



Adam Equipment

# CFM SERIES

(P.N. 9657, Revision A6, April 2009)



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## 1.0 INTRODUCTION

- The CFM series provide an accurate, fast and versatile series of general purpose weighing scales with animal weighing and check-weighing functions.
- The display is very large easy to read liquid crystal display (LCD).The LCD is back lit for easy viewing.
- All scales include automatic zero tracking, audible alarm for preset weights, automatic tare and an accumulation facility that allows the individual weights to be stored and recalled as an accumulated total.
- The indicators have an optional bi-directional RS-232 interface for communicating with a PC or printer.

## 2.0 SPECIFICATIONS


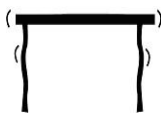
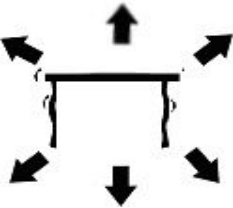
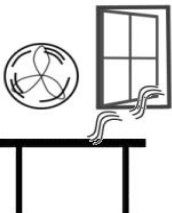
Model #	CFM 60	CFM 150	CFM 300	CFM 600 Available in South Africa Only
Maximum Capacity	60 kg	150 kg	300 kg	600 kg
Readability	5 g	10 g	20 g	50 g
Repeatability (Std Dev)	5 g	10 g	20 g	50 g
Linearity ±	10 g	20 g	40 g	100 g
Tare Range	-60 kg	-150 kg	-300 kg	-600 kg
Platform Size	420 mm x 520 mm			600 mm x 800 mm
Overall Dimensions (w x d x h)	425 mm x 700 mm x 950 mm			600 mm x 925 mm x 970 mm
Net Weight	15 kg			45 kg
Units of Measure	Kg, Lb, Lb/Oz.			

## COMMON SPECIFICATIONS

Model	CFM-series
Resolution	1:30,000 division
Interface	RS-232 output interface(optional)
Stabilisation Time	2 Second typical
Operating Temperature	-10°C - 40°C 22°F - 104°F
Power supply	External AC adapter, 9V 800mA and rechargeable 6V 4Ah battery
Calibration	Automatic External
Display	5 1/2 digits LCD display with 52mm high digits, with LED backlight
Indicator Housing	ABS Plastic
Base Construction	Aluminum casting with stainless steel pan, adjustable feet.

## 3.0 INSTALLATION

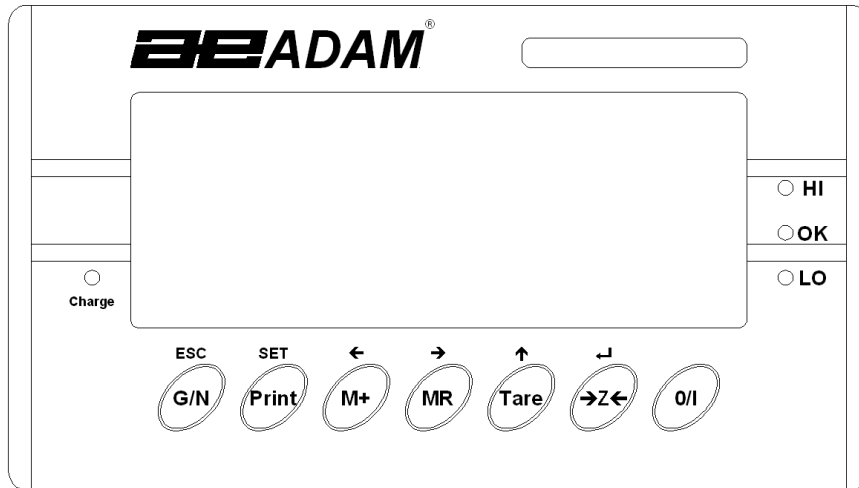
### 3.1 LOCATING THE SCALES

	<ul style="list-style-type: none"><li>• The scales should not be placed in a location that will reduce the accuracy.</li><li>• Avoid extremes of temperature. Do not place in direct sunlight or near air conditioning vents.</li><li>• Avoid unsuitable tables. The table or floor must be rigid and not vibrate.</li></ul>
	<ul style="list-style-type: none"><li>• Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors.</li><li>• Do not place near vibrating machinery.</li></ul>
	<ul style="list-style-type: none"><li>• Avoid high humidity that might cause condensation. Avoid direct contact with water. Do not spray or immerse the scales in water.</li><li>• Avoid air movement such as from fans or opening doors. Do not place near open windows or air-conditioning vents.</li></ul>
	<ul style="list-style-type: none"><li>• Keep the scales clean. Do not stack material on the scales when they are not in use.</li></ul>

### **3.2 SETTING UP THE INDICATOR**

- The pillar is attached to the base using a bracket that must be attached to the base frame using the 4 bolts supplied. The pillar is secured to the bracket using 2 sets of screws. The cable from the base to the indicator is run through the pillar and taken out through the plastic indicator support at the top. Excess cable can be stored within the pillar.
- Attach the indicator module to the pillar by sliding it over the bracket with the flanges engaged in the groves on the base of the indicator.
- Attach the power supply to the connector on the back of the indicator.

## 4.0 KEY DESCRIPTIONS

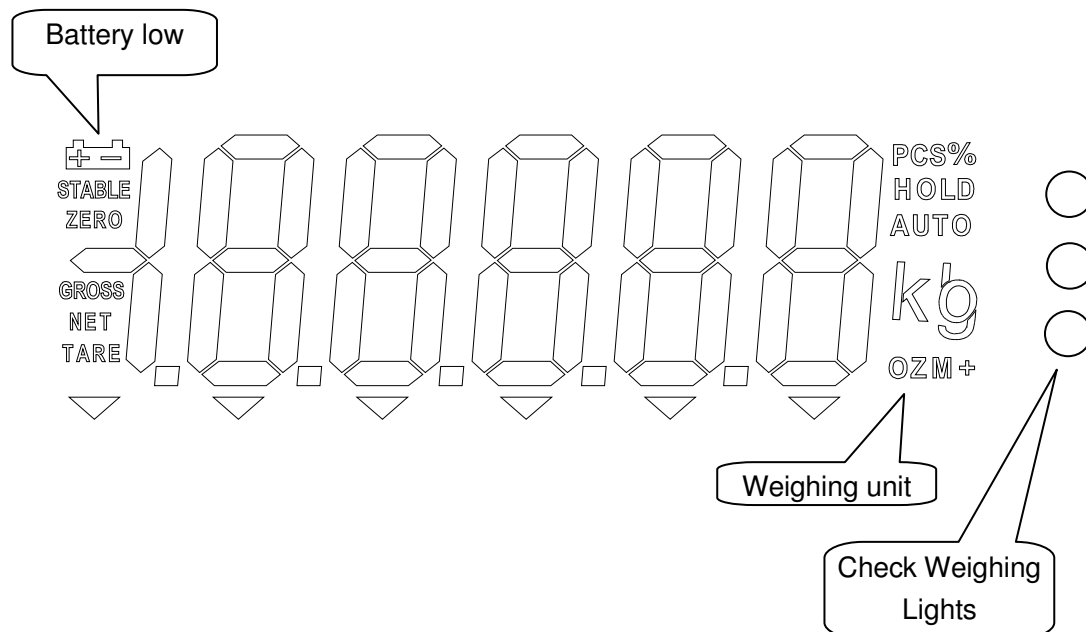


<p><b>[Tare]</b></p>	<p>Tares the scale. Stores the weight currently on the scale as tare value, subtracts the tare value from the gross weight and shows the results.</p> <p>A secondary function <b>↑</b> is of incrementing the active digit when setting a value for Parameters.</p>
<p><b>[Zero]</b></p>	<p>Set the zero point for all subsequent weighing, the display shows zero.</p> <p>A secondary function is <b>↵</b> of “Enter” key used when setting up the value for the parameters and functions.</p>
<p><b>[MR]</b></p>	<p>Recall the memory, the display will show the total accumulate weight in memory.</p> <p>A secondary function is to move the active/flashing digit to <b>→</b>the right when setting values for the Parameters.</p>
<p><b>[M+]</b></p>	<p>Adds the value to the accumulation memory if the accumulation function is not automatic.</p> <p>A secondary function is to move the active/flashing digit to <b>←</b> the left when setting values for the Parameters.</p> <p>Press <b>[M+]</b> and <b>[MR]</b> key to clear the memory</p>

<b>[Print]</b>	Sends the results to a PC or a Printer using the RS-232 interface.  A secondary function is to enter the parameter setting mode when the scale is self checking.
<b>[G/N]</b>	Switch between gross weight and net weight. Press and hold to select other weighing units that have been enabled. See Section 7.  A secondary function (ESC) is to return to normal operation when the scale is in the parameter setting mode.
<b>[O/I]</b>	To switch on and switch off the indicator.

## 5.0 DISPLAY

The LCD display will show a value and a unit to the right of the digits. In addition there are labels for TARE, GROSS weight, Zero ,stable and for Low battery



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## 6.0 OPERATION

### 6.1 ZEROING THE DISPLAY

- You can press the **[Zero]** key at any time to set the zero point .This will usually only be necessary when the platform is empty. When the zero point is obtained the display will show an indicator for zero. The **[Zero]** will only function when the scale is within a small range (usually 2% of maximum capacities) around the original zero range.
- The scale has an automatic rezeroing function to account for minor drifting or accumulation of material on the platform. However you may need to press the **[Zero]** key to rezero the scale if small amounts of weight are shown when the platform is empty.

### 6.2 TARING

- Zero the scale by pressing the **[Zero]** key if necessary. The zero symbol will be on.
- Place a container on the platform, a value for its weight will be displayed.

- Press the **[Tare]** key to tare the scale. The weight that was displayed is stored as the tare value and that value is subtracted from the display, leaving zero on the display. The **“GROSS”** indicator will be off and the **“NET”** indicator will be on. As a product is added only the net weight of the product will be shown. The scale could be tared a second time if another type of product was to be added to the first one. Again only the weight that is added after taring will be displayed.
- When the container is removed a negative value will be shown. If the scale was tared just before removing the container. This value is the gross weight of the container plus all products that were removed. The **“ZERO”** indicator will also be on because the platform is back to the same condition it was when the **[Zero]** key was last pressed.
- To delete the tare value, press **[Tare]** key when the pan is empty

To determine the weight of a sample, first tare the empty container then place the sample in the container. The display will show the net weight and the units of weight currently in use.

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### 6.3 CHECK-WEIGHING

- Check-weighing is a procedure to cause an alarm to sound when the weight on the scale meets or exceeds values stored in memory. The memory holds values for a high limit and a low limit.
- See PARAMETER Section, (section 7) for the procedure. To set the limits, "PO CHK" is used. After limits have been set, the check-weighing function is enable.
- When a weight is placed on the scale the display will show if the weight is above or below the limits and the beeper will sound as the describe below-

<b>Check mode "OK"</b>	The display will show OK and the beeper will sound when the weight is between the limits.
<b>Check mode "nG"</b>	The display will show OK and the beeper will sound when the weight is out of the limits.
<b>Check mode "no"</b>	The beep will not sound regardless of the weight. The LED's still operate as normal.

**NOTE:** weight must be more than 20 scale divisions for check weighing to operate.

- To disable the check-weighing function, enter zero into both limits by pressing the **[Print]** key when the current limits are shown, then pressing **[Zero]** to store the zero values

## 6.4 ACCUMULATED TOTAL

- The scale can be set to accumulate manually by pressing the **[M+]** key. See the PARAMETERS Section for details of selecting the method using function "P2 com".
- The scale must return to zero, (remove the weight or tare the scale) and the weight must be stable before pressing the **[M+]** key or else it will not allow another value to be added to the memory.
- Weight must be more than 20 scale divisions for the accumulation.
- The weight displayed will be stored in memory when the **[M+]** key is pressed and the weight is stable.
- The display will show **"ACC 1"** and then the total in memory for 2 seconds before returning to weighings. If the optional RS-232 interface is installed the weight can be output to a printer or PC.
- Remove the weight, allowing the scale to return to zero and put a second weight on. Press the **[M+]** key, the display will show **"ACC 2"** then the new total and finally the value of the second weight.
- Continue until all weights have been added.
- To view the total in memory press **[MR]** key when there is no weight on the scale. The display will show the number of entries and total.
- To clear the memory, press **[M+]** and **[MR]** together

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## 6.5 **AUTOMATIC MEMORY ACCUMULATION**

- When the scale has been set to automatic accumulate the value is stored in memory automatically. (See section 7.0, set P2Com, Mode = Auto)
- Place a weight on the scale. The beeper will sound twice when the scale is stable indicating the value is accepted.
- Remove the weight or tare the scale to zero the display.
- Adding the second weight will repeat the process. And put the third, fourth...weights on the scale.
- To view the total weight removes all the weights from the scale.

## 6.6 **ANIMAL WEIGHING**

- If animal weighing has been enabled in the parameters, See section 7, parameter P4 Oth, Anm = on) then the user may enable the animal function from the keypad. When animal weighing is active the scale uses a much more intense filter to average out any movement of the animal.
- When the scale is in normal weighing, press the **[Zero]** and **[Tare]** keys together to enable /disable the animal weighing function. The display will show "Hold" on the right side.
- When the animal weighing function is enabled, place the animal to be weighing on the platform. After a few seconds, when the

reading is stable the display will show the average value. If the weight changes a large amount the scale will show the new value. For small changes in the weight due to animal movement the display will hold the average weight.

- The scale will remain in animal weighing mode until the **[Zero]** and **[Tare]** keys are both pressed, then it will return to normal weighing.

## **6.7 KEYBOARD LOCK**

- The keyboard lock can be set by the user. To enable or disable the feature. See parameter setting section 7.0.
- The keyboard will lock up when the scale has not been used for more than 10 minutes. In this case, the display will show **"K-LCK"** when you press any key.
- To unlock the keyboard, hold **[Print],[MR]** and **[zero ]** key for 2 seconds, the display will then show **"uLCK"**, then it will return to normal weighing.

## **6.8 BACKLIGHT SETTING MODE**

The backlight for the LCD can be set by the user to always off, always on or automatic (on only when the scale is in use or a key is pressed)

- Press and hold down the **[Zero]** key for 3 seconds, the display will show **"SEt bl"**. Press **[Zero]** again to enter the setting mode.

- 
- Press [**Tare**] key to scroll through the various backlight options.

“**bl on**”: backlight will be on all the time.

“**bl AU**”: auto backlight, backlight will come on when the scale is in use or a key is pressed.

- “**bl OFF**”: the backlight will be off all the time.
- Press [**Zero**] key to confirm the setting. Then press the [**G/N**] key to return to the normal weighing.

## **6.9 SETTING OF THE AUTO SHUT OFF FUNCTION**

The auto power off can be set by the user to disable the feature or to a pre-set time interval.

- Hold [**Zero**] key for 3 second, display will show “**SEtbl** “ ,press [**Tare**] key, display will show “**SEtoF**”.

- press [**Zero**]key to enter auto power settings off , press [**Tare**] key to change the setting of the auto power off function-

**of 0**: means that the function is disabled.

**of 5**: means that the scale will shut off automatically after not in use for 5 minutes

**of 15**: auto power off after standby 15 minutes

- Press [**Zero**] key to confirm the setting. Then press the [**G/N**] key return to the normal weighing.

## **6.10 OTHER WEIGHING UNITS**

The scale can display weight in kilograms, pounds or pounds and ounces if they are enabled in the parameter setup section. To change the display to other weighing units press and hold the [G/N] key until the unit changes.

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## 7.0 USER PARAMETERS

- The scale has 6 user parameters that can be set by the user. In addition there are 3 others that are only for the factory. (P6-P8).
- To set these parameters press the **[Print]** key during self-checking, the display will show **"Pn"** (ask for password).
- Pressing **[M+] [GN]** and **[Tare]** keys to enter, the display will show **"PO chk"**.
- Pressing the **[Tare]** key will cycle through the various functions.
- Pressing **[Zero]** key will allow you to enter a parameter directly for setting or further enters into a sub-parameter. Press the **[G/N]** key to leave the parameter unchanged.
- For setting a new value for the parameter or a sub-parameter, first enter the parameter or sub-parameter by pressing the **[Zero]** key. Then use the **[M+]** key or the **[MR]** key to move the active/flashing digit to the left or to the right and use the **[Tare]** key to increment the flashing digit.
- Press the **[Zero]** key to confirm the changed value.
- Use the **[G/N]** key to leave the parameter.

For example-

When the display shows **“PO chk”**, press the **[Zero]** key.

The display will show **“Set Lo”**(the sub-parameter). Press **[Zero]** key to set the low limit or press the **[Tare]** key to skip to **“Set Hi”** for setting the high limit.

When all digits have been set press the **[Zero]** key to store the value. The display will go to **“bEEP”** to set the beeper then back to first parameter.

Press **[G/N]** to return to **‘po chk’**.

Advance to next parameter if needed by pressing **[Tare]** key or press the **[G/N]** key to return to weighing.

### Setting of user parameters

parameter	Sub-parameter	description
<b>PO CHK</b>	<b>SET Hi</b>	Sets a value for the high limit for check weighing.
	<b>SET LO</b>	Sets a value for the low limit for check weighing.
	<b>BEEP</b>	Set the beep to- <b>no:</b> (off all the time) <b>OK:</b> on when the weight is ok. i.e., in between LO and HI limits) <b>nG:</b> ON only when the weight is outside the limits during the check-weighing function.

parameter	Sub-parameter	description
<b>P1 rEF</b>	<b>AZnO</b>	Set Auto zero range, select 0.5d, 1d, 2d, or 4d, normally set to 2d
	<b>OAuto</b>	Set initial (Power on) zero range. Select from 0 to 100% of scale capacity. Normally set to 10%
	<b>OrAGE</b>	Set the user Zero range, Select up to 100% of scale capacity, Normally set to 100%
	<b>OtArE</b>	Set multiple tare on or off., normally on.
	<b>SPEEd</b>	Set the speed of the analog to digital conversion, Time per second, Normally set to 15.
	<b>ZErO</b>	Enter preset tare value, up to capacity of the scale, normally set to zero.
<b>P2 COM</b>	<b>MODE</b>	Applies only if the RS-232 option is installed. This option is used to set RS-232 communication mode,  Options: CONT: continuously send data ST1: send one frame data after stable STC: send data continuously when stable PR1: print only when [Print] is pressed PR2: print continuously when [M+] is pressed. AUTO: print automatically when scale is stable and return to zero. and store the weight into the accumulation memory. ASK: ask mode, bi-direction, Command R: read data Command T: tare Command Z: zero
	<b>BAUD</b>	Select from the desired baud rates. Options are 600/1200/2400/4800/9600
	<b>Pr</b>	This option is used to set parity verify 7E1-7 data bits. Even parity 7O1-7 data bits, odd parity 8N1-8 data bits, no parity
	<b>PtYPE</b>	Select a brand of printer to select, does not apply to AE printers
	<b>LAB</b>	Select a preformatted label type
	<b>Prt</b>	
	<b>LANg</b>	Select an alternate language if available.

<b>P3 CAL</b>	<b>COUnt</b>	The display will show the values from the analog to digital converter.
	<b>DECI</b>	Selects the decimal point position Do not change from factory settings
	<b>InC</b>	Set the increment of the scale. Do not change from factory settings
	<b>CAP</b>	Set the scale capacity Do not change from factory settings
	<b>CAL</b>	Start the calibration procedure. See the details of calibration procedure in section 10.0
	<b>GrA</b>	Set the value for new gravity zone, Does not apply to CFM scales.
<b>P4 0TH</b>	<b>LOCK</b>	Enable /disable key lock
	<b>ANM</b>	Enable /disable the animal weighing function
<b>P5 Unt</b>	<b>Kg</b>	Set kilograms unit of weight on or off
	<b>Lb</b>	Set pounds unit of weight on or off
	<b>Lb:oz</b>	Set pounds: ounces unit of weight on/off
	<b>KJ</b>	Set to off for CFM scales
	<b>HJ</b>	Set to off for CFM scales
<b>P6 OCL</b>	Factory parameters, Do not enter. The scales may become inoperative.	
<b>P7 rSt</b>		
<b>P8 UWb</b>		

Use the **[G/N]** key to leave the set-up mode of the parameter and return to weighing.

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## 8.0 BATTERY OPERATION

- The scale can be operated from the rechargeable battery if desired. The battery operation life is on a full charge may exceed 90 hours, however it will be less if the backlight is used and as the battery ages.
- When the battery needs charging a symbol on the display will turn on. The battery should be charged when the symbol is on. The scale will still operate for about 10 hours 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.
- To the left of the 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 it is Red the battery is nearly discharged and yellow indicates the battery is being charged.

## 9.0 RS-232 INTERFACE

The CFM scales can be ordered with an optional RS-232 output.

### Specifications:

RS-232 output of weighing data

ASCII code

7/8 data bits

Parity selectable

Baud rate selectable from 600bps to 9600bps

### Connector: 25 pin d-subminiature socket

Pin 2: Input,

Pin 3: Output

Pin 5: Signal Ground

Data Format for normal weighing operations, parts counting or recalling of totals from memory will all be different. Examples follow:

S/N	The number increments every time a new value is stored in memory
GW	GW for gross weight, NT for net weight and a unit of weight
<lf>	
<lf>	Includes 2 line feeds

Normal Output

When recalling the Total weight stored in the accumulation memory the output format is:

```
*****
A line of stars is shown
<lf> Includes 1 line feed
Total No: 3 Times of the accumulation memory
Total wt.: 0.447KG Weight of the accumulation memory
*****
```

If the output is set to continuous each line will have the weight in the format below.

		,		+/-									k	g	CR	LF
-HEADER1-			-HEADER2-		--- WEIGHT DATA --						WEIGHT UNIT		TERMINATOR			

HEADER1: ST=STABLE , US=UNSTABLE

HEADER2: NT=NET , GS=GROSS

## 10.0 CALIBRATION

- Turn the scale off. Turn the scale back on, during the count down from 9 to 0, press the **[Print]** key.
- The display will show **"Pn"** ( password), press **[M+]**, **[G/N]** and **[Tare]** keys in sequence to enter the parameter setting. The display will show **"POchk"**.
- Press the **[Tare]** key to cycle through the other parameters until the display show **"P3 cal"**, press **[Zero]** key to enter, press **[Tare]** to select **"CAL"**(calibration).
- Press **[Zero]** key to enter calibration section. The display will show **"noLin"** , press the **[Zero]** key, The display will show **"unLd"**.
- Remove any weight from the platform and when stable press the **[Zero]** key.
- Then the display will show the last calibration weight used. If this is correct you can continue by pressing the **[Zero]** key. If it is not correct use the **[M+]**, **[MR]**, **[Tare]** keys to change the calibration weight value. When it is correct press the **[Zero]** key.
- Then display will show **"LoAd"**. Place the calibration weight on the scale and wait for it to be stable, press the **[Zero]** key.

- 
- If the calibration is accepted the display will return to normal weighing. If an error message is shown try calibrating again as a disturbance may have prevented a successful calibration.
  - After calibration the scale should be checked for whether the calibration and linearity is correct. If necessary repeat calibration as required.

## 11.0 ERROR CODES

ERROR CODES	DESCRIPTION	RESOLUTION
-----	Over range	Remove weight from the scale. If the problem persist contact your dealer or ADAM equipment for assistance.
Err 4	Zero Setting Error	The scale was outside the normal zero setting range either when it was turned on or when the <b>[Zero]</b> key was pressed.  Remove weight from the scale and try again.  Use the TARE key to set the display to zero value. If the problem persist contact your dealer or Adam equipment for assistance.
Err 6	A/D out of range	The values from the A/D converter are outside the normal range. Remove weight from the scale if overloaded, make sure the pan is attached. Indicates the load cell or the electronics may be faulty. If the problem persist contact your dealer or Adam equipment for assistance.





### Manufacturer's Declaration of Conformity

This product has been manufactured in accordance with the harmonised European standards, following the provisions of the below stated directives:

Electro Magnetic Compatibility Directive 2004/108/EC

Low Voltage Directive 2006/95/EC

Adam Equipment Co. Ltd.  
Bond Avenue, Denbigh East  
Milton Keynes, MK1 1SW  
United Kingdom

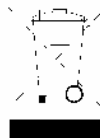
### FCC COMPLIANCE

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. 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. 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.

Shielded interconnect cables must be employed with this equipment to insure compliance with the pertinent RF emission limits governing this device.

Changes or modifications not expressly approved by Adam Equipment could void the user's authority to operate the equipment.

### WEEE COMPLIANCE



Sealed Lead Acid  
Battery  
Must be recycled  
Properly

Any Electrical or Electronic Equipment (EEE) component or assembly of parts intended to be incorporated into EEE devices as defined by European Directive 2002/95/EEC must be recycled or disposed using techniques that do not introduce hazardous substances harmful to our health or the environment as listed in Directive 2002/95/EC or amending legislation. Battery disposal in Landfill Sites is more regulated since July 2002 by regulation 9 of the Landfill (England and Wales) Regulations 2002 and Hazardous Waste Regulations 2005. Battery recycling has become topical and the Waste Electrical and Electronic Equipment (WEEE) Regulations are set to impose targets for recycling.

---

**ADAM EQUIPMENT** is an ISO 9001:2000 certified global company with more than 35 years experience in the production and sale of electronic weighing equipment.

Adam products are predominantly designed for the Laboratory, Educational, Medical, retail and Industrial Segments. The product range can be described as follows:

- Analytical and Precision Balances
- Compact and Portable Balances
- High Capacity Balances
- Moisture analysers / balances
- Mechanical Scales
- Counting Scales
- Digital Weighing/Check-weighing Scales
- High performance Platform Scales
- Crane scales
- Medical Scales
- Retail Scales for Price computing

For a complete listing of all Adam products visit our website at  
[www.adamequipment.com](http://www.adamequipment.com)

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