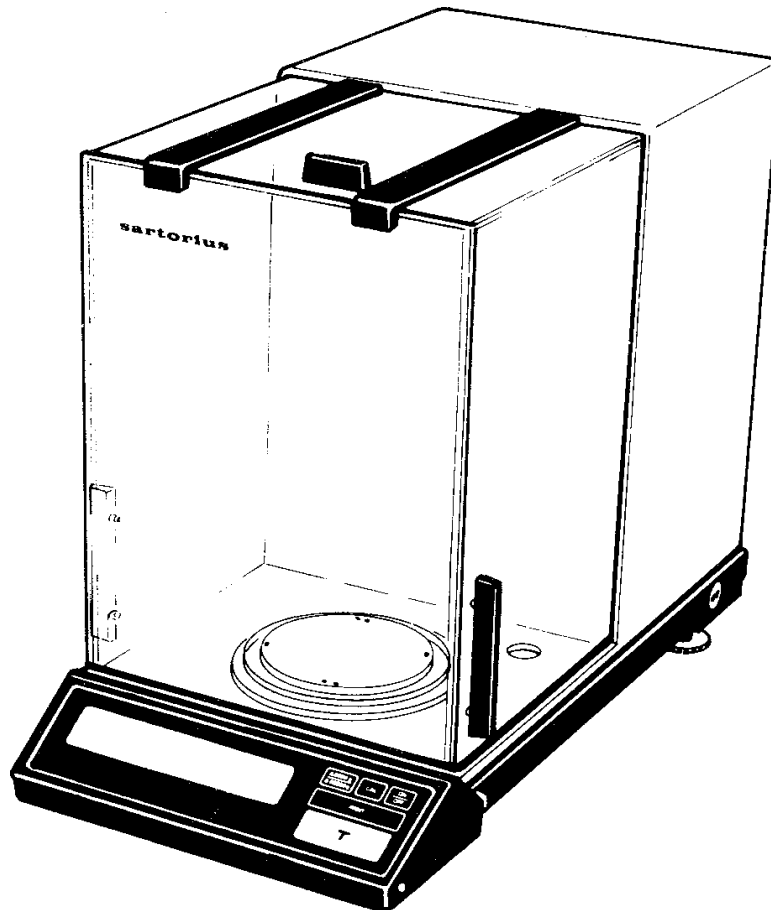


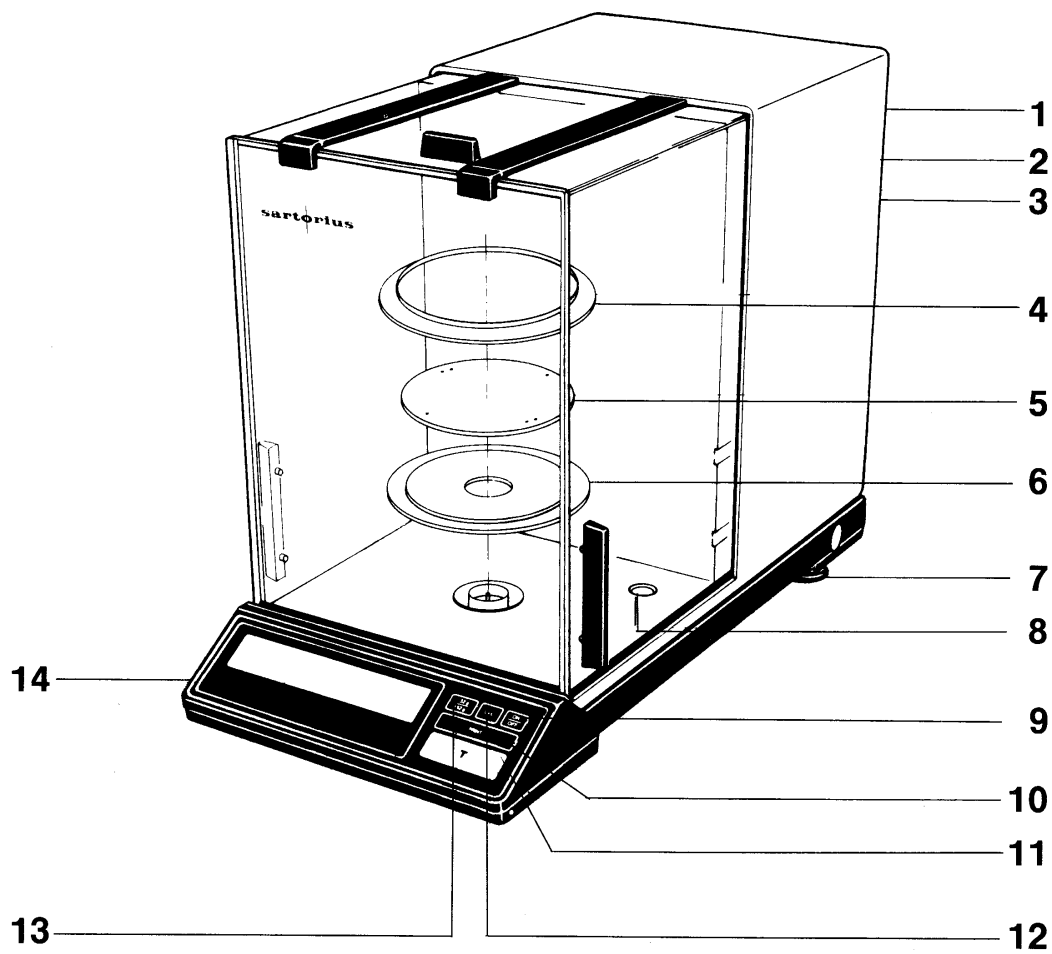
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**Sartorius Research.**  
**R 200 D, R 180 D-\*F1**  
**Electronic Semi-Microbalance**



Installation and Operating Instructions

**sartorius**



- |   |  |    |  |
|---|--|----|--|
| 1 | Power receptacle, fuse, voltage selector | 8  | Level indicator  |
| 2 | Menu access switch                       | 9  | ON/OFF key   |
| 3 | Interface                                | 10 | Print control (functions only if balance has a built-in interface) |
| 4 | Protective ring                          | 11 | Tare control   |
| 5 | Pan                                      | 12 | CAL key  |
| 6 | Shield plate                             | 13 | Selector key   |
| 7 | Leveling foot                            | 14 | Weight display   |

# Sartorius Research

## R 200 D, R 180 D-\*F1

With this Sartorius Semi-Microbalance you have acquired a high-quality electronic weighing Instrument that will ease your daily work load.

Before you operate your new balance, please read these Installation and operating instructions carefully.

Pursuant to the German Directive for the Implementation of Regulations for Prevention of Accidents "Elektrische Anlagen und Betriebsmittel (VBG 4)" [Electrical Installations and Equipment] of April 1986, it is hereby certified that the equipment delivered, "Semi-Microbalance, model R 200 D," is manufactured and tested in compliance with the following DIN/VDE regulations

DIN IEC 348/VDE 041 1:  
Safety requirements for electronic measuring apparatus

DIN IEC 380/VDE 0806:  
Safety of electrically energized office machines

DIN IEC 601 /VDE 0750:  
Safety of medical electrical equipment

When you use electrical equipment in installations and under ambient conditions requiring higher safety Standards, you must comply with the provisions as specified in the applicable regulations for installation in your country.

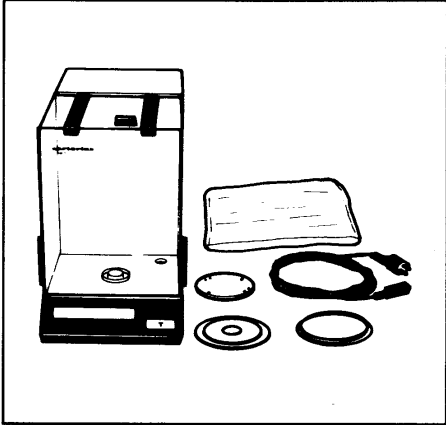
# Contents

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Calibration	11
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Troubleshooting Guide	16
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## Equipment Supplied

Do not miss out on the benefits of our full warranty. Please complete the warranty card, indicating the date of installation, and return the card to your Sartorius dealer.

The equipment supplied includes the components pictured on the left.



Save the packaging and the box for shipping your balance to prevent any damage caused during transportation.

# Installation Instructions

Choose a suitable place to set up your balance. It should not be exposed to the following:

- heat radiation
- aggressive/corrosive substances
- vibrations
- drafts.

Your Sartorius balance will provide accurate readouts even when it is exposed to unfavorable weighing conditions. You can adapt it to your requirements simply by changing the menu code settings of the balance operating program. For this purpose, please refer to pages 13 -15.

**After you have plugged your balance into a wall outlet, allow for at least 2 hours' warmup.**

## **Important Note**

Unplug the balance before you connect or disconnect peripherals.

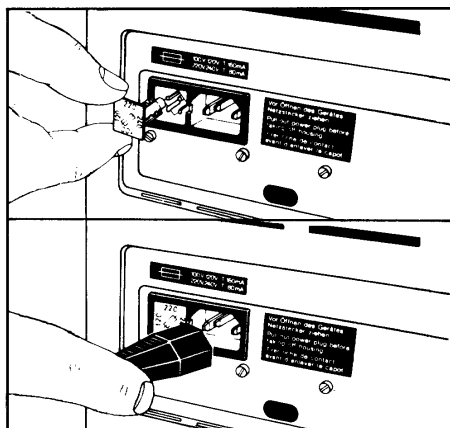
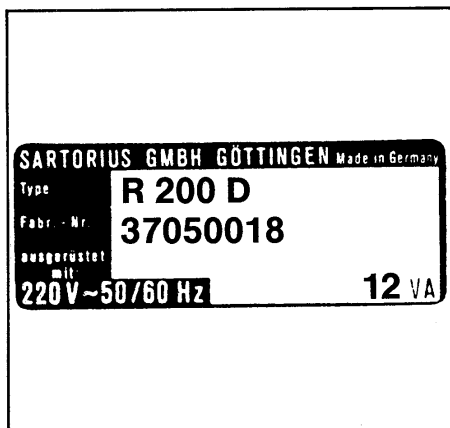
# Startup

Install components (6 - 4) in the weighing chamber.

The balance has been factory-set to 220 volts.

How to change the voltage setting:

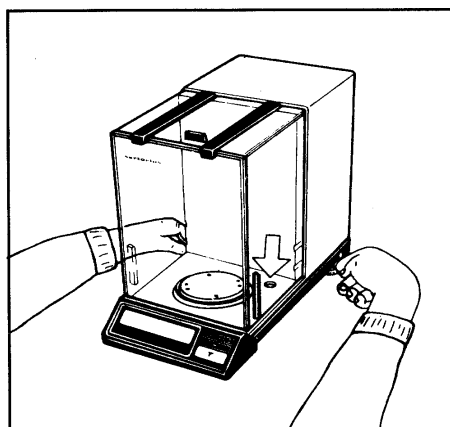
Adjust the voltage selector (1) to your local line voltage rating. Write the new voltage setting on the manufacturer's label located on the rear panel of the balance. Whenever you change the operating voltage to 100/120 V, make sure to exchange the installed T 80 mA fuse (1) for the T 160 mA fuse that comes with the balance.



The fuse (1) is plugged into the voltage selector located on the rear panel of the balance.

100/120 V-T 160mA  
220/240 V-T 80mA

At the point of use, plug the power cable into a properly installed wall outlet. If you use a wall outlet that does not have a protective grounding conductor, make sure to ground the balance.



Level the balance using the leveling feet (7) so that the air bubble is centered within circle of the level indicator (8).

# Operation

**The weight display shows the following special Status messages for your information:**

## **BUSY**

The balance processor is still busy processing a function and will not accept any other commands to perform functions at this time.

## **STANDBY**

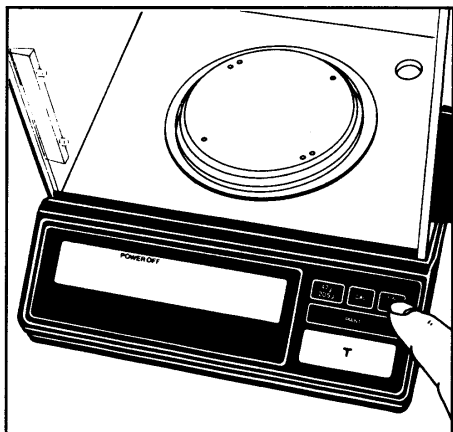
The display has been turned off with the ON/OFF key **(9)** and the balance is now in the ready-to-operate state so that it does not require warmup.

## **POWER OFF**

The balance has been disconnected from line power (power failure or outage, reconnection to line power after the balance has been unplugged).

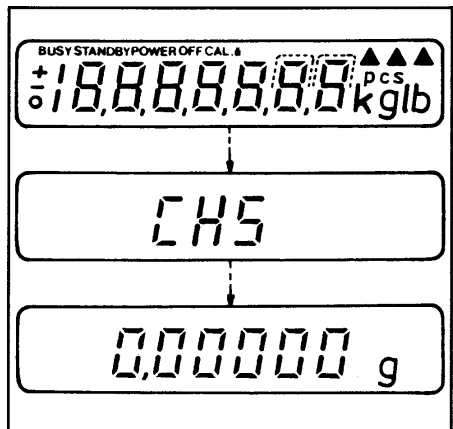
## **CAL**

The calibration function has been activated.



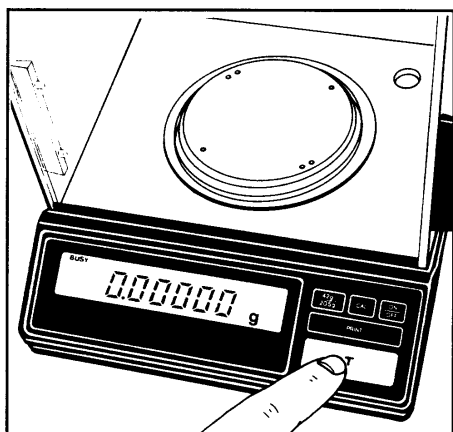
Press the ON/OFF key **(9)** to turn the display on or off. You can also turn it on with the tare control **(11)**.

After the balance is plugged into a wall outlet, the weight display will go out whenever you switch off the balance. All other circuits will remain energized (indicated by STANDBY). This means the balance is immediately ready to operate without requiring warmup the next time you switch it on.



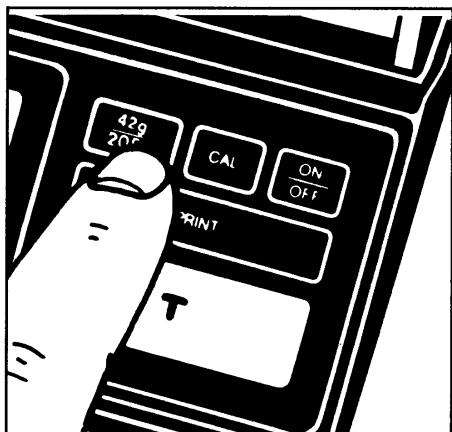
After the power is turned on, a test of all essential electronic functions is run automatically. The self test ends with the read-out 0.00000 g.

Now place your sample on the pan **(5)** to determine the weight. Close the doors of the weighing chamber. Read off the weight indicated in the display **(14)** as soon as the weight unit (in this case "g") appears as the stability symbol.



If you wish to use a Container or if the display does not indicate 0.00000 g/0.0000 g, press the tare control to zero the display.

## Weighing



The R 200 D has two display ranges which you can easily select at the touch of the softkey selector **(13)**.

After the power is turned on, you will automatically be in the **42 g** range with a resolution of 5 decimal places. Once you go beyond the 42 g range, weight readouts will be shown with 4 decimal places (readability of 0.1 mg).

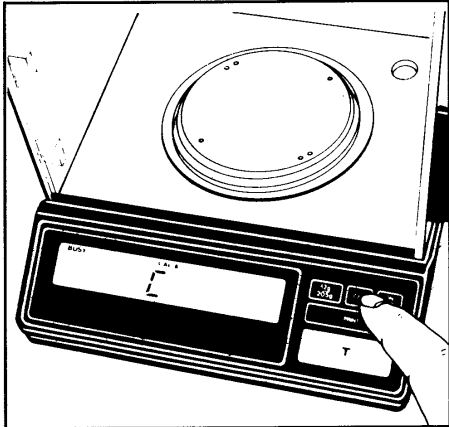
If you wish to return to a readout accuracy of 5 decimal places within the fine range (42 g) unload the balance and zero the display (tare).

If you select the **205 g** range by pressing the softkey selector **(13)**, you will have 0.1 mg readability over the entire weighing range for a maximum display range of 199.9999 g.

The balance will stabilize at a faster rate in the display range with an accuracy of 4 decimal places - 0.1 mg readability - than in the one with five decimal places - 0.01 mg readability.

This selector provides you with a readily accessible weighing-in convenience feature so that you do not have to access the menu to change the codes set in the balance operating program.

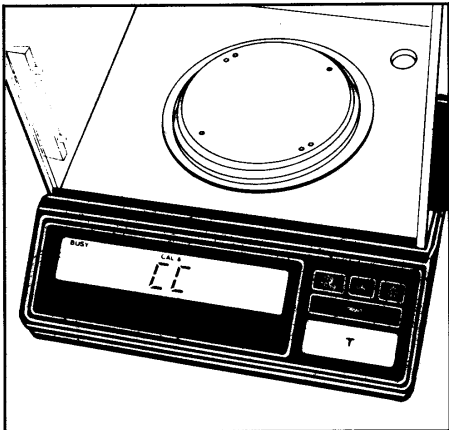
# Calibration



## Internal Calibration:

Unload the balance and zero the display (tare). As soon as the display shows a zero readout, press the « CAL key (12). The weight display will now read "C."

If "CE" is displayed instead, zero the display by pressing the tare control and press the CAL key again.



After a few seconds, the display will show "CC" followed by a zero readout.

An acoustic signal indicates the end of the calibration procedure.

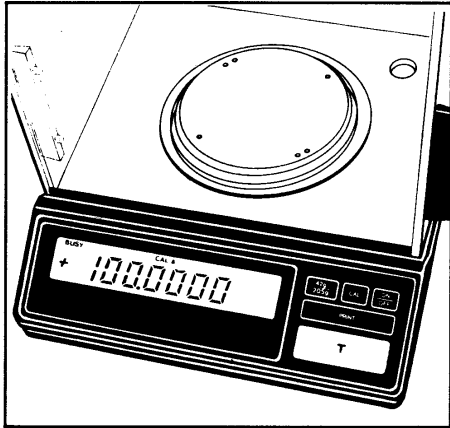
## How to Obtain a Calibration Weight Readout (models starting with serial no. 37090001)

You can obtain a readout of the calibration weight. To do so, select menu code 342 in the balance operating program.

Press the CAL key to have the internal calibration weight automatically applied so you can obtain a readout in the display.

To use the internal calibration function with this menu code setting, make sure to press the CAL key a second time to have the calibration weight automatically removed before internal calibration.

Now you can press the CAL key once again for approx. 3 seconds to activate the internal calibration function.



### **External Calibration:**

This requires an accurate calibration weight (100 g). Unload the balance and depress the tare control for at least 3 seconds until the calibration weight appears in the display.

Place the calibration weight in the center of the pan. Now the weight unit symbol "**g**" is displayed, and an acoustic Signal indicates the end of the calibration procedure.

If the display continues to show "CC" (infernial calibration) or if the stability symbol "g" does not appear (external calibration), the balance cannot be calibrated on account of the momentary Status. Turn it off and back on again with the ON/OFF key. The calibration procedure must be repeated until you obtain an acoustic signal indicating proper completion of the calibration procedure.

Possible causes for a readout of "**CC**":

- The balance is still in the warmup phase.
- The weighing System is affected by a draft or Vibration.

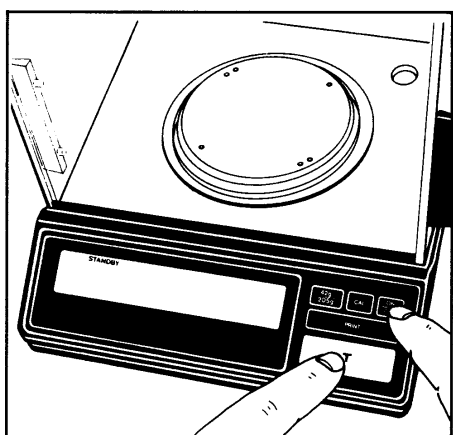
You can block the calibration function (see "Balance Operating Program"). The function is accessible whenever the balance operating program has been unlocked using the menu access switch **(2)**.

# Balance Operating Program

The balance operating program lets you adapt your balance to various ambient conditions and requirements.

At the factory, we have set the codes for a Standard program, which is protected by a locking function to prevent accidental changes.

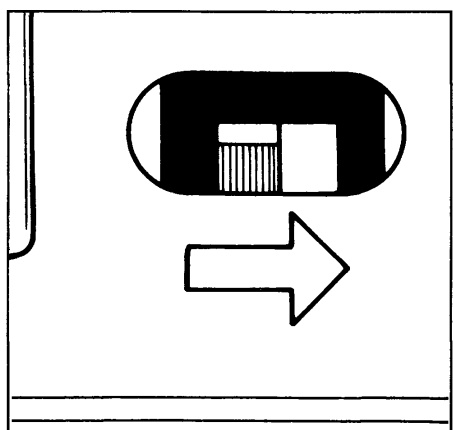
The "**menu code**" contains the information of the operating program, It consists of three digits, known in "computerese" as the page (1st digit), the line (2nd digit) and the word (3rd digit).



How to access the menu of the balance operating program:

With the balance switched off (**STANDBY** state) hold down the tare control (**11**) and briefly press the ON/OFF key (**9**). Upon completion of the automatic self-test, release the tare control as soon as "**CH5**" is displayed. Now the Status of the balance operating program will appear in the weight display "**L**". Stands for the list mode. In this mode, you can check the menu code settings, but you cannot program new codes.

If you wish to change a program menu code, you must first unlock the menu access switch to access the menu.

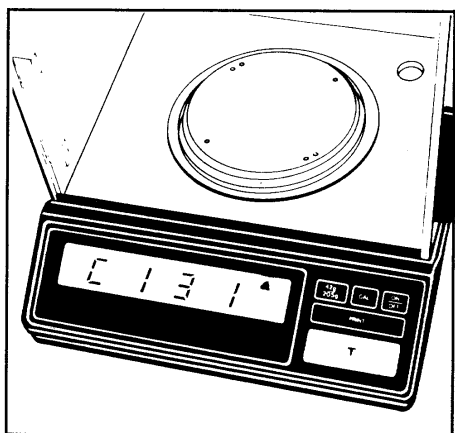


To do so, remove the protective cover located on the rear panel of your balance (next to the power receptacle), and slide the menu access switch (**2**) in the direction of the arrow.

The display will indicate "**C**", which Stands for the change mode, meaning you can now change the menu code settings.

After you have accessed the menu of the balance operating program, the display will show a continuous numerical sequence from 0 to 3 for the "page", in addition to the Status code letter "L" or "C." When the first digit of the code you wish to check or change appears, press the tare control.

The "page" code number now stops in the display, and a series of numbers for the second digit or "line" will start to cycle. Again, press the tare control to stop the code number of your choice in the display. Next, the numbers for the "word" (last digit) will cycle in the display. Repeat the procedure to enter the last digit of the code.



The ▲-symbol that appears indicates the actual setting.

To change any setting ("C" mode), press the tare control as soon as the appropriate numeric code appears.

Brief display of BUSY and the ▲-symbol confirms your selection, followed by return to "zero" for the 2nd digit or "line."

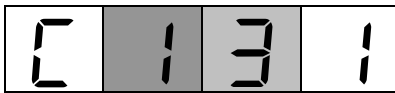
How to return to the weighing mode:

press the tare control each time a 0 appears in the numerical sequence (word, line, page). If you have changed a menu code, your code entry will be stored as soon as the display returns to the weighing mode.

Lock the balance operating program using the menu access switch ("L" readout) and replace the protective cover.

### **Auto Zero**

This balance has an automatic zero tracking function known as "Auto Zero" (can be turned off by menu code). Any change off zero < 3 digits per second within the zero tracking range will be set to zero automatically.



Page    Line    Word  
 1<sup>st</sup>    2<sup>nd</sup>    3<sup>rd</sup>  
 Digit    Digit    Digit

### Menu of the Balance Operating Program

(Active Parameters)

#### Code

[	1	1	1
[	1	1	2
[	1	1	3
[	1	1	4

#### Ambient Conditions

Very stable  
 Stable  
 Unstable  
 Very unstable

Factory setting

#### Code

[	1	2	1
[	1	2	2
[	1	2	3
[	1	2	4
[	1	2	5
[	1	2	6
[	1	2	7
[	1	2	8
[	1	2	9

#### Stability Range

0,25 digit  
 0,5 digit  
 1 digit  
 2 digits  
 4 digits  
 8 digits  
 16 digits  
 32 digits  
 64 digits

#### Code

[	1	3	1
[	1	3	2
[	1	3	3
[	1	3	4

#### Display Format

Last decimal ON  
 Last decimal OFF  
 Last decimal at stability  
 All decimals at stability

#### Code

[	1	4	1
[	1	4	2

#### Tare Parameter

Without stability  
 At stability

#### Code

[	1	5	1
[	1	5	2

#### Auto Zero

ON  
 OFF

#### Code

[	1	6	1
[	1	6	2

#### External Calibration

Accessible  
 Access blocked

#### Code

[	1	7	1
[	1	7	2

#### Internal Calibration

Accessible  
 Access blocked

#### Special Information

#### Code

[	3	1	1
[	3	1	2

#### Program Lock

OFF  
 ON

#### Code

[	3	2	1
[	3	2	2

#### Acoustic Signal

ON  
 OFF

#### Code

[	3	4	1
[	3	4	2
[	3	4	0

#### Calibration

#### Weight Readout

Locked  
 Accessible

#### Call Program Line

[	3	0	
---	---	---	--

#### Call Program Page

[	0		
---	---	--	--

#### End of programming

Factory setting

Additional Parameters for the data Output format at the interface port and for calculation programs are available on request.-Please refer to the "Accessories."

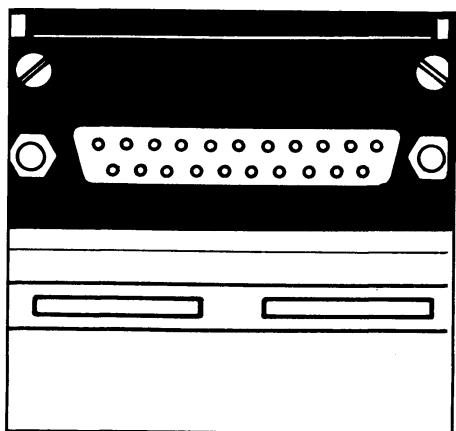
<sup>1)</sup> You can choose any weight unit as long as it can be displayed in the particular weighing range you selected (for example do not set the code for "kg" when you are using a 0.1 mg balance).

# Troubleshooting Guide

Problem ...	Causes	Remedy
No segments appear in the weight display (14).	<ul style="list-style-type: none"> <li>- No line voltage available</li> <li>- The power cord has not been plugged</li> <li>- Incorrect setting of the voltage selector</li> <li>- Defective fuse (1) (If this problem occurs again, please contact your nearest Sartorius service center)</li> </ul>	<ul style="list-style-type: none"> <li>- Check AC current supply</li> <li>- Plug in power cord</li> <li>- Check setting of voltage selector and readjust, if necessary</li> <li>- Replace fuse</li> </ul>
Weight display shows »L« or »CH2«.	<ul style="list-style-type: none"> <li>- The pan (5) is not in place</li> </ul>	<ul style="list-style-type: none"> <li>- Position the pan</li> </ul>
Weight display shows »H«.	<ul style="list-style-type: none"> <li>- Sample exceeds weighing capacity or display range</li> </ul>	<ul style="list-style-type: none"> <li>- Unload balance</li> </ul>
The weight readout constantly changes or the special message "BUSY" does not go out in the weight display	<ul style="list-style-type: none"> <li>- Unstable ambient conditions</li> <li>- Too much vibration or balance exposed to a draft</li> <li>- The door of the weighing chamber is not completely closed</li> <li>- Sample does not have a stable weight</li> </ul>	<ul style="list-style-type: none"> <li>- Set up balance in another area</li> <li>- Access the menu to adjust the proper code for the particular type of weighing environment</li> <li>- Close the door of the weighing chamber</li> </ul>
Weight display shows »CE«.	<ul style="list-style-type: none"> <li>- The CAL key (12) was not pressed when the display indicated a zero readout</li> <li>- The balance is loaded</li> </ul>	<ul style="list-style-type: none"> <li>- Press the tare control (11) and re-press the CAL key</li> <li>- Unload the balance</li> </ul>
The code "CC" does not go out in the display	<ul style="list-style-type: none"> <li>- The balance is not ready to calibrate or is in the warmup phase</li> <li>- The weighing system is affected by draft or vibration</li> </ul>	<ul style="list-style-type: none"> <li>- After plugging the balance into a wall outlet, allow for least 2 hours' warmup</li> <li>- Set the appropriate code by accessing the menu of the operating program</li> </ul>
The weight readout is obviously wrong	<ul style="list-style-type: none"> <li>- Balance has not been calibrated</li> <li>- Balance has not been tared before weighing</li> <li>- The air bubble (8) is not within the circle of the level indicator</li> </ul>	<ul style="list-style-type: none"> <li>- Calibrate balance</li> <li>- Tare before weighing</li> <li>- Level balance</li> </ul>

## Interface

(models starting with serial no. 39070001)

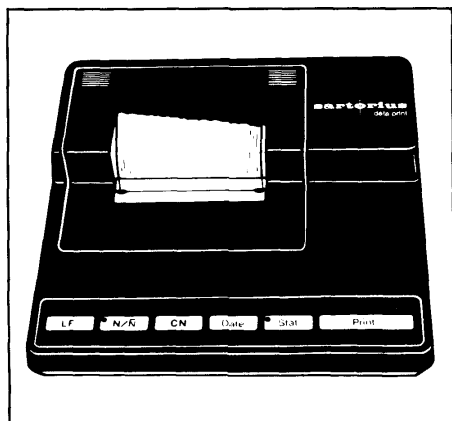


For a description of the interface (3), see the enclosed "Interface Description of the MP8-6/6.1"

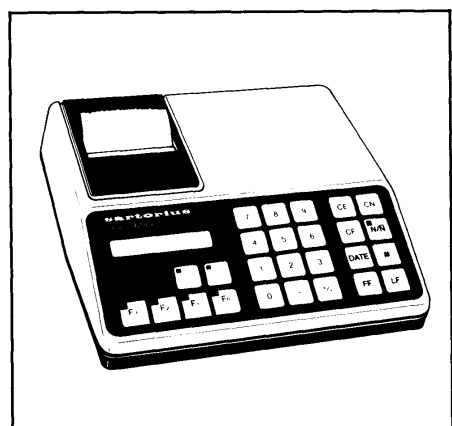
### Interfacing Devices with the Balance (RS Interface)

Make sure that the interface port is electrically connected to the protective grounding conductor of the balance housing. The cabling supplied as accessory components is shielded and electrically connected on both ends to the cases of the connectors. This electrical connection may result in interference caused by cables scraping the floor or by transient currents if you have grounded the housing or connected the protective grounding conductor for line power. If necessary, connect an equipotential bonding conductor to the balance.

## Accessories (Options)



Data Printer with date/time and statistics functions	YDP02-0D V1
Print speed, approx. lines/sec.	1,5
Printer housing (W x D x H) in mm	150 x 138 x 43
in inches	5.5 x 5.4 x 1.7



Data Control printer with LCD and program set, replace & with:	73822 C &
2126 for specific gravity determination	
2086 for statistics	

Carrying case	YDB 01 R
Antitheft locking device	6087
Vibrating spatula	6025
Specific gravity determination kit	6080
Balance table	YWT 01
Wall console	6804
Weighing bowl, 20 g (Stainless steel)	6003
Weighing scoop, 20 g (stainless steel)	60010
Weighing bowl, 20 g (glass)	6015
Antistatic weighing pan	YWP 01 R
Weighing bowl with pouring spout, 300 ml (stainless steel)	6407

# Specifications

Model		R 200 D	R 180 D-*F1
Weighing capacity	g	42 / 205	33 / 182
Display range	g	42 / 199,9999	33 / 182
Readability	mg	0.01 / 0.1	0.01 / 0.1
Tare range (by subtraction)	g	205	182
Standard deviation	mg	≤ ±0.02 / 0.1	≤ ±0.02 / 0.1
Max. linearity	mg	≤ ±0.03 / 0.2	≤ ±0.03 / 0.2
Stabilization time (typical)	s	7 / 4	5 / 3
Display update	s	0.2	
Adaption to ambient conditions and application requirements		by selection of one of 4 optimized filter levels	
Stability range	d	0.25 ... 64 (selectable)	
Ambient temperature range	K	283-313 (+10°C ...+40°C)	
Sensitivity drift within 283 ... 303 K	/K	≤ ± 2 x 10 <sup>-6</sup>	
Pan size	mm	Ø 90	
Balance housing (W x D x H)	mm	219 x 408 x 317 (8.6 x 16.1 x 12.5 in)	
Weighing chamber (W x D x H)	mm	188 x 149 x 253 7.4 x 5.9 x 10 in)	
Net weight	kg	13 (27.5 lbs)	
Power requirements (voltage + frequency)		100 / 120 / 220 / 240 V, 50-60 Hz	
Allowable voltage fluctuation		-15%...+10%	
Power consumption	VA	12	
Interface		RS 232C / V24-v28 RS 423 V 10; 7 bit parity: even, odd, mark, space; transmission rates: 150... 9600 Baud	

## **Sartorius AG**

✉ 37070 Göttingen  
📦 Weender Landstraße 94–108, 37075 Göttingen  
☎ (0551) 308-0, 📠 (0551) 308-3289

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