

WEIGHT TRACEABILITY CERTIFICATE

TO: Southwest Research Inst.
6220 Culebra Bldg 57 (CNWRA lab)
San Antonio, Tx

The Sartorius balances listed below have been calibrated by our
representative on 2-27-92

This is to certify that the test weights used are traceable to the
National Institute of Standards & Technology

Sartorius identification number of test weights used: S30442

Calibrated to class: S

Sartorius calibration date of test weights used: 10-25-91

N.I.S.T. Test Number: 731 | 243669

Type and serial number of balances serviced:

RC210P#10704379 _____

J. Ronald V. Long
Sartorius Service Representative
2-29-92
Date of Issue

sartorius
BALANCES AND SCALES
SARTORIUS CORPORATION
140 Wilbur Place
Bohemia, Long Island
New York, 11716

140 Wilbur Place
 Bohemia, N.Y. 11716
 800-645-3108

Balances and Scales
SERVICE REPORT

green
lines

Customer # _____ PO # _____
 Customer: Southwest Research Inst
 Bldg/Dept.: Bldg 57
 Street: 6220 Cellara
 City, State, Zip: San Antonio TX
 Contact: Dr. Narain Sridhar
 Phone #: 512-522-5538 Date: _____
 Spec. Instr. _____

Work Order # _____

Service Program	Travel Zone
ROUTINE MAINTENANCE	<input checked="" type="checkbox"/> A
HOURLY	<input type="checkbox"/> B
EMERGENCY	<input type="checkbox"/> C
WARRANTY	<input type="checkbox"/> D
SHOP SERVICE	
<input checked="" type="checkbox"/> <u>Set up - NK</u>	

ROUTINE MAINTENANCE

Line #	Model/Serial #	Make	Explanation
1	RC210P #10704379	Sartorius	Cal (69.99938)
2			
3			

ADDITIONAL UNITS LISTED ON ACCOMPANYING SHEETS

Total units serviced = _____ Total labor hours = _____

ITEM(S) FOR REPAIR

Line #	Model/Serial #	Make	Explanation	(in 1/4 hours) Labor hours
1				.
2				.
3				.

Total hours = _____

SPARE PARTS USED FOR REPAIR

Spare Part Number	Description	Qty Used	Qty. to Bill	Used for Line #	Cost
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.

SERVICES PERFORMED

Service Date: _____ Tech # _____ Tech Name: Jonell V. Jones
 Travel Time = _____ Comments: Balances Cleaned & Cal'd to Manufacturer
 Return Time = _____
 Mileage = _____
 Next Service Due: 11/0

Customer Signature: _____ Date: _____
TECHNICIAN

WEIGHT TRACEABILITY CERTIFICATE

TO: Southwest Research Inst,
6220 Culebra Rd Bldg 57 (Nwra Lab)
San Antonio, Tx

The Sartorius balances listed below have been calibrated by our
representative on 4-30-92

This is to certify that the test weights used are traceable to the
National Institute of Standards & Technology

Sartorius identification number of test weights used:	<u>530442</u>	<u>530408</u>
Calibrated to class:	<u>S</u>	<u>P</u>
Sartorius calibration date of test weights used:	<u>10-25-91</u>	<u>8-7-91</u>
N.I.S.T. Test Number:	<u>731/243669</u>	<u>732/246308</u>

Type and serial number of balances serviced:

RC 210P# 1070437A

3808 # 3903006

AE 240# 101237

Pm 240# 101237

Donald J. Jorg
Sartorius Service Representative

4-30-92

Date of Issue

sartorius
BALANCES AND SCALES

SARTORIUS CORPORATION
140 Wilbur Place
Bohemia, Long Island
New York, 11716

405... Place
... N.Y. 11716
... 3108

Balances and Scales SERVICE REPORT

Customer # _____ PO # M 3157
Customer: Southwest Research Inst
Bldg/Dept: Bldg 57 CNWRA Lab.
Street: 6220 Cullen Rd
City, State, Zip: San Antonio Tx
Contact: J. Prikeyl
Phone # _____ Date: _____
Spec. Instr: _____

Work Order #

Service Program	Travel Zone
<input checked="" type="checkbox"/> ROUTINE MAINTENANCE	<input checked="" type="checkbox"/> A
<input type="checkbox"/> HOURLY	<input type="checkbox"/> B
<input type="checkbox"/> EMERGENCY	<input type="checkbox"/> C
<input type="checkbox"/> WARRANTY	<input type="checkbox"/> D
<input type="checkbox"/> SHOP SERVICE	

ROUTINE MAINTENANCE

Line #	Model/Serial #	Make	Explanation
1	3808 # 3903006	Sartorius	Cal (2000.2)
2	RC410 # 10704375	Sartorius	Cal (999.9968)
3	DE 100 # 100000000	Mettler	OK (100000000)
ADDITIONAL UNITS LISTED ON ACCOMPANYING SHEETS			
Total units serviced =			Total labor hours =

TRIM/STUPE REPAIR

Line #	Model/Serial #	Make	Explanation	(in 1/4 hours) Labor hours
4	PM4600 # 20467	Bettor	Cal (1999.9)	.
2				.
3				.
Total hours =				

SPARE PARTS USED FOR REPAIR

Spare Part Number	Description	Qty. Used	Qty. to Bill	Used for Line #	Cost
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.
					\$.

SERVICES PERFORMED

Service Date: _____	Tech # _____	Tech Name: <u>Jim Long</u>
Travel Time = _____	Comments: <u>Balance Cleaned + Calib to Manu. Specs.</u>	
Return Time = _____		
Mileage = _____		
Next Service Due: _____		

Customer Signature: _____

Date: _____

TECHNICIAN

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 23196 ASSET # 3029 DATE 11/20/96

ITEM DATA:

Manufacturer SANTINIUS Model 202107
Description Balan Serial # 10704370
Accessories _____

ACTION REQUESTED CAL

CUSTODIAN DV 20 357 D. DUNK

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: NUCLEAR DOD NASA GLP SPPE
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

CONDITION RECEIVED: _____ Out of tolerance, repaired to specifications
_____ In tolerance, minor adjustments/repairs made
_____ In tolerance, no adjustments/repairs
 Out of tolerance, adjusted to specifications LIMITED
_____ Received into system, introduced or reactivated
_____ Calibration interval
_____ Reliability code

23196

ACTION TAKEN: (Calibration/Repair/Parts) CAL

CAL ENVIRONMENT:
Temperature 71 °F Humidity 51 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure QALCP or MB-007
Date 11/20/96 Accuracy MG
Cal Interval L Time to complete: _____
Next Cal due 1 MAY 97 Cal 3L Repair _____
Standards used (Asset#) _____

DATE COMPLETED _____
DATE PICKED UP CAL PICKED UP BY SIL

OUT. of. TOLUANE

DARRELL DUNK

BALANCE CALIBRATION VERIFICATION FORM

DATE: 1 NOV 94 MODEL: RC210P

SER. NO. 10704379 MAKE: SARTORIUS CALIBRATION DATES: _____

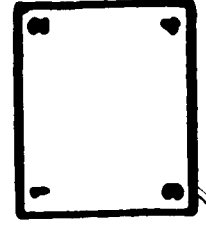
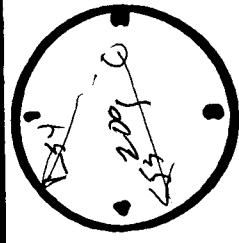
TEMPERATURE: 71 HUMIDITY: 51 LAST: _____ NEXT: _____

CALIBRATED BY: Terry P. White

BALANCE TOLERANCE: _____

BALANCE CAL. #: _____ LINE TOL.: _____ REP. TOL.: _____

	PANSE VERIFICATION				POUNCE GUIDE			
	1	2	3	4	1	2	3	4
DATA FILE	2007	1005	15					
FILE #1	199.99925	99.99964	.99990					
FILE #2								
FILE #3	200.00016	100.00007	1.00001					
MEAN								
STD. DEV.								



SELF CALIBRATION IN INTERVAL: _____ EXTEND: _____

COMMENTS: Limited because of Opium Load - now will be repaired by Sartorius

SIGNATURE: *[Signature]*

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CE

25063

CERTIFICATE # 25070 ASSET # 2029 DATE 8/12/97

ITEM DATA:

Manufacturer Sontidine Model EC5107
Description Balance Serial # 1574379
Accessories _____

ACTION REQUESTED cal check

CUSTODIAN DWEN D. Dunn

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: NUCLEAR DOD NASA GLP SPPE
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

CONDITION RECEIVED: Out of tolerance, repaired to specifications
 In tolerance, minor adjustments/repairs made
 In tolerance, no adjustments/repairs
 Out of tolerance, adjusted to specifications
 Received into system, introduced or reactivated
 Calibration interval
 Reliability code

ACTION TAKEN: (Calibration/Repair/Parts) g.c.k. after checking with Powell
Copy of work calibration with his
should be before use.
Scale was cal with M2 class and a seal.

25063

CAL ENVIRONMENT:
Temperature 74 °F Humidity 62 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure CSOP-118-001
Date 7/20/97 Accuracy M6
Cal Interval 6 Time to complete: 1
Next Cal due POct97 Cal 1.5 Repair _____
Standards used (Asset#) _____

DATE COMPLETED _____
DATE PICKED UP _____ PICKED UP BY _____

SwRI Form QA-169-2 cont on 5, 12

ID 2029

BALANCE CALIBRATION VERIFICATION FORM

DATE: 8 APR 97 MFGR: SARTORIUS MODEL: RC 2107

SER. NO. 10704379 RANGE: 200 CALIBRATION DATES

TEMPERATURE: 24 HUMIDITY: 62 LAST: 22 NOV 96 NEXT: 8 OCT 97

CALIBRATED BY: Terry A. White

BALANCE CAL #: 25063

LINE. TOL.: REP. TOL.: BALANCE TOLERANCES

RANGE VERIFICATION				RANGE VERIFICATION				POSITION GUIDE	
DATA PTS.	RANGE #1			RANGE #2			RANGE #3		
	1	2	3	1	2	3	1	2	3
5717	200	170	120	100	80	70	50	20	1
5718	199.9995	169.9995	119.9995	99.9990	80.0000	70.0000	49.9995	19.9998	.9999
1712	99.9996	/	/	/	/	/	/	/	/
10204	/	/	/	/	/	/	/	/	/
0204	/	/	/	/	/	/	/	/	/
MEAN									
STD. DEV.									



SHIFT VERIFICATION

SELF CALIBRATION Y/N INTERNAL: EXTERNAL:

WEIGHT VALUE

PAN POSITION

1 2 3 4

COMMENTS: Tol of eal weight is +/- 0.3mg

SIGNATURE: [Signature]

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 27011 ASSET # 3035 DATE 25 Sept 97

ITEM DATA:

Manufacturer TECHNICS Model PC 2107
Description Balanci Serial # 170579
Accessories _____

ACTION REQUESTED Cal

CUSTODIAN DUNN DUNN DUNN

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: DOD/NASA NUCLEAR GLP SPPE ISO
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.
By _____ Date _____

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
_____ (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

27011

ACTION TAKEN: (Calibration/Repair/Parts) OUT. of Tol 97-CD-39
pending 909 97
-reference limitation
on Cal cert, sticker

CAL ENVIRONMENT:
Temperature 71 °F Humidity 54 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure ELCP-WT-001
Date 29 Sept 97 Accuracy mg
Cal Interval 6 Reliability Code: _____
Next Cal due 29 MAR 98 Cal Time 2.5 Repair Time _____
Standards used (Asset#) _____

DATE COMPLETED _____
DATE PICKED UP [Signature] PICKED UP BY [Signature]

RFLA

BALANCE CALIBRATION VERIFICATION FORM

DATE: 29 Sep 1977
 BALANCE CAL NO.: 27011
 TEMPERATURE: 76
 HUMIDITY: 54
 BARO. PRESSURE: 17.27

MFGR: SANTON/US
 MODEL: RC210P
 SERIAL NO.: 10704378
 ASSET NO.: 2029
 RANGE: 200
 MASS UNCERTAINTY (U_m): _____

MFGR BALANCE TOLERANCES

LINEARITY: _____
 ECCENTRICITY: _____
 REPRODUCIBILITY: _____
 TEMP. DRIFT/°C: _____
 COMBINED MFR SPECS (U_{mfr}): _____

TUR = Comb. MFR Specs (U_{mfr}) = 1
 U_{m-std}

CALIBRATION DATES
 LAST CAL: 8/11/77
 NEXT CAL: 25/11/78

If TUR < 4:1, U_b = _____

DATA POINTS	RANGE VERIFICATION			
	RANGE 1	RANGE 2	RANGE 3	
	CALIBRATION POINTS		CALIBRATION POINTS	
200	100	50	20	10
200.00005	99.99995	49.99990	19.99985	9.99984
200.00005	99.99990	49.99985	19.99980	9.99979
200.00000	99.99985	49.99980	19.99975	9.99974
MEAN				
STD. DEV.				

POSITION GUIDE

1	2
3	4

SHIFT VERIFICATION

ACTUAL WEIGHT IN CENTER	PAN POSITION			
	1	2	3	4
DIFF.				

SELF CALIBRATION Y/N INTERNAL: _____ EXTERNAL: _____

COMMENTS:

 SIGNATURE: [Signature]

MEASURED UNCERTAINTY:

Linearity ± _____ g
 Eccentricity ± _____ g
 Comb. Uncertainty ± _____ g
 Rep. (σ) ± _____ g
 Mass tol. (2σ) ± _____ g
 Comb. Uncertainty ± _____ g

Std. Uncertainty ± _____ g
 Std. Uncertainty ± _____ g

(σ) ± _____ g
 (linearity, eccentricity, reproducibility, mass)

Expanded Unc. (k = 2) ± _____ g



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

9 October 1997

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SARTO RC210P
Description: ELECTRONIC BALANCE
Serial Number: 10704379
Asset Number: 002029

Environmental Conditions

Temperature: 76.00 Deg. F

Humidity: 54 % RH

Calibration Information

Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

The uncertainty of the calibration was sufficient to determine that the instrument met the manufacturer's specifications.

Calibration Date: 29 Sep 97

Calibration Procedure: CLCP-WT-001

Interval: 6 months

Uncertainty: MFGR SPEC

Next Calibration Due: 29 Mar 98

Received: Out of Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
001708	RICE LAKE	10G	WEIGHT STANDARD	C863	21 Jul 98
001710	RICE LAKE	20G	WEIGHT STANDARD	C865	21 Jul 98
001711	RICE LAKE	50G	WEIGHT STANDARD	C866	21 Jul 98
005116	RICE LAKE	100G	WEIGHT STANDARD	T097	21 Jul 98
005117	RICE LAKE	200G	WEIGHT STANDARD	T098	21 Jul 98

COPY

Certificate # 27011

Certificate of Calibration

9 October 1997

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SARTO RC210P
Description: ELECTRONIC BALANCE
Serial Number: 10704379
Asset Number: 002029

Signed: _____

Title: _____

LAST PAGE OF REPORT Total Pages Printed: 2

Certificate # 27011

To: DDunn@CNWRA@SwRI20
Cc: JPatterson@QACal@SwRI30
From: KHughs@QACal@SwRI30
Certify: N
Subject: limited cal request
Date: Thursday, October 9, 1997 at 2:24:54 pm CDT
Attached: None

Hi Darrell,

Time for another request for your OK on a limited calibration - this one comes after the fact, but in the future, they will precede the actual calibration...

Anyway, this is on the Sartorius RC210P balance, serial no. 10704379, that Jerry White calibrated on 29 September. The balance did not meet manufacturer's stated specifications, so we would like to give you a limited calibration to the actual uncertainty that was observed at the time of the calibration.

Once again, we will need an e-mail reply or other written acceptance of this limited calibration.

Thanks, Karin

Happy  Mail!



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

**CALIBRATION DEVIATION REQUEST
NO. 97-CD-39**

Date: 9 October 97

ITEM IDENTIFICATION: Sartorius RC210P balance, asn: 002029, sn: 10704379, belonging to Darrell Dunn (Div 20).


REASON FOR DEVIATION: The balance does not meet manufacturer's stated specifications. Technician requests that calibration be limited to uncertainty observed at the time of calibration, as listed on the Certificate of Calibration.

The customer understands this limitation and accepts it.

(Use additional attachments or documents as necessary)

Email from Cal Lab metrologist requesting Equipment Custodian's OK of the limitation.

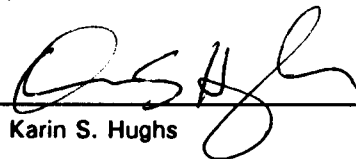
Requested by:


Jerry White

Date:

9 Oct 97

Approved by:


Karin S. Hughs

Date:

13 OCT 97

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 29181 ASSET # 2028 DATE 27 Nov 87

ITEM DATA:

Manufacturer TELEPHONICS Model RC 2107
Description Balance Serial # 1074371
Accessories _____

ACTION REQUESTED CAL

CUSTODIAN DIV 20 D DUNN

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: DOD/NASA NUCLEAR GLP SPPE ISO
OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

- CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
_____ (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

29181

ACTION TAKEN: (Calibration/Repair/Parts) Cal

CAL ENVIRONMENT:

Temperature 70 °F Humidity 70 %RH

CALIBRATED/REPAIRED:

By [Signature] Cal Procedure ELCP-WT.001

Date 27 Nov 87 Accuracy M

Cal Interval 6 Reliability Code: _____

Next Cal due 27 Sep 88 Cal Time 1.5 Repair Time _____

Standards used (Asset#) _____

DATE COMPLETED _____
DATE PICKED UP Cal PICKED UP BY [Signature]

DANROL 2100V

BALANCE CALIBRATION VERIFICATION FORM

DATE: 27 MAR 2017
 BALANCE CAL NO.: 29117
 TEMPERATURE: 73
 HUMIDITY: 73
 BARO. PRESSURE: 14.24

MFR: SARTORIUS
 MODEL: LC 2107
 SERIAL NO.: 10202379
 ASSET NO.: 2022
 RANGE:
 MASS UNCERTAINTY (Um):

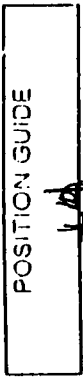
MFR BALANCE TOLERANCES
 LINEARITY:
 ECCENTRICITY:
 REPRODUCIBILITY:
 TEMP. DRIFT/°C:
 COMBINED MFR SPECS (U_{mfr}):

TUR = Comb. MFR Specs (U_{mfr}) = 1
 U_{m-sd}

CALIBRATION DATES
 LAST CAL: 29 Sep 15
 NEXT CAL: 27 Sep 17

If TUR < 4:1, U₀ = _____

DATA POINTS	RANGE VERIFICATION			
	RANGE 1 170	RANGE 2 170	RANGE 3 170	RANGE 4 170
RUN #1	149.9996	149.9997	149.9998	149.9999
RUN #2	149.9997	149.9998	149.9999	149.9999
RUN #3	149.9998	149.9999	149.9999	149.9999
MEAN	149.9997	149.9998	149.9999	149.9999
STD. DEV.				



ACTUAL WEIGHT IN CENTER	SHIFT VERIFICATION			
	1	2	3	4
DIFF.				

COMMENTS:
 SIGNATURE:

SWRI CALIBRATION LAB
 (210) 522-5215
 CAL 29 Sep 17 BY SW
 DUP 5 MAR 2017 ID 2028
 SN 10705379

MEASURED UNCERTAINTY:
 Linearity = _____ g
 Eccentricity = _____ g
 Comb Uncertainty = _____ g

Rep (σ) = _____ g
 Mass tol. (2σ) = _____ g
 Comb. Uncertainty = _____ g

Std Uncertainty = _____ g
 Std Uncertainty = _____ g
 (σ) = _____ g
 (linearity, eccentricity, reproducibility, mass)

Expanded Unc (k = 2) = _____ g

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 31406 ASSET # 2029 DATE 28 Sep 98

ITEM DATA:

Manufacturer SANTORIUS Model RC210P
Description BALANCE Serial # 10704379
Accessories _____

ACTION REQUESTED o n L

CUSTODIAN _____

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
_____ (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

Handwritten signature

ACTION TAKEN: (Calibration/Repair/Parts) o n L

CAL ENVIRONMENT:
Temperature 72 °F Humidity 47 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure CEP-WT-001
Date 28 Sep 98 Accuracy MA
Cal Interval 6 Reliability Code: _____
Next Cal due 28 Mar 99 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 517 516 171 170 1700 1706

DATE COMPLETED o n L 5, 15
DATE PICKED UP _____ PICKED UP BY _____

BALANCE CALIBRATION VERIFICATION FORM

DATE: 28 Sep 98
 BALANCE CAL NO.: 31406
 TEMPERATURE: 22
 HUMIDITY: 67
 BARO. PRESSURE: 14.27

MFGR: SANTOSUS
 MODEL: AC2107
 SERIAL NO.: 10704379
 ASSET NO.: 2039
 RANGE: 200
 MASS UNCERTAINTY (U_m): _____

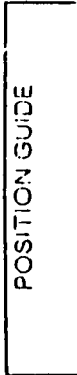
MFGR BALANCE TOLERANCES
 LINEARITY: _____
 ECCENTRICITY: _____
 REPRODUCIBILITY: _____
 TEMP. DRIFT/°C: _____
 COMBINED MFR SPECS (U_{mfr}): _____

CALIBRATION DATES
 LAST CAL: 27 Mar 98
 NEXT CAL: 28 Mar 99
 TUR = Comb. MFR Specs (U_{mfr}) = _____ : 1
 U_{m-sig}

If TUR < 4:1, U₉ = _____

5117
5116
1711
1710

DATA POINTS	RANGE VERIFICATION			
	RANGE 1	RANGE 2	RANGE 3	RANGE 4
1	2	3	4	5
200	120	100	80	50
200.00005	199.99995	199.99995	199.99995	199.99995
200.00005	199.99995	199.99995	199.99995	199.99995
200.00005	199.99995	199.99995	199.99995	199.99995
200.00005	199.99995	199.99995	199.99995	199.99995
MEAN				
STD. DEV.				



ACTUAL WEIGHT IN CENTER	SHIFT VERIFICATION			
	1	2	3	4
DIFF.				

SELF CALIBRATION Y/N INTERNAL: _____ EXTERNAL: _____

COMMENTS: Out balance w. 11 Lnd weight
Serial 5117, 5116, 1711, 1710
 SIGNATURE: [Signature]

MEASURED UNCERTAINTY:
 Linearity = _____ g
 Eccentricity = _____ g
 Comb. Uncertainty = _____ g
 Rep (σ) = _____ g
 Mass tol. (2σ) = _____ g
 Comb. Uncertainty = _____ g

Std Uncertainty = _____ g
 Std Uncertainty = _____ g
 (σ) = _____ g
 (linearity, eccentricity, reproducibility, mass)

SWRI CALIBRATION LAB
 (210) 522-5255
 CAL 27 MAR 98 BY [Signature]
 DUE 23 OCT 98
 SIN 10704379
 Expanded Unc (k = 2) = _____ g

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 33816 ASSET # 2029 DATE 25 MAR 99

ITEM DATA:

Manufacturer SANTOPUS Model RC 210P
Description BALANCE Serial # 10704379
Accessories _____

ACTION REQUESTED CAL

CUSTODIAN DW20 DORRELL DUNN 357

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

Work involves proprietary/confidential information or equipment (Yes) (No)

- CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
_____ (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

33816

ACTION TAKEN: (Calibration/Repair/Parts) _____

MEASURING UNCERTAINTY is $\pm 0.48mg$ (0-60), ± 0.54 (60/10)
 $\pm 0.56mg$ (110 to 210)

CAL ENVIRONMENT:
Temperature 72°F Humidity 43 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure CALP-WT-007
Date 25 MAR 99 Accuracy \pm
Cal Interval 5 Reliability Code: _____

Next Cal due 25 SEP 99 Cal Time _____ Repair Time _____

Standards used (Asset#) 5116 5117 1712 11 10 09 0E

DATE COMPLETED cont on setu JMD

DATE PICKED UP _____ PICKED UP BY _____

BALANCE CALIBRATION VERIFICATION FORM

DATE: 25 MAR 99
 BALANCE CAL NO.: 53812
 TEMPERATURE: 72
 HUMIDITY: 43
 BARO. PRESSURE: 74.35

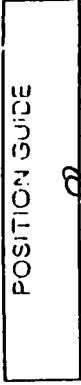
MFGR: SANTALIO
 MODEL: R210P
 SERIAL NO.: 10704379
 ASSET NO.: 2027
 RANGE: 209
 MASS UNCERTAINTY (U_m): _____

MFGR BALANCE TOLERANCES
 LINEARITY: _____
 ECCENTRICITY: _____
 REPRODUCIBILITY: _____
 TEMP. DRIFT/°C: _____
 COMBINED MFR SPECS (U_{mfr}): _____

CALIBRATION DATES
 LAST CAL: 24 MAR 98
 NEXT CAL: 25 MAR 99
 TUR = Comb. MFR Specs (U_{mfr}) = 1
 U_{m-stg} = _____
 If TUR < 4:1, U₉₅ = _____

1712 1711 1710 1705

DATA POINTS	RANGE VERIFICATION			
	RANGE 1	RANGE 2	RANGE 3	RANGE 4
5117				
200	120	90	70	50
199.99995	119.99995	89.99995	69.99995	49.99995
199.99995	119.99995	89.99995	69.99995	49.99995
199.99995	119.99995	89.99995	69.99995	49.99995
199.99995	119.99995	89.99995	69.99995	49.99995
MEAN				
STD. DEV.				



SHIFT VERIFICATION

SELF CALIBRATION Y/N INTERNAL: _____ EXTERNAL: _____

ACTUAL WEIGHT IN CENTER	PAN POSITION			
	1	2	3	4
DIFF.				

COMMENTS: _____

SIGNATURE: _____

MEASURED UNCERTAINTY:

Linearity = _____ g
 Eccentricity = _____ g
 Comb Uncertainty = _____ g

Rep (σ) = _____ g
 Mass tol. (2σ) = _____ g
 Comb Uncertainty = _____ g

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Expanded Unc (K=2) = _____ g

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

B57
25 Sept 99

WORK ORDER

WORK ORDER # 36122 ASSET # 2029 DATE 23 Sept 99

ITEM DATA:

Manufacturer Sartorius Model EC210P
Description Balance Serial # 16704379
Accessories _____

ACTION REQUESTED _____

CUSTODIAN Darrell Dunn

Turned in by: _____ Phone _____

CHARGE # 20-0751-006 Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: Out of tolerance
 In tolerance
 Damaged (Contact customer)
 Contact _____ Date _____
 Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) work adjusted w/ no weight / check

CAL ENVIRONMENT:
Temperature 77 °F Humidity 41 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure RECIP. WI-001 AUG 91
Date 24 Sept 99 Accuracy _____
Cal Interval 6 Reliability Code _____
Next Cal Due 21 MAR 00 Cal Time 2 Repair Time _____
Standards used (Asset #) 5117 5116 7102

DATE COMPLETED work on site

DATE PICKED UP _____ PICKED UP BY _____

36122

BALANCE CALIBRATION VERIFICATION FORM

DATE: 24 Sep 98
 BALANCE CAL NO.: 36122

TEMPERATURE: 77
 HUMIDITY: 43
 BARO. PRESSURE: 14.33

MFGR: SANTONIUS
 MODEL: RC 210P
 SERIAL NO.: 10704379
 ASSET NO.: 2029
 RANGE: 200
 MASS UNCERTAINTY (U_m): _____

MFGR BALANCE TOLERANCES

LINEARITY: _____
 ECCENTRICITY: _____
 REPRODUCIBILITY: _____
 TEMP. DRIFT/°C: _____
 COMBINED MFR SPECS (U_{mfr}): _____

TUR = Comb MFR Specs (U_{mfr}) = 1
 U_{m-sig}

LAST CAL: 25 MAR 99
 NEXT CAL: 24 MAR 00

IF TUR < 4.1, U₉₅ = _____

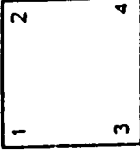
5117 5116 7102

RANGE VERIFICATION

DATA POINTS	RANGE 1			RANGE 2			RANGE 3			
	CALIBRATION POINTS	1	2	CALIBRATION POINTS	1	2	CALIBRATION POINTS	1	2	
RUN # 1	206	150	120	100	100	130	50	50	26	1
RUN # 2	200.0005	190.0000	19.9999	97.9999	70.0002	49.9997	19.9997	0.9999	0.9999	2
RUN # 2	200.0005	150.0005	15.9999	55.9999	70.0002	49.9997	19.9997	0.9999	0.9999	2
MEAN										
STD. DEV.										

POSITION GUIDE

1 10



SHIFT VERIFICATION

SELF CALIBRATION IN INTERNAL: _____ EXTERNAL: _____

ACTUAL WEIGHT IN CENTER	PAN POSITION		
	1	2	3
DIFF			

COMMENTS: _____

SIGNATURE: _____

MEASURED UNCERTAINTY:

Linearity = _____ g
 Eccentricity = _____ g
 Comb Uncertainty = _____ g

Std Uncertainty = _____ g
 Std Uncertainty = _____ g

Rep (σ) = _____ g
 Mass tol (2σ) = _____ g
 Comb Uncertainty = _____ g

(σ) = _____ g
 (linearity, eccentricity, reproducibility, mass)

Expanded Unc (k=2) = _____ g

[Handwritten Signature]
 1977.97030
 after calibration 200.00040
 TRV / +1.5% for weight

WORK ORDER 38381

Date Received 3/24/00

Asset No. 002029 Manufacturer SARTORIUS Model RC210P
 Description ELECTRONIC BALANCE Serial Number 10704379
 Accessory Received/Required NONE
 Div/CC ID NONE Accessory to Asset No. N/A Accuracy MFG SPECS
 Div/CC DIV20 Location B57 Custodian DARRELL DUNN Tel. 6090
 Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE
 Work Requested CALIBRATION ONSITE
 Receiving Inspection _____
 Delivered By N/A Tel. 6090

WORK HISTORY

Date	Start Time	Stop Time	Notes

PARTS

Part Name	Part Number	Cost	Failure Description

WORK SUMMARY

Failure Description _____

Repair Action _____

Cal Procedure CLCP-WT-001, 12/99 Temp 23 F Hum 63 %

Tech enl Cal Hrs. 1.5 Repair Hrs. _____ Part Cost _____

Action Taken enl

Standards Used 5117 5116 1712

Date Cal 24 Mar 2000 Int. 6 Mo. Date Due 21 Apr 2000 Reliability Code D

Date Picked Up _____ Picked Up By _____

workreq.rpt Rev 30 Jan 00

enl *enl* *enl*

38381

ELECTRONIC BALANCE CALIBRATION DATA SHEET

WORK ORDER 38381 DATE 24 MAR 2001 TECHNICIAN Jmw

MODEL PC210P SERIAL NO 10714329 ASSET NO. 2029

LOCATION B57

AMBIENT: TEMP 73 HUMIDITY 63 BARO PRESS 14.27

1) CALIBRATION CHECK

AS FOUND FULL-CAPACITY INDICATION 200.00035 5117

POST-CALIBRATION INDICATION 200.00035 TOLERANCE 5⁰ P/F

2) REPEATABILITY

1	100.00006	6	100.00002
2	100.00006	7	99.99995
3	100.00004	8	99.99998
4	99.99998	9	99.99996
5	100.00002	10	99.99998

SWRI CALIBRATION LAB
(210) 522-5215

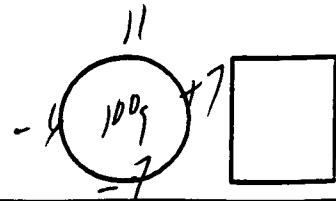
CAL 24 SEPT 99 BY Jmw
DUE 24 MAR 00 ID 2029
S/N 10704329

CAL EXTERNAL
WITH LAB WEIGHT
DEFENS USE/US

5116

84

S.D. _____ TOLERANCE _____ P/F _____



3) OFF-CENTER ERROR

1	100.00011	3	99.99994
2	99.99993	4	100.00007

TOLERANCE _____ P/F _____

4) NON-LINEARITY

TEST POINT	INDICATION	NON-LIN ERROR	TEST WEIGHT S/N
0		—	—
25%	50.00007		
50%	50.00005		
75%	50.00003		
100%	50.00007		

1704

TOLERANCE _____ P/F _____

5) COMMENTS:



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

24 March 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SARTORIUS RC210P
Description: ELECTRONIC BALANCE
Serial Number: 10704379
Asset Number: 002029

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 73.0 Degrees Fahrenheit Humidity: 63 % RH

Calibration Date: 24 Mar 00 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Jim Patterson, Supervisor or Walt Hill, Metrologist

Certificate # 38381

m:\nona21a.rpt Rev date 13 Apr 99

Measurements performed by:

Jerry White, Technician

Page 1 of 1

WORK ORDER 40565

Date Received 9/14/00

Asset No. 002029 Manufacturer SARTORIUS Model RC210P
 Description ELECTRONIC BALANCE Serial Number 10704379
 Accessory Received/Required NONE
 Div/CC ID NONE Accessory to Asset No. N/A
 Div/CC DIV20 Location B57 Custodian DARRELL DUNN Tel. 6090
 Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE
 Work Requested CALIBRATION ONSITE
 Receiving Inspection
 Delivered By N/A Tel. 6090

WORK HISTORY

Date	Start Time	Stop Time	Notes

PARTS

Part Name	Part Number	Cost	Failure Description

40565

WORK SUMMARY

Failure Description _____

Repair Action _____

Cal Procedure CLCP-WT-001, 12/99 Temp 72 F Hum 52 %

Tech JW Cal Hrs. 1.5 Repair Hrs. _____ Part Cost _____

Action Taken on L

Standards Used 7102 7103

Date Cal 15 Sep 2000 Int. 6 Mo. Date Due 15 Nov 2001 Reliability Code _____

Date Picked Up _____ Picked Up By _____

cal on site

ELECTRONIC BALANCE CALIBRATION DATA SHEET

WORK ORDER _____ DATE 15 Sept 2000 TECHNICIAN JW

MODEL RC210P SERIAL NO. _____ ASSET NO. _____

LOCATION B57

AMBIENT: TEMP 72 HUMIDITY 52 BARO PRESS 14.26

1) CALIBRATION CHECK

AS FOUND FULL-CAPACITY INDICATION 199.9990 (=)

POST-CALIBRATION INDICATION 199.9990 TOLERANCE _____ P/F _____

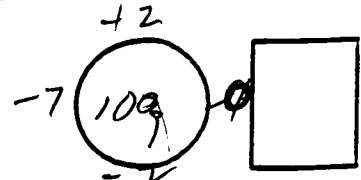
2) REPEATABILITY

1	99.99994	6	99.99996
2	99.99992	7	99.99994
3	99.99992	8	99.99994
4	99.99994	9	99.99997
5	99.99994	10	99.99992

710^v
7103

SWRI CALIBRATION LAB
(210) 522-5215
CAL 24 MAR 2000 BY JW
DUR 45 min ID 2029
S/N 16704379
CAL EXTERNAL
w/ LAB WEIGHT
42084 1/31/00

S.D. _____ TOLERANCE _____ P/F _____



3) OFF-CENTER ERROR

1		3	
2		4	

TOLERANCE _____ P/F _____

4) NON-LINEARITY

TEST POINT	INDICATION				NON-LIN ERROR	TEST WEIGHT S/N
	0-60	60	110	110 210		
0	0.0	(40) 0.000	110	0.0000	-	-
25%	14.99999	14.99994	19.99995			
50%	14.99996	14.99995	19.99997			
75%	14.99998	14.99996	19.99996			
100%	14.99996		19.99999			

TOLERANCE _____ P/F _____

210
110
60

5) COMMENTS:



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

15 September 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SARTORIUS RC210P
Description: ELECTRONIC BALANCE
Serial Number: 10704379
Asset Number: 002029

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. The results of this calibration relate only to the individual item as described above. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 72.0 Degrees Fahrenheit Humidity: 52 % RH


Calibration Date: 15 Sep 00 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:



Jim Patterson, Supervisor, or Walt Hill, Metrologist

Certificate # 40565

m\la2la.rpt Rev date 22 May 00

Measurements performed by:



Jerry White, Technician

Page 1 of 1

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by WHILL at 11:11:05AM on 3/1/01

Work Order **444042612**

Arrived 3/1/01

Asset No. 002029

Manufacturer SARTORIUS

Model RC210P

Instrument Type/Class BALANCE

Serial No. 10704379

Accessory No. _____

Calibration Procedure CLCP-WT-001, 12/99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel. 6090

Charge/Project No. 20.00751.006

Delivered By / Telephone _____

IN4CAL

Special Instructions _____

WORK NOTES

Date	Hours	Remarks/Notes
<u>3-21-01</u>		<u>Sartorius P.O. Carolh 149 Cal. # 375⁰⁰ estimate</u>
		<u>RNA# 200411 P.O.# 129383R I.R.# 57528</u>
		<u>S.T.# 380516 Shipped out per D. Dunn verbal</u>
<u>5-4-01</u>		<u>Returned to SRI assigned to E. White</u>
<u>5-8-01</u>	<u>1h</u>	<u>(Received with a ERROR-54) (M)</u>
<u>10 JUL 01</u>	<u>2h</u>	<u>(SOT) comm work -</u>
<u>27 JUL 01</u>	<u>4h</u>	<u>-CNC-</u>

REPAIR PARTS

Date	Hours	Part Name	Part Number	Failure Description	Cost
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

WORK SUMMARY

Failure Description _____

Repair Action _____

Calibration Procedure _____ Temp F Hum. %

Tech _____ Totals Cal Hours _____ Repair Hours _____ Parts Cost _____

Standards Used _____

Date Picked Up _____

Picked Up By _____

42612

5/11/2001

ST# 384803 shipped for warranty repair

6-5-01

Assigned to Vince for calibration repair
by AFB.

6-12-01

Called Russell from Sacramento to confirm

RMA # per J. White. left message.

RMA # 20773 S.T. # 384803

51657

ELECTRONIC BALANCE CALIBRATION DATA SHEET

WORK ORDER 440A262 DATE _____ TECHNICIAN R Dykstra

MODEL RC210P SERIAL NO. 10704379 ASSET NO. 002029

LOCATION B 57 bill correction lab

AMBIENT: TEMP _____ HUMIDITY _____ BARO PRESS _____

1) CALIBRATION CHECK 200g

AS FOUND FULL-CAPACITY INDICATION 199.99955g

POST-CALIBRATION INDICATION _____ TOLERANCE ±0.54mg P/F _____

2) REPEATABILITY 100g

1		6	
2		7	
3		8	
4		9	
5		10	

S.D. _____ TOLERANCE ±0.15mg P/F _____



3) OFF-CENTER ERROR 100g

1		3	
2		4	

TOLERANCE ±0.25mg P/F _____

4) NON-LINEARITY

TEST POINT	INDICATION	NON-LIN ERROR	TEST WEIGHT S/N
0		—	—
25%			
50%			
75%			
100%			

TOLERANCE ±0.15mg P/F _____

5) COMMENTS: Initially Balance was not level

To: DDunn@CNWRA@SwRI20
From: RCruz@QACal@SwRI30
Originated by: "Darrell Dunn" <ddunn@swri.edu>
Cc: RDykstra@QACal@SwRI30,WHill@QACal@SwRI30
Subject: fwd: RE: Sartorius Model RC 210 P
Attachment: Headers.822,BEYOND.RTF
Date: 3/21/01 1:34 PM

Darrell,

The evaluation cost for this Balance is \$375.00. Sartorius requires we send them a P.O. for this amount prior to start of work. If the required work exceeds this amount they will send a new estimate. If the required amount is less than \$375.00 they will charge us the lesser amount. The \$95.00 charge will only apply if we decline all services. I will send out there balance today with your approval and the purchase req will follow. respond by phone or e-mail as soon as possible.

Thanks,
Ralph Cruz
x5215

From: RDykstra@QACal@SwRI30, on 3/21/01 1:37 PM:
To: RCruz@QACal@SwRI30

----- Original Text -----

From: "Darrell Dunn" <ddunn@swri.edu>, on 3/19/01 4:54 PM:
To: Incognito2@CTC@SwRI26(<ddunn@swri.edu>),rdykstra@qacal@swri30
Cc: WHill@QACal@SwRI30

Yes, this sounds reasonable. I will look into a replacement but that may not be approved quickly, if at all. Let me know if you need a signature or some other information or assistance. Thanks.

-----Original Message-----

From: rdykstra@swri.edu (mailto:rdykstra@swri.edu)
Sent: Monday, March 19, 2001 3:57 PM
To: ddunn@swri.edu
Cc: WHill@swri.edu
Subject: Sartorius Model RC 210 P

Darrell, I have talked with Sartorius and its a \$95.00 initial fee to evaluate what is wrong with the balance. Sartorius will come up with an estimate and send that to us for approval. At that point you will have to make a decision as far as if you want the instrument fixed. Does this sound like a workable plan? Give me your feedback on how you want to proceed. I have not looked into the cost of a new balance.
Roger Dykstra

To: DDunn@CNWRA@SwRI20
From: RCruz@QACal@SwRI30
Cc:
Subject:
Attachment:
Date: 4/10/01 2:16 PM

A Sartorius Balance Model # RC210P S/N 10704379 was sent to the mfg for repair. The repair and calibration was quoted as \$375.00 on P.R.575289. After evaluation of the balance the mfg sent a quote of \$567.38 for repair and calibration. Please inform me as soon as possible if you want repairs to continue.

Thanks,
Ralph Cruz
x5215

To: Incognito2@CTC@SwRI26 [<ddunn@swri.edu>]
From: RCruz@QACal@SwRI30
Cc:
Subject: RE: sartorius balance
Attachment:
Date: 4/10/01 4:09 PM

With your e-mail approval of the repairs purchasing will amend the original purchase request.

Thanks,
Ralph Cruz
x5215

From: "Darrell Dunn" <ddunn@swri.edu>, on 4/10/01 4:09 PM:

OK. Are you going to send me another purchase requisition or is this going to be a change order?

-----Original Message-----

From: rcruz@swri.edu (mailto:rcruz@swri.edu)
Sent: Tuesday, April 10, 2001 3:08 PM
To: ddunn@swri.edu
Subject: sartorius balance

A Sartorius Balance Model # RC210P S/N 10704379 was sent to the mfg for repair.
The repair and calibration was quoted as \$375.00 on P.R.575289. After evaluation of the balance the mfg sent a quote of \$567.38 for repair and calibration. Please inform me as soon as possible if you want repairs to continue.

Thanks,
Ralph Cruz
x5215

To: rcruz@qacal@swri30
From: "Darrell Dunn" <ddunn@swri.edu>
Cc:
Subject: RE: sartorius balance
Attachment: Headers.822
Date: 4/10/01 4:52 PM

I approve.

-----Original Message-----

From: rcruz@swri.edu (mailto:rcruz@swri.edu)
Sent: Tuesday, April 10, 2001 4:40 PM
To: ddunn@swri.edu
Subject: RE: sartorius balance

With your e-mail approval of the repairs purchasing will amend the original purchase request.

Thanks,
Ralph Cruz
x5215

----- Original Text -----

From: "Darrell Dunn" <ddunn@swri.edu>, on 4/10/01 4:09 PM:

OK. Are you going to send me another purchase requisition or is this going to be a change order?

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From: rcruz@swri.edu (mailto:rcruz@swri.edu)
Sent: Tuesday, April 10, 2001 3:08 PM
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Thanks,
Ralph Cruz
x5215

Sartorius Corporation
131 Heartland Boulevard
Edgewood, NY 11717
800/645-3108

SERVICE PACKING LIST
Our ref. no.: 200411/20076933

Date : 04/27/2001

For attention of

SOUTHWEST RESEARCH INSTITUTE
PO Box 28510
SAN ANTONIO TX 78228
USA

Ship Method : UPS Ground
Your Order No. : 179449R
Sold To Party : SOUTHWEST RESEARCH INSTITUTE
Model : RC210P
Serial-No. : 10704379

Accessories included:
-

Please note that all repairs are warranted for 90 days from the date of this document. All service work to the above product has been carried out in strict compliance with our ISO certification. In the unlikely event of the goods being received damaged, or if there appears to be a discrepancy in connection with the content of this shipment, please contact Sartorius Corporation within three business days of receipt. Please reference the above service order number.

ELECTRONIC BALANCE CALIBRATION DATA SHEET

WORK ORDER _____ DATE 11 June 01 TECHNICIAN V. Morlan

MODEL _____ SERIAL NO. _____ ASSET NO. _____

LOCATION _____

AMBIENT TEMP _____ HUMIDITY _____ BARO PRESS _____

1) CALIBRATION CHECK

RMA, 207713

AS FOUND FULL-CAPACITY INDICATION 199.99995

POST-CALIBRATION INDICATION _____ TOLERANCE _____ P/F _____

2) REPEATABILITY

*Found Linearity at 100g and 100.0012g
found some slight
to repair. (M)*

1		6	
2		7	
3		8	
4		9	
5		10	

S.D. _____ TOLERANCE _____ P/F _____



3) OFF-CENTER ERROR

1		3	
2		4	

TOLERANCE _____ P/F _____

4) NON-LINEARITY

TEST POINT	INDICATION	NON-LIN ERROR	TEST WEIGHT S/N
0		—	—
25%			
50%			
75%			
100%			

TOLERANCE _____ P/F _____

REPAIR TAG # 28918

RGA #: 761246 MODEL: 100

DATE RECEIVED: 5/15/01 S/N: 074379

DATE ESTIMATED: _____ CUSTOMER: _____

DATE APPROVED: _____

DATE REPAIR COMPLETED: 5/25/01

DATE QC COMPLETED: 5/25/01

RECEIVED WITH: (circle YES or NO)

LINE CORD Y N / DUST COVER Y N / FACTORY BOX Y N / ADAPTER Y N

PAN Y N / MANUAL Y N / PAN SUPPORT Y N / PAN IN PLACE Y N

ORIGINAL PACKAGING Y N / POWER PACK Y N (S/N _____)

SCALE PACKAGING: EX GD FR PR NONE

ELECTRONIC BALANCE CALIBRATION DATA SHEET

WORK ORDER 44042612 DATE 27 JUL 2001 TECHNICIAN JHW
 MODEL RC210P SERIAL NO. 10704379 ASSET NO. 2029
 LOCATION (B57) Loentlin of Biloma
 AMBIENT TEMP 72 HUMIDITY 57 BARO PRESS 14

1) CALIBRATION CHECK

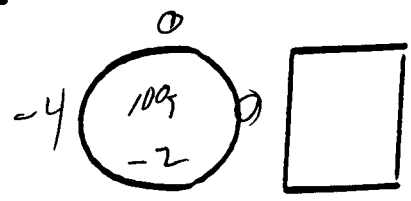
AS FOUND FULL CAPACITY INDICATION 200.00000
 POST-CALIBRATION INDICATION 200.00000 TOLERANCE _____ P/F _____

2) REPEATABILITY

1	100.00008	6	100.00010
2	6	7	6
3	4	8	6
4	4	9	6
5	4	10	4

7103
7102

S.D. _____ TOLERANCE _____ P/F _____



3) OFF-CENTER ERROR

1		3	
2		4	

TOLERANCE _____ P/F _____

4) NON-LINEARITY

TEST POINT	INDICATION	NON-LINEARITY
0	0.00000	-
25%	50.00004	
50%	50.00001	
75%	50.00002	
100%	49.99996	

LabServe™
by **sartorius**

6/29/01	FOR SERVICE (800) 645-3108
RC210P	10704379
6/02	E25
CAL. DUE DATE	TECHNICIAN

sartorius corporation
REF: S70B0900

TOLERANCE _____ P/F _____



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

27 July 2001

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SARTORIUS RC210P
Description: BALANCE
Serial Number: 10704379
Asset Number: 002029
Work Order Number: 444042612

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. The results of this calibration relate only to the individual item as described above. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 72.0 Degrees Fahrenheit Humidity: 57 % RH

Calibration Date: 27 Jul 01 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: OUT OF TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:

Jerry White, Technician

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Received by MROMERO, 1/22/02 1:15:40PM

Arrived 1/22/02

Work Order **444046885**

Asset No. 002029 Manufacturer SARTORIUS

Model RC210P

Equipment Type BALANCE

Serial No. 10704379

Accessory No. _____

Interval 6 M

Calibration Procedure CLCP-WT-001, 12/99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel 6090

IN4CAL

Special Instructions _____

Notify before adjustments or repairs. () Provide data with certificate () Certificate Typ _____

Charge/Project No. 00751.006 1.20

Requester / Telephone _____

This information is correct for the work requested. _____

WORK NOTES

Date	Hours	Remarks/Notes
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

SwRI Cal-Lab By: jaw
CAL: Jul 27, 01 DUE: Jan 27, 02
AN: 002029 SN: 10704379

Date	Hours	Part Name	Part Number	Failure Description	Cost
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

WORK SUMMARY

Failure Description _____

Repair Action _____

Tech MAD Cal Hrs. 2.0 Repair Hrs _____ Parts Cost _____ Temp 13 F Hum. 54 %

Standards Used M11, S117

Date Picked Up 22 JAN. 02

Picked Up By CAL ON SITE

444046885



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

22 January 2002

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SARTORIUS RC210P
Description: BALANCE
Serial Number: 10704379
Asset Number: 002029
Work Order Number: 444046885

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 73.0 Degrees Fahrenheit Humidity: 54 % RH

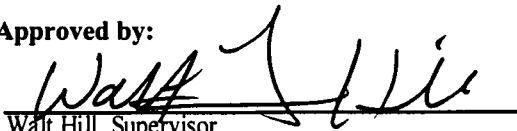
Calibration Date: 22 Jan 02 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: SEE ATTACHED DATA


Condition as Returned: SEE REMARKS

Remarks: SEE DATA SHEET FOR UNCERTAINTIES.

Approved by:


Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:


Mark Romero, Technician

Southwest Research Institute
Calibration Laboratory
Calibration Data Sheet

Work Order 444046885	Mfr. Sartorius	Technician Mark A. Romero
Asset No. 2029	Model RC210P	Procedure CLCP-WT-001, 12/99
Serial No. 10704379	Type Balance	Cal Date 22-Jan-02

Location: Bldg. 57/ Corrosion Lab L111

Ambient Conditions: 73 F 54 %RH 14.29 PSIA

Operational Check: Limits +/- : 0.00030 g Uncertainty: 0.00045 g

STD Mass Load	As Found Indication	Instrument Error
200.00000 g	199.99970 g	-0.00030 g

Post Calibration Check:

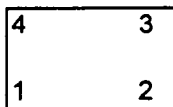
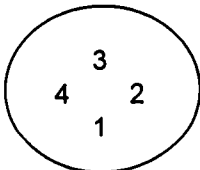
STD Mass Load	Post calibration Indication	Instrument Error	Results *
200.00000 g	200.00000 g	0.00000 g	

Repeatability Check: Mass Load: 200.00000 g

1	200.00000 g	6	199.99995 g
2	200.00000 g	7	199.99995 g
3	200.00000 g	8	200.00000 g
4	200.00000 g	9	200.00000 g
5	200.00000 g	10	200.00000 g

Std Deviation	Tolerance
0.00002 g	0.00015 g

Off-Centerline Check: Mass Load: 200.00000 g Uncertainty: 0.00045 g



	Indication	Instrument Error	+/- Limits	Results *
1	-0.00007 g	-0.00007 g	0.00025	
2	0.00000 g	0.00000 g	0.00025	
3	0.00000 g	0.00000 g	0.00025	
4	0.00000 g	0.00000 g	0.00025	

Non-Linearity Check: Range: 200.00000 g Uncertainty: 0.00045 g

STD Mass Load	Indication	Instrument Error	+/- Limits	Results *
0.00000 g	0.00000 g	0.00000 g	0.00015	
50.00000 g	50.00006 g	0.00006 g	0.00015	
100.00000 g	49.99999 g	-0.00001 g	0.00015	
150.00000 g	49.99996 g	-0.00004 g	0.00015	
200.00000 g	49.99989 g	-0.00011 g	0.00015	

Remarks: Readability 0.01 mg (60g), 0.02 mg (110g), and 0.05 mg (210g). Standards used 1711 and 5117.

* The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, which provides a level of confidence of approximately 95%. The results can be Pass, Fail, or if blank "not determinable". If "not determinable" the end user is responsible in determining whether the results meet their requirements.

Southwest Research Institute
Calibration Laboratory
Uncertainty Budget

Sartorius RC210P (TI)	Units	Range	Acc. +/- (1)	Resolution
	mg	210 000		0.57
Source of Uncertainty	Value	Distribution	Divisor	Std. Uncert. mg
Standard weight (2)	0.323	Rectangular	Sqrt 3	0.187
Resolution	0.05	Rectangular	Sqrt 3	0.0289
Air buoyancy (3)	0.210	Rectangular	Sqrt 3	0.121
Combined Uncertainty	RSS			0.224
Expanded Uncertainty	$k=2$			0.45
Test Accuracy Ratio (TAR)	TI Acc./STD Acc.			
	1.8	to 1		
Test Uncertainty Ratio (TUR)	TI Acc./Muk=2			
	1.3	to 1		
<p>(1) Combined Uncertainty (2 sigma) of mfg std dev. (0.15g), linearity (0.15g), corner load (0.25g), & Class E2 200g (0.30mg) internal check weight tolerance.</p> <p>(2) RSS of combined tolerances for standard wghts [Class E2 200g (0.30mg) and S1 50g (0.12mg)].</p> <p>(3) No correction is made for air buoyancy. As the span of the weighing machine was adjusted before calibration, the uncertainty limits were estimated to be 1 ppm of the nominal value ie= 0.210 mg.</p>				

Sartorius RC210P (TI)	Units	Range	Acc. +/- (1)	Resolution
	mg	110 000		0.54
Source of Uncertainty	Value	Distribution	Divisor	Std. Uncert. mg
Standard weight (2)	0.345	Rectangular	Sqrt 3	0.1993
Resolution	0.02	Rectangular	Sqrt 3	0.0115
Air buoyancy (3)	0.110	Rectangular	Sqrt 3	0.0635
Combined Uncertainty	RSS			0.209
Expanded Uncertainty	$k=2$			0.42
Test Accuracy Ratio (TAR)	TI Acc./STD Acc.			
	1.6	to 1		
Test Uncertainty Ratio (TUR)	TI Acc./Muk=2			
	1.3	to 1		
<p>(1) Combined Uncertainty (2 sigma) of mfg std dev. (0.12g), linearity (0.15g), corner load (0.25g), & Class E2 200g (0.30mg) internal check weight tolerance.</p> <p>(2) RSS of combined tolerances for check wghts [Class E2 200g (0.30mg), E2 100g (0.15mg), S1 20g (0.074mg), and S1 5g (0.034mg)].</p> <p>(3) No correction is made for air buoyancy. As the span of the weighing machine was adjusted before calibration, the uncertainty limits were estimated to be 1 ppm of the nominal value ie= 0.110 mg.</p>				

Southwest Research Institute
 Calibration Laboratory
 Uncertainty Budget

Sartorius RC210P (TI)	Units	Range	Acc. +/- (1)	Resolution
	mg	60 000	0.50	0.01
Source of Uncertainty	Value	Distribution	Divisor	Std. Uncert. mg
Standard weight (2)	0.329	Rectangular	Sqrt 3	0.190
Resolution	0.01	Rectangular	Sqrt 3	0.00577
Air buoyancy (3)	0.060	Rectangular	Sqrt 3	0.0346
Combined Uncertainty			RSS	0.193
Expanded Uncertainty			k=2	0.39
Test Accuracy Ratio (TAR)	TI Acc./STD Acc.			
	1.5	to 1		
Test Uncertainty Ratio (TUR)	TI Acc./Muk=2			
	1.3	to 1		
<p>(1) Combined Uncertainty (2 sigma) of mfg std dev. (0.06g), linearity (0.15g), corner load (0.25g), & Class E2 200g (0.30mg) internal check weight tolerance.</p> <p>(2) RSS of combined tolerances for check wghts [Class E2 200g (0.30mg), S1 50g (0.12mg), S1 10g (0.05mg), and S1 5g (0.034mg)].</p> <p>(3) No correction is made for air buoyancy. As the span of the weighing machine was adjusted before calibration, the uncertainty limits were estimated to be 1 ppm of the nominal value ie= 0.06 mg.</p>				