



DOC022.97.90402

# **LZV943**

# **DR 6000**

04/2012, Edition 1

**User Manual en**



## General information

### Safety information

Read through the entire user manual carefully before you unpack the device, set up and put into operation. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.


To ensure safety when using the instrument, the DR6000 may not be used in any manner that is not described in this user manual.

### Danger notes in this user manual


Indicates a potentially or imminently hazardous situation that, if not avoided, can result in death or serious injury.


Indicates a potentially or imminently dangerous situation that, if it is not avoided, can lead to death or to serious injuries.




Indicates a possible dangerous situation that can have minor or moderate injuries as the result.


Indicates a situation that, if it is not avoided, can lead to damage to the device. Information that requires special emphasis.

**Note:** Information that supplements points in the main text.

### Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. For symbols attached to the instrument, corresponding warning notes are found in the user manual.

	This symbol may be attached to the device and references the operation- and/or safety notes in the user manual.
	Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems after 12 August 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the manufacturer for disposal at no charge to the user. <b>Note:</b> For return for recycling, please contact the equipment manufacturer or supplier for instructions on how to return end-of-life equipment, manufacturer-supplied electrical accessories, and all auxiliary items for proper disposal.

### Installation notes

1. Select **SYSTEM CHECKS > INSTRUMENT UPDATE**.
2. Connect the USB stick with the additional software "Enzymology Tests LZV943" to a USB connection (type A) of the DR 6000.
3. Confirm with **OK**.  
The software is installed.
4. Switch the DR 6000 off after the complete installation at the power source and start it again.

**Note:** Wait at least **20 seconds** before restarting the instrument in order to avoid damaging its electronics.

## Chemical and biological safety

### DANGER

Working with chemical samples, standards and reagents can be dangerous. It is recommended that the users of these products familiarize themselves with safe procedures and correct use of chemicals before beginning work. Please read all relevant Material Data Safety Sheets carefully.

During the analysis of the samples, the use of toxic, highly flammable or corrosive chemicals can be required.

- Please observe safety information present on the packaging and material safety data sheets.
- All consumed solutions must be disposed of in accordance with the local and national regulations and laws.

## Introduction

The additional software LZV943 is a compilation of enzymology tests manufactured by R-Biopharm AG, Darmstadt that can be performed with spectrophotometer DR 6000 and carousel insert LZV902.99.00002.

## Selection of a stored test

1. Select **STORED PROGRAMS**. An alphabetically arranged list of all available programs is shown. The methods of the additional Enzymology Tests software LZV943 are located at the end of the list.
2. Select a program by choosing the corresponding parameter.  
**Note:** *The programs of the Enzymology Tests have the numbers 2200 to 2227. Select **SELECT BY NUMBER** and confirm the entry with **OK**.*
3. Press **START** to start the program.

The following parameters can be determined using the current software version.

Table 1 Test overview

Program number	Parameter	Measurement range upper limit
2201	L-malic acid	0.350 g/L
2202	L-ascorbic acid	0.200 g/L
2203	Cholesterol	0.400 g/L
2204	Citric acid	
2205	Acetic acid	0.300 g/L
2206	Acetic acid (S)	0.300 g/L
2207	Ethanol	0.120 g/L
2208	D-glucose	1.00 g/L
2209	D-glucose (S)	1.00 g/L
2210	D-glucose/D-fructose	
2211	D-glucose/D-fructose (S)	
2212	Glycerin	0.400 g/L
2213	Glycerin (S)	0.400 g/L
2214	D-isocitric acid	1.00 g/L
2215	D-isocitric acid (S)	1.00 g/L
2216	Lactose / D-galactose	
2217	Lactose / D-galactose (S)	
2218	D-/L-lactic acid	
2219	Sucrose / D-glucose / D-fructose	
2220	D-sorbitol	0.100 g/L
2221	Xylitol	0.100 g/L
2222	Starch	0.700 g/L
2223	Starch (S)	0.700 g/L
2224	Starch (SBV)	0.700 g/L
2225	Starch (SBV / S)	0.700 g/L
2226	Sulphite	0.300 g/L
2227	Sulphite (S)	0.300 g/L

**Note:** The tests discussed in this document have been programmed in accordance with the "Methods of enzymatic bio-analysis and foodstuffs analysis" code (1997) of R-Biopharm AG, Darmstadt, Biochemica for the DR 6000. The factors for calculating the test results correspond to the test procedures and volumes specified in the aforementioned manual.

**Note:** Changes to factors or test procedures undertaken by R-Biopharm AG, Darmstadt are not automatically incorporated into the programming of these tests. The operator must ensure the compatibility of the DR 6000 test with the test kit applied. Departures from the original code on the part of the operator may also cause changes to factors. All changes or variations can be factored in accordingly by the operator by reprogramming (operator programs in DR 6000) or by modifying the original programming.

To ensure that the procedure and factors of a programmed test are compatible with the test kit applied, print out the corresponding test.

1. Select the required test from **STORED PROGRAMS**.
2. Select **PROGRAM OPTIONS > EDIT**.
3. Connect a printer to the DR 6000.
4. Select the **PC/PRINTOUT** symbol.

The desired test is printed out.

**Note:** Reinstallation (update) reverses all changes to the original programming.

The various tests require that the cuvettes for blank values and samples are set to specific positions on the carousel insert. The positions on the carousel insert are marked from 1 to 7.

The test sequence is illustrated only to the extent necessary to understand how the DR 6000 is used, to perform the test itself and to evaluate the results.

Please consult the relevant specialist literature and the operating instructions for the corresponding tests for further information on the particulars and characteristics of enzymatic testing.

## Creep monitoring

Tests that include the reference (**S**) in their name incorporate automatic creep monitoring. These tests can only be performed with a carousel

insert. Automatic creep monitoring generates additional extinction measurements in accordance with R-Biopharm guidelines. Creep monitoring considers the potential occurrence of creep reactions in the analysis results.

## Use of multiple carousel inserts

Two or more carousel inserts must be used if more than six enzymatic test samples are processed in a single transit with a single blank value, or more than three samples in tests with a sample blank value. The DR 6000 automatically detects the number of carousel inserts required from the specified number of samples. The DR 6000 prompts the operator to insert a re-stocked carousel insert during each measurement transit (this function applies only to tests without creep monitoring).

**Note:** Several measurement transits may be necessary depending on the test. The test is programmed such that each new measurement transit must begin with the first carousel insert. Ensure that carousel insert 1 is positioned in the DR 6000 before each new measurement transit. The DR 6000 automatically moves carousel insert 1 into the correct position at the beginning of the new measurement transit.

**Table 2 Tests with simple blank value, positioning of samples**

Carousel insert	Position	Contents
1	1	Blank value
1	2	Sample 1
1	3	Sample 2
1	4	Sample 3
1	5	Sample 4
1	6	Sample 5
1	7	Sample 6
1	8	Sample 7
2	1	Sample 8
2	2	Sample 9
etc.	etc.	etc.

**Table 3 Tests with sample blank value, positioning of samples**

Carousel insert	Position	Contents
1	1	free
1	2	Sample 1 blank value
1	3	Sample 1
1	4	Sample 2 blank value
1	5	Sample 2
1	6	Sample 3 blank value
1	7	Sample 3
2	1	Sample 4 blank value
2	2	Sample 4
etc.	etc.	etc.

### Input of number of samples

Several samples can be measured in each measurement series.

In order to guarantee that the carousel insert is loaded correctly, input the number of samples as follows:

1. Under **STORED PROGRAMS**, select the required test and open the test with **START**.
2. In the toolbar, select the symbol for the carousel insert. This symbol opens a window with carousel options.
3. Select **NO. OF SAMPLES**.
4. Enter the number of samples and press **OK** to confirm.
5. Select **CELL ORDER INFORMATION** and load the carousel insert with blank values and samples as per the specifications.
6. Close the cell order window with **CLOSE**.
7. Close the carousel options window with **CLOSE**.

**Note:** *The configuration can be changed at any time.*

### Input of sample ID

Each sample can be assigned an individual sample ID.

1. Under **STORED PROGRAMS**, select the required test and open the test with **START**.
2. In the toolbar, select the symbol for the carousel insert. This symbol opens a window with carousel options.
3. Select **SAMPLE ID**.

**OFF:** The samples are not assigned a sample ID.

**ENTER SAMPLE ID:** The sample is selected and a sample is entered under Edit. The sample IDs are not saved in the general sample ID list, rather they only apply to the current measurement series.

**SELECT SAMPLE ID:** The sample is selected and the general sample ID list opens under Select. Each sample is allocated the desired sample ID.

**IMPORT EXTERNAL SAMPLE ID LIST:** \*.txt and \*.csv files can be imported via a USB stick or network; refer to chapter "Import external sample ID".

4. Confirm the entry with **OK**.
5. Close the Carousel Options window with **CLOSE**.

**Note:** *The configuration can be changed at any time.*

### Input of dilution factor

An individual dilution factor can be included in the results calculation for each sample.

To enter the dilution factor for a sample, proceed as follows:

1. Under **STORED PROGRAMS**, select the required test and open the test with **START**.
2. In the toolbar, select the symbol for the carousel insert. This symbol opens a window with carousel options.
3. Select **DILUTION FACTOR: ON**.
4. Select the corresponding sample and open with **EDIT**.
5. Enter the dilution factor.

6. To abort the entry without saving, press **CANCEL**.  
To confirm and complete the entry, press **DONE**.  
To call up the next sample, press **NEXT**.
7. Close the dilution factor window with **CLOSE**.
8. Close the carousel options window with **CLOSE**.

**Note:** *The configuration can be changed at any time.*

### Input of initial sample weight

An individual initial sample weight can be included in the results calculation for each sample.

To enter the initial weight for a sample, proceed as follows:

1. Under **STORED PROGRAMS**, select the required test and open the test with **START**.
2. In the toolbar, select the symbol for the carousel insert. This symbol opens a window with carousel options.
3. Select **INITIAL SAMPLE WEIGHT**.
4. Select the corresponding sample and open with **EDIT**.
5. Enter the initial sample weight in g/100 mL.
6. To abort the entry without saving, press **CANCEL**.  
To confirm and complete the entry, press **DONE**.  
To call up the next sample, press **NEXT**.
7. Close the initial sample weight window with **CLOSE**.
8. Close the carousel options window with **CLOSE**.

**Note:** *The configuration can be changed at any time.*

The weight-related result is calculated automatically according to the following formula:

$$C_x = \frac{C_{\text{mg/L result}} \times 10}{C_{\text{Y initial sample weight}}}$$

The concentration of the result is illustrated in g/100 g (initial sample weight).

### Changes to the results display

Depending on the test, the result is calculated and output in many different variants.

If you would like to customize the results information, proceed as follows:

1. Select the required test under **STORED PROGRAMS**.
2. Select **PROGRAM OPTIONS > EDIT**.
3. Highlight the **FORMULA** row and select **EDIT**.
4. Select row **CN: G/100 G SUBSTANCE**, for example, and select **EDIT**.
5. Highlight the **DISP RESULT: YES** row and select **EDIT**.
6. Select **OFF** and confirm with **OK**.
7. Close the two subsequent windows with **OK**.
8. Confirm the change with **SAVE**.
9. Close the program with **EXIT**.

**Note:** *The configuration can be changed at any time.*

# Work procedures

## L-malic acid (L-malate)

<b>Program number</b>	2201
<b>Parameter</b>	L-malic acid
<b>R-Biopharm AG order number</b>	Art. no. 10 139 068 035
<b>Results information</b>	g L-malic acid / L sample solution g L-malic acid / 100 g sample
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6

### Procedure for L-malic acid

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2201** for the program "L-malic acid". Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **3:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **10:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 2 is measured in all cuvettes.  
The result is indicated in g/L L-malic acid and g/100 g L-malic acid on the display.



## L-ascorbic acid

<b>Program number</b>	2202
<b>Parameter</b>	L-ascorbic acid
<b>R-Biopharm AG order number</b>	Art. no. 10 409 677 035
<b>Results information</b>	g L-ascorbic acid / L sample solution g L-ascorbic acid / 100 g sample
<b>Carousel loading</b>	Carousel position 1: Free Carousel position 2: Sample 1 blank value Carousel position 3: Sample 1 Carousel position 4: Sample 2 blank value Carousel position 5: Sample 2 Carousel position 6: Sample 3 blank value Carousel position 7: Sample 3

Extinction 2 is measured in all cuvettes.

The result is indicated in g/L L-ascorbic acid and g/100 g L-ascorbic acid on the display.

### Procedure for L-ascorbic acid

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2202** for the program "L-ascorbic acid". Confirm with **OK**.
4. Press **START** to start the program.
5. Set sample blank value 1 to carousel position 2, carousel position 1 remains free.
6. Set sample 1 to carousel position 3.
7. Set sample blank value 2 to carousel position 4.
8. Set sample 2 to carousel position 5 and so forth.
9. Press **READ CAROUSEL**.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
10. Pipette the reagent into the sample and sample blank value cuvettes according to the process specification.
11. Press **READ CAROUSEL**.  
The **15:00** timer starts. When the time elapses, two short acoustic signals are sounded.

## Cholesterol

<b>Program number</b>	2203
<b>Parameter</b>	Cholesterol
<b>R-Biopharm AG order number</b>	Art. no. 10 139 050 035
<b>Results information</b>	g cholesterol / L sample solution g cholesterol / 100 g sample
<b>Carousel loading</b>	Carousel position 1: Free Carousel position 2: Sample 1 blank value Carousel position 3: Sample 1 Carousel position 4: Sample 2 blank value Carousel position 5: Sample 2 Carousel position 6: Sample 3 blank value Carousel position 7: Sample 3

### Procedure for cholesterol

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2203** for the program "Cholesterol". Confirm with **OK**.
4. Press **START** to start the program.
5. Set sample blank value 1 to carousel position 2, carousel position 1 remains free.
6. Set sample 1 to carousel position 3.
7. Set sample blank value 2 to carousel position 4.
8. Set sample 2 to carousel position 5 and so forth.
9. Press **READ CAROUSEL**.

Extinction is measured in all cuvettes.

The result is indicated in g/L cholesterol and g/100 g cholesterol on the display.

## Citric acid

<b>Program number</b>	2204
<b>Parameter</b>	Citric acid
<b>R-Biopharm AG order number</b>	Art. no. 10 139 076 035
<b>Results information</b>	g citric acid / L sample solution g citric acid x 1 H <sub>2</sub> O / L sample solution g citric acid / 100 g sample g citric acid x 1 H <sub>2</sub> O / 100 g sample
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6

### Procedure for citric acid

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2204** for the program "Citric acid". Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **5:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **5:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 2 is measured in all cuvettes.  
The result is indicated in g/L citric acid, g/L citric acid x 1 H<sub>2</sub>O, g/100 g citric acid and g/100 g citric acid x 1 H<sub>2</sub>O on the display.

## Acetic acid (acetate) and acetic acid (S)

<b>Program number</b>	2205	2206
<b>Parameter</b>	Acetic acid	Acetic acid (S)
<b>R-Biopharm AG order number</b>	Art. no. 10 148 261 035	
<b>Results information</b>	g acetic acid / L sample solution g acetic acid / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6	

### Procedure for acetic acid

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2205** for the program "Acetic acid". Confirm with **OK**.  
Enter the number **2206** for the program "Acetic acid (S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **3:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 2 is measured in all cuvettes. **R2** is shown on the display.
10. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
11. Press **READ CAROUSEL**.

The **15:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 3 is measured in all cuvettes.

**Note:** For program 2206 acetic acid (S) with creep monitoring, extinction 3 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

The result is indicated in g/L acetic acid and g/100 g acetic acid on the display.

## Ethanol

<b>Program number</b>	2207
<b>Parameter</b>	Ethanol
<b>R-Biopharm AG order number</b>	Art. no. 10 176 290 035
<b>Results information</b>	g ethanol / L sample solution g ethanol / 100 g sample
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6

### Procedure for ethanol

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2207** for the program "Ethanol". Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.

The **3:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 1 is measured in all cuvettes. **R1** is shown on the display.

8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.

The **10:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 2 is measured in all cuvettes.

The result is indicated in g/L ethanol and g/100 g ethanol on the display.

## D-glucose and D-glucose (S)

<b>Program number</b>	2208	2209
<b>Parameter</b>	D-glucose	D-glucose (S)
<b>R-Biopharm AG order number</b>	Art. no. 10 716 251 035	
<b>Results information</b>	g D-glucose / L sample solution g D-glucose / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6	

### Procedure for D-glucose

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2208** for the program "D-glucose". Confirm with **OK**.  
Enter the number **2209** for the program "D-glucose (S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **3:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **15:00** timer starts. When the time on the timer elapses, two short acoustic signals are sounded.

Extinction 2 is measured in all cuvettes.

**Note:** For program 2209 D-glucose (S) with creep monitoring, extinction 2 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

The result is indicated in g/L D-glucose and g/100 g D-glucose on the display.

## D-glucose/D-fructose and D-glucose/D-fructose (S)

<b>Program number</b>	2210	2211
<b>Parameter</b>	D-glucose/ D-fructose	D-glucose/ D-fructose (S)
<b>R-Biopharm AG order number</b>	Art. no. 10 139 106 035	
<b>Results information</b>	g D-glucose / L sample solution g D-fructose / L sample solution g D-glucose / 100 g sample g D-fructose / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: blank value Carousel position 2-7: Samples 1 to 6	

### Procedure for D-glucose/D-fructose

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2210** for the program "D-glucose". Confirm with **OK**.  
Enter the number **2211** for the program "D-glucose (S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **3:00** timer starts. When the time on the timer elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **15:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 2 is measured in all cuvettes.

**R2** is shown on the display.

**Note:** For program 2211 D-glucose/D-fructose (S) with creep monitoring, extinction 2 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

10. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
11. Press **READ CAROUSEL**.  
The **15:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 3 is measured in all cuvettes.  
The result is indicated in g/L D-glucose, g/L D-fructose, g/100 g D-glucose, g/100 g D-fructose on the display.

## Glycerin and glycerin (S)

<b>Program number</b>	2212	2213
<b>Parameter</b>	Glycerin	Glycerin (S)
<b>R-Biopharm AG order number</b>	Art. no. 10 148 270 035	
<b>Results information</b>	g glycerin / L sample solution g glycerin / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6	

### Procedure for glycerin

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2212** for the program "Glycerin". Confirm with **OK**.  
Enter the number **2213** for the program "Glycerin (S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **7:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **10:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 2 is measured in all cuvettes.

**Note:** In the case of program 2213 glycerin (S) with creep monitoring, extinction 2 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

The result is indicated in g/L glycerin and g/100 g glycerin on the display.



## D-isocitric acid and D-isocitric acid (S)

<b>Program number</b>	2214	2215
<b>Parameter</b>	D-isocitric acid	D-isocitric acid (S)
<b>R-Biopharm AG order number</b>	Art. no. 10 414 433 035	
<b>Results information</b>	g D-isocitric acid / L sample solution g D-isocitric acid / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6	

### Procedure for D-isocitric acid

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2214** for the program "D-isocitric acid". Confirm with **OK**.  
Enter the number **2215** for the program "D-isocitric acid (S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **3:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **10:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 2 is measured in all cuvettes.

**Note:** For program 2215 D-isocitric acid (S) with creep monitoring, extinction 2 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

The result is indicated in g/L D-isocitric acid and g/100 g D-isocitric acid on the display.

## Lactose/D-galactose and lactose/D-galactose (S)

<b>Program number</b>	2216	2217
<b>Parameter</b>	Lactose / D-galactose	Lactose / D-galactose (S)
<b>R-Biopharm AG order number</b>	Art. no. 10 176 303 035	
<b>Results information</b>	g lactose / L sample solution g lactose x 1 H <sub>2</sub> O / L sample solution g D-galactose / L sample solution g lactose / 100 g sample g lactose x 1 H <sub>2</sub> O / 100 g sample g D-galactose / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: Lactose blank value Carousel position 2: D-galactose blank value Carousel position 3: Lactose sample 1 Carousel position 4: D-galactose sample 1 Carousel position 5: Lactose sample 2 Carousel position 6: D-galactose sample 2	

### Procedure for lactose/D-galactose

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2216** for the program "Lactose/D-galactose". Confirm with **OK**.  
Enter the number **2217** for the program "Lactose/D-galactose (S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set lactose blank value to carousel position 1.
6. Set D-galactose blank value to carousel position 2.
7. Set lactose sample 1 to carousel position 3.
8. Set D-galactose sample 1 to carousel position 4 and so forth.
9. Press **READ CAROUSEL**.

The **2:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 1 is measured in all cuvettes. **R1** and **R2** are shown on the display.

10. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
11. Press **READ CAROUSEL**.

The **20:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 2 is measured in all cuvettes.

**Note:** For program 2217 Lactose/D-galactose (S) with creep monitoring, extinction 2 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

The result is indicated in g/L lactose, g/l lactose x 1 H<sub>2</sub>O, g/L D-galactose, g/100 g lactose, g/100 g lactose x 1 H<sub>2</sub>O and g/100 g D-galactose on the display.

## D-/L-lactic acid (D-/L-lactate)

<b>Program number</b>	2218
<b>Parameter</b>	D-/L-lactic acid
<b>R-Biopharm AG order number</b>	Art. no. 11 112 821 035
<b>Results information</b>	g D-/L-lactic acid / L sample solution g D-/L-lactic acid / 100 g sample
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6

### Procedure for D-/L-lactic acid

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2218** for the program "D-/L-lactic acid". Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.

The **5:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 1 is measured in all cuvettes. **R1** is shown on the display.

8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
  9. Press **READ CAROUSEL**.
- The **30:00** timer starts. When the time elapses, two short acoustic signals are sounded.
- Extinction 2 is measured in all cuvettes. **R2** is shown on the display.
10. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
  11. Press **READ CAROUSEL**.

The **30:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 3 is measured in all cuvettes.

The result is indicated in g/L D-/L-lactic acid and g/100 g D-/L-lactic acid on the display.

## Sucrose / D-glucose / D-fructose

<b>Program number</b>	2219
<b>Parameter</b>	Sucrose / D-glucose / D-fructose
<b>R-Biopharm AG order number</b>	Art. no. 10 716 260 035
<b>Results information</b>	g sucrose / L sample solution g D-glucose / L sample solution g D-fructose / L sample solution g sucrose / 100 g sample g D-glucose / 100 g sample g D-fructose / 100 g sample
<b>Carousel loading</b>	Carousel position 1 Carousel position 2 Carousel position 3 Carousel position 4 Carousel position 5 Carousel position 6
	Sucrose blank value D-glucose/D-fructose blank value Sucrose sample 1 D-glucose/D-fructose sample 1 Sucrose sample 2 D-glucose/D-fructose sample 2

### Procedure for sucrose / D-glucose / D-fructose

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2219** for the program "Sucrose / D-glucose / D-fructose". Confirm with **OK**.
4. Press **START** to start the program.
5. Set sucrose blank value to carousel position 1.
6. Set D-glucose / D-fructose blank value to carousel position 2.

7. Set sucrose sample 1 to carousel position 3.
8. Set D-glucose / D-fructose sample 1 to carousel position 4 and so forth.
9. Press **READ CAROUSEL**.  
The **3:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** and **R2** are shown on the display.
10. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
11. Press **READ CAROUSEL**.  
The **15:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 2 is measured in all cuvettes. **R3** and **R4** are shown on the display.
12. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
13. Press **READ CAROUSEL**.  
The **15:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 3 is measured in all cuvettes.  
The result is indicated in g/L sucrose, g/L D-glucose, g/L D-fructose, g/100 g sucrose, g/100 g D-glucose and g/100 g D-fructose on the display.

## D-sorbitol

<b>Program number</b>	2220
<b>Parameter</b>	D-sorbitol
<b>R-Biopharm AG order number</b>	Art. no. 10 670 057 035
<b>Results information</b>	g D-sorbitol / L sample solution g D-sorbitol / 100 g sample
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6

### Procedure for D-sorbitol

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2220** for the program "D-sorbitol". Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **2:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **2:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 2 is measured in all cuvettes. **R2** is shown on the display.
10. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
11. Press **READ CAROUSEL**.

The **30:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 3 is measured in all cuvettes.

The result is indicated in g/L D-sorbitol and g/100 g D-sorbitol on the display.

## Xylitol

<b>Program number</b>	2221
<b>Parameter</b>	Xylitol
<b>R-Biopharm AG order number</b>	Art. no. 10 670 057 035
<b>Results information</b>	g xylitol / L sample solution g xylitol / 100 g sample
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6

Extinction 3 is measured in all cuvettes.

The result is indicated in g/L xylitol and g/100 g xylitol on the display.

### Procedure for xylitol

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2221** for the program "Xylitol". Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **2:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **2:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 2 is measured in all cuvettes. **R2** is shown on the display.
10. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
11. Press **READ CAROUSEL**.  
The **30:00** timer starts. When the time elapses, two short acoustic signals are sounded.

## Starch and starch (S)

<b>Program number</b>	2222	2223
<b>Parameter</b>	Starch	Starch (S)
<b>R-Biopharm AG order number</b>	Art. no. 10 207 748 035	
<b>Results information</b>	g starch / L sample solution g starch / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6	

The result is indicated in g/L starch and g/100 g starch on the display.

### Procedure for starch

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2222** for the program "Starch". Confirm with **OK**.  
Enter the number **2223** for the program "Starch (S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **3:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **15:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 2 is measured in all cuvettes.  
**Note:** For program 2223 starch (S) with creep monitoring, extinction 2 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

## Starch (SBV) and starch (SBV / S)

<b>Program number</b>	2224	2225
<b>Parameter</b>	Starch (SBV)	Starch (SBV / S)
<b>R-Biopharm AG order number</b>	Art. no. 10 207 748 035	
<b>Results information</b>	g starch / L sample solution g starch / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: Free Carousel position 2: Sample 1 blank value Carousel position 3: Sample 1 Carousel position 4: Sample 2 blank value Carousel position 5: Sample 2 Carousel position 6: Sample 3 blank value Carousel position 7: Sample 3	

### Procedure for starch with sample blank value (SBV)

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2224** for the program "Starch (SBV)". Confirm with **OK**.  
Enter the number **2225** for the program "Starch (SBV / S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set sample blank value 1 to carousel position 2, carousel position 1 remains free.
6. Set sample 1 to carousel position 3.
7. Set sample blank value 2 to carousel position 4.
8. Set sample 2 to carousel position 5 and so forth.
9. Press **READ CAROUSEL**.  
The **3:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.

10. Pipette the reagent into the blank value and sample cuvettes according to the process specification.

11. Press **READ CAROUSEL**.

The **15:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 2 is measured in all cuvettes.

**Note:** For program 2225 Starch (SBV / S) with creep monitoring, extinction 2 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

The result is indicated in g/L starch and g/100 g starch on the display.



## Sulphite and sulphite (S)

<b>Program number</b>	2226	2227
<b>Parameter</b>	Sulphite	Sulphite (S)
<b>R-Biopharm AG order number</b>	Art. no. 10 725 854 035	
<b>Results information</b>	g sulphite / L sample solution g sulphite / 100 g sample	
<b>Carousel loading</b>	Carousel position 1: Blank value Carousel position 2-7: Samples 1 to 6	

### Procedure for sulphite

1. Prepare the test according to the process specification.
2. Select **STORED PROGRAMS > SELECT BY NUMBER**.
3. Enter the number **2226** for the program "Sulphite". Confirm with **OK**.  
Enter the number **2227** for the program "Sulphite (S)" with creep monitoring. Confirm with **OK**.
4. Press **START** to start the program.
5. Set the blank value cuvette to carousel position 1.
6. Set the sample cuvettes to carousel positions 2-7.
7. Press **READ CAROUSEL**.  
The **5:00** timer starts. When the time elapses, two short acoustic signals are sounded.  
Extinction 1 is measured in all cuvettes. **R1** is shown on the display.
8. Pipette the reagent into the blank value and sample cuvettes according to the process specification.
9. Press **READ CAROUSEL**.  
The **30:00** timer starts. When the time elapses, two short acoustic signals are sounded.

Extinction 2 is measured in all cuvettes.

**Note:** For program 2227 sulphite (S) with creep monitoring, extinction 2 is measured six times in order to verify the stability of the value and to preclude a subsequent creep reaction.

The result is indicated in g/L sulphite and g/100 g sulphite on the display.

## Accessories

Description	Order- no.
Carousel insert (sample changer) 10 mm	LZV902.99.00002
10 mm square plastic cuvettes	2743400
10 mm square cuvettes, matched pair, glass, (3.5 mL)	2095100



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