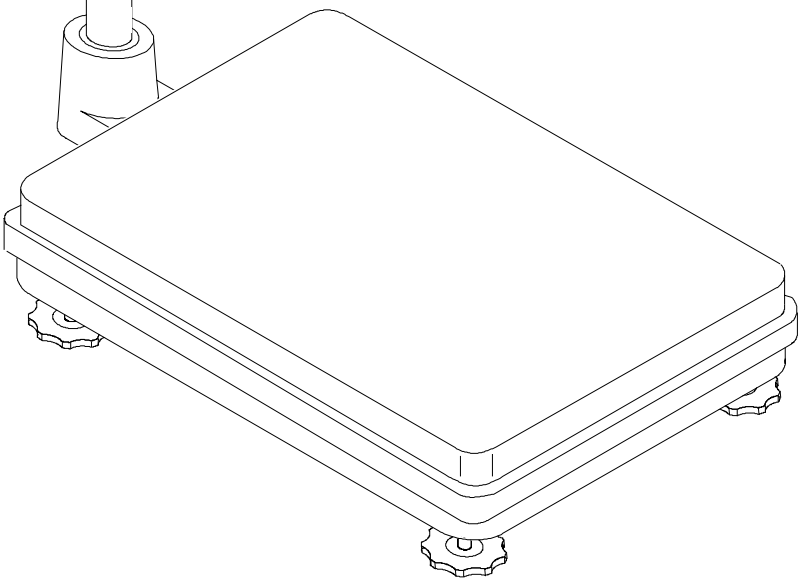
MODEL DP-6100GP
Technical Manual



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FEATURES

Introduction and General Description

The Yamato DP-6100GP Series Scales are versatile, reliable, multipurpose scales. Its many features allow the DP-6100GP to be used in a variety of environments and situations.

Some features include:

- automatic zero tracking
- push-button zero reset
- center zero indication
- push-button lb/kg toggle
- net/gross weighing
- one-touch and preset tare
- low battery indication
- over/under mode (checkweighing)
- large, easy-to-read 1.5" LCD
- color keypad panel
- programmable auto-shut off for extended battery life

Additional Standard Features include:

- stainless steel platform and base (new models only)
- strain gauge load cell
- tiltable and rotatable display

Options:

- AC adaptor
- stainless steel column

The many features of the DP-6100GP allow it to be used in a variety of environments and situations.

ENTERING TEST MODE

To calibrate scale or modify keyword parameters, the DP-6100GP must be put into TEST MODE. To enter TEST MODE, perform the following procedure (please refer to Figure 1 & 2):

1) Open indicator housing by pulling tab, located on right rear of housing, forward.
2) Remove two Sealing Screws (see **Figure 1**).
3) Remove CPU Board Cover, push down and pull out.
4) Push Reset Button (blue) located in center of CPU Board (see **Figure 2**). Display will initialize.
5) Turn scale off. Keep power supply connected or batteries installed throughout.
6) Locate Test Plug Connector. It is located on back side of Keyswitch Board (see **Figure 2 & 2b**).
7) Insert and remove Test Plug (see **Figure 2a**) into Connector. If you do not have a test plug, short Pins 1 & 4 on Connector. Pins are located on front side of Keyswitch Board (see **Figure 2c**). (Using needle-nose pliers to connect pins works well.)
Note: If printer is attached Connector is occupied, therefore short Pins 1 & 4.
8) Turn scale on. Display will blink momentarily, then read close to all zeros.
Congratulations, you have successfully entered TEST MODE!

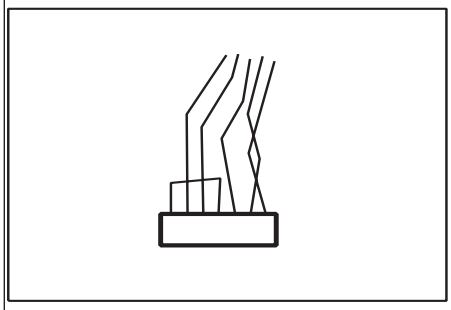


Figure 2a: Test Plug

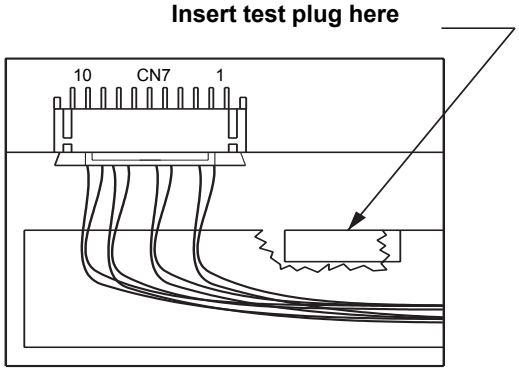


Figure 2b: Test Plug Connector Location

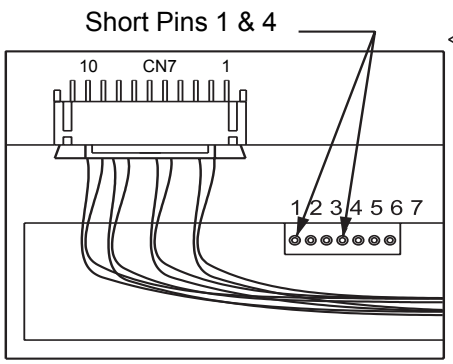


Figure 2c: Pin Location

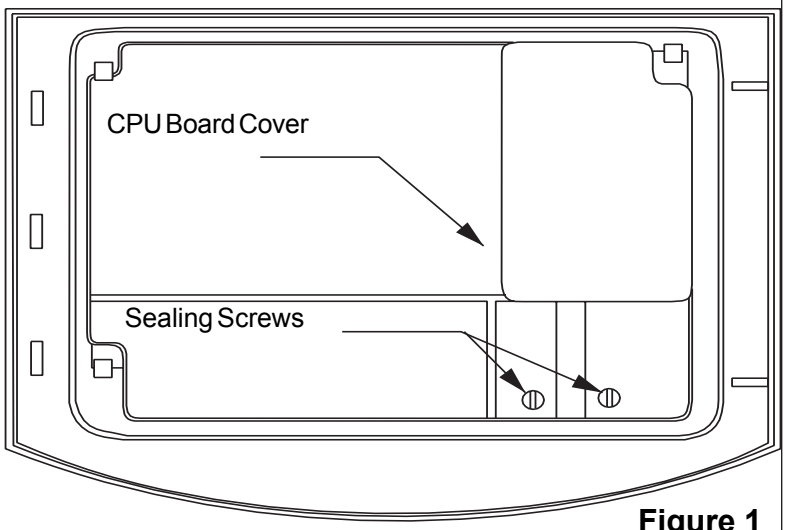


Figure 1

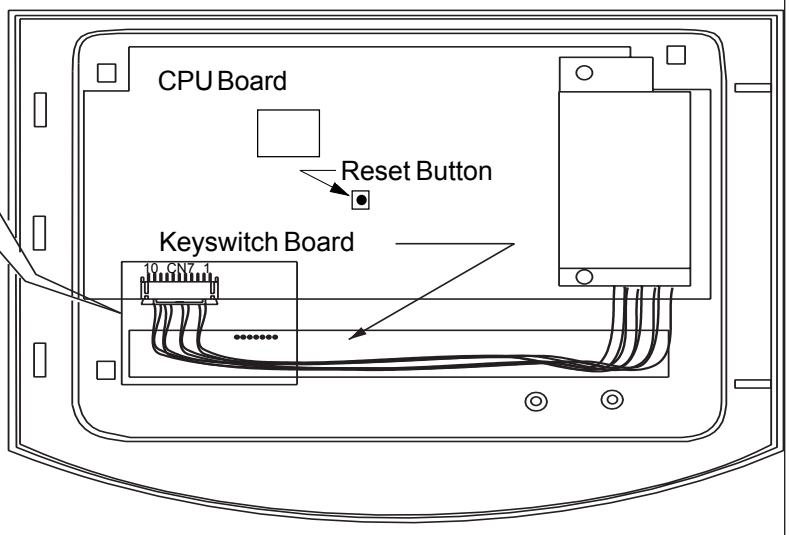


Figure 2

SELECTING MODE

To select desired Mode, perform the following procedure.

1) In not in, enter TEST MODE (see page 4).

2) Use [N/G] and [kg/lb] to display desired Mode (see **Figure 3**).

***Note:** Below numbers are examples of Mode display. They will not be identical for every scale.

3) Press [SETTING] to select Mode.

Mode Options

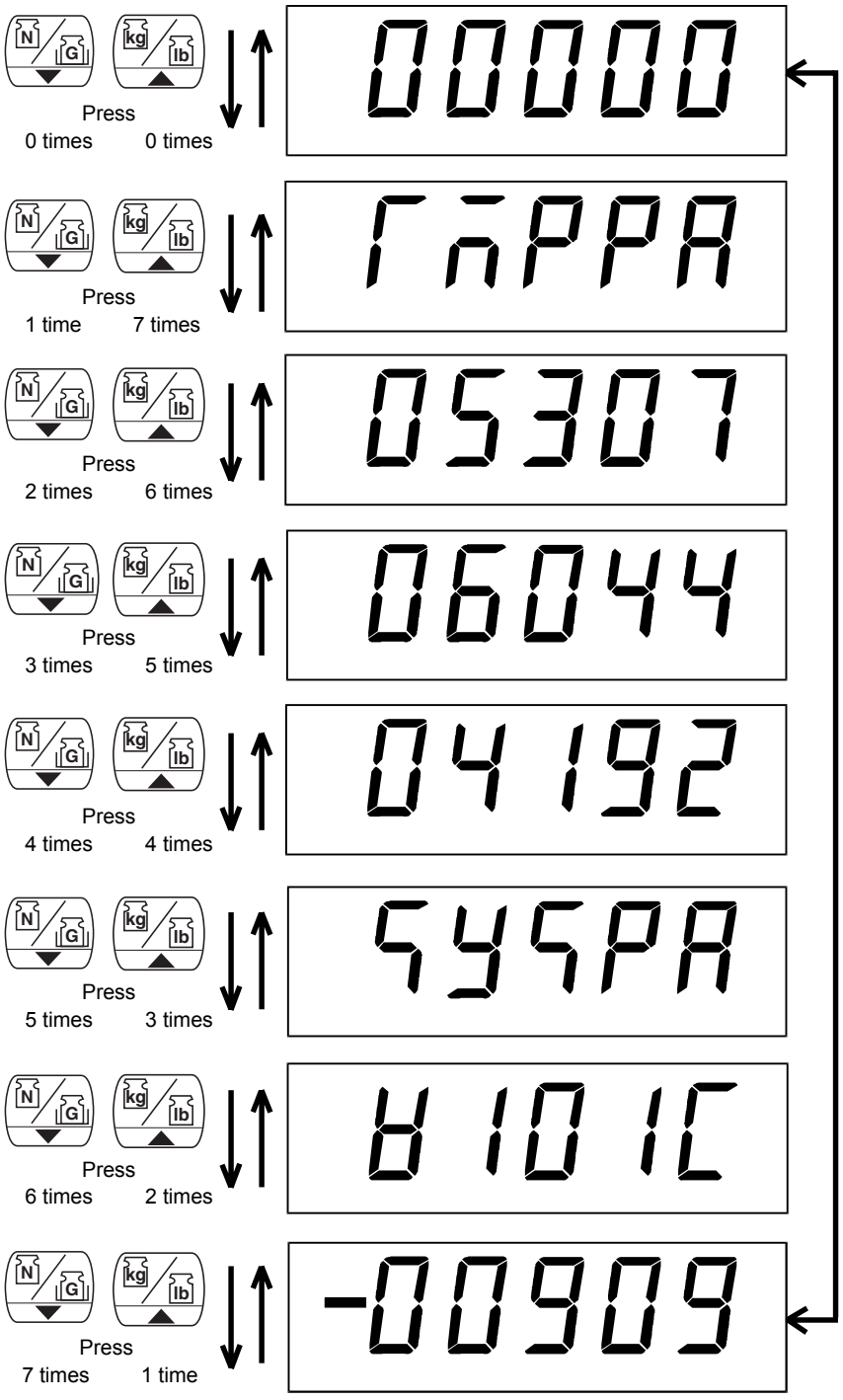


Figure 3

MODIFYING KEYWORD PARAMETERS

Keyword parameters must be checked and/or modified if CPU board (or A/D board) is replaced. Note: If you replace a version V1.00G CPU board with a version V1.01(A, B, C) CPU board, the parameters must be modified as shown in Appendix.

To modify Keyword Parameters, perform the following procedure.

1) Enter TEST MODE (refer to page 4).

2) Press [kg/lb] three times. Display will indicate "Keyword Parameter Setup" mode >> SYSPA

3) Press [SETTING] to enter setup. (Mode flow chart is on page 5 for further understanding.)

4) First Keyword Parameter will be displayed, "30.032". The two digits left of the decimal point is the "Keyword". The three digits right of the decimal point is the Keyword's "Parameter" (see **Figure 4**).

5) Check and modify Keyword Parameters as necessary. Keyword Parameter Values are listed in Appendix A.

a) To increase "Keyword", press [SETTING].

To decrease, press and hold [SETTING], then press [→0← CLEAR].

b) To increase "Parameter", press [kg/lb]. To decrease, press [N/G].

Reminder: Keyword Parameter Values are listed in Appendix A.
Important: After "Parameter" is modified, you must advance to next "Keyword" by pressing [SETTING]. Otherwise, modification will not be saved!

c) Repeat steps **5 a)** & **b)** until all Keyword Parameters are check and/or modified.

6) When Keyword Parameter modification is complete, press [ON/OFF]. This moves you into "Supplementary Keyword Parameter Setup" >> rnPPA

a) To skip "Supplementary" setup, press [ON/OFF].

b) To enter setup, press [SETTING]. Check and modify using procedure above and Appendix B.

Note: Procedure is same, except display lacks decimal point (see **Figure 5**).

When modification is complete, press [ON/OFF].

6) Congratulations, Keyword Parameter Setup is complete!

Figure 4

Figure 5

CALIBRATION

To calibrate scale using pounds or kilograms, perform the following procedure.
Note: Check and modify Keyword Parameters before attempting calibration.

1) Enter TEST MODE (refer to page 4).

2) Wait approximately one minute, then press →0← CLEAR.

a) If "TIME" indicator goes on momentarily* and display reads all zeros >>

00000 (+/- 5), then proceed to step **(3)** (see **Figure 5**). Zero point is set.

b) If display flashes* 1n0tE (= "1 more"), then return to step **(2)**.

Note: It may take several minutes to perform steps **(1)** & **(2)**.

*Often flash is too fast to read or identify.

Figure 5

3) Place weight # 1 (see **Table 1**) on platform, then press SETTING (press only once!).

Important: Be sure to use correct scale capacity from Table. Scale capacity is marked on indicator.

Display will flash* >> SPAN 1, then read 8000 (+/- 5) internal counts ("10000" for 60 lb model). "Span 1" calibration complete.

4) Place weight # 2 (see **Table 1**) on platform, then press SETTING (press only once!).

Display will flash* >> SPAN2, then read 24000 (+/- 5) internal counts ("30000" for the 60 lb model). "Span 2" is complete.

5) Place weight # 3 (see **Table 1**) on platform, then press SETTING (press only once!).

Display will flash* >> SPAN3, then read 60000 (+/- 5) internal counts. "Span 3" is complete.

6) Remove weight from platform and press ON/OFF to turn scale off.

7) Congratulations, calibration is complete! Turn scale on and check accuracy.

Weight #	Scale Capacity		
	300 lb (150 kg)	**150 lb (60 kg)**	**60 lb (30 kg)**
1	40 lb (20 kg)	20 lb (10 kg)	10 lb (5 kg)
2	120 lb (60 kg)	60 lb (30 kg)	30 lb (15 kg)
3	300 lb (150 kg)	150 lb (75 kg)	60 lb (30 kg)

Table 1

Important:

If calibrating with **lb**, then Keyword 92 must be Parameter Value 001. "**92.001**"

If calibrating with **kg**, then Keyword 92 must be Parameter Value 000. "**92.000**"

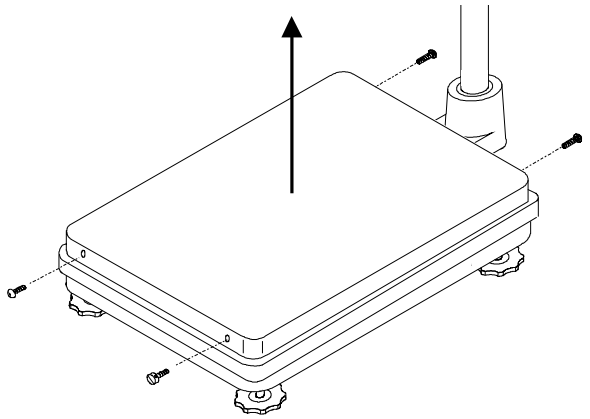
Note: Scales with V1.00G CPU board can only be calibrated with kg.

REPLACING LOAD CELL

Removing Load Cell:

1) Unplug power supply or remove batteries.

2) Remove platform:
To remove, unscrew (2) Sealing Screws and (2) Phillips head screws from front and back of platform.

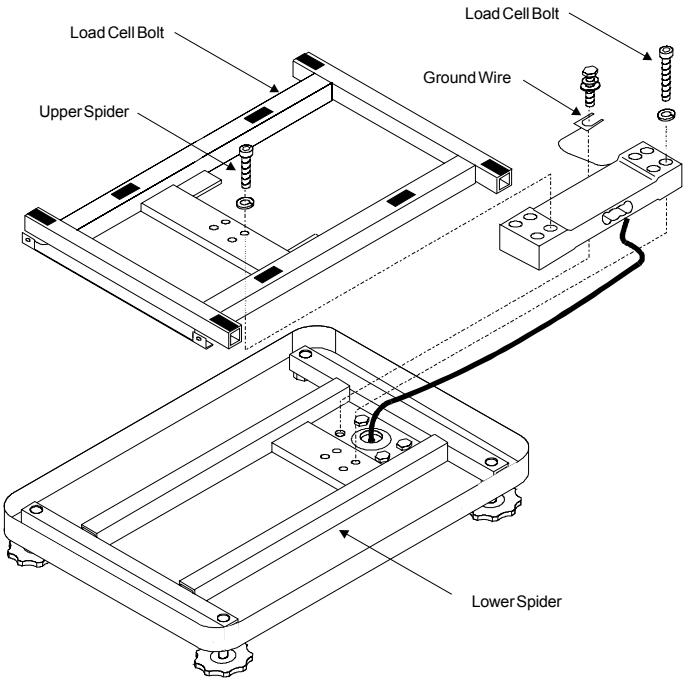


3) Remove (4) Load Cell Bolts which attach Upper Spider to Load Cell.
Upper Spider is the frame to which platform is attached.

4) Upper Spider is now free to remove.

5) Remove (4) Load Cell Bolts which attach Load Cell to Lower Spider.
Note: Lower Spider Load Cell Bolts are longer.

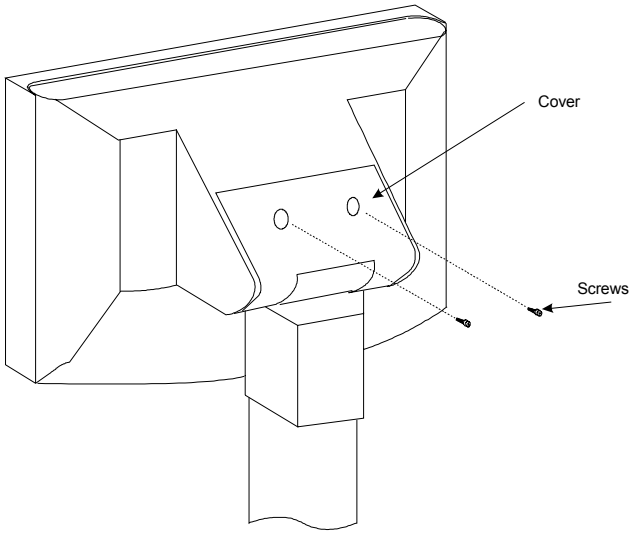
6) Remove bolt which holds Ground Wire (from load cell) against Lower Spider.
Note: Bolt does not need to be completely removed.



Load cell in now free from upper and lower spider. The following steps remove load cell wiring harness from column and indicator housing.

7) Remove Column Cover:
Column Cover is located on back of indicator. Remove (2) screws and cover.

Note position of rubber gasket that is reveal for proper installation in future.



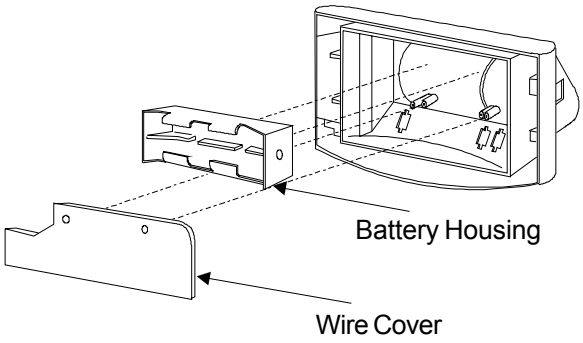
REPLACING LOAD CELL

8) Remove (2) upper screws from base collar and (1) from indicator collar to free column.
Remove and lay indicator/column assembly on counter.

9) Open indicator housing by pulling tab, located on back of housing, forward.
IMPORTANT: Be careful not to scratch display window. Lay on soft surface (towel, pad, etc...).

10) Remove Wire Cover (2 screws) and Battery Housing (2 screws). Battery Housing is connected by two wires and does not need to be completely removed.

11) The load cell cable is now visible from behind Battery Housing. It emerges out of back of indicator housing. Six colored wires come out of this cable: yellow, black, green, white, red, and yellow with a green stripe. At the end of the colored wires is a flat, 7-pin connector. Unhook this connector and unscrew ground wire which is attached to indicator housing.



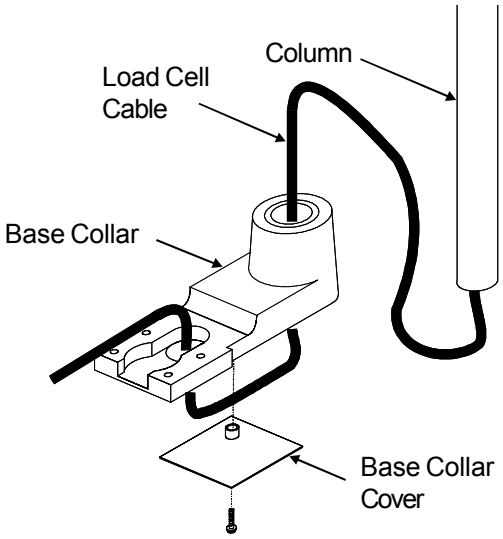
12) Thread Load Cell Cable through small, rectangular hole at back of indicator housing. Remove and retain black, rectangular gasket.

13) Remove indicator from Column (and cable) and pull Cable from inside Column.

14) Remove Base Collar Cover (1 screw) from the underside of Base Collar. To access Cover, platform must be tilted.

15) Feed Cable through Base Collar and pull Cable through round rubber seal in platform base.
Note: Base Collar does not need to be remove from platform.

16) Load cell in now free to be removed.



Installing Load Cell:

1) Installing load cell is reverse of removal, except mounting load cell to spiders first is recommended.

Important: -Ensure upper and lower spider are aligned and straight before tightening.
-Torque load cell bolts to 115 ft-lb.

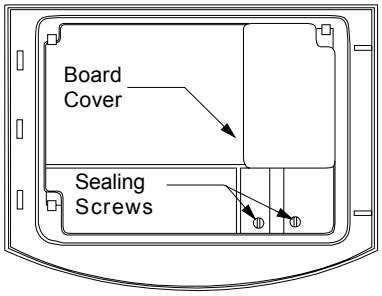
Reminders: -The longer load cell bolts go through the load cell into the lower spider.
-Do not forget to connect ground wire.
-The end of column with drilled hole goes into base collar.
-Hide wires neatly under wire cover and battery housing.

REPLACING A/D BOARD

1) Open indicator housing by pulling tab, located on back of housing, forward.

2) Remove two Sealing Screws and Board Cover.

3) Remove wire cover (2 screws) and battery housing (2 screws) (see Page 9 Step 10). Battery Housing is connected by two wires and does not need to be completely removed, let it hang down out of the way.



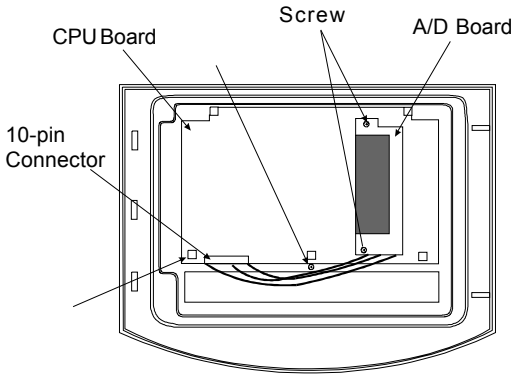
4) The A/D Board is mounted on the right side of the CPU Board by (2) screws. Remove the (2) screws.

5) Disconnect the 10-Pin Connector that goes from the A/D Board into the bottom of the CPU Board.

6) Disconnect the 7-pin connector that goes from the A/D Board to the load cell cable. Connector is located behind original position of battery housing.

7) A/D Board is now disconnected. Note position of wires for proper reassembly

8) Free and remove A/D Board by removing wire holder and cutting necessary wire ties.



Installing new A/D Board:

1) Installation is reverse of removal.

Note: Return wires to original position and organize with wire ties. Improper wire positioning will hinder housing closure.

Important: If new A/D board is not equipped with filter, then use filter off the old A/D board. Filter is simply an extension that connects between the 10-pin connector on the A/D board and the 10-pin connector of the CPU board.

2) Setup A/D board as shown on page 11.

A/D BOARD
SETUP

The A/D board converts the analog signal from the strain gauge load cell into a digital signal, which the CPU board can understand. The A/D board also contains a EEPROM which holds the calibration and keyword parameter data. When the A/D board is replaced, you must program the system keyword and supplementary keyword data, setup the battery check value, and calibrate the scale. Please complete the following steps after a new A/D board is installed.

Important: For proper setup, run scale off 4 new D-cell batteries only.

1) Enter TEST MODE (refer to page 4).

2) Press 

two times to display ROM Version Indicator (refer to page 5).

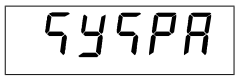
3) Press 

. This will write the battery level value into the EEPROM.

4) Press 

. This will properly setup the A/D board port value.

5) Press 

one time. Display will indicate “Keyword Parameter Setup" mode >> 

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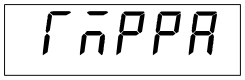
6) Modify Keyword Parameters as shown on page 6. ***Begin with Step 3.**

7) Enter “Supplementary Keyword Parameters Setup” >> 

(refer to page 6 step 6).

Verify that **Keyword 41** is between **Parameter** value **146 -159**. If not, install 4 new D-cell batteries and restart A/D Board Setup from step 1.

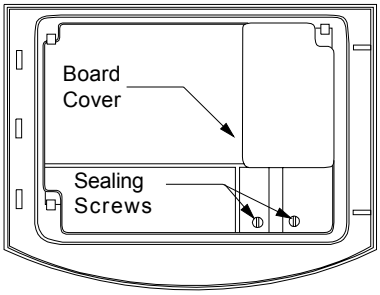
8) Calibrate scale as shown on page 7. TEST MODE must be reentered.

9) Congratulations, A/D Board setup is now complete!

REPLACING CPU BOARD

1) Open indicator housing by pulling tab, located on back of housing, forward.

2) Remove two Sealing Screws and Board Cover.



3) CPU Board is located behind Board Cover. It is the large green circuit board.

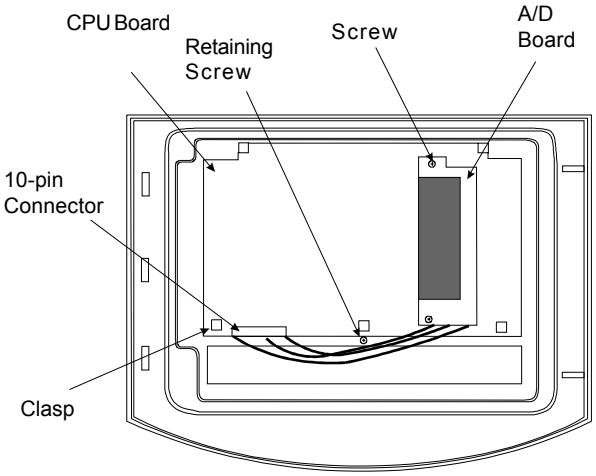
4) Remove A/D Board from CPU Board. It is mounted on right side of CPU Board.
To remove, unscrew (2) mounting screws and disconnect 10-Pin Connector (bottom left of CPU Board).

5) Remove Retaining Screw located just below bottom edge of CPU Board.

6) Remove CPU Board.
To remove, push board down and out, enough to clear (4) clasps.

7) Free CPU Board by disconnecting remaining (2) connectors and (1) ribbon, noting orginal positions. Each connector can fit in only one position.

8) CPU Board is now remove.



Installing the CPU Board:

1) Installation is reverse of removal.
Important: -Before installing make sure display window and display are free from dirt.
-Reconnect all connectors: Back side (connect before installation) > 2-pin, 3-pin, and ribbon.
Front side (connect after installation) > 10-pin from A/D board.
-Make sure board is held by all (4) clasps.

2) Once installed, check and modify Keyword Parameters for new CPU model (refer to page 6).
Important: If A/D Board is also replace, board setup must be done before cablibration (refer to page 11).

3) Calibrate scale as shown on page 7.

4) Congratulations, CPU Board is now installed and setup.

SPECIFICATIONS

Specifications

MODEL: DP-6100GP

CLASSIFICATION: NTEP approved C. of C. #96102, Class III, 3000 divisions

SCALE CAPACITIES/GRADUATIONS:

Capacity	Minimum Graduation
30 Kg 60 lb	0.01 Kg 0.02 lb
60 Kg 150 lb	0.02 Kg 0.05 lb
150 Kg 300 lb	0.05 Kg 0.1 lb

PLATFORM SIZE: 20" x 16" (513 mm x 410 mm)

INDICATOR: EDI-360 ~ The display can be tilted and rotated.
display tube ~ 7 segment, fluorescent type, 5 digits
digit size ~ 1.5" (H) x 0.75" (W) (38 mm x 20 mm)
enclosure ~ plastic, IPX2 (drip proof)

DISPLAY CONTENT: weight ~ 5 digits
upper limit ~ 5 digits
lower limit ~ 5 digits
tare ~ 5 digits

TARE: push-button tare and preset tare up to full scale capacity

POWER SUPPLY/CONSUMPTION: 4 "D" cell batteries (6 volts), 0.08 W
Optional AC adaptor (8 volts).

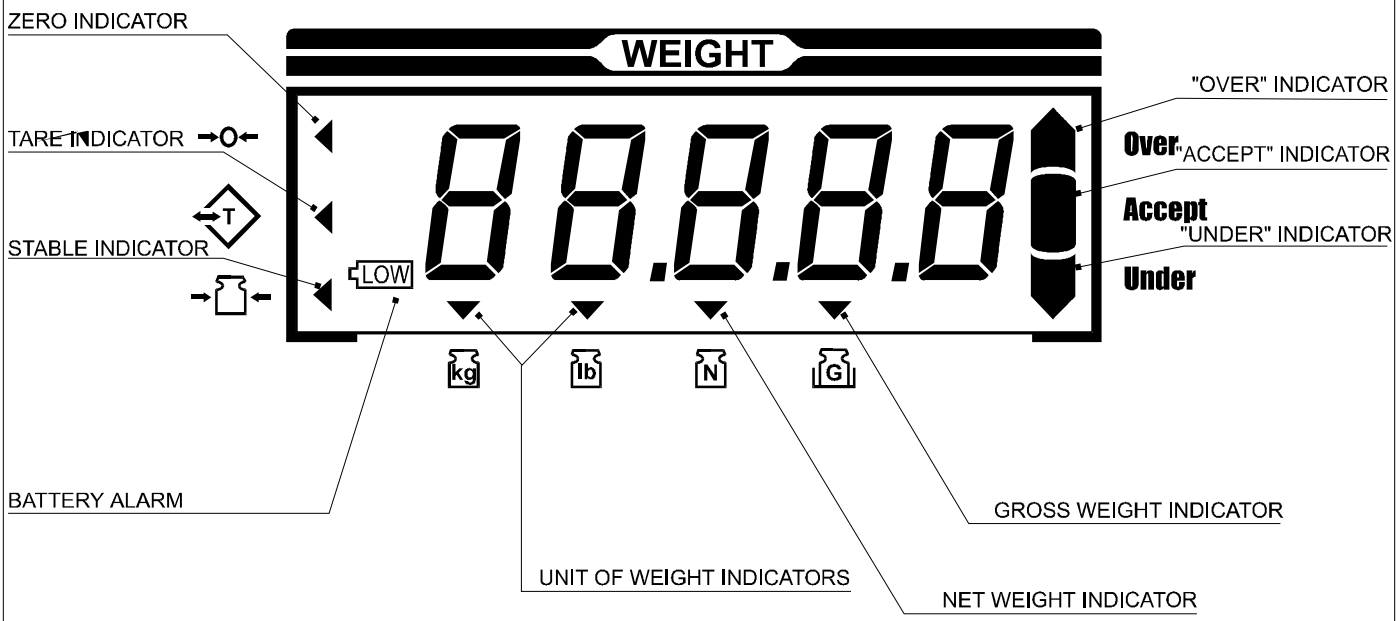
OPERATING TEMPERATURE: -5°C to 40°C

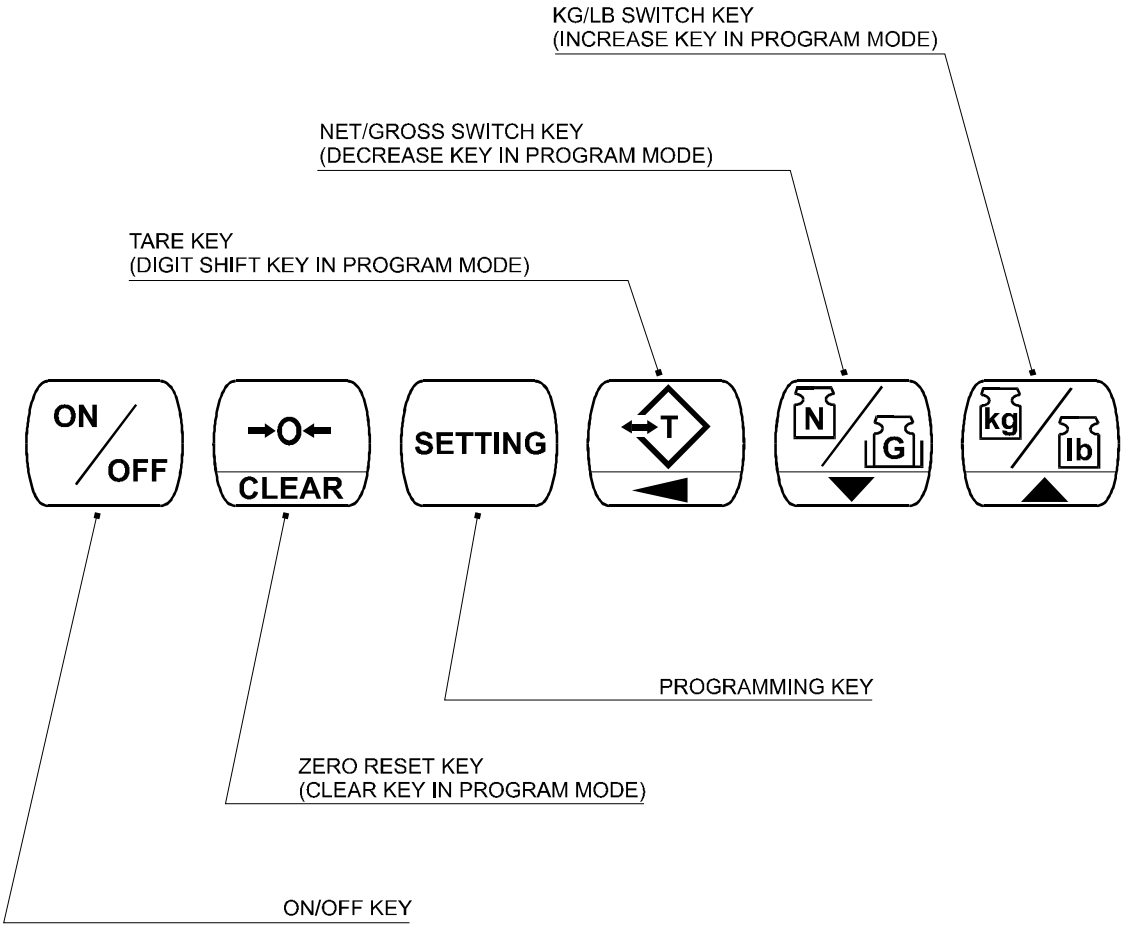
SPECIFICATIONS

Load Cell Specifications

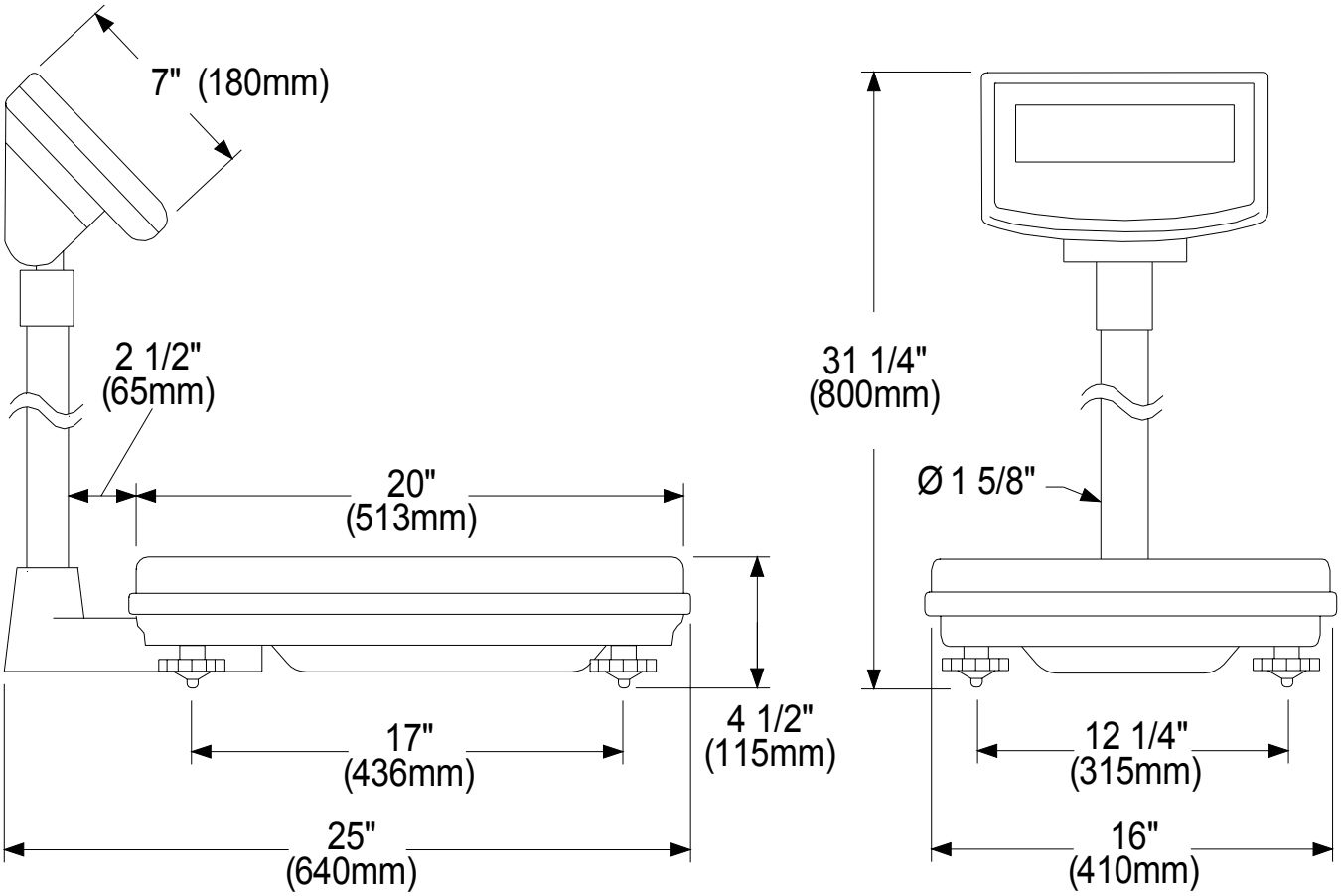
Model	UH-69
Capacity	75 Kg, 150 Kg, 300 Kg
Rated Output	2.0 (+0.1, -0.2) mV/V
Linearity	+/- 0.015%
Hysteresis	+/- 0.015%
Repeatability	+/- 0.01%
Creep (after 30 minutes)	+/- 0.016%
Creep Recovery	+/- 0.016%
Temperature Effect on Load	+/- 0.014 %/10 C
Temperature Effect on Zero Balance	+/- 0.007 %/5 C
Compensated Temperature Range	-10°C to 40°C
Safe Temperature Range	-15°C to 80°C
Zero Balance	+/- 3%
Input Terminal Resistance	1263 +/- 30 Ω
Output Terminal Resistance	1000 +/- 9 Ω
Insulation Resistance	5000 MΩ
Recommended Exitation Voltage	18 V
Maximum Exitation Voltage	25 V
Safe Overload	150%
Maximum Overload	200%

DISPLAY AND KEYPAD





DIMENSIONS


7" (180mm)
2 1/2"
(65mm)
20"
(513mm)
4 1/2"
(115mm)
17"
(436mm)
25"
(640mm)
31 1/4"
(800mm)
Ø 1 5/8"
12 1/4"
(315mm)
16"
(410mm)

APPENDIX A: KEYWORD PARAMETER VALUES

Parameters listed in second column are factory defaults (STD). For custom settings, refer to the "Function" and "Description" columns. Note: For Parameter Values marks * , refer to "Function" and "Description" columns and choose appropriately.**

Keyword #	Parameter Value (STD)	Function	Description
30	032	not used	
31	020	not used	
32	004	not used	
33	004	not used	
34	060	not used	
35	030	not used	
36	000	not used	
37	000	suppress zero	000: yes 001: no
39	018	zero resettable limit (% of full capacity)	001: 1% ~~~: ~~~% 100: 100%
40	014	zero resettable limit, positive side (% of full cap.)	001: 1% ~~~: ~~~% 100: 100%
41	005	over capacity	001: 1 division 0~~: ~~ divisions 010: 10 divisions
44	***	do not modify	
45	***	do not modify	
46	***	do not modify	
47	***	do not modify	
48	***	do not modify	
49	***	do not modify	
51	001	sample count for stability	000: 0 count 001: 1 count 0~~: ~~ counts 060: 60 counts
52	002	average count/stability	000: no average 001: no average 002: 2 A/D conversions 0~~: ~~ A/D conversions 060: 60 A/D conversions
53	002	stability width	000: 0 count ~~~: ~~~ counts 255: 255 counts
54	002	non-stabiltiy width	000: 0 count ~~~: ~~~ counts 255: 255 counts

APPENDIX A: KEYWORD PARAMETER VALUES

Keyword #	Parameter Value (STD)	Function	Description
55	004	polarity stability width	000: 0 count ~~~: ~~~ counts 255: 255 counts
56	032	zero tracking	000: disabled 001: 1 tracking/1 sample ~~~: 1 tacking/~~~ samples 255: 1 tracking/255 samples
57	001	increment changeover	000: no 001: yes
58	***	scale capacity (see indicator housing)	000: 30 kg 001: 60 kg 002: 150 kg 003 - 009: do not use 010: 60 lb/30 kg 011: 150 lb/60 kg 012: 300 lb/150 kg
59	001	signs	000: Japanese market 001: US market 002: other markets
60	001	zero reset during taring	000: enabled 001: disabled
61	004	not used	
62	000	not used	
63	004	not used	
68	000	not used	
69	000	preset tare	000: enabled 001: disabled
70	*** use equation to calculate value	gravity compensation	001 - 016: do not use value = local gravity (m/s^2) x 1000 - 9700 (enter below) 017: value = 17 ~~~: value = ~~~ 150: value = 150
72	000	min. value printed	000: 20d 001: 1d 0~~: ~~d 099: 99d
73	000	new software	
74	000	new software	000: no
76	001	temp. conpensation	001: yes

APPENDIX A: KEYWORD PARAMETER VALUES

Keyword #	Parameter Value (STD)	Function	Description
78	000 (60 lb/30 kg) 003 (150 lb/60 kg) 003 (300 lb/150 kg)	integration time	001: 14 msec 002: 15 msec 003: 16 msec 004: 17 msec 005: 18 msec 006: 19 msec 007: 20 msec 008: 21 msec 009: 22 msec 010: 23 msec 011: 24 msec
80	***	not used	
81	***	not used	
82	***	not used	
83	***	not used	
84	***	not used	
85	***	not used	
86	***	not used	
87	***	not used	
92	001	calibration units	000: kg 001: lb
93	006	not used	
94	040	not used	
95	001	A/D port setting	000: low 001: high
06	022	auto-off timer	000: disabled 001: disabled 002: auto-off after 1 min 003: auto-off after 2 min 0~~: auto-off after ~~ min 062: auto-off after 60 min
11	000	printer	000: disabled 001: enabled
12	000	print time	000: disabled 001: enabled
13	000	year/month/day print	000: disabled 001: enabled
14	008	space at end of ticket	000: no space 001: 1 line 0~~: 0~~ lines 015: 15 lines

APPENDIX B: SUPPLEMENTARY KEYWORD PARAMETER VALUES

Keyword #	Parameter Value (STD)	Function	Description
00 to 24	do not modify	for system parameters	
25	*** use equation to calculate value	gravity compensation at calibration	001 - 016: do not use value = local gravity (m/s^2) x 1000 - 9700 (enter below) 017: value = 17 ~~~: value = ~~~ 150: value = 150
26 to 38	do not modify	for system parameters	
39	1	min. zero re-print	192: with printer 001: without printer
40	255	Auto Shut-off with AC Adapter	000: disabled 001: enabled, as set in Keyword #6 002 - 255: off
41	about 151	battery value	automatically set
42	5	AC adaptor value	
43 to 47	***	temp compensation	
48 to 62	***	not used	
63	248	new software	