CS-250 Series

CHAIR SCALE

SERVICE MANUAL (v1.06D)

Brecknell

CONTENTS

1. PRECAUTIONS

WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, CLEANING, OR SERVICING. FAILURE TO DO SO COULD RESULT IN BODILY HARM OR DAMAGE THE UNIT.

CAUTION

- **Permit only qualified persons to service the instrument**
- **Before connecting or disconnecting any components, remove the power.**
- **Failure to observe these precautions bodily harm or damage to or destruction of the equipment.**

- The chair scale is a precision electronic instrument, handle it carefully.
- Do not install the scale in direct sunlight.
- Verify the local voltage and receptacle type are correct for the scale.
- Only use original adaptor, other could cause damage to the scale.
- Pluggable equipment must be installed near an easily accessible socket outlet.
- Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors.
- Avoid sudden temperature changes, vibration, wind and water.
- Avoid heavy RF noise.
- Keep the scale clean

2. INTRODUCTION

- The CS-250 series chair scales, that amplifies signals from a load cell, converts it to digital data and displays it as a mass value.
- It is accurate, fast and versatile series of general purpose balances with % weighing functions and accumulation.
- Ergonomically optimized seat, comfortable, safe and reliable.
- Grasp the handrails in two ways: gross grip area, vertical grip area.
- Handrails with rubber material, comfortable and safe.
- Adjustable angle of instruments to meet the user reading.
- 4 transportation wheels with brake.
- Footrest foldable, when folded out with low distance to the floor.
- Each single armrest foldable.
- Bag for power supply fixed on the chair, when power supply not in use.
- Optional RS-232 interface, can connect computer and printer.

3. SPECIFICATION

3.1 Specifications

Model	**CS-250**
Maximum Capacity	250kg
Readability	100g
Resolution	1/2,500
Tare range	-249.9kg
Minimum Capacity	2000g
Linearity ±	200g

Common Specifications	
Interface	RS-232 Output Optional
Stabilisation Time	2 Seconds typical
Operating Temperature	0°C - 40°C / 32°F - 104°F
Power supply (external)	12V/500mA AC power adapter
Calibration	Automatic External
ADC	Σ-Δ
Display	25 mm high 6 digits LCD with auto backlight and loading bar graph
Housing	Aluminium platform, ABS plastic indicator
Gross weight	19kg

3.2 Load Cell Specifications

Model No	**L6D**
Rated Capacity (kg)	2.5/3/5/6/8/10/15/20/30/35/40/50
Sensitivity	2.0±0.2 mv/v
Excitation Voltage	5~12V
Material	Aluminum
Cable	0.3~3m Φ 4mm
Input Resistance	409Ω ±6Ω/1065Ω ±15Ω
Out put Resistance	350Ω ±3Ω/1000Ω ±10Ω
Temperature Range	-35℃ ~ +65℃
Safe overload	150%F.S
Ultimate overload	300%F.S
Error	±0.0233%F.S
Creep (20min)	±0.020%F.S
Zero Balance	0±5%mV/V
Max. Platform Size	250x350mm

4. INSTALLATION

Unpacking

Carefully take the balance out of its package, make it sure its not damaged and all accessories are included.

- Remove the weighing scale from the carton.
- Remove the protective covering. Store the packaging and to use if you need to transport the scale later.
- Inspect the scale and terminal for damage.
- Make sure all components are included

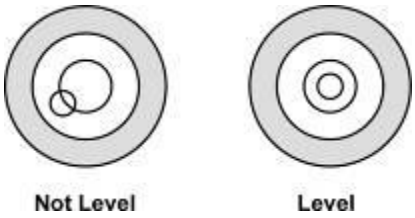
Accessories,

1. Balance
2. Adaptor
3. Product manual

Level Adjusting

Place the scale on a table.

Check the water mark. If, bubble is not centre adjust the leveling feet until reach centre. Check the level when you change the location.

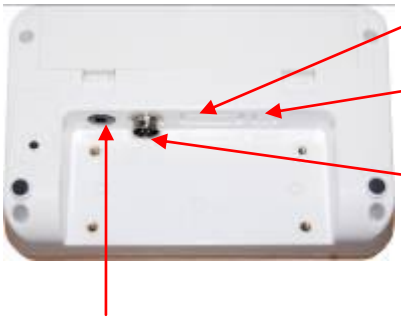


Charging Battery

- To charge the battery insert the adaptor pin to jack, jack is locating rear side of the scale. Adaptor simply plug into the mains power. The scale no needs to be turned on.
- The battery should be charged for 12 hours for full capacity.
- In the display there is an indicator show the status of battery charging. When the scale is plugged into the mains power the internal battery will be recharged. If the indicator off, the battery has a full charge. If it is on, the battery is nearly discharged and if yellow, the battery is being charged.
- Do not use any other type of power adaptor than the one supplied with the scale.
- Verify that the AC power socket outlet is properly protected.

Note: Please charge the battery before using the scale for the first time

Installation



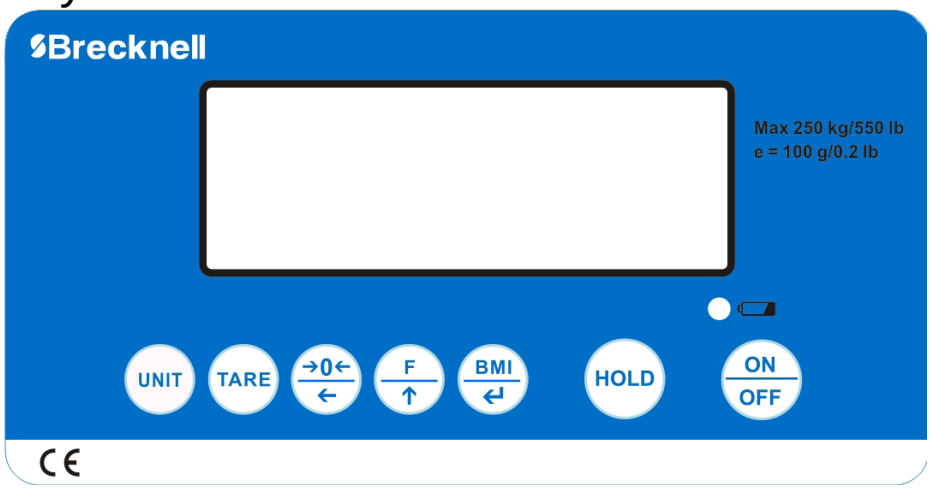
- Place the scale on a table.
- Connect the adaptor pin in to the scale adaptor jack. Adaptor jack is locating, rear side of the scale.

- Adaptor connects into your AC power socket. Pluggable equipment must be installed near an easily accessible socket outlet with a protective ground/ earth contact.
- Turn on the On/Off key. If you want to turn off, press the key again.
- Display will be show the version number and will be starting self checking.
- After self checking, display will be come to normal weighing mode.
- **Warm-up time of 15 minutes stabilizes the measured values after switching on.**
- Calibrate with exact calibration weights, minimum 1/3 of the scale capacity want to use for calibration. For calibration see details in parameter.

Then you can start your operation

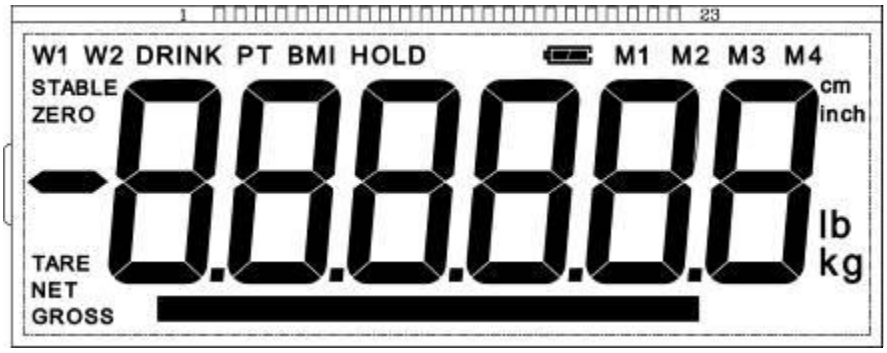
5. DESCRIPTION

Key Board



ON OFF	Turns the scale power On / Off
HOLD	Set to hold mode
BMI	Set to BMI mode
F	Enter into the menu
→0←	Sets display to Zero
TARE	Subtracts weight of container
UNIT	Set weight unit

Display



DISPLAY	FUNCTION
STABLE	Indicator for Display stability
ZERO	Indicator for Zero display
TARE	Indicator for Tare display
NET	Indicator for Net weight
GROSS	Indicator for Gross weight
BMI	Indicator for BMI operations
	Indicator for BMI graph
Cm/inch	Indicator for measuring units
Lb/kg	Indicator for weight units
	Indicator for Charging status of battery Voltage has dropped
	Low Voltage
	Fully Charged

6. OPERATION

Initial Start-up

Warm-up time of 15 minutes stabilizes the measured values after switching on.

6.1 Power ON/OFF

Switch on the scale by pressing 

. The display is switched on and the self test is started.
If you want to switch off press the key again.

6.2 Zero

Environmental conditions can lead to the balance exactly zero in spite of the pan not taking any strain. However, you can set the display of your balance to zero any time by pressing 

key and therefore ensure that the weighing starts at zero.

6.3 Tare

The weight of any container can be tared by pressing 

key so that with subsequent weighing the net weight of the object being weighed is always displayed.

- Load weight on the pan.
- Press 

key. Zero is displayed, and tare is subtracted.
- Remove weight from the platform. Tared weight is displayed. It can set only one tare value. It can display with a minus value.
- Press 

key. Zero is displayed, tare weight is cleared.

6.4 Hold function

The weight(>20d) of any container can be hold by pressing 

key, the weight value will be hold on the display, press 

key again will turn back to normal weighing mode.

6.5 BMI function

Press 

key on the weighing mode, display will show the last setting of the height value “xxxxxx”, and “BMI” indicator will turned on

Press 

key to select the height to cm / inch

If necessary, use 

and 

keys to setting new height value, then press 

key confirm.

Display will be show the BMI graphics bar and weighing value.

Press 

key will turn back to weighing mode, BMI” indicator will be turned off.

6.6 Unit change

Press 

key to select the weight unit (kg/lb).

When in BMI settings, it can select to cm/ inch.

7. PARAMETERS

Enter the Menu

- In the normal weighing mode, press 

key
- Display will be show F 1 oFF

Choose the Menu / Sub Menu

- Press 

, it can choose menu block or options one by one.

Enter the Selected Menu

- Press 

, it can confirm which will be shown displayed.

Enter in to TECH

- When display showed P 1 n , press 

and 

keys to enter the function

Escape from the Menu

- Press 

key, it can escape from the menu to weighing mode.

Parameter Block

Menu	Sub Menu	Description
F 1 oFF	oFF 0	To set to turn off scale automatically, as per selecting time, when scale not in use.
	oFF 3	
	oFF 5	
	oFF 15	
	oFF 30	
	P Cont	Send data continuous
	SE rE	Set the remote display
	ASH	ASK mode Command R: read data Command T: Tare Command Z: Zero

F2 Con	P Cnt2	Another mode, to send data continuous,
	P StAb	Send data when the display stable
F3 bt	bL on	Set the backlight always on.
	bL oFF	Set the backlight always off.
	bL AU	Set the backlight automatic on.
F4 Str	Str on	Multi tare operation turn on
	Str oF	Multi tare operation turn off
tCH	P in	Press password to enter into the technical parameter
P1 SPd	SPd 75	To select display AD speed,
	SPd 15	
	SPd 30	
	SPd 60	
P2 CAL	CUr Ut kg	Select to current weighing unit “kg”
	CUr Ut lb	Select to current weighing unit “lb”
	CAL Ut kg	Select to calibration unit “kg”
	CAL Ut lb	Select to calibration unit “lb”
	dESC	To select scale decimal points; Options: C 0, C 0.0, C 0.00, C0.000 C00000
	inC	To select scale division/increment; Options: d iu 1, d iu 2, d iu 5, d iu 10, d iu 20, d iu 50
	CAP	Select to set scale capacity
	CAL	Scale Calibration; details check the calibration section
	tr 1	To modify the calibration. This display will be show XXXXX. For trimming the load cells, showing primary weight. You can calculate new rate by this formula: N2=N1+N1×[(K2-K1)÷K2] N1: primary rate, N2: new rate, K1: calibrate weight, K2: display weight
	CoUnt	To show the scale internal count
	rESEt	Reset the scale
	SEtGrA	Set the local gravity value

Note: When Jumper K2 is connected on the PCB, then only can access “tch” parameters.

8. CALIBRATION

Simple Calibration;

- Turn on the scale.
- Press F key during normal weighing, display will be show UnLoAd
- Press BMI key to confirm display will be show last calibrated value. 0 10000lb
- If necessary, use →0← and F keys to change new test weight value, then press BMI key confirm
- Display will be show LoAd
- Place the test weight on the chair.
- After stable, press BMI key confirm
- Display will be show PASS
- Then will start self-test and will come to normal display.

Calibration Settings in the Parameter;

- Turn on the scale. And when in the normal display
- Press F key, display will be show F 1 oFF
- Press F key until to display tCH
- Press BMI key to confirm display will be show P in
- Press →0← UNIT and BMI keys, display will be show P 1 SPd
- Press F key to show display P2 CAL
- Press BMI key to enter calibration. Display will show CUr Utlb
- Press F key to choose the weighing unit(kg/lb) for to select unit of current operation, press BMI key to confirm.
- Display will show CAL Utlb
- Press F key to choose the calibration unit(kg/lb) for to select unit of calibration, press BMI key to confirm
- Display will show dESC

- Press 

key until display show

- display will be show
- Press 

key to confirm display will be show last calibrated value.

- If necessary, use 

and 

keys to change new test weight value, then press 

key confirm
- Display will be show

- Place the test weight on the chair.
- After stable, press 

key confirm
- Display will be show

- Then will start self-test and will come to normal display

9. BATTERY OPERATION

The Medical Scales can be operated from the battery if desired. The battery life is approximately 40 hours.

When the battery needs charging a symbol on the weight display will turn on. The battery should be charged when the symbol is on. The scale will still operate for about several minutes after which it will automatically switch off to protect the battery.

To charge the battery simply plug into the mains power. The scale does not need to be turned on.

The battery should be charged for 12 hours for full capacity.

Just under the quantity display is an LED to indicate the status of battery charging. When the scale is plugged into the mains power the internal battery will be charged. If the LED is green the battery has a full charge. If the LED is green the battery has a full charge. If it is blue indicates the battery is being charged.

As the battery is used it may fail to hold a full charge. If the battery life becomes unacceptable then contact your distributor.

Note: Useless battery should be want to use for recycle.

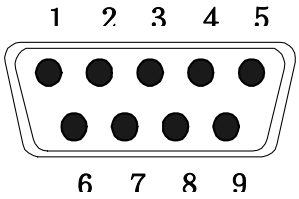
10. RS-232 OUTPUT

The CS-250 Series of scales can be ordered with an optional RS-232 output.

Specifications:

RS-232 output of weighing data
ASCII code
600~9600 Baud
No Parity

RS-232 (9pin D type connector)



Pin 2	RXD	Input	Receiving data
Pin 3	TXD	Output	Transmission data
Pin 5	GND	—	Signal ground

9pin D Connecter:

Scale	**Computer/Printer**
Pin 2:	Pin 3
Pin 3:	Pin 2
Pin 5:	Pin 5

Note: If data is not getting in PC/Printer, want to inter-change one of the Pin 2 and Pin3 connections

11. MAINTENENCE

⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, CLEANING, OR SERVICING. FAILURE TO DO SO COULD RESULT IN BODILY HARM OR DAMAGE THE UNIT.

⚠ CAUTION

- **Permit only qualified persons to service the instrument**
- **Before connecting or disconnecting any components, remove the power.**
- **Failure to observe these precautions bodily harm or damage to or destruction of the equipment.**

11.1. General

If the scale does not operate properly, find out the problem as possible. Determine whether the problem is constant or alternate. Be aware that problems can be caused by mechanical or electrical influences.

Check the following.

- Water
- Corrosive materials
- Vibrations or temperature or wind
- Physical damage

Check the scale cables for damage, and check all connections and connecters for any loose contact or incorrect connection

Cleaning

- Disconnect the power before cleaning.
- Use a cloth with mild suds and light cleaning agents.
- Make sure that fluid not able to get into the device.
- Use a clean and soft cloth for rub off.

11.2. Error Codes

Error Code	Description	POSSIBLE CAUSES
Err 4	Zero range exceeded, due to turning on or by pressing 	• Goods on the platform • Overload, when zeroing the scale. • Improper calibration • Load cell problem • PCB problem
Err 6	A/D Count out of the range	• Platform not installed • Load cell problem • PCB problem
Err 19	Auto zero out of limit	• Remove the goods from the chair and turn on again.

11.3. Determine the Problem

Determine whether the problem is in the PCB or the Load Cell

- Remove power from the system, and disconnect the load cell connection from the PCB
- Connect the PCB to a load cell simulator
- Reapply power and test the PCB
- If problem goes away, its source is probably in the Load cell. Check the wiring, connecter, load cell and mechanical components of the load cell.

If problem persists, its source is probably in the PCB. Check the PCB voltages, connecters, cables and function programs

11.4. Testing Load cell

For testing load cell, remove power from the system, and disconnect the PCB from the Load cell

Physical Test:

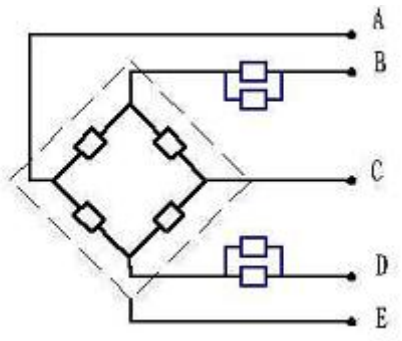
- Check the moisture, or foreign material inside.
- Check load cell surface badly rusted or corroded

- Check the strain gauge areas become compressed
- Check any physical damage (body bent or twisted) to the load cell
- Check load cell cable, all leads are connected, any cut, splits or tears.
- Check load cell for proper input and output resistances

Electrical Test:

Use an accurate multimeter to check the ohms

Load Cell Connections



Signal + Green
Supply + Red
Signal - White
Supply - Black
Shield

Resistance

Measuring Points	**Resistance**
Red (+ Exc) to Black (–Exc)	409 ±6Ω
Green (+Sig) to White (–Sig)	350Ω ±3Ω

Leakage Resistance

- Check each of the load cell wires to the load cell cable screen.
- Check each of the load cell wires to the load cell body.

These readings should be greater than 1000mΩ or OL.
If this reading is less than 1000 mΩ, then this load cell has leakage between the internal circuit and the load cell body or cable screen

Zero Balance

- Connect the load cell to a stable DC source of between 5 to 10V
- Connect multimeter to mV and connect to the load cell signal wires
- The meter should read 0.00mV ± approximately 1 % of full load.

If the output reads greater than ±10% of full scale capacity, then the load cell will require replacement.

11.5. Check PCB Voltages

If the problem is in the PCB, use a multimeter to check the following voltages

11.5.1 AC Power

Check the AC power socket out put voltage.

- Voltage must be a -20% and +10% of the normal AC voltage.

11.5.2 Adaptor Voltage

Check the adaptor output cable connecter voltage

- Voltage must be minimum 9VDC and maximum 15VDC

11.5.3 PCB Input Voltage

Check the PCB input power connecter voltage

- Voltage must be minimum 9VDC in to the pin AD+

11.5.4 Check Battery Voltage and Charging Voltage

1. Check the Battery Voltage,
   - Voltage must be minimum 6VDC. If below the 6VDC connect the adaptor for charging
   - The battery voltage below the 5.5VDC, replace the battery and install new 6V/3.4Ah battery.

2. Check the Battery Charging Voltage;
   - Remove the battery connection terminals (Red and Black) from the battery.
   - Connect the power and turn on the scale
   - Voltage into the terminal minimum 6.5VDC

11.6 Trouble Shooting

Problems	Possible cause	Common Solutions
Display is blank. No self test	Mains power is turned off. Power supply faulty or not plugged. Internal battery is not charged. On/Off switch problem	Check power is getting inside the scale and on/off switch is working. Verify the voltages, which is on the power labels.
Blank display after self test	Pan not installed. Unstable weight, load cell damaged	Check the pans are installed correctly. Try to turning on again.

OL or -------	Maximum capacity exceeded. Load cell or mechanics damaged. Power supply faulty	Check the platform is installed correctly. Try to turn on the scale again. Do the calibration again
------- or NULL displayed	Weight is on the platform is below permissible limit. Pan not installed correctly. Power supply faulty. Load cell or mechanism faulty	Check the platform is installed correctly. Try to turn on the scale again. Do the calibration again
Display is unstable	Goods touching somewhere. Air variation or any vibrations. Temperature changed . Load cell or connections faulty. Power supply faulty	Check the scale is in acceptable location. Check the connecters and load cell. Check the power supply and battery
Weight value incorrect	Calibration error. Platform of load cell touching somewhere. Wrong weighing unit	Use accurate weight for to do the calibration Check the pan and load cell is installed proper and touching. Check the parameter settings. Check the load cell and connecters
Can not use full capacity	Over load protection stoppers or transport locks are not removed. Parameters are set incorrectly. AD problem. Load cell or mechanism damaged	Check the stoppers and locks under the platform. Check the weighing unit and parameter settings. Check the load cell.
Platform Corner Weight different	Over load protection stoppers or transport locks are not removed. Load cell or mechanism damaged	Check the stoppers and locks under the platform. Use accurate weight for to do the calibration Check the load cell.
Battery not charging	Mains voltage problem Charging circuit problem Battery Problem	Check the mains and adaptor. Check the battery. Check the charging circuit

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