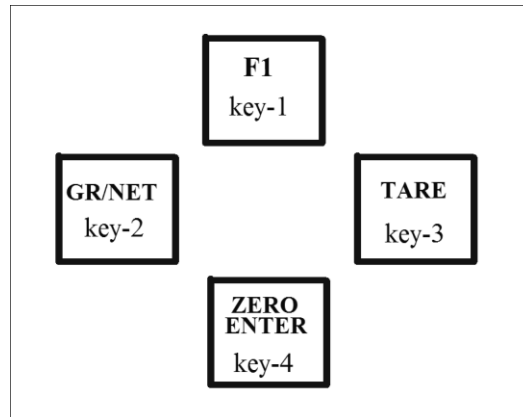


Chapter 3

Settings using 4-key front panel keyboard

FRONT PANEL KEYS:

Figure – Front key panel of indicator



Note: To enter the required value for the blinking digit on LED display, use the arrow keys as described below:

- (→) : To shift the blinking digit to Right.
- (↑) : To increment the value of blinking digit
- (↓) : To decrement the value of blinking digit
- ENTER:** To enter the required parameter value.

Example: To set the Maximum Scale Capacity 50000 during calibration, press left arrow key four times, the fifth digit from right will start blinking. Now by pressing up arrow key five times, bring the value of digit on ten thousands place to 5.

Example of Data Entry Using Numeric Keys:

Numeric entries using front panel keyboard can be done by arrow keys. At a time only one digit will be blinking. Values can be changed only for the digit, which is blinking. To set value on any blinking digit increment or decrement keys (**up arrow key** for incrementing and **down arrow key** for decrementing) should be used. To change the digit for data modification, **side arrow key** should be used. Pressing the side arrow key will shift the blinking digit by one left. On reaching the extreme 6th digit, the next press of side arrow key will bring the blinking digit to position number one (extreme right).

For example, we will see the password entry, in calibration parameter setting procedure.

1. To enter into calibration parameter setting procedure, press and hold 'key1', 'key3' and 'key4' simultaneously.
2. Release all the keys simultaneously, when the display shows, 'PASSWd'.
3. The display will show 'PASSWd' for a short time.
4. The display will now show '00000' with the right most digit blinking. The blinking digit is denoted here by gray color for ease of understanding.
5. The password to be entered is '54247'
6. Press down arrow key thrice, the blinking digit will first show 9; then 8 and then 7. Which is the required value for right most digits.
7. The display will appear as '00007'

8. Press left arrow key, now the display looks like, '00007'
9. Press up arrow key four times to set the '2nd digit from right' to 4.
10. The display will appear as '00047'
11. Press left arrow key, now the display looks like, '00047'
12. Press up arrow key two times to set the '3rd digit from right' to 2.
13. The display will appear as '00247'
14. Press left arrow key, now the display looks like, '00247'
15. Press up arrow key four times to set the '4th digit from right' to 4.
16. The display will appear as '04247'
17. Press left arrow key, now the display looks like, '04247'
18. Press up arrow key five times to set the '5th digit from right' to 5.
19. The display will appear as '54247'
20. Press ENTER key to accept the entered password.

3-1) Adjust dead load:

1. Press and hold key1 (left arrow/ F), key2 (up arrow / Gr-Net) and key4 (Enter / Zero) simultaneously.
2. Release all the keys simultaneously, when the display shows, 'PASSWd'.
3. The display will show 'PASSWd', for a short time.
4. Now the display shows '00000'
5. Use arrow keys to enter the password '127'. Press 'ENTER' key.
6. The display will show, 'd L E'

Indicator will automatically adjust the dead load and will show zero weight

3-2) The Process of 'Switching to Test Count Mode' using 4key keyboard:

1. Press and hold key3 (down arrow / Tare) and key4 (Enter / Zero) simultaneously.
2. Release all the keys simultaneously, when the display shows, "tCMODE".
3. "tCMODE" will be displayed for a short time.
4. The display will now show, the "Test Counts" in numeral value. For example ". . 1. 2. 3. 4"
5. To exit this mode press and release "ENTER (4)" key.
6. The display shows "wtMODE" momentarily.

3-3) Flicker Test:

1. Press and hold key1 (left arrow/ F), key2 (up arrow / Gr-Net) and key4 (Enter / Zero) simultaneously.
2. Release all the keys simultaneously, when the display shows, 'PASSWd'.
3. The display will show 'PASSWd', for a short time.
4. Now the display shows '00000'
5. Use arrow keys to enter the password '127'. Press 'ENTER' key.
6. The display will show, 'fLickr', 'tEst', 'Wait'
7. After a short time test result will be displayed as, "Flickr Lowest".
8. If the performance is found to be "Flicker Lowest/low/normal", then proceed to next step. If flicker is found to be high/highest then check the indicator with load cell simulator and then remove the structure or load cell error.

3-4) The Process of ‘Machine Parameter Setting’ using 4key keyboard:

1. Press and hold key1 (left arrow/ F), key3 (down arrow / Tare) and key4 (Enter / Zero) simultaneously.
2. Release all the keys simultaneously, when the display shows ‘PASSWd’.
3. ‘PASSWd’ will be displayed for a short time.
4. Now the display shows ‘00000’
5. Enter the password ‘54247’ using arrow keys and Press ‘ENTER’.
6. The display shows ‘MCAP1’ for a short time.
7. Now the display shows previously saved value for a moment and then shows, ‘000000’. If the previous value is to be kept unchanged, press ‘ENTER’ key.
8. Use arrow keys to enter the new desired “MCAP 1” value by presuming the desired Decimal Point but not punching any point. Example if 200.00 is to be entered then enter “20000”. Presume a Decimal Point after 2 least significant digits (Decimal Point value =2). Press, “ENTER” key.
9. The display shows ‘MCAP2’, for a short time.
10. Now the display shows previously saved value for a moment and then shows ‘000000’. If the previous value is to be kept unchanged, press ‘ENTER’ key.
11. Use arrow keys to enter the desired “MCAP 2” value by presuming the desired Decimal Point but not punching any point. Example if 300.00 is to be entered then enter “30000”. Presume a decimal Point after 2 least significant digits (Decimal Point value =2). “MCAP 2” value should be equal to or higher than “MCAP 1” value entered in step ‘6’ above. Press ‘ENTER’ key.
12. The display shows ‘dP’, for a short time.
13. Now the display shows previously saved value for a moment and then shows ‘0’. If the previous value is to be kept unchanged, press ‘ENTER’ key.
14. Use arrow keys to enter desired value of Decimal Point (from 0 to 3) and press ENTER (key4).
15. The display shows ‘diV1’, for a short time. x-czi
16. Now the display shows previously saved value for a moment and then shows ‘000’. If the previous value is to be kept unchanged, press ‘ENTER’ key.
17. Use arrow keys to enter Division Size 1 non zero value and press ENTER (key4).
18. The display shows ‘diV2’, for a short time.
19. Now the display shows previously saved value for a moment and then shows ‘000’. If the previous value is to be kept unchanged, press ‘ENTER’ key.
20. Use arrow keys to enter Division Size 2 non zero value and press ENTER (key4).
21. The display shows ‘AZt’, for a short time.
22. Now the display shows previously saved value for a moment and then shows ‘00’. If the previous value is to be kept unchanged, press ‘ENTER’ key.
23. Use arrow keys to enter Auto Zero Tracking width value and press ENTER (key4).
24. The display shows ‘AztdLY’ for short time.
25. Now display shows the previously saved value for a moment and then shows ‘000’. If the previously value is to be kept unchanged, press ‘ENTER’ key.
26. Use arrow keys to enter default value ‘6’ and press ‘ENTER’ (key4).
27. The display shows ‘WtrACK’, for a short time.
28. Now the display shows previously saved value for a moment and then shows ‘0’. If the previous value is to be kept unchanged, press ‘ENTER’ key.
29. Enter the default value ‘0’.
30. The display shows ‘FivE_Z’ for short time.
31. Now the display shows previously saved value for a moment and then shows ‘0’. If the previous value is to be kept unchanged, press ‘ENTER’ key.

32. Use arrow keys to enter 1 for enabling Five Zero on Zero Weight; enter 0 for disabling Five zero on Zero Weight and press ENTER (key4).

3-5) The Process of ‘Actual Calibration using Test Weights’ using 4key keyboard:

1. Press and hold key1 (left arrow/ F) and key2 (up arrow / Gr-Net) simultaneously.
2. Release all the keys simultaneously, when the display shows, ‘PASSWd’.
3. ‘PASSWd’ will be displayed for a short time.
4. Now the display shows ‘00000’
5. Enter the password ‘12345’ using arrow keys and Press ‘ENTER’ (key4).
6. The display will show, ‘noStEP’, for a short time.
7. Now the display shows ‘0’ blinking
8. Use arrow keys to enter Number of Steps for calibration and press ‘ENTER’ (key4). (Maximum Number of Steps is 3).
9. The display will show, ‘ClrPtF’.
10. Achieve clear platform condition by removing all the weights from platform and press ‘ENTER’ (key4). The D300 will store the load cell signal as a zero reference for all future weight calculation.
11. The display will show ‘Wait’ for some time and then it will show ‘CAL 1’ for some time and Display ‘000000’ with right side 0 blinking.
12. Load the platform with first test weight, enter the numeric value of weight in D300 using arrow keys and press ‘ENTER’ (key4). While entering the weight value through keyboard, enter the weight by presuming the existence of Decimal Point in the display without actually punching the point. Example:
 - a. If “10.50” is to be entered then just enter “1050” (the Decimal Point value will be specified as 2 in this case).
 - b. If “0.010” is to be entered then just enter “10” (the Decimal Point value will be specified as 3 in this case).
 - c. If “3.0” is to be entered then just enter “30” (the Decimal Point value will be specified as 1 in this case).

It should be noted that the loaded weight should always be in multiple of “10”. i.e. the last digit has to be zero. This is internal software check for entering any weight irrespective of Division Size.
13. The display will show ‘CALOvr’, if Number of Steps is set as 1.
14. If Number of Steps are programmed more than 1, the display will show ‘StOvr’

The calibration has to be repeated as specified in the entry for Number of Steps earlier. To perform calibration with new test weight, repeat the step 1 to step 5, i.e, pressing of key1 and key2 simultaneously and enter the required password. The step loads have to be in increasing order. Repeat the steps 11 and step 12 if calibration is done in 2 or 3 Number of Steps. After all the steps have been completed, the display will show “Wait” for some time and then will display ‘CALOvr’. After this sequence the calibration result will be stored in the memory of the digitizer D300 for further weighing procedure.

3-6) The Process of ‘Ending Calibration’ using 4key keyboard:

If the calibration process has to be pre-terminated without completion of all the steps then the following has to be done:

1. Press and hold key2 (up arrow / Gr-Net), key3 (down arrow / Tare) and key4 (Enter / Zero) simultaneously.

2. Release all the keys simultaneously, when the display shows 'CALOvr'. The process will be terminated without going through the process of further calibration with other test loads.

3-7) The Process for 'Displaying Calibration Result' using 4key keyboard:

1. Press and hold key1 (left arrow/ F) and key3 (Tare / Down arrow) simultaneously.
2. Release all the keys simultaneously, when the display shows, 'PASSWd'.
3. The display will show 'PASSWd', for a short time.
4. Now the display shows '00000'
5. Use arrow keys to enter the password '12347'. Press 'ENTER' key.
6. The display will show 'SCAP' for some time.
7. The display will show System Capacity # # # # (where # indicates numeric digits) achieved after calibration for some time.
8. The display will show 'tCD300'
9. The display will show test count per division or gain of the system # # # # (where # indicates numeric digits) for some time and return to weight mode.

3-8) The Process for 'Performing Smart Calibration', using 4key keyboard:

1. Keep the platform in empty condition.
2. Press and hold key2 (up arrow / Gr-Net) and key3 (down arrow / Tare) simultaneously.
3. Release all the keys simultaneously, when the display shows, 'PASSWd'.
4. The display will show 'PASSWd', for a short time.
5. Now the display shows '00000'
6. Use arrow keys to enter the password '12346'. Press 'ENTER' key.
7. The display will show "OLd-Wt" for some time.
8. The display will show "000000".
9. Use arrow keys to enter old or faulty weight and press "ENTER" key.
10. The display will show "nEW-Wt" for some time.
11. The display will show "000000".
12. Use arrow keys to enter new or correct weight and press "ENTER" key
13. The display will show "WaiT" for some time and this will terminate the process of SMART CALIBRATION.
14. The internal weight correction will be carried out by D300.

3-9) The Process for 'Setting Display Type At Power On', using 4key keyboard:

1. Press and hold key1 (left arrow/ F), key2 (up arrow / Gr-Net) and key3 (down arrow / Tare) simultaneously.
2. Release all the keys simultaneously, when the display shows, 'P_on'
3. 'P_on' will appear for some time.
4. The display shows previously set numeric value of 'P_on', and then shows '0'
5. Use arrow keys to enter the value 1 for displaying actual weight on power on and press ENTER (key4).
6. Use arrow keys to enter the value 0 for displaying zero weight on power on and press ENTER (key4).

3-10) The process of setting 'Weight Value for Zero' using 4keys:

1. Press and hold key1 (left arrow/F), key2 (up arrow/ Gr-Net) and key4 (Zero/Enter) simultaneously.

2. Release all the keys simultaneously, when display shows, 'PASSWD'.
3. 'PASSWD' will display for a short time.
4. Now display shows '00000'. Enter password 96947 using arrows keys.
5. Press 'Enter' key, display will show last entered value for some time, then shows '000'.
6. Keep the default value '0' Press enter key.

3-11) The Process of 'Setting Averaging Test Counts', using 4key keyboard:

1. Press and hold key1 (left arrow/ F) and key4 (Zero/Enter) simultaneously.
2. Release all the keys simultaneously, when the display shows, 'Av tC'.
3. Now the display shows '00'
4. Use arrow keys to enter the required averaging test counts value and press 'ENTER' KEY.

3-12) Viewing Calibration Data:

1. Press and hold key1 (left arrow/ F), key2 (up arrow / Gr-Net) and key4 (Enter / Zero) simultaneously.
2. Release all the keys simultaneously, when the display shows, 'PASSWd'.
3. The display will show 'PASSWd', for a short time.
4. Now the display shows '00000'
5. Use arrow keys to enter the password '20050'. Press 'ENTER' key.
6. The display will show 'V1' for short time.
7. After this display will show a five-digit number, for example '45002'.
8. Note down this number and press enter key.
9. The digitiser will again show a five digit number, for example '34522',
10. Note down this number and press enter key.
11. The display will show 'V2' for short time.
12. After this display will show a five-digit number, for example '35002'.
13. Note down this number and press enter key.
14. The digitiser will again show a five digit number, for example '24520',
15. Note down this number and press enter key.
16. Note these readings and write/store on a proper place with company data for future utilization in case of calibration disturb.

3-13) Calibration Data Re-entering (Restoring Disturbed Calibration)':

1. Press and hold key1 (left arrow/ F), key2 (up arrow / Gr-Net) and key4 (Enter / Zero) simultaneously.
2. Release all the keys simultaneously, when the display shows, 'PASSWd'.
3. The display will show 'PASSWd', for a short time.
4. Now the display shows '00000'
5. Use arrow keys to enter the password '20060'. Press 'ENTER' key.
6. The display will show 'V1' for short time.
7. After this display will show five-zeros with right most digits blinking, for example '00000'.
8. Enter the noted number and press enter key.
9. The digitiser will again show five-zeros with right most digit blinking, for example '00000',
10. Enter the noted number and press enter key.
11. The display will show 'V2' for short time.

12. After this display will show five-zeros with right most digit blinking, for example '00000'.
13. Enter the noted number and press enter key.
14. The digitiser will again show five-zeros with right most digit blinking, for example '00000',
15. Enter the noted number and press enter key.
16. The disturbed calibration will be restored.

3-13) Securing Calibration with hardware jumper lock:

1. Place the jumper on AE8973.j2 (or on AE8973.j2), after completing successful calibration, this is a hardware lock, which cannot be opened without opening the box-cover of indicator.
2. After placing the jumper lock, restart the indicator.

3-14) The Process for 'Selecting Type of Serial String' using 4key keyboard:

1. Press and hold key1 (left arrow/ F), key2 (up arrow / Gr-Net) and key4 (Enter / Zero) simultaneously.
2. Release all the keys simultaneously, when the display shows, 'PASSWd'.
3. The display will show 'PASSWd', for a short time.
4. Now the display shows '00000'
5. Use arrow keys to enter the password '12350'. Press 'ENTER' key.
6. The display shows previously set serial string for sometime, and then shows '00'
7. Use the arrow keys to enter the number of required serial string and press ENTER.

3-15) The process of Zero Band Setting using 4key keyboard:

1. Press and hold key1 (left arrow/F), key2 (up arrow/ Gr-Net) and key4 (Zero/Enter) simultaneously.
2. Release all the keys simultaneously, when display shows, 'PASSWD'.
3. 'PASSWD' will display for a short time.
4. Now display shows '00000'. Enter password **11224** using arrows keys
5. The display will show, 'Z_trig', for a short time.
6. Now the display shows previously saved value for a moment and then shows '00000'. If the previous value is to be kept unchanged, press 'ENTER' key.
7. Enter the default value '0' and press 'ENTER' (key4).
8. The display will show, 'Z__div' for shorttime.
9. Now the display shows previously saved value for a moment and then shows '00000'. If the previous value is to be kept unchanged, press 'ENTER' key.
10. Enter the default value '0' and press ENTER (key4).
11. The display shows, 'Z_-div' for sometime.
12. Now the display shows previously saved value for a moment and then shows '00000'. If the previous value is to be kept unchanged, press 'ENTER' key.
13. Enter the default value '0' and press ENTER (key4).
14. The display returns to normal weight mode.

3-16) The process for ON and OFF the Zero Band Setting using 4key keyboard:

1. Press and hold key1 (left arrow/F), key2 (up arrow/ Gr-Net) and key4 (Zero/Enter) simultaneously.

2. Release all the keys simultaneously, when display shows, '**PASSWD**'.
3. '**PASSWD**' will display for a short time.
4. Now display shows '**00000**'. Enter password **11556** using arrows keys
5. The display will show, '**Z_oN**', for a short time. This will **ON** or Enabled Zero Band Setting.
6. Press and hold key1 (left arrow/F), key2 (up arrow/ Gr-Net) and key4 (Zero/Enter) simultaneously.
7. Release all the keys simultaneously, when display shows, '**PASSWD**'.
8. '**PASSWD**' will display for a short time.
9. Now display shows '**00000**'. Enter password **11557** using arrows keys
10. The display will show, '**Z_oFF**' for sometime. This will **OFF** or Disabled Zero Band Setting.

3-17) The Process of 'Changing Calibration Password', using 4key keyboard:

1. Press and hold key1 (left arrow/ F), key2 (up arrow / Gr-Net), key3 (down arrow / Tare) and key4 (Enter / Zero) simultaneously.
2. Release all the keys simultaneously, when display shows, '**OLdPAS**'.
3. '**OLdPAS**' is displayed for a short time.
4. Now the display shows, '**00000**'.
5. Use arrow keys to enter the old password of actual calibration (**12345** for first time) and press ENTER (key4).
6. The display shows, '**nEWPAS**' for a short time.
7. Now the display shows, '**00000**'.
8. Use arrow keys to enter the new password and press ENTER (key4).
9. A long beep will be heard as an acceptance of the new password.

Note: Enter the new password required using arrows keys and press enter key, the new password will be used instead of calibration password '**12345**'. After changing the calibration password, all other passwords will also change respectively. The '**new password+1**' will be used instead of '**12346**' and '**new password+2**' will be used instead of '**12347**' and so on.

3-18) The process of setting 'Weight Value for Zero" using 4keys:

1. Press and hold key1 (left arrow/F), key2 (up arrow/ Gr-Net) and key4 (Zero/Enter) simultaneously.
2. Release all the keys simultaneously, when display shows, '**PASSWD**'.
3. '**PASSWD**' will display for a short time.
4. Now display shows '**00000**'. Enter password **96947** using arrows keys.
5. Press 'Enter' key, display will show last entered value for some time, then shows '**000**'.
6. Keep the default value '0' Press enter key.

Chapter 4 Summary

Parameters for calibration	Press and hold	F ←	TARE ↓	ZERO ENTER	And enter password 54247	
Auto Calibration	Press and hold	F ←	GR-NET ↑		And enter password 12345	
Smart Calibration	Press and hold		GR-NET ↑	TARE ↓	And enter password 12346	
Switching to Test Count mode	Press and hold		TARE ↓	ZERO ENTER		
Switching to Weight Mode	Press		ZERO ENTER			
Calibration Result	Press and hold	F ←	TARE ↓		And enter password 12347	
Calibration Over	Press and hold		GR-NET ↑	TARE ↓	ZERO ENTER	To end the process of calibration, if no. of Steps are programmed more than 1
Zero Weight on Power ON	Press and hold	F ←	GR-NET ↑	TARE ↓		
Zeroing Weight	Press and hold		ZERO ENTER			
Averaging Test Count	Press and hold	F ←	ZERO ENTER			
Weight Value for zero	Press and hold	F ←	GR-NET ↑	ZERO ENTER	And enter password 96947	
View calibration data	Press and hold	F ←	GR-NET ↑	ZERO ENTER	And enter password 20050	
Re-enter calibration data	Press and hold	F ←	GR-NET ↑	ZERO ENTER	And enter password 20060	

Flicker Testing	Press and hold	F ←	GR-NET ↑	ZERO ENTER	And Enter Password 131
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Auto dead load Adjust	Press and hold	F ←	GR-NET ↑	ZERO ENTER	And Enter Password 127
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Zero Band Setting	Press and hold	F ←	GR-NET ↑	ZERO ENTER	And enter password 11224
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Zero band setting ON /OFF	Press and hold	F ←	GR-NET ↑	ZERO ENTER	And enter password 11556 to ON the setting or 11557 to OFF the setting
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Serial String Selection	Press and hold	F ←	GR-NET ↑	ZERO ENTER	And Enter Password 12350
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Chapter 5

Precautions

Please keep in mind following precautions before installation of the indicator on the site:

1. When connecting with the Mains power supply, connection to true Earth should be as per drawing and recommendations suggested in this manual. This will provide protection to indicator from damage due to Lightning, Voltage Spikes, Electrical Surge, Static Charge and Electrical Noise
2. The indicator must be protected from high electrical voltages (spikes and surges) by using UPS, if required.
3. Avoid using solvents like benzene and nitro oils for cleaning the outer body of the indicator. Use a damp cloth to clean the outer surface if required. Shut off the power input to the indicator before cleaning the body.
4. Liquid and conducting particle should not be poured into the indicator, otherwise the electronic components will be damaged and the indicator will be prone to electric shocks.
5. In case of any malfunction or electrical fault, the power supply to the indicator must be shut immediately and indicator returned to factory for repairs.
6. Avoid Welding on the platform structure or foundation, if the load cells are connected to the platform.
7. The cable length between the junction box and the indicator must be as small as possible.
8. Cut off power supply of indicator, before connecting or disconnecting any peripherals like printer, load cell, display etc.
9. Read carefully & apply what described in the POWER SUPPLY & START-UP section!
10. Do not install in an environment with any risk of explosion.
11. Any attempt to repair or alter the unit can expose the user to the danger of electric shock and it will void warranty.
12. Plug the indicator into properly grounded socket outlet of the correct voltage, installed near the equipment and easily accessible. Never use the unit without an appropriate earth ground connection.
13. Any computer based system should have a separate, grounded power circuit.



Attention

This equipment has been thoroughly tested and it is designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses and can radiate radio frequency energy and if, not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Chapter 6

Safety Regulations

To avoid personal injury and equipment damage, follow the safety regulations below.

Use as originally intended

The measuring system and mechanical components connected to it are exclusively designed for weighing and related controlling tasks.

Hazards and risks

No danger originates from the measuring system itself, if it is properly installed and commissioned.

However, risks may originate from the measuring system if unskilled operators improperly handle the system or the measuring system is a part of a more complex plant. The user is fully responsible for the overall plant safety.

Personnel

Only skilled persons may should install, commission, operate and maintain the device.

All persons working on the measuring system are required to observe the safety instructions and know the parts of the technical documentation relevant to the operation.

The supervisor is responsible for instructing his operators to observe all regulations and instructions given.

Parameter Changes

The measuring system's functionality is determined by parameters, which must exclusively be changed by persons familiar with the measuring system's operation. Parameters incorrectly set may cause injuries or damage to the machine whenever a user control system is connected. They can also adversely affect weighing operation.

Password

Software parameters are protected from unintended change by password.

Moisture Protection

Protect all system parts, electrical items in particular, from moisture (e.g. during maintenance and servicing) when housings are open. Observe housing protection standards.

Modification and Replacement

Unauthorized modifications to the system and/or use of replacement parts not supplied by manufacturer voids manufacturer's liability for any resulting damages. This particularly applies to modifications, which have the potential to affect the operating safety and accuracy of the measuring system.

Replacement of Components

Spare parts must meet the technical specifications indicated by manufacturer. To ensure this requirement is met, only genuine spare parts from manufacturer should be used. When using other spare parts, the warranty will be void.

DISCLAIMER

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

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