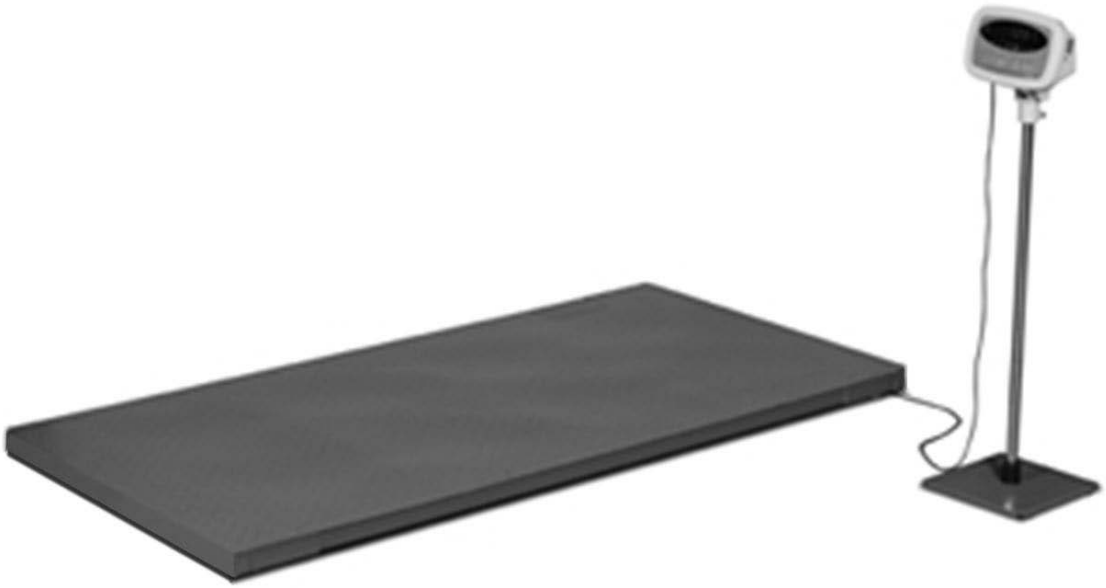
SALTER Brecknell

Model PS3000 with SBI-100 Indicator



Operation Manual

Safety and Warnings

Installation and service

THE EQUIPMENT CONTAINS NO USER SERVICEABLE COMPONENTS.
Installation and maintenance of the equipment must only be carried out by trained and authorised personnel.

Electrical installation
The mains lead must be connected to a supply outlet with a protective earth contact. The electrical supply at the socket outlet must provide over current protection of an appropriate rating.

For your protection all mains (110V or 230V) equipment used out of doors or in wet or damp conditions should be supplied from a correctly fused source and protected by an approved ground fault protection device (RCD, GFCI etc.)

IF IN DOUBT SEEK ADVICE FROM A QUALIFIED ELECTRICIAN.

Pluggable equipment must be installed near a easily accessible socket outlet.

Routine maintenance
To avoid the possibility of electric shock or damage to the machine, always switch off the machine and isolate from the power supply before carrying out any routine maintenance.

To avoid the risk of the machine falling, where applicable, ensure that it is placed securely on a flat and level surface.

Cleaning the machine
The outside of standard products may be wiped down with a clean cloth, moistened with water containing a small amount of mild detergent.

Harsh abrasives, solvents, scouring cleaners and alkaline cleaning solutions, such as washing soda, should not be used especially on the display windows. Under no circumstances should you attempt to wipe the inside of the machine.

Do not spray any liquid directly onto the display windows. If you are using a proprietary cleaning fluid ensure you spray the cloth and not the display.

Training
Do not attempt to carry out any procedure on a machine unless you have received the appropriate training or read the Instruction Manual. To avoid the risk of RSI(repetitive Strain Injury) it is important to ensure that the machine is placed on a surface which is ergonomically satisfactory to the user. It is recommended that frequent breaks are taken during prolonged use.

Sharp Objects
Do not use sharp object (screw drivers, long fingernails, etc. to operate the keys.

EMC compliance
The following may be applicable to your machine.

WARNING: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Display and Keypad

Function Keys	Annunicators
Tare Tare	Zero →0← Weight is zero
On/Off Zero On/Off/Zero	kg lb Unit of measure (Flashing LED means that the weight reading is not stable.)
kg/lb Units Unit of measurement	NET Tare is activated
Hold Print Hold/Print	CH Battery is charging.
	AC Adapter is plugged in, the indicator is receiving power.
	Hold Hold is activated
	Low Batt Battery is low.

Manual symbols

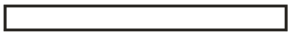
Short Key Press

Multiple Key Press

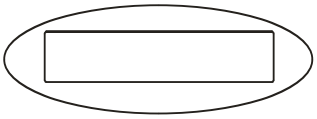
Long key press

Scale Operation

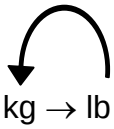
Turning On and Zeroing the Scale



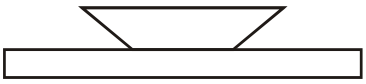
Turning off the scale

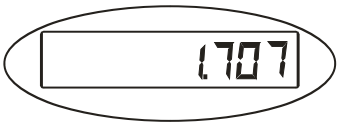


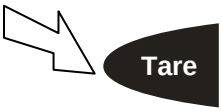
Selecting Unit of Measure

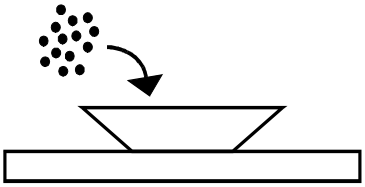


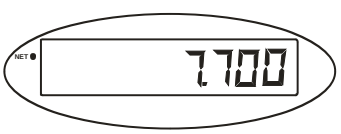
Using the Tare

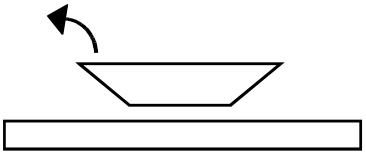
1. 

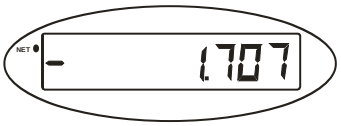


2. 

3. 



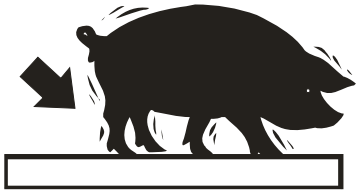
4. 



Removing the Tare

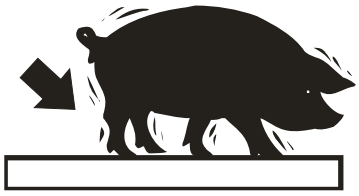
Hold function with automatic zero on next weigh.

1. 

2. 


➔


3. 

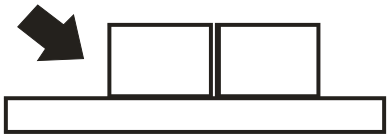
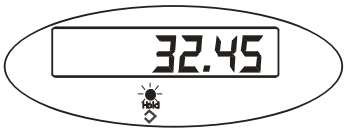
4. 


➔


Hold function with manual release.

This function needs to be setup in Parameter P3.1 shown on page 10

1. 

2. 


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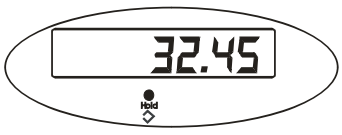
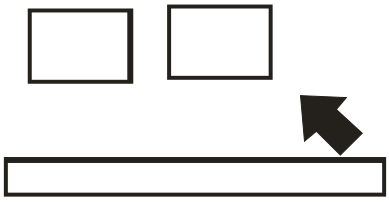
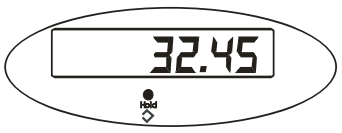
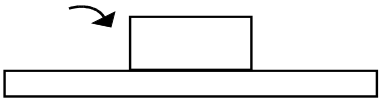


3. 


Removing Hold

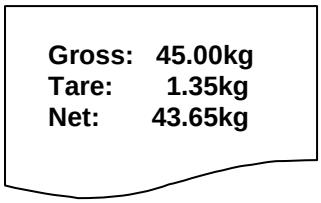
Print Function

For communications to a printer or PC, the indicator has to be setup in the following parameters P2, P4, P5 and P6.

1. 

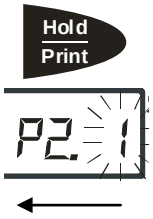
2. 

3. Print

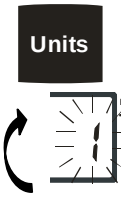


USER CONFIGURATION SETTINGS

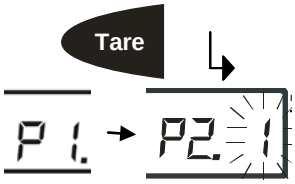
Setup Controls



Moves flashing digit



Change flashed digits



Saves data and move down to next Parameter setting

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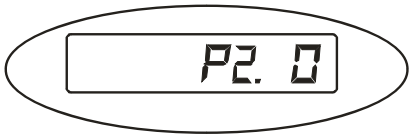
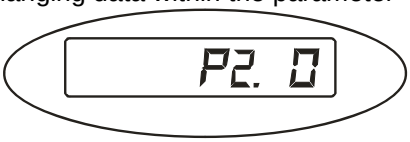
Exits setup mode

Entering setup

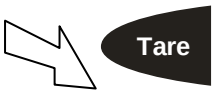
Selecting parameter



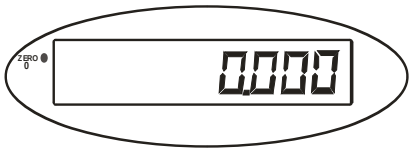
Changing data within the parameter



Saving data



Exiting setup



User Configuration Settings

Parameter	Setting	Default settings in bold
P1.xy	**Auto shutoff timer in minutes** *Set up time for the auto off function.* (00 = 0ff, 01-15 = time in minutes)	P1.00 P1.01 – P1.15, **P1.5 = 5 minutes**
P2.x	**Hold and print key functionality** *Setup button function* 0 = Press button once to activate hold 1= Press button once to print 2= Press button to print/Press and hold button to activate hold.	**P2.0= Hold** P2.1= Print; P2.2= Print & Hold,
P3.xy	**Hold Function Settings** 0= No hold function active. 1= Averaging hold with manual push button release. The weight reading will be held on the display until a higher weight is applied, this will automatically release the held weight and re-hold it at the new higher weight reading. 2= Averaging hold with automatic release and re-hold. As above but The weight reading will be held on the display until the platform is empted and the next weight reading over 10divisions is applied. 3-50= Selectable hold window from +/- 3 to 50 divisions Will hold display reading once stable within a selectable weight range, to release the hold button must be represses..	P3.0 P3.1 **P3.2** P3.3 to 50
P4.x	**RS232 – Serial Interface** *Settings for serial interface* 0= No RS232 output 1= Print displayed data once stable when print key is pressed; 2= Print gross, tare and net weight once stable when print key is pressed 3= Continuously output gross weight 4= Continuously output gross, tare and net weight 5= Print displayed data once stable one time only. 6= Print gross, tare and net weight once stable, one time only. 7= Bidirectional - RS232, SBI protocol	P4.0 P4.1 P4.2 P4.3 P4.4 P4.5 P4.6 **P4.7**
P5.x	**RS232 Baud rate**	P5.0= 1200 **P5.3= 9600** P5.1= 2400 P5.4= 19200 P5.2= 4800
P6.x	**RS232 Data format** 0 = 8 bits, no parity, 1 start bit, 1 stop bit 1 = 7 bits, 1 even, 1 start bit , 1 stop bit 2 = 7 bits, 1 odd, 1 start bit, 1 stop bit	**P6. 0** P6. 1 P6. 2
P7-P19 .x	**SERVICE CONFIGURATIONS ONLY** ***Any adjustment to these settings could seriously affect the indicators performance. Seek advice from a service engineer before changing.***	

RS-232 data commands for SBI protocol

The RS232 can be set so a bidirectional connection can be established between the indicator and the host. To establish this connection set parameter P4 to 7, and configure setting P5 (baud) and P6 (parity) to host device. Commands can then be sent from the host to the indicator using the following commands (ensure the letters entered are in CAPS) (<CR> - Enter)

Command	Action	Response
W<CR>	Takes a reading Over capacity - Under capacity - Zero point error - Reading (kg or lb)	 <LF>^^^^^^^^^u1u2<CR><LF>H1H2H3<CR><ETX> <LF>_____u1u2<CR><LF>H1H2H3<CR><ETX> <LF>----------u1u2<CR><LF>H1H2H3<CR><ETX> <LF><p>w1w2w3w4w5w6<dp>w7u1u2<CR><LF>H1H2H3<CR><ETX>
S<CR>	Prints Status Bytes	<LF>H1H2H3<CR><ETX>
Z<CR>	Zeros the scale	<LF>H1H2H3<CR><ETX>
T<CR>	Sets up a tare	<LF>H1H2H3<CR><ETX>
U<CR>	Changes the units	<LF>u1u2<CR><LF>H1H2H3<CR><ETX>
L<CR>	Activates the hold function	<LF>H1H2H3<CR><ETX>
X<CR>	Switches off the scale	Indicator switches off.
?	Unrecognised command	<LF>?<CR><ETX>

Key Symbols

<LF> Line feed
<CR> Carriage Return
<ETX> End of text character
<SP> Space
H1H2H3 3 status bytes
<p> Polarity character including minus sign for negative weigh and a space character for positive.
W1-W7 Weight data
<dp> Decimal point
U1U2: Unit measure, kg, lb or oz

Output Status Bit Meaning:

Bit	Byte 1	Byte 2	Byte 3
0	0=Stable	0=Not Under Capacity	00=Not defined
	1=Unstable	1=Under Capacity	01=Normal working mode
1	0=Not at zero point	0=Not over capacity	10=Hold working mode
	1=At zero point	1=Over capacity	11=Not defined
2	Always 0	Always 0	0=Gross Weight 1=Net Weight
3	0=eprom OK 1=eprom error	Always 0	Always 0
4	Always 1	Always 1	Always 1
5	Always 1	Always 1	Always 1
6	Always 0	Always 1	Always 0
7	Parity	Parity	Parity

Other RS-232 Output Strings

P4-1 = Output Displayed data @ print key :

Format:
<LF>< reading, minus, decimal point, weight unit><CR><EXT>

Example:
xxxxx0.18lb

P4-2 = Output Gross, Tare, Net @ print key

Format:
<LF><Gross: reading, minus, decimal point, unit><CR><EXT>
<LF> <Tare: reading, decimal point, unit><CR><EXT>
<LF> <Net: reading, minus, decimal point, unit><CR><EXT>

Example:
Gross:xxxxx0.36lb
Tare:xxxxxx0.18lb
Net:xxxxxxx0.18lb

RS232 serial interface wiring

DE-9 Female Scale			DE-9 Male Host		
Pin	**Name**	**Direction**	**Pin**	**Name**	**Direction**
2.	TXD	Out	2.	RXD	In
3.	RXD	In	3.	TXD	Out
5.	SG	-	5.	Ground	-

Pins 1, 4, 6, 7, 8, 9 not used

Load cell cable interface wiring

1. Red Excitation+
2. Black Excitation-
3. Green Signal-
4. White Signal+

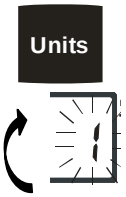
Scale calibration

Calibration Configuration Settings –

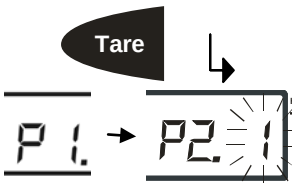
The scale is configured from the factory to match the specified settings for each unit, as defined by the product specifications and sales brochure. Modification of the setting can be accomplished by altering user configuration settings P7-P10. **Caution:** Calibration and/or configuration of calibration settings of your scale should be accomplished by a trained service technician using certified weights to ensure proper operation and accuracy. Calibration is not covered under warranty.

Setup Controls

▲ Moves flashing digit



Change flashed digits



Saves data and move down to next Parameter setting

.

Exits setup mode

Config Menu	Avail. Settings	Default	Definition	Detailed Setting
P7	00-31	**10**	Displayed Resolution	(00) = 500 (08) = 2400 (15) = 7000 (01)= 600 (09) = 2500 (16) = 7500 (02)= 750 (10)= 3000 (17) = 8000 (03)= 800 (11) = 3500 (18) = 10,000 (04) =1000 (12)= 4000 (19) = 12,000 (05)=1200 (13) = 5000 (20) = 15,000 (06) =1500 (14) = 6000 (21-31) = N/A (07) = 2000
P8	0,1,2	**0**	Division Increment	0 = 1 ; 1 = 2 ; 2 = 5
P9	0-5	**0**	Decimal Position	0 = 123456 ; 1 = 12345.6; 2 = 1234.56 ; 3 = 123.456 ; 4 = 12.3456 ; 5 = 1.23456
P10	0, 1	**1**	Calibration weight	0 = KG ; 1 = LB

You may choose to configure your scale for a higher resolution. The factory does not recommend increasing the resolution above 3,000 divisions for a stable weight reading. Certain environments may cause the scale to be unstable at factory settings, reduce the # of division settings to increase your stability.

Calibration Settings when configuring as an SBI 100 Indicator to a remote base

If you are configuring the SBI 100 Indicator to be used with a scale other than the PS3000 base, you will need to alter the configuration setting in P7- P10 manually.

In order to configure the Indicator follow the steps defined below:

1. Determine the full capacity of your scale. **Example: 3000 pounds**
2. Determine the displayed division of your scale. **Example: 1 pounds** (this is your P8, P9, and P10 setting)
3. Divide the capacity by the displayed division to determine the displayed resolution of your scale. **Example: 3000/1 = 3000** (this is your P7 setting)

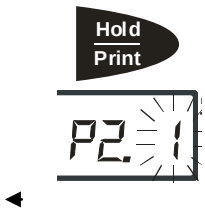
You are now able to configure P7 – P10 as follows.

Primary Capacity	Displayed Resolution	Units Selectable Capacity	P7	P8	P9	P10
3000 x 1 lbs	3000	1500 x 0.5 kg	**10**	**0**	**0**	**1**

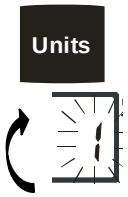
If primary capacity is 1500 x 0.5 kg, configure P7-P10 as follows:.

Primary Capacity	Displayed Resolution	Units Selectable Capacity	P7	P8	P9	P10
1500 x 0.5 kg	3000	3000 x1 lbs	**10**	**2**	**1**	**0**

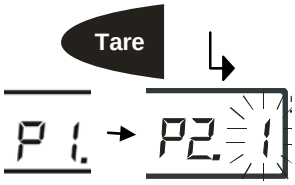
Calibration Menu



Moves flashing digit



Change flashed digits



Saves data and move down to next Parameter setting

.

Exits setup mode

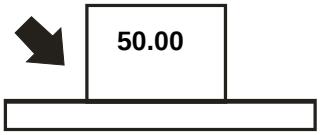
Calibration can be done with 10% to 100% of requested load and can be calibrated with 1 or 2 calibration points

1. 

2. Tare

3. Tare

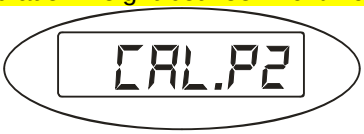
4. Enter in calibration weight from 5% to 100% full capacity



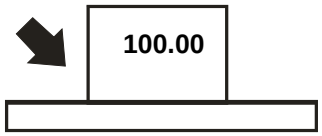
Hold Print Units Tare

5. Single point calibration, enter the same weight in again and move to number 7
For 2 point calibration enter in the second calibration weight between 10% 100% full capacity.

Tare



6.



Hold Print Units Tare

7 Tare

8.

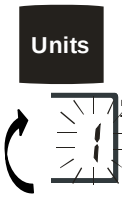
9. Tare

Service Configuration Settings

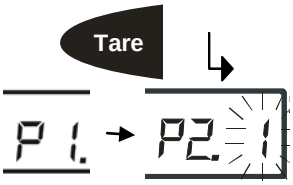
The scale is configured from the factory to match the specified settings for each unit, as defined by the product specifications and sales brochure. Modification of the setting can be accomplished by altering user configuration settings P11-P19. **Caution:** Configuration of the settings of your scale should be accomplished by a trained service technician to ensure proper operation and accuracy. Configuration is not covered under warranty.

Setup Controls

Moves flashing digit



Change flashed digits



Saves data and move down to next Parameter setting

.

Exits setup mode

Config Menu	Avail. Settings	Default	Definition	Detailed Setting
P11	0,1,2	**2**	Units key configuration	0 = KG only ; 1 = LB only ; 2 = units key active KG and LB
P12	0-7	7	Power On zero range	0 = +/- 1% ; 1 = +/- 2% ; 2 = +/- 5% ; 3 = +/- 10% ; 4 = +/- 20% ; 5 = +/- 50% ; 6 = +/- 100% ; 7 = no limitation
P13	00 - 15	03	Zero button range	(00) = +/- 1% (06) = +/- 20% (12) = + 5% (01)= +/- 2% (07) = +/-no limit (13) = + 10% (02)= +/- 3% (08)= + 1% (14) = + 20% (03)= +/- 4% (09) = + 2% (25) = + no limit (04) =+/- 5% (10)= + 3% (05)= +/- 10% (11) = + 4%
P14	0, 1, 2	0	Signal within power on zero point range	0 = current weight ; 1 = calibration zero ; 2 = power off zero point
P15	0, 1, 2	1	Signal not within power on zero point	0 = current weight ; 1 = calibration zero ; 2 = power off zero point ; 3 = continuously display "0˙˙˙˙"
P16	0-8	6	Zero tracking	0 = 0d AZT off ; 1 = +/- 0.25d, 2 = +/- 0.5d ; 3 = +/- 1d; 4= +/- 1.5d ;5= +/- 2d ;6 = +/- 3d; 7= +/- 4d; 8 = +/- 5d
P17	0-3	3	Data Filter	0 = very weak; 1 = weak; 2 = standard; 3 = strong
P18	0 - 9	9	Weight stability	0 = +/- 0.5d ; 1= +/- 1d; 2= +/- 1.5d ; 3= +/- 2d; 4= +/- 3d ;5= +/- 4d ;6 = +/- 5d; 7= +/- 6d; 8 = +/- 7d; 9 = +/- 8d
P19	0-9	1	Overload range Full scale	0 = 0% ; 1 = +9d ; 2 = 101% ; 3 = 102% ; 4 = 405% ; 5 = 110% ; 6 = 120% ; 7 = 150%; 8 = 200%; 9 = no limitation

Technical Specifications

Scale Indicator

Input signal range:	0mV ~ +30mV
Sensitivity:	>0.2uV/grad
Internal Resolution:	Approximately 520,000 counts
Display Resolution:	Can be selected between 500-100,000
System Linearity:	Within 0.01% of FS
Loadcell excitation Voltage:	+5 V_{DC} (MAX current: 85mA)

Load cells:

1. quantity: 4 pcs
2. each one capacity: 1000kg
3. sensitivity: 2.5±0.5mV/V
4. input resistant: 400±10Ω
5. output resistant: 352±2Ω

Temperature

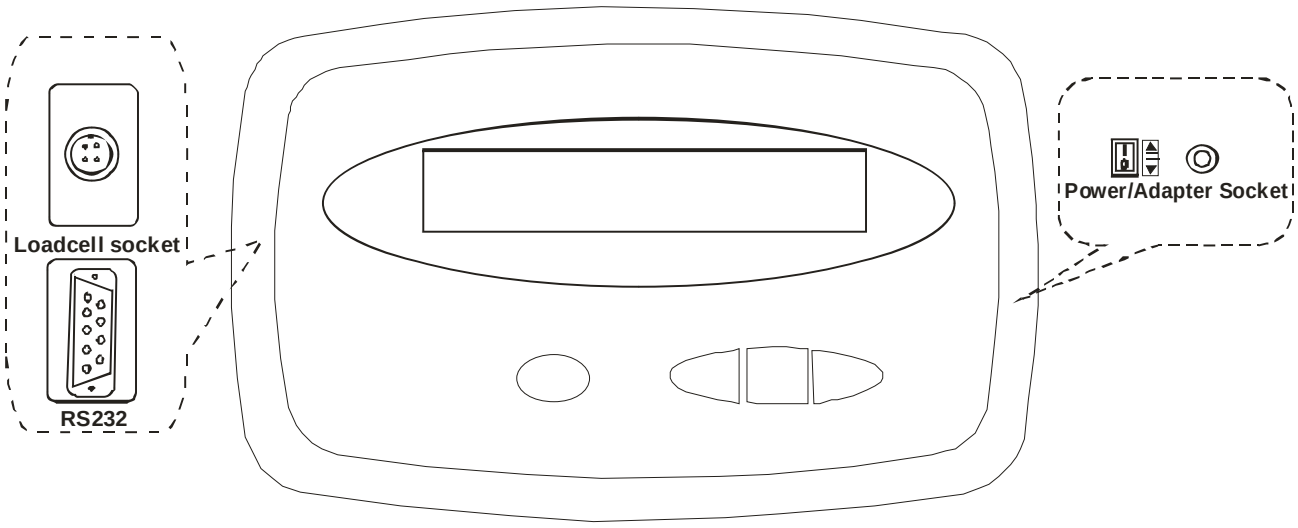
Operation:	$5^{o}C$ - $35^{o}C$
Storage:	$10^{o}C$ - $70^{o}C$
Humidity:	≤95%RH (no condensation)

Power

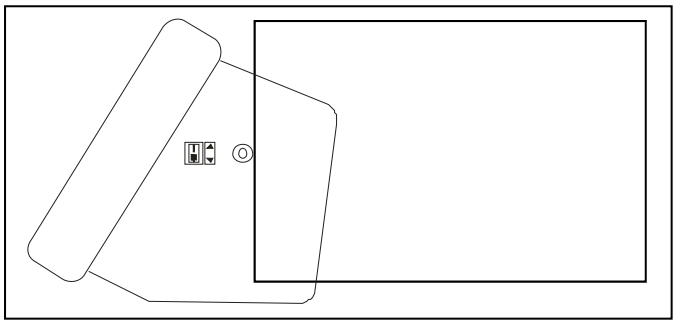
Battery: 6V4AH lead acid battery, 30 hrs continuous use

When the voltage of battery is below 5.7V, the “Low Bat”annunciator will be lighted, plug in AC adapter to charge the battery. When ”Lo.bAt” and actual weight is displayed alternately, this indicates the voltage of battery is below 5.5V and the scale will be turned off in two minutes automatically.

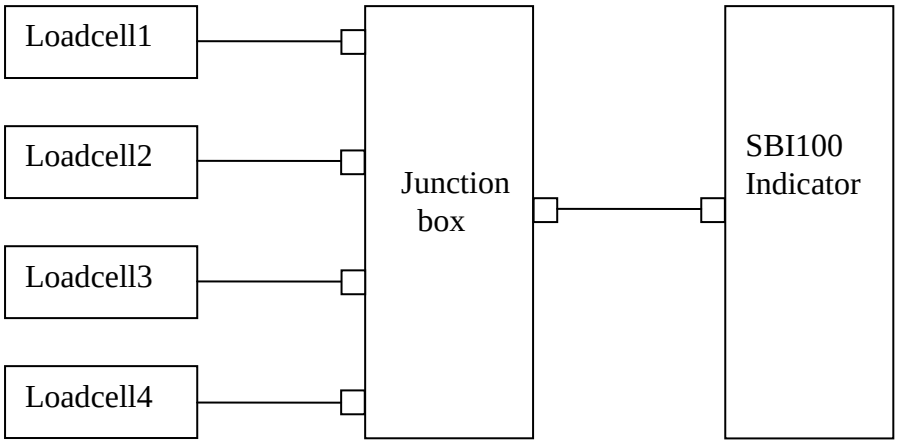
Connection Information



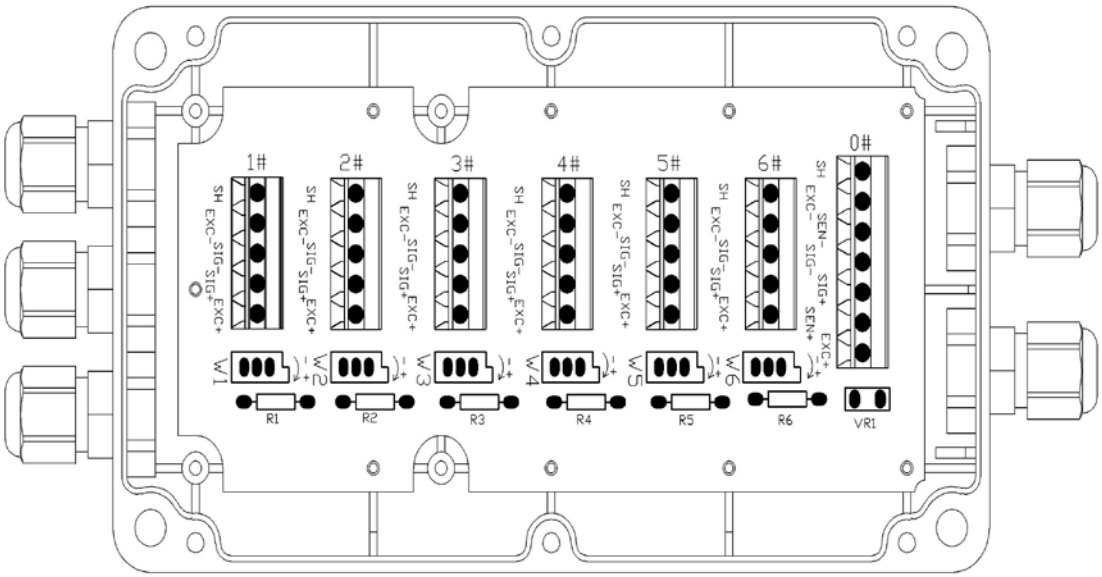
Power Supply



Connecting:



Junction Box:



1. W1-W4: to adjust 4 corner error, W5-W6: not used
2. W0: to adjust scale's zero-point balance
3. 1#-4# connector: connect to loadcell1---loadcell4, 5#-6#connector: not used
4. 0#connector: connect to indicator

5. Connector pins:
   SH---shield wire
   EXC+ --- Excitation+
   EXC- --- Excitation-
   SIG+ --- Signal +
   SIG- --- Signal -
   SEN+ --- Sense+ , connect to EXC+
   SEN- --- Sense- , connect to EXC-

Platform material:

1. 4mm chequered plate

Wire the cable attached to the indicator as shown

1. Red Excitation+
2. Black Excitation-
3. Green Signal-
4. White Signal+

Error Messages

Error Message	Definition	Required Solution/Troubleshooting
0‾‾‾‾:	Weight above range for calibrated zero point.	Remove load before zeroing Or Recalibrate the scale.
0_____:	Weight below range for calibrated zero point.	Put platform on scale(if it removed) Or Recalibrate the scale.
_____:	Indicates an under range condition	Recalibrate the scale.
‾‾‾‾:	Capacity exceeded	Remove the load or a scale with a larger capacity is required.
CAL-Er:	Calibration error	Restart calibration
Lo.bAt:	Low Battery	Recharge the battery. Upon initial use, it is recommended to charge battery for more than 8 hours prior to use.
EEP.E0	EEPROM can't be accessed	Replace S100 Indicator
EEP.E1	Configuration settings have changed and not been stored	Reconfigure and Calibrate the scale to store settings
EEP.E2	Configuration settings exceed scale's normal range	Reconfigure and Calibrate the scale to store settings

Declarations of Compliance

United States
This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada
This digital apparatus does not exceed the Class A limits for the radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le Règlement sur le brouillage radioélectrique edicté par le ministère des Communications du Canada.

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