Fisher Scientific

SERIES XA

Electronic Analytical Balances

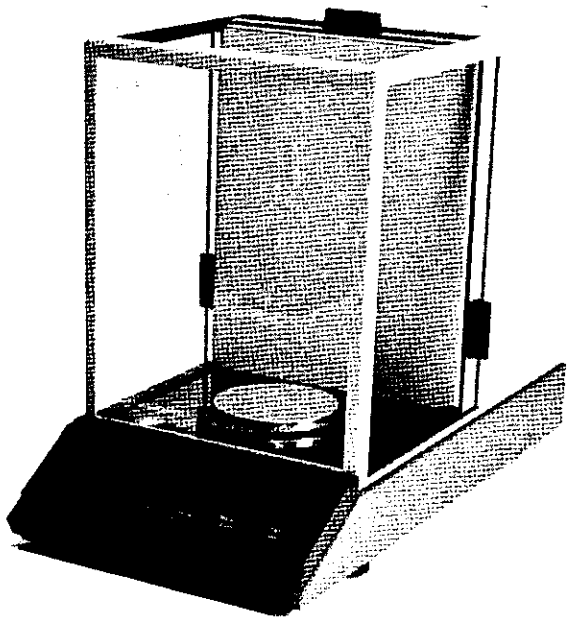
Models XA-100, XA-200, XA-250, XA-200D, XA-200DS

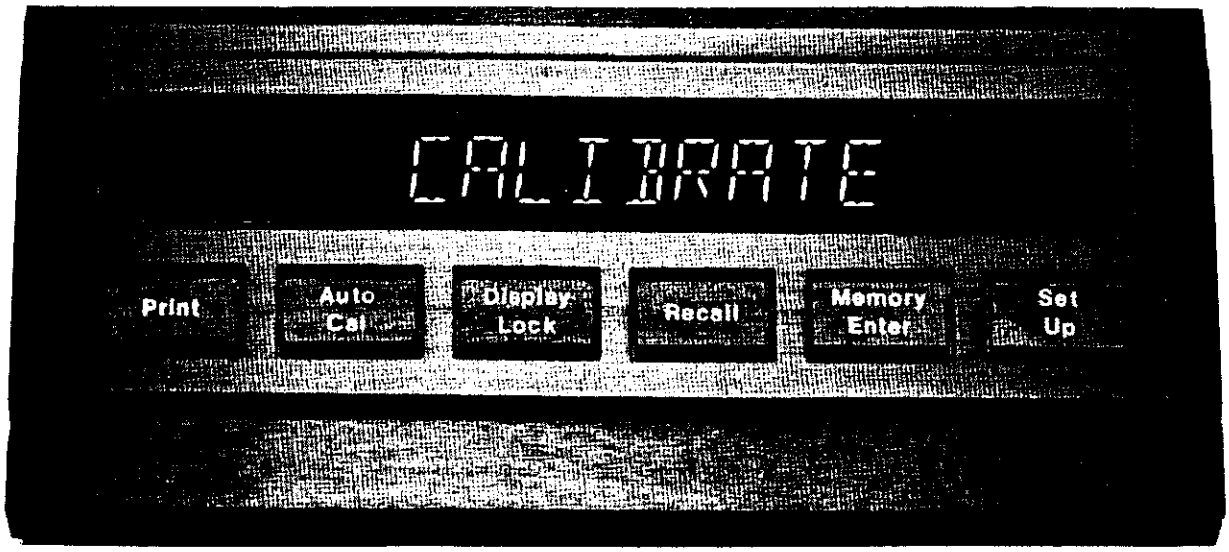
Fisher Scientific Electronic Analytical Balances

MODEL	XA-100	XA-200	XA-250	XA-200D	XA-200DA
Capacity	100g	200g	250g	200/50g	200/25g
Resolution	0.1mg	0.1mg	0.1mg	1/0.1mg	0.1/0.02mg

Common Specifications All Models

Response Time (stability) ..... Operator variable
Taring Time ..... 1-3 seconds
Pan Diameter ..... 3¼" (8.25cm)
Electrical Requirements 115/230vac, 50/60Hz
Internal Calibration Weight 100.0000g





Print
Transmits sample weight to printer or computer via RS-232C data link.

Auto Cal
Initiates automatic calibration. Internal weight is automatically activated and retracted to permit hand free calibration.

Display Lock
Freezes sample weight value; L prompt appears until key is pressed again to release.

Recall
Stores and sums tare values, clears memory.

Memory Enter
Stores sample weight; may be pressed repeatedly to accumulate a number of values and total them, minus tare; M prompt appears until memory is cleared.

Set Up
Accepts or changes default values for integration time, automatic rezero, RS-232C baud rate and continuous or command operation of the PRINT key, pressing tare bar returns balance to normal operation.

WORK AREA

Select an environment suitable for precision weighing

1. Work area should be relatively free from drafts and vibrations.
2. Work surface should be level and rigid.
3. Line voltage to the balance should be reasonably constant and free from fluctuations. It is ***not*** advisable to use an outlet that is shared with fluorescent fixtures or other electrical equipment that draws voltage in an inconsistent manner.
4. Do not locate near magnetic materials or equipment/instruments which incorporate magnets in their design.
5. Excessive room temperatures above 85°F/29°C or below 60°F/15°C, could affect balance operation and accuracy.

INSTALLATION (Set-Up)

- Remove balance and all accessories from carton. There are no internal packing or tie downs inside the balance.
- Set voltage select switch to proper voltage (located on back panel)
- Select a suitable work surface.
- Level balance with leveling feet.
- Place the weighing pan in the receptacle.
- Insert power cord into the receptacle located on the rear panel of the unit. Push the plug in firmly to assure proper contact.
- Plug power cord into power supply. Initially allow a 30 minute warm up period before making any adjustments to the balance. SERIES XA balances are designed to be continuously plugged in with power supplied at all times to the unit.

SERIES XA OPERATION

1. The balance remains "ON" at all times when plugged in and power is supplied. It is advised to leave the balance "ON" continuously.
2. An audible "BEEP" will be emitted whenever a function is activated. If a key is pressed and a "BEEP" is not heard, press the key again until a "BEEP" is heard to ensure that function is activated. Some keys are disabled in some functions.
3. The TARE bar is located across the front of the balance, directly in front of the keyboard. All other functions of the SERIES XA are controlled directly from the keyboard.

DUAL RANGE Models

Weigh in the lower capacity/higher sensitivity range until the mass exceeds the lower capacity. When the mass exceeds the lower capacity this model automatically switches to the higher capacity/lower sensitivity range with no adjustments by the operator necessary or required. To return to the lower capacity/higher sensitivity range, **Tare** the unit.

TARING/ ZEROING

To Tare or Zero all SERIES XA balances simply press the **TARE BAR** located across the front of the balance.
SERIES XA have tare capabilities up to their total weight capacity. Place sample container on weighing pan. Press Tare Bar, an audible "BEEP" will be heard and the display will read zeroes. Place sample to be weighed in the container. The display will indicate only the weight of the sample added. Additional samples and continuous taring may be done until the capacity of the balance has been exceeded.

AUTOMATIC CALIBRATION

All SERIES XA balances feature Auto Cal with an internal weight calibrated to NBS standards for accuracy. To activate the automatic calibration feature, (with the unit warm and the display stable) depress the Tare Bar to zero the display, press Auto Cal key. "CALIBRATE" will be displayed briefly, followed by the calibration weight value (for example "CAL - 100 -" for units with a 100 gram internal weight). When the calibration weight value is displayed, it indicates calibration is complete and normal operation may resume. Press the **Tare Bar,** display will read out in zeroes, begin sample weighings.

External calibration weights may also be used for calibration purposes. Remove samples from the pan, Tare the balance to a zero reading, place calibration weight on pan, press Auto Cal key. "CALIBRATE" will be displayed briefly, followed by the calibration weight value when calibration is complete. The balance will display "NO CAL" and not complete calibration if weights being used are out of range or balance capacity is exceeded.

DISPLAY LOCK

To freeze or lock the display, press the Display Lock key. A capital "L" will appear next to the function symbol and the display will not change until the Display Lock key is pressed again or the **Tare Bar** is depressed.

MEMORY/ MEMORY RECALL

This function allows the user to store and sum tare values. Pressing Memory Enter stores the displayed value in memory, clears the display to zero, and places an upper case "M" to the right of the grams/stability indicator on the display

Pressing **Recall** will bring the stored values out of memory and display it. Pressing **Recall** also clears the upper case "M".

Multiple weighings may be entered into memory where they will be summed with the values currently in memory. Pressing **Recall** will bring the summed values out of memory.

Memory values will be summed to the current value that is being displayed if **Recall** is pressed when a displayed mass is on the weighing pan. For example; if there is 100 grams stored in the memory and there is currently 20 grams on the weighing pan, pressing **Recall** will bring the 100 grams out of the memory and add it to displayed value, giving a total displayed weight of 120 grams.

► NOTE: if the **Tare Bar** is pressed during a memory operation or when there are values stored in the memory, the display will be zeroed and the memory contents will be zeroed, essentially clearing all operations.

SET-UP

Set-Up is designed to allow the user to change various features of the balance to fit the application. Features which may be modified are:

A. Filter (Integration)
B. Automatic Zero
C. Operation of Print Command
D. I/O Printing Speed, BAUD Rate
E. Audible Beeper Control

To step through the messages, repeatedly press the Set Up key or hold it down until the applicable option appears. To select an option, press the Memory Enter key when the option appears on the display. Default values may be selected when Set Up is initially pressed, they are:

1. FILTER (FT) Normal
2. AUTO-ZERO (AZ) ½ Count
3. PRINT Single on demand
4. BAUD RATE 300 Baud
5. BEEPER On

FILTER

PROCEDURE	DISPLAY READS
Push Set Up key	DEFAULT VL
Push again	FILTER
Push again	FT - FAST
Push again	FT - NORMAL
Push again	FT - SLOW

When desired variable appears, push Memory Enter key. Setting the filter will adjust integration time of balance reading

AUTO-ZERO

PROCEDURE	DISPLAY READS
Push Set Up key again	AUTO-ZERO
Push again	AZ 0 CNT
Push again	AZ ½ CNT
Push again	AZ 1 CNT

When appropriate option appears, push Memory Enter key. Setting the Auto-Zero will adjust the zero tracking.

Example: At the ½ CNT setting, the display will zero anytime unit is within ½ count (on 00g unit ½ count is ±0.00005) of zero.

Push Set Up key to advance to	PRINT
Push again	SINGLE
Push again	AFTER STAB
Push again	EVERY DISP

"SINGLE" indicates that **Print** must be pressed to send signal from balance to printer or computer. computer.
"AFTER STAB" indicates that balance will automatically send the signal after display stabilizes.
"EVERY DISP" sets the balance to continually send a signal through I/O port. When desired option appears, push Memory Enter key to set the balance.

PRINT

Print key is designed so user can manually send weighing results to printer or computer when interfaced. To use:

Push Set Up key and hold until display shows: "**PRINT**"

Push Set Up key and hold until "**SINGLE**" shows in display, then push Memory Enter key. The balance is now "set-up" to send the print signal each time **Print** is pushed.

BAUD RATE

PROCEDURE	DISPLAY READS
Push Set Up key to advance to	BAUD RATE

BAUD RATE (con'd.)	Push again	110
	Push again	300
	Push again	600
	Push again	1200
	Push again	2400
	Push again	4800
	Push again	9600
	When the appropriate baud rate appears, push **Enter** to set	

	PROCEDURE	**DISPLAY READS**
BEEPER	Push Set Up key to advance to	BEEPER
	Push again	BEEPER ON
	Push again	BEEPER OFF
	When the appropriate option displayed, press Memory Enter to set the beeper ON or OFF.	

INTERFACE APPLICATIONS

NOTE:
Improper connections to the I/O connector may result in damage to the balance!

Technical Specifications

I/O Connector
The mating connector is a 9 pin subminiature D socket, Cinch DE-9S or equivalent. Pins utilized are as follows:

PIN #	FUNCTION	PIN #	FUNCTION
1	Case Ground	3	Data Output
2	Data Input	7	Ground

Signal Definition

The SERIES XA utilizes a level compatible RS-232C interface, with 8 data bits and null parity. For the balance to interface to the functions, the balance must receive one (1) or two (2) stop bits and will output two (2) stop bits.

Data output: Voltage output compatible with RS-232C levels, 300 ohm source resistance and ±10 volt swing minimum.

Data input: Voltage input compatible with RS-232C levels, nominal 3000 ohms input impedance, ±5 volt minimum swing, ±20 volts maximum voltage.

Case ground: Tied to earth ground through the power cord.

Signal ground: Tied internally to the case ground.

I/O Specifications

The information transfer to and from the balance is accomplished with RS-232C serial compatible signals, using 8 data bits and null parity. The interface connector is a 9 pin male subminiature D plug. ***It is important for the user to determine interface requirements of equipment connected to the balance.*** The maximum recommended cable length is 25 feet. The information is transmitted at variable baud rates (from 110 to 9600) in standard ASCII

format. Baud rates from 110 to 4800 will have less than 1% error factor. A baud rate of 9600 will be approximately 5% slower than actual rate and may not work with some peripheral equipment. See "SET-UP" procedures for changing baud rates.

Output Specifications

The function and value displayed on the balance is output in the form:

F<+/ — >VVVV./VV<cr><lf>

where F is the function number, <+/ — > is the sign, VVVV.VV is the value displayed, <cr> is a carriage return and <lf> is a line feed. The output only occurs when the stability indicator is on. The balance will output under control of the print command (?#) or the front panel print switch.

Input Specifications

It is possible to control the balance from a terminal or computer with RS-232C interface and a baud rate between 110 and 9600. When interfaced the balance may be tared, functions changed, output requested from balance, reset to start-up conditions and new scale factors entered.

I/O COMMANDS

The following commands can be used to perform the functions. The commands will either be immediate or must be followed by carriage return, noted by <cr>. The symbol # designates a number following the command letter. Except as noted all commands are upper case.

★ RESETS balance to start-up conditions.

T Immediately TARES balance to zero.

?# Will PRINT the data # number of times. # can be 1 to 9. If # is zero then the balance will do a continuous output of the data. For example if # = 4 then the balance will output its data string containing the function number and weight four times consecutively immediately following receipt of the command, assuming the balance is stable. If the balance is unstable it will wait until the stability indicator is on before outputting the data.

F# FUNCTION select. The balance will go into the function number #. It is not necessary to remove the weight or tare when changing functions. The following table lists the function number, mode/function symbol and function name.

0	P	PARTS COUNT	5	G	GRAIN
1	g	GRAMS	6	C	CARAT
2	d	PENNYWEIGHT (DWT)	7	L	Av. POUND
3	o	AV. OUNCES	8	S	SCRUPLES
4	o	TROY OUNCES	9	r	DRAM

D# DECIMAL POINT POSITION. When in the PARTS COUNT function the decimal point may be positioned as necessary. Position zero is to the right of the least significant digit and position seven is to the left of the seventh digit.

P###<cr> PARTS Recalibration. Allows the user to display a number to represent the weight on the pan. This can be used for parts counting, check weighing, or conversion to other weight functions not available with the F command. The number ### can be any value from .000001 to 999999, however care must be exercised when using this command to ensure accurate results.

L##<cr> LOAD command. Allows the user to recalibrate the balance to a new scale factor when the relationship between the new unit and grams is known. The value of ## is an eight digit octal number corresponding to the conversion factor. The conversion factor used for the input is chosen for the best resolution and stability. The decimal point is then chosen for the correct units.

CAL<cr>	The CALIBRATE command allows the user to recalibrate the balance using the allowed calibration weights. To use, place the calibration weight on the pan and send the calibrate command. The balance will display CALIBRATE (it may flash very quickly if the balance is able to complete the calibration without waiting), then return with the new calibration if possible.
SU	SET-UP allows user to access set-up menu.
M message <cr>	For entering any MESSAGE, up to 10 characters for readout on the display.
E	ENTERS statistical data.
R	RECALL statistical data.
B	CLEARS memory of any/all statistical data.
G0	Turns ON FILL GUIDE.
G1	Turns OFF FILL GUIDE.
H##<cr>	Sets HIGH LIMIT for FILL GUIDE.
I##<cr>	Sets LOW LIMIT for FILL GUIDE.
K0	Locks out keyboard with exception of PRINT and TARE.
K1	Turns OFF Keyboard Lock
N<cr>	SAMPLE #, allows user to assign first sample number with additional samples being numbered consecutively. SEE "Statistical Analysis" section.