



**VI-  
Series**

**VIR-  
Series**

A technical line drawing of a laboratory fume hood, viewed from an isometric perspective. The drawing includes various dimension lines and numerical values: 5.500 (top length), 2.750 (inner length), 2.375 (lower length), 875 (width), 164 (height), 2.501 (lower width), and R6.000 (radius).

# Instruction Manual

for Models:

- VI-1mg
- VI-3mg

- VI-200
- VI-350
- VI-400
- VI-600
- VI-1200

- VI-2400
- VI-4800
- VI-4kg
- VI-6kg
- VI-10kg

# *Certificate of Calibration*

*We hereby certify that this instrument  
was manufactured in the United States and  
that it has been calibrated using appropriate  
reference standards traceable to the  
National Institute of Standards and  
Technology.*

*This instrument has been fully  
inspected and has passed all quality tests as  
specified by Acculab quality procedures.  
To assure proper measurements, it is necessary  
to periodically recalibrate the instrument using  
appropriate standards as specified in the  
operating manual*

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**ACCULAB®**

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Thank you for purchasing the Acculab VI / VIR-Series Electronic Balance. With proper care and treatment it will provide years of reliable service.

Please read all operating instructions carefully.

## **BEFORE YOU BEGIN**

- Avoid lengthy exposure to extreme heat or cold. Your balance works best when operated within the temperature limits listed in the specifications. Always allow the unit to acclimate to a stable temperature before calibration.
- Allow at least 2 hrs of warm up time before starting calibration to give internal components sufficient time to stabilize.
- Keep your operating environment as clean as possible. Electrostatic fields, gravitational fields, dust, dirt, moisture, vibration, air currents, and proximity to other electronic equipment can all have an adverse effect on the reliability and accuracy of your unit.
- Handle with care. Carefully set weighing pan onto top of unit until level. Gently apply all items to be weighed onto the center of the weighing pan. Although designed to be quite durable, avoid rough treatment as this may permanently damage the internal sensor.

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### **SECTION 2:** VI-200, VI-350, VI-400, VI-600, VI-1200, VI-2400, VI-4800, VI-4kg, VI-6kg, VI-10kg

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**WARRANTY**..... inside back cover

Model #  
VI-1mg  
VI-3mg

# SECTION 1



**For Models VI-1mg & VI-3mg**

## OPERATION

### AC Adapter Operation:

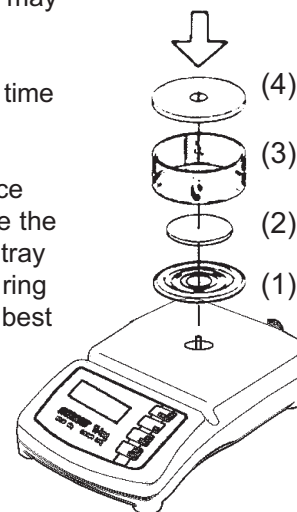
1) **Power** - Use only the AC adapter provided with the unit. Use of another adapter may damage the balance. This unit does not operate by battery power.

2) **Start Up** - Plug in provided adapter. Turn the unit on and allow sufficient warm up time of at least 2 hours.

3) **Set Up** - Always set up the unit on a level surface in a clean draft-free area. Place the stainless steel spill ring base onto the raised lip on the top of the balance. Place the stainless steel weighing pan on the center post and GENTLY turn until you feel the tray top settle onto the pin stand. Place the glass draft shield on the stainless steel spill ring base and (as needed) place the stainless steel cover on the glass draft shield. For best results always use the draft shield assembly.

Place components listed below on the balance in the order shown.

- (1) Spill Ring
- (2) Weighing Pan
- (3) Glass Draft Shield Cylinder
- (4) Stainless Draft Shield Cover



## <sup>1</sup> CALIBRATION

### IMPORTANT

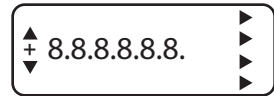
Please follow the calibration procedure described. Use the calibration weights provided or equivalent weights. Calibration is recommended upon the initial balance setup, after the unit has been moved, or after the unit has been subjected to an extreme change in temperature. Perform the described calibration procedure AFTER the unit has been allowed to properly warm up (approximately 2 hours). In addition to the initial setup calibration, the factory recommends that the unit be recalibrated periodically for optimum performance.

### **External Calibration Procedure:**

- 1) After allowing sufficient warm up time (approx. 2 hrs), remove all items from the weighing pan and tare the balance. The spill ring and glass draft shield should be in place without the stainless draft shield cover (see above).
- 2) After observing a stable ZERO reading, indicated by a stable arrow in the (g) grams mode, press and hold the CAL/MODE button. After approx. 4 seconds the unit will beep and the calibration weight will appear on the display (example + 100.000). Release the CAL/MODE button.
- 3) Gently place the calibration weight onto the weighing pan (example 100g).
- 4) The + sign will disappear. Wait approximately seven to ten seconds as the unit performs calibration.  
**IMPORTANT- Do not disturb the balance during this time. Avoid vibrations and air currents.**
- 5) When calibration is complete the unit will beep. The displayed calibration weight will disappear momentarily and then reappear as an active weight value. The balance is now calibrated.
- 6) Remove the calibration weight. **Note: If calibration weight value remains on the display, an improper weight has been used. Remove the improper weight and repeat the calibration procedure with the correct weight.**

<sup>1</sup> The term 'calibration' mentioned here refers to a span adjustment

**Model #**  
**VI-1mg**  
**VI-3mg**



## FEATURES

- **Power Up Segment Test:** When first turning on the unit, all segments of the LCD display will appear as shown. This display will remain for approximately three seconds and then reset to zero.
- **Stable Reading Indication:** A right-facing arrow appears on the right side of the display indicating the weighing mode in which the unit is operating. This arrow will disappear during weighing while the unit stabilizes, and then reappear when a stable value is reached.
- **Key Tone:** Pressing the ON, TARE and CAL/MODE buttons on the front panel will emit a tone indicating registry of the function. There is no key tone with the OFF keypad.
- **Overload:** When an applied load exceeds the unit's capacity, "H" will appear on the display. Remove excessive load immediately. The unit should return to normal operation.
- **Negative Value:** Any tared value will be displayed as a negative number once all weight is removed from the weighing surface. The negative sign will appear and tared value will be displayed.
- **Tare:** The tare feature is designed to allow the user to reset the balance to zero at any time. Tare can also be used to eliminate the value of a pan liner, scoop, beaker, etc. from a sample or procedure, when the weighed material needs to be held in a container and only the net weight of the material is desired. Place the container only (without material) on the weighing pan, wait for a stable reading and then press tare. The unit returns to zero and the weight value of the container is permanently removed from the remainder of the procedure. When all weight is removed from the weighing pan, the tared value of the container will be displayed as a negative number. Press the TARE key again to return the balance to zero. **NOTE:** The total weight of the container plus material cannot exceed the capacity of the balance.
- **Lock Down Bracket:** A molded piece is attached to the back of the balance housing that can be used on an optional basis to secure the unit. An optional cable lock can be incorporated and is sold separately as an accessory.

## KEYPAD FUNCTIONS

- **ON/MEMORY:** Press to turn on balance. For Memory function operation refer to page 13 in Section 3.
- **OFF:** Press to turn off balance.
- **CAL/MODE:** Press and hold this key to begin calibration procedure as outlined under the CALIBRATION section. After unit is on or calibrated, briefly pressing the same key will change the weighing mode. When balance is turned on the unit initially defaults to the gram (g) mode. However, if the mode is changed the balance will default to the last mode used when turned on again. The following modes may also be selected: ounces (oz), carats (ct), and penny weight (dwt).

The right facing arrow will point to the weighing mode the unit is currently displaying. To change modes briefly press the CAL/MODE key to scroll between grams, ounces, carats, and penny weights.

- **TARE:** Press tare to reset the balance to zero. Tare can be used to eliminate the weight value of a container from a sample or procedure. The container weight is permanently removed from the remainder of the procedure. When all weight is removed from the weighing pan, the tared value of a container will be displayed as a negative number. Press TARE again to return the balance to zero.

## ERROR CODES

Following is a description of typical error codes that may appear on VI/VIR-Series balances.

- 1) **L** This indicates that the balance is under loaded. Check to see if the weighing pan is properly installed and seated on the top of the unit.
- 2) **H** This indicates that there may be an excessive weight applied to the weighing pan. It is critical not to exceed the maximum load capacity by more than 150% or damage to the balance may occur.
- 3) **E-01** Capacity of LCD digit readout has been exceeded in CT and DWT modes.
- 4) **E-02** Usually detected when the calibration operation is being attempted. It is usually the result of the balance being exposed to vibrations, air drafts, or unstable environments. The balance must be placed in a stable environment before calibration occurs. Before pushing the CAL/MODE button as part of the calibration process, the LCD should display a stable ZERO with the mode arrow stable on the gram (g) mode.
- 5) **E-10** This will be displayed only if there is a value stored in memory and the tare button is pressed. Memory must be cleared or the unit turned off in order to restore the normal tare function.
- 6) **E-30** This is an indication that an electronic malfunction has occurred. The unit must be returned to the factory for evaluation.
- 7) **E-54** This fault will appear on the display when the unit is powered on. This occurs when the electronics are no longer within the factory set parameters. The most common cause is from objects being dropped onto the weighing pan or from the balance itself being dropped. The balance must be returned to Acculab or an authorized service center for electronic evaluation and repair.
- 8) **▲** (in the upper left corner of display) Following are the most probable causes of this error code. The balance must be returned to Acculab or an authorized service center for electronic evaluation and repair.
  1. There is something causing the sensor to function out of specification.
  2. Rough, improper handling of the balance.
  3. Liquids and other materials spilled into the balance.

**NOTE:** Do not attempt to access internal components or make any unauthorized repairs since this will void the warranty.

## SUPPLIED ACCESSORIES

- AC Adapter (DC 12V):

#AC-1 -For use in USA/Canada (AC 120V 60Hz)

#AC-2 -For use in Europe (AC 230V 50Hz)

#AC-3 -For use in U.K. (AC 240V 50Hz)

#AC-4 -For use in Japan (AC 100V 50/60Hz)

#AC-5 -For use in AUS/NZ (AC 240V 50Hz)

- Calibration Weight:

#VI-1mg - One (1) 100g weight to calibrate balance at 100g OIML Class F1

#VI-3mg - Two (2) 100g weight to calibrate balance at 200g OIML Class F1

- Draft Shield & Spill Ring:

Glass Draft Shield with stainless steel cover

Stainless steel spill ring

## OPTIONAL ACCESSORIES

- Cable lock, carry case

**Model #**  
**VI-1mg**  
**VI-3mg**

# Specifications

*Performance specifications measured within optimum temperature range after recommended warm up and proper calibration.  
Specifications subject to change without notice.*

Acculab Model Numbers	VI-1mg	VI-3mg
CAPACITY	120g / 4.2328oz / 600.005ct / 77.1610dwt	300g / 10.5821oz / 750.000ct / 96.4500dwt
READABILITY (g)	0.001g	
REPEATABILITY (g)	±4mg	
WEIGHING MODES	g, oz, ct, dwt	
TARE RANGE	To capacity by subtraction	
CALIBRATION	External calibration from keypad w/included weight	
STABILIZATION TIME (sec)	3	
MAXIMUM OVERLOAD	150% of capacity	
OVERLOAD INDICATION	"H" reading on LCD	
UNDERLOAD INDICATION	"L" reading on LCD	
OPERATING TEMPERATURE	50° - 84°F (10° - 30°C)	
OPERATING HUMIDITY	Less than 80% RH	
DISPLAY TYPE	LCD / .75" high with segment test	
AUDIO TONE	At startup and function keys	
POWER REQUIREMENTS	AC adapter only(included)	
PLATFORM SIZE/TYPE	100mm diameter (4"), stainless steel	
DIMENSIONS H x W x D	4.75"x5.75"x10.25" (120 x 146 x 260mm)	
NET WEIGHT (lb/kg)	4/1.8	
DRAFT SHIELD	Glass & stainless steel w/ spill ring	
SECURITY	Built-in lock-down bracket, cable lock sold separately	
INCLUDED ACCESSORIES	Calibration weight, AC adapter	
OPTIONAL ACCESSORIES	Cable lock, carry case	



# SECTION 2

## Model #

- VI-200
- VI-350
- VI-400
- VI-600
- VI-1200
- VI-2400
- VI-4800
- VI-4kg
- VI-6kg
- VI-10kg

Brushed stainless steel weighing surfaces.

9V battery operation on many models for complete portability.

Built in lock down bracket (cable lock sold separately).

AC adapter included with all models and calibration weights included with all models under 1200g.

New housing design directs spills away from the keypad.

Housing is constructed of sturdy ABS material with special structural cross-bracing for added rigidity.

Sealed keypad with raised buttons for tactile feel along with audio function tone.

Large angled LCD display.

VI-350

VI-2400

Bubble level and leveling feet only on VIR models.

VIR models include RS-232 interface for computer or printer capability. Data output menu options available, including stability settings.

**For Models VI-200, VI-350, VI-400, VI-600, VI-1200, VI-2400, VI-4800, VI-4kg, VI-6kg, VI-10kg**

### Model #

- VI-200
- VI-350
- VI-400
- VI-600
- VI-1200
- VI-2400
- VI-4800
- VI-4kg
- VI-6kg
- VI-10kg

## OPERATION

### AC Adapter Operation:

CAUTION: Use only a 12V Adapter with a negative tip, as provided, to supply AC power. Use of another type of adapter may permanently damage the unit and will void the warranty.

- 1) Model # VI-350 will operate on AC 120V or AC 240V, only.
- 2) Plug the provided AC adapter into the balance (the power receptacle is located at the rear of the balance), then into desired electrical outlet. It is recommended to unplug the AC adapter when not in use for extended periods.

### Battery Operation:

- 1) Model #'s VI-200, VI-400, VI-600, VI-1200, VI-2400, VI-4800, VI-4kg, VI-6kg, VI-10kg operate on one 9V Alkaline battery, or AC adapter as provided.
- 2) To install battery, open battery cover on bottom of balance and connect battery to snap. Place battery into its compartment and replace the cover. Always handle battery lead wires with care. **DO NOT USE EXCESSIVE FORCE!**
- 3) Remove battery when balance is not used for extended periods. Replace battery when LCD indicates flashing display for 30 seconds then shuts-off.

## <sup>1</sup> CALIBRATION

**\*\*PLEASE NOTE:** Calibration weights are NOT supplied with Models VI-1200, VI-2400, VI-4800, VI-4kg, VI-6kg, VI-10kg. Calibration weights may be purchased separately from your local Acculab dealer (see optional accessories).

### **IMPORTANT:**

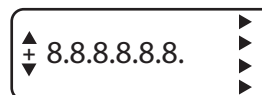
All balances are factory tested and calibrated prior to shipping. However, an external calibration is recommended upon the initial balance setup, after the unit has been moved, or after the unit has been subjected to an extreme change in temperature. Please follow the calibration procedure described. Use the calibration weights provided, equivalent class weights purchased from an Acculab dealer, or ASTM class weights. Perform the described calibration procedure **AFTER** the unit has been allowed to properly warm up (approximately 30 min). In addition to the initial setup calibration, the factory recommends that the unit be recalibrated periodically for optimum performance.

### **External Calibration Procedure:**

- 1) After allowing sufficient warm up time (approx. 30 min), remove all items from the weighing pan and tare the balance. The spill ring and glass draft shield should be in place without the stainless draft shield cover.
- 2) After observing a stable ZERO reading, indicated by a stable arrow in the (g) grams mode, press and hold the CAL/MODE button. After approx. 4 seconds the unit will beep and the calibration weight will appear on the display (example + 1000.0). Release the CAL/MODE button.
- 3) Gently place the calibration weight onto the weighing pan (example 1000g).
- 4) The + sign will disappear. Wait approximately seven to ten seconds as the unit performs calibration.  
**IMPORTANT- Do not disturb the balance during this time. Avoid vibrations and air currents.**
- 5) When calibration is complete the unit will beep. The displayed calibration weight will disappear momentarily and then reappear as an active weight value. The balance is now calibrated.
- 6) Remove the calibration weight. **Note: If calibration weight value remains on the display, an improper weight has been used. Remove the improper weight and repeat the calibration procedure with the correct weight.**

<sup>1</sup> The term 'calibration' mentioned here refers to a span adjustment

## FEATURES



### Model #

- |           |           |
|-----------|-----------|
| • VI-200  | • VI-2400 |
| • VI-350  | • VI-4800 |
| • VI-400  | • VI-4kg  |
| • VI-600  | • VI-6kg  |
| • VI-1200 | • VI-10kg |

- **Power Up Segment Test:** When first turning on the unit, all segments of the LCD display will appear as shown. This display will remain for approximately three seconds and then reset to zero.
- **Stable Reading Indication:** A right-facing arrow appears on the right side of the display indicating the weighing mode in which the unit is operating. This arrow will disappear during weighing while the unit stabilizes, and then reappear when a stable value is reached.
- **Key Tone:** Pressing the ON, TARE and CAL/MODE buttons on the front panel will emit a tone indicating registry of the function. There is no key tone with the OFF keypad.
- **Overload:** When an applied load exceeds the unit's capacity, "H" will appear on the display. Remove excessive load immediately. The unit should return to normal operation.
- **Negative Value:** Any tared value will be displayed as a negative number once all weight is removed from the weighing surface. The negative sign will appear and tared value will be displayed.
- **Tare:** The tare feature is designed to allow the user to reset the balance to zero at any time. Tare can also be used to eliminate the value of a pan liner, scoop, beaker, etc. from a sample or procedure, when the weighed material needs to be held in a container and only the net weight of the material is desired. Place the container only (without material) on the weighing pan, wait for a stable reading and then press tare. The unit returns to zero and the weight value of the container is permanently removed from the remainder of the procedure. When all weight is removed from the weighing pan, the tared value of the container will be displayed as a negative number. Press the TARE key again to return the balance to zero. **NOTE:** The total weight of the container plus material cannot exceed the capacity of the balance.
- **Auto Off:** An auto shut off feature is provided which is operational only while the unit is operating under battery power. The unit will automatically turn off after approximately two minutes if no active weighing takes place. Auto shut off will not occur during operation with AC Adapter.
- **Lock Down Bracket:** A molded piece is attached to the back of the balance housing that can be used on an optional basis to secure the unit. An optional cable lock can be incorporated and is sold separately as an accessory.

## KEYPAD FUNCTIONS

- **ON/MEMORY:** Press to turn on balance. For Memory function operation refer to page 13 in Section 3.
- **OFF:** Press to turn off balance.
- **CAL/MODE:** Press and hold this key to begin calibration procedure as outlined under the CALIBRATION section. After unit is on or calibrated, briefly pressing the same key will change the weighing mode. When balance is turned on the unit initially defaults to the gram (g) mode. However, if the mode is changed the balance will default to the last mode used when turned on again. The following modes may also be selected: ounces (oz), penny weight (dwt), troy ounces (ozt) and ref sampling (Ref 5, Ref 10, Ref 20, Ref 50).

The right facing arrow will point to the weighing mode the unit is currently displaying. To change modes briefly press the CAL/MODE key to scroll between grams, ounces, penny weights, troy ounces and ref sampling.

- **TARE:** Press tare to reset the balance to zero. Tare can be used to eliminate the weight value of a container from a sample or procedure. The container weight is permanently removed from the remainder of the procedure. When all weight is removed from the weighing pan, the tared value of a container will be displayed as a negative number. Press TARE again to return the balance to zero.

### Model #

- VI-200
- VI-350
- VI-400
- VI-600
- VI-1200
- VI-2400
- VI-4800
- VI-4kg
- VI-6kg
- VI-10kg

## ERROR CODES

Following is a description of typical error codes that may appear on VI/VIR-Series balances.

- 1) **L** This indicates that the balance is under loaded. Check to see if the weighing pan is properly installed and seated on the top of the unit.
- 2) **H** This indicates that there may be an excessive weight applied to the weighing pan. It is critical not to exceed the maximum load capacity by more than 150% or damage to the balance may occur.
- 3) **E-02** Usually detected when the calibration operation is being attempted. It is usually the result of the balance being exposed to vibrations, air drafts, or unstable environments. The balance must be placed in a stable environment before calibration occurs. Before pushing the CAL/MODE button as part of the calibration process, the LCD should display a stable ZERO with the mode arrow stable on the gram (g) mode.
- 4) **E-10** This will be displayed only if there is a value stored in memory and the tare button is pressed. Memory must be cleared or the unit turned off in order to restore the normal tare function.
- 5) **E-30** This is an indication that an electronic malfunction has occurred. The unit must be returned to the factory for evaluation.
- 6) **E-54** This fault will appear on the display when the unit is powered on. This occurs when the electronics are no longer within the factory set parameters. The most common cause is from objects being dropped onto the weighing pan or from the balance itself being dropped. The balance must be returned to Acculab or an authorized service center for electronic evaluation and repair.
- 7) **▲** (in the upper left corner of display) Following are the most probable causes of this error code. The balance must be returned to Acculab or an authorized service center for electronic evaluation and repair.
  1. There is something causing the sensor to function out of specification.
  2. Rough, improper handling of the balance.
  3. Liquids and other materials spilled into the balance.

**NOTE:** Do not attempt to access internal components or make any unauthorized repairs since this will void the warranty.

### •Parts Counting: HOW TO USE THE PARTS COUNTING FEATURE

- 1) To set your balance to parts counting mode, scroll through the weighing modes by pressing the CAL/MODE keypad until a down facing arrow appears in the lower left corner on the display. The minimum parts quantity number (5) will also be displayed as rEF 5.
- 2) Continue to press the CAL/MODE keypad to select the desired parts counting unit: 5, 10, 20, 50 pieces. After "50" is displayed, the indicator will scroll back to the gram weighing mode.
- 3) With the selected parts counting unit still displayed, place the desired sample on the weighing pan. Allow the sample to stabilize for 3-5 seconds then press TARE. The parts counting function is now set for the selected 5, 10, 20, 50 piece quantity.

**IMPORTANT:** Minimum individual (1 piece) part weight must be greater than or equal to 2X "D" ("d" is the division or graduation of the balance). If the sample unit weight for one piece is less than 2X "D" the display will read "E 22", indicating that the individual (1 piece) part weight is too low and must be increased. To reset, press CAL/MODE and scroll through the weighing modes again to the desired parts counting value. Refer to the following chart for minimum unit part weight (1 piece) for your particular balance.

Balance Graduation	Minimum (1 piece) Part Weight
1 gram	2 grams
0.1 gram	0.2 gram
0.01 gram	0.02 gram

## SUPPLIED ACCESSORIES

### • Calibration Weight with the following models:

VI-200 - One (1) 200g weight to calibrate balance at 200g OIML Class M1  
 VI-350 - One (1) 200g weight to calibrate balance at 200g OIML Class M1  
 VI-400 - One (1) 200g weight to calibrate balance at 200g OIML Class M2  
 VI-600 - Two (2) 200g weights to calibrate balance at 400g OIML Class M2

### • AC Adapter (DC12V)

#AC-1 -For use in USA/Canada (AC 120V 60Hz)  
 #AC-2 -For use in Europe (AC 230V 50Hz)  
 #AC-3 -For use in U.K. (AC 240V 50Hz)  
 #AC-4 -For use in Japan (AC 100V 50/60Hz)  
 #AC-5 -For use in AUS/NZ (AC 240V 50Hz)

## OPTIONAL ACCESSORIES

### • Cable Lock, Carry Case

### • Calibration Weight

VI-1200 - One (1) 1kg weight to calibrate balance at 1000g OIML Class M2  
 VI-2400 - One (1) 2kg weight to calibrate balance at 2000g OIML Class M2  
 VI-4800 - Two (2) 2kg weights to calibrate balance at 4000g OIML Class M2  
 VI-4kg - One (1) 2kg weight to calibrate balance at 2000g OIML Class M2  
 VI-6kg - Two (2) 2kg weights to calibrate balance at 4000g OIML Class M2  
 VI-10kg - Three(3) 2kg weights to calibrate balance at 6000g OIML Class M2

## Model #

• VI-200 • VI-2400  
 • VI-350 • VI-4800  
 • VI-400 • VI-4kg  
 • VI-600 • VI-6kg  
 • VI-1200 • VI-10kg

# Specifications

Performance specifications measured within optimum temperature range after recommended warm up and proper calibration.  
 Specifications subject to change without notice.

AcuLab Model Numbers	VI-200	VI-350	VI-400	VI-600	VI-1200	VI-2400	VI-4800	VI-4kg	VI-6kg	VI-10kg
CAPACITY	200g 7.054oz 126.602dwt 6.430ozt	350g 12.345oz 225.055dwt 11.252ozt	400g 14.10oz 257.20dwt 12.86ozt	600g 21.16oz 385.80dwt 19.29ozt	1200g 42.32oz 771.61dwt 38.58ozt	2400g 84.65oz 1543.23dwt 77.16ozt	4800g 169.31oz 3086.47dwt 154.32ozt	4000g 141.0oz 2572.0dwt 128.6ozt	6000g 211.6oz 3858.0dwt 192.9ozt	10000g 352.7oz 6430.1dwt 321.5ozt
READABILITY (g)	0.01		0.1					1		
REPEATABILITY (g)	±0.01		±0.1					±1		
WEIGHING MODES	g, oz, dwt, ozt & parts counting									
TARE RANGE	To capacity by subtraction									
CALIBRATION	External calibration from keypad w/included weight				External calibration from keypad					
STABILIZATION	3 seconds									
MAXIMUM OVERLOAD	150% of capacity									
OVERLOAD INDICATION	"H" reading on LCD									
UNDERLOAD INDICATION	"L" reading on LCD									
OPERATING TEMPERATURE	50° - 86°F (10° - 30°C)									
OPERATING HUMIDITY	Less than 80% RH									
DISPLAY TYPE	LCD / .75" high with segment test									
AUDIO TONE	At startup and function keys									
POWER REQUIREMENTS	9V alkaline battery or AC adapter	AC adapter only	9V alkaline battery or AC adapter							
PLATFORM SIZE/TYPE	4.5" diameter (115mm), stainless steel		5.5"x5.7" (141 x 145mm), stainless steel							
DIMENSIONS H x W x D	3.5"x5.75"x10.25" (89 x 146 x 260mm)									
NET WEIGHT (lb/kg)	4/1.8									
SECURITY	Built-in lock-down bracket, cable lock sold separately									
INCLUDED ACCESSORIES	Calibration weight & AC adapter				AC adapter only					
OPTIONAL ACCESSORIES	Cable lock, carry case				Cable lock, calibration weight, carry case					

## **The Memory Key & Function (cumulative weighing application)**

All VI/VIR-Series balances include a unique memory function that allows cumulative weighing up to the capacity of the balance. The following steps outline how to use this function:

- 1) Place a container on the weighing pan (if desired). Wait for a stable reading and press the Tare/Print button to return balance to a displayed weight value of Zero. This removes the container's weight from the cumulative weight procedure.
- 2) Add sample until the desired weight is achieved. Example: 10.00g
- 3) Press the On/Memory button. This will store the displayed weight value (example 10.00g) in the memory and reset display to zero. An arrow symbol in the upper left corner of the display will indicate storage of the weight value into the memory.
- 4) Add sample until the next desired weight is achieved. Example: 25.00g
- 5) Press the On/Memory button again. This will recall the previously stored weight value (step 2 example 10.00g) and add the current displayed weight value (step 3 example 25.00g). A cumulative weight will now be displayed. Example 35.00g

**Note: To continue the cumulative weighing application start again at step 3.**

To end the cumulative application, stop at step 5, remove the samples and/or container, and press the Tare/Print key to zero the display.

A few things to keep in mind:

- You cannot switch weighing modes once you have started cumulative weighing. Choose a weighing mode before you begin the application.
- If your balance is a VIR series equipped with RS-232, and you are properly connected to a printer or computer, display value can be printed at any point by pressing and holding the Tare/Print button until a beep is heard.

## **VIR-Series RS-232 Bi-Directional Serial Communications**

All VIR-Series balances are equipped with a standard 9-pin male, bi-directional RS-232 interface located at the rear of the balance. The RS-232 communication parameters are configurable with respect to baud rate, parity, # of stop bits, and handshake. A seven-bit ASCII data stream is sent from the balance to an appropriate connected computer or printer via the proper data interface cable. Correctly configured cables can be purchased from Acculab, or, can be made by the user. See the table "Data Interface Cable PIN Configuration For VIR-Series Balances".

### **User Configurable Balance Parameters**

The table "User Configurable Internal Menu Codes" shows the balance parameters that are user configurable. Changing configurable internal balance parameters requires accessing the balance internal menu system via the keypad. Navigating the menu system is performed as follows:

1. To gain access to the balance internal menu system, start with the balance turned off. Briefly press the "ON/MEMORY" key and immediately (and briefly) press the "TARE/PRINT" key while all LCD segments are illuminated. You should see a "1" toward the left side of the LCD. This is the "left" segment value.
2. To increment the displayed digit within any segment, briefly press the "TARE/PRINT" key repeatedly until you reach your target value.
3. To switch from one code segment to another, IE. from the left to center digit, center to right digit, or right to left digit, briefly press the "CAL/MODE" key. Increment each digit segment by the method explained in #2, above.
4. When switching from the center to right segment, the number displayed is the setting that is currently selected - marked by a small right facing arrow ► that points to the "g" indicator on the lower right side of the display.
5. To select a new value, increment the third segment (#2) until you reach the new desired value. To lock in this new value, press and hold the "CAL/MODE" key until the small right facing arrow ► appears and points to the "g" indicator on the lower right side of the display.
6. If you need to move on and change other internal values, do so by repeating steps 2-5 above.
7. To finalize and save all revised parameter settings, press and hold the "TARE/PRINT" key until the balance resets. All your new settings are now balance defaults at startup.

Note: To reset the balance to all its factory default parameters, specify the menu code "9 - 1" and invoke step #7, above.

### **Printing To A Printer Or Computer**

Printing with VIR-Series balances simply means that the displayed LCD contents are sent out the 9-pin RS-232 port to either a connected printer or computer. To successfully print the following conditions must exist:

1. Attach the balance to a printer or computer using the appropriate data interface cable. The correct cable must be used to connect the two devices together. Correctly configured cables can be purchased from Acculab, or, can be made by the user. See the table "Data Interface Cable PIN Configuration For VIR-Series Balances".
2. The RS-232 settings on both the balance and printer (or computer) must be the same. Both devices must be set to the same number of data bits ("7", not configurable), baud rate, parity, stop bits and handshake.
3. If the balance is set to manual print (default), press and hold the "TARE/PRINT" key until an audible beep is heard. The LCD contents will be sent out the RS-232 port to the attached device.

## Verifying A Correct Cable Connection

This procedure assumes the following:

- You are using a PC that is running either Windows 95/98/NT4.0.
- The PC has Hyperterminal installed, (a communications package that ships with Windows).
- The interface cable is properly attached to both the balance RS-232 port and PC port (COMx).
- The balance communication parameters are all set to their defaults of 1200 baud, odd parity, and 1 stop bit.

Perform the following steps:

1. Turn on your balance, and invoke Hyperterminal.
2. Click "File-->Properties" to bring up the Properties window.
3. Make sure the box called "Connect Using" says "Direct to Comx".  
... "x" is the COM port of your PC, usually, either 1 or 2.
4. Click the "Configure" button, and check that the following values are selected:

Bits per second:	<b>1200</b>
Data bits:	<b>7</b>
Parity:	<b>Odd</b>
Stop bits:	<b>1</b>
Flow control:	<b>Software</b>

5. Exit back to the main Hyperterminal screen, by clicking "OK" twice. The bottom-left of your window should say "Connected". At this point, press and hold the "TARE/PRINT" button on the balance. The value on the LCD should show up in the Hyperterminal window.

## Controlling The Balance Remotely Via Computer

Because the VIR-Series RS-232 interface is bi-directional, a connected computer can remotely control the balance. There are nine (9) balance functions, as listed in the table entitled "Remote Balance Operation Functions & Control Codes" (page 17) that can be remotely invoked from an attached computer. The process of sending these codes varies depending on the computer software used. Programming languages such as C++ and Visual Basic can be used to create routines to grab data from the balance. There are also many software packages commercially available to help users capture data from RS-232-enabled laboratory devices, like the VIR-Series.



<b>User Configurable Internal Menu Codes</b>				
<b>Category</b>	Segment Position			<b>Value</b>
	<b>L</b>	<b>C</b>	<b>R</b>	
Ambient Conditions	1	1	1	very stable
	1	1	2*	stable (default)
	1	1	3	unstable
	1	1	4	very unstable
Stability Range	1	3	1	1/4 digit
	1	3	2	1/2 digit
	1	3	3	1 digit
	1	3	4*	2 digits
	1	3	5	4 digits
External Calibration	1	5	1*	external calibration is enabled (default)
	1	5	2	external calibration is disabled
Auto Zero	1	6	1*	on (default)
	1	6	2	off
Baud Rate	5	1	1	150
	5	1	2	300
	5	1	3	600
	5	1	4*	1200 (default)
	5	1	5	2400
	5	1	6	4800
	5	1	7	9600
Parity	5	2	1	mark
	5	2	2	space
	5	2	3*	odd (default)
	5	2	4	even
Stop Bits	5	3	1*	1 stop bit (default)
	5	3	2	2 stop bits
Handshake	5	4	1	software
	5	4	2	hardware, w/2 chars after CTS (default)
	5	4	3*	hardware, w/1 char after CTS
Print Stream	6	1	1	manual print, regardless of stability
	6	1	2*	manual print when stable (default)
	6	1	3	continuous print, regardless of stability
	6	1	4	continuous print, when stable
Printed Output	7	1	1*	LCD contents only (default)
	7	1	2	header and LCD contents
Menu Codes Reset	9	1	1	reset balance to factory defaults
<p>Note: Settings 5--, 6-- and 7-- have no effect on VI-Series balances because they affect performance of the RS-232 port included with VIR-Series balances only.</p> <p>*=Factory default setting.</p>				

## Remote Balance Operation Functions & Control Codes

<u>Remote Function</u>	<u>How Balance is Affected</u>	<u>PC Key Control Codes</u>
Very Stable Conditions	Changes balance state	ESC K
Stable Conditions	Changes balance state	ESC L
Unstable Conditions	Changes balance state	ESC M
Very Unstable Conditions	Changes balance state	ESC N
Disable Balance Keypad	Changes balance state	ESC O
Enable Balance Keypad	Changes balance state	ESC R
Print When Stable	Performs a function	ESC P
Tare	Performs a function	ESC T
Invoke External Calibration	Performs a function	ESC W

## Data Interface Cable PIN Configuration For VIR-Series Balances

Acculab VIR-Series <u>Balance 9-PIN port</u>		Standard RS-232 <u>9-PIN Connector</u>
RxD 2	↔	3 TxD
TxD 3	↔	2 RxD
Signal Ground 5	↔	5 Signal Ground

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Acculab VIR-Series <u>Balance 9-PIN port</u>		Standard RS-232 <u>25-PIN Connector</u>
RxD 2	↔	2 TxD
TxD 3	↔	3 RxD
Signal Ground 5	↔	7 Signal Ground

# **ACCULAB**

## **Limited Warranty** **Effective Date: January 1, 2003**

### **Standard Terms & Conditions**

Models: VI series

ACCULAB warrants the product series "VI" against defects in material and workmanship to the original consumer purchaser for a period of twenty four (24) months or a maximum of thirty (30) months from date of sale to Authorized ACCULAB Distributor. The warranty includes parts, labor and return shipping charges to customer (ground freight).

This specific warranty shall not apply to any product damaged due to accident, misuse, abuse, lightning strike, power surges, improper packaging for shipment to ACCULAB, or service/modification by anyone other than an authorized ACCULAB Technician.

The purchaser's sole remedy, ACCULAB and its suppliers sole liability are set forth herein. In no event shall ACCULAB or its suppliers be liable for any damages, incidental or consequential, expenses, lost profits, lost savings, or any other claims due to the use of or inability to use the product/s. ACCULAB shall limit its obligations under warranty to a time not to exceed the original product warranty period set forth herein. This warranty gives you specific legal rights and you may have other rights, which may be different from state to state.

In the event that service is required, the Customer/Distributor should call ACCULAB (800-656-4400), extension 8342 for proper return authorization. The product must be delivered to ACCULAB, Service Division 6542 Fig Street, Arvada, CO. 80004 within the warranty period, freight charges prepaid. The customer is responsible for product removal, installation and proper packing in order to prevent damage while shipping to ACCULAB Service facility.

This limited warranty supersedes all other warranties pertaining to the ACCULAB products, whether expressed or implied. Claims may be made by calling: 800-656-4400/631-254-4299, by fax 800-356-0338/631-253-5472, or in writing to:

### **ACCULAB**

Attn: Warranty Administrator  
6542 Fig Street  
Arvada, CO., 80004  
(800-656-4400)

Specifications subject to change without notice.



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