

Roche Applied Science

Rapid Translation System RTS ProteoMaster Instrument

Cat. No. 3 265 650

Operator's Manual

Version 1, November 2001



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1. RTS ProteoMaster Instrument

1.1 Marks of Conformity

The RTS ProteoMaster* Instrument has been manufactured according to EN 61010-1 (Safety Regulations for Measuring, Control and Laboratory Instruments; Part 1: General Requirements [IEC 1010-1 + A1: 1992, modified]) and has been checked in accordance with all relevant safety standards prior to leaving the factory.

The instrument has been approved for use by recognized testing institutions. This is affirmed by the following test/conformity symbols:

| Acronym | Test Symbol | Testing Institution |
|---------|---|---|
| GS |  | Certified by TÜV Product Service |
| CE |  | The instrument conforms to current directives as issued by the European Union according to the Council Directive 89/336/EC. |
| UL |  | Certified by Underwriters' Laboratories, Inc. |
| CUL |  | Certified by Underwriters' Laboratories for Canada a testing facility recognized by the Standards Council of Canada (SSC) |

* **Note:** RTS, Rapid Translation System and ProteoMaster are trademarks of a member of the Roche group

1. **RTS ProteoMaster Instrument**, continued

Classification

The RTS ProteoMaster Instrument is classified as:

- ISM instrument (Industrial Scientific Medical Device), medium sized, for industrial, laboratory, and domestic use
 - Designed for stationary operation
 - Intended for worldwide use
 - Intended for expression of recombinant genes.
-

1.2 General Data

Dimensions and Weight

| | |
|--------------------|--|
| Dimensions: | Length: 42 cm Width: 21 cm Height: 37 cm |
| Weight: | 12.8 kg |

Specifications

| | |
|-------------------------------------|-----------------------|
| Input voltage and frequency: | 100-240 VAC, 50-60 Hz |
| Power | 100 VA |
| Input fuse and spare fuse | 1.6 AT/250 V |

| | | |
|---------------------|---------------------------|-------------------------|
| Shaking mode | <i>Key:</i> | start/stop |
| | <i>LED indicator:</i> | green/red |
| | <i>Display indicator:</i> | default setting 600 rpm |
| | <i>Range:</i> | 120-990 rpm, \pm 5% |

| | | |
|-------------------------|---------------------------|-----------------------|
| Temperature mode | <i>Key:</i> | start/stop |
| | <i>LED indicator:</i> | green/red |
| | <i>Display indicator:</i> | default setting 30°C |
| | <i>Range:</i> | 20-50°C |
| | <i>Cooling mode:</i> | cooled to/kept at 8°C |

| | | |
|-------------------|---------------------------|-----------------------|
| Timer mode | <i>Key:</i> | start/stop |
| | <i>LED indicator:</i> | green/red |
| | <i>Display indicator:</i> | default setting 00:00 |
| | <i>Range:</i> | 00:00-99:59 hours |

| | |
|-----------------------|--|
| Shaking module | stepper motor with eccentric gearing and an amplitude of \pm 0.75 cm |
|-----------------------|--|

| | |
|---------------------------|--|
| Temperature module | two Peltier elements, each for heating and cooling, and a heating foil |
|---------------------------|--|

Environmental Parameters

| | |
|--|--|
| Temperatures allowed during operation | 15-35°C |
| Temperatures required to maintain specifications during operation | 18-30°C (at environmental temperatures above 30°C during operation, the efficiency of the cooling system may be slightly reduced.) |
| Temperatures allowed during transportation/ storage/ packaging | -20°C to 60°C |
| Relative humidity allowed | 20-80%, no condensation |
| Altitude/pressure | 0-2000 m above sea level, 1030-850 hectopascal |

1.3 Safety Precautions

General Safety Precautions

Always observe these precautions when using the RTS Proteomaster Instrument:

- Observe all general safety precautions which apply to electrical instruments.
 - Never touch switches or power cord with wet hands.
 - Do not open the housing of the RTS ProteoMaster Instrument.
- Note:** Only authorized service personnel should perform service or repairs required for this instrument.

Note:

In an industrial environment the device may be disturbed. If necessary, the operator should take appropriate protective measures. Static electrical discharges originating from the user as well as surge pulses at the main outlet may necessitate a device restart.

Warning:

Great care should be taken to prevent moisture or objects from entering the space under the sample chamber, since this may cause immediate and irreparable damage to mechanical and electronic components.

Note: The fan may be switched on automatically in the stand-by mode when the temperature inside the instrument exceeds a certain level.

Warning:

When working with the RTS ProteoMaster Instrument and related reagents, the usual precautions taken when handling chemicals and radioactively labeled material should be observed. In addition, given the possibility that it may be hazardous, extreme care should be taken in handling any material synthesized by use of the product.

1.4 Error Listings

| Error code | What does it mean | What to do |
|-------------------|--|---|
| E0 | Temperature $\leq 6^{\circ}\text{C}$ | Switch the instrument off and then on again. If error code appears repeatedly call local service representative. |
| E1 | Temperature $> 70^{\circ}\text{C}$ | Disconnect from mains for 30 min and check ambient temperature. If error code appears repeatedly call local service representative. |
| E2 | Period to reach target temperature > 2 h | Check ambient temperature. If error code appears repeatedly call local service representative. |
| E3 | Operating temperature $< 15^{\circ}\text{C}$ | Switch the instrument off and then on again. If error code appears repeatedly call local service representative. |
| E4 | Operating temperature $> 55^{\circ}\text{C}$ | Switch the instrument off and then on again. If error code appears repeatedly call local service representative. |
| E 5 | Stepper motor error | Switch the instrument off and then on again. If error code appears repeatedly call local service representative. |

2. Working with the RTS ProteoMaster Instrument

2.1 Description of the RTS Proteomaster Instrument

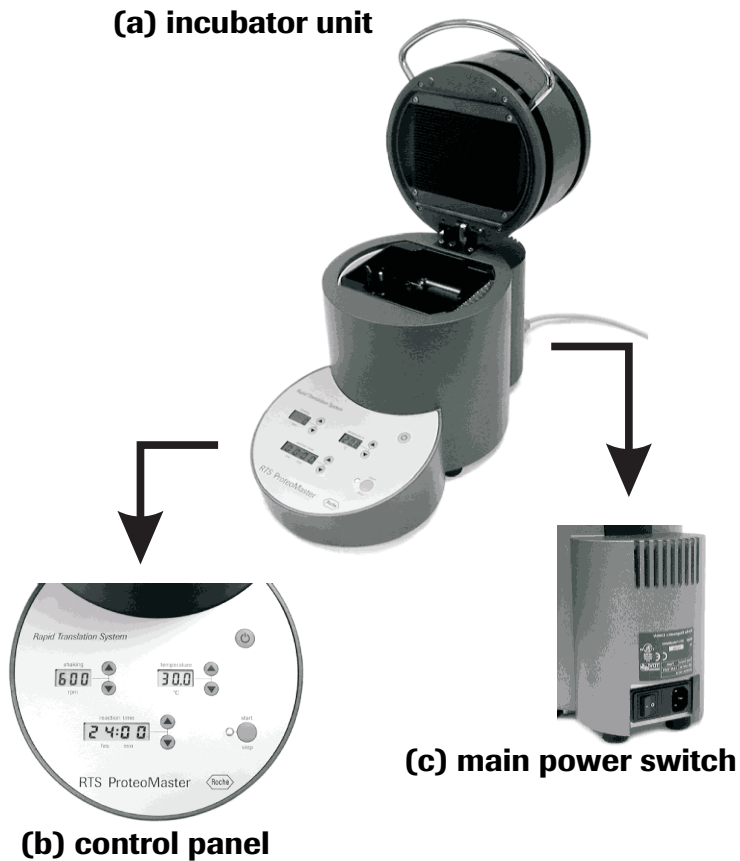


Fig. 1: RTS ProteoMaster Instrument consisting of incubator unit (a) and control panel (b). The main power switch at the back of the instrument is shown in (c).

2.1 Description of the RTS ProteoMaster Instrument, continued

Description of the Instrument

The RTS ProteoMaster Instrument consists of the incubator unit containing the sample chamber (Figure 1a) and the control unit (Figure 1b). The incubator unit consists of a sample chamber which can be shaken with a fixed amplitude and variable shaking speed. Two Peltier elements in the lid and a heating foil located at the bottom of the sample chamber allow for heating and cooling and prevent the formation of condensation in the reaction devices.

The instrument comes with variable inserts for the reaction chamber, designed to carry the different RTS devices as well as standard microtiter plates or standard microcentrifuge tubes. Deep-well microtiter plates fit in the sample chamber without insert.

The sample chamber can be removed from the instrument for easy cleaning (Figure 2).

Variable functions (temperatures, stirring speeds, and time) can be set using the keys on the panel of the control unit.



Fig. 2: The reaction chamber can easily be removed from the incubator unit for cleaning. The temperature sensor (indicated with an arrow) fits into the hole at the bottom of the chamber in one orientation only.

2.2 Guidelines for Operation and Maintenance

| | |
|--------------------------------|---|
| Location | <p>The RTS ProteoMaster Instrument should only be operated in locations that are protected from weather. It should not be operated in buildings that lack facilities for regulating temperature. If necessary, additional drying agents should be used to eliminate humidity.</p> <p>Neither ice nor moisture should be allowed to form on the instrument.</p> <ul style="list-style-type: none">• The instrument should be placed on a level work surface and protected from direct sunlight.• It should not be operated near dripping, spraying, splashing or running water. The RTS ProteoMaster Instrument is suitable for use according to Classification 3K3 in accordance with Standard EN 60721-3-3.• It may be used at locations subject to noticeable or significant vibration. However, it should not be exposed to higher levels of shock waves. The instrument is suitable for use according to Classification 3M4 in accordance with EN 60721-3-3. The instrument is capable of withstanding moderate levels of vibrations. |
| Transport and Storage | <p>Avoid temperatures below -20°C, which may cause damage to the LCD indicators. When storing and transporting the instrument, do not allow it to be exposed to extreme cold, e.g., by placing it in an air-cargo bin.</p> |
| Guarantee | <p>The terms of guarantee are included in the purchase agreement. For further details, please contact your Roche Applied Science representative.</p> |
| Cleaning the Instrument | <ul style="list-style-type: none">• Clean the instrument with a sponge moistened with a minimum amount of water containing a mild commercial household detergent.• For cleaning of the sample chamber remove the chamber from the instrument (see Section 2.1) Use a 70% ethanol solution to disinfect the sample chamber. |
| <i>Warning:</i> | <p>Great care should be taken to prevent moisture or objects to enter the space under the sample chamber, since this may cause immediate and irreparable damage to mechanical and electronic components.</p> |

2.3 Installation

General Remarks The RTS ProteoMaster Instrument is delivered by parcel service. The package contains the instrument, connecting cables, several inserts and this operator's manual. Unpack the instrument carefully. All instrument functions are preset by the manufacturer prior to delivery. The instrument is ready for use as delivered.

Power Requirements The instrument automatically adjusts from 100 V to 240 V.

Installation of the RTS ProteoMaster Instrument

- Connect the cable to the instrument.
- Connect the instrument to the mains.
- Turn on the main power switch at the back of the instrument (see section 2.1)
- Press the on/off key and wait until the red LCD is switched off.

2.4 Working with the RTS ProteoMaster Instrument

2.4.1 The Rapid Translation System

The RTS ProteoMaster Instrument is primarily designed to be used in combination with the RTS reaction devices and the respective reagents provided by Roche Applied Science. Additionally the instrument can be used as an incubator for other applications which are performed in microtiter plates or microcentrifuge tubes.

| Reaction type or format | Cat. No. and pack size | Use of the RTS ProteoMaster Instrument for this reaction type |
|--|---|---|
| Rapid Translation System RTS 100 <i>E. coli</i> HY Kit | 3 186 148 24 reactions | An insert is provided that can carry up to 48 of the type of tubes provided with this kit. Separate tubes can also be obtained from Roche Applied Science: Strip PCR Tubes and Caps; Cat. No. 1667 017; 80 Strips (12 tubes/strip) |
| Rapid Translation System RTS 100 <i>E. coli</i> HY Kit | 3 186 156 96 reactions | An insert is provided that adjusts the depth of the incubation chamber to the optimal depth for optimal incubation conditions |
| Rapid Translation System RTS 500 <i>E. coli</i> HY Kit | 3 246 817 2 reactions | An insert is provided that can carry up to 8 of the RTS 500 type devices as provided with these kits. |
| Rapid Translation System RTS 500 <i>E. coli</i> HY Kit | 3 246 949 5 reactions | |
| Rapid Translation System RTS 9000 <i>E. coli</i> HY Kit | 3 290 395 one 10 ml reaction | The device provided with these kits fits into the reaction chamber without insert. As described in the manual of these kits, this device can be inserted into the reaction chamber in one orientation only. |
| Rapid Translation System RTS 9000 <i>E. coli</i> HY Kit | 3 290 468 three 10 ml reactions | |
| Deep-well microtiter plates | | Selected deep-well microtiter plates fit into the reaction chamber without insert. Please check the compatibility with the instrument before running an experiment |
| Microtiter plates | | An insert is provided that adjusts the depth of the incubation chamber to the optimal depth for optimal incubation conditions. Selected microtiter plates will fit. Please check the compatibility with the instrument before running an experiment |
| Microcentrifuge tubes (0.5 ml and 1.5 ml) | | An insert is provided that can carry up to twelve 1.5 ml tubes (e.g., Eppendorf Micro Test Tubes 0030 125.150) and twenty-four 0.5 ml tubes (e.g., Eppendorf Safe-lock Micro Test Tubes 0030 121.023 or Perkin Elmer Reaction Tube N801-0180). Please check the compatibility with the instrument before running an experiment. |

2.4 Working with the RTS ProteoMaster Instrument, continued

Care must be taken to correctly place the inserts into the reaction chamber of the RTS ProteoMaster Instrument, using weak pressure from the right- to the left-hand side (Fig. 3). The inserts provided with the instruments fit into the reaction chamber in both orientations. Make sure that the insert is properly inserted and that no parts of the insert or of any tube or device is protruding from the incubation chamber.

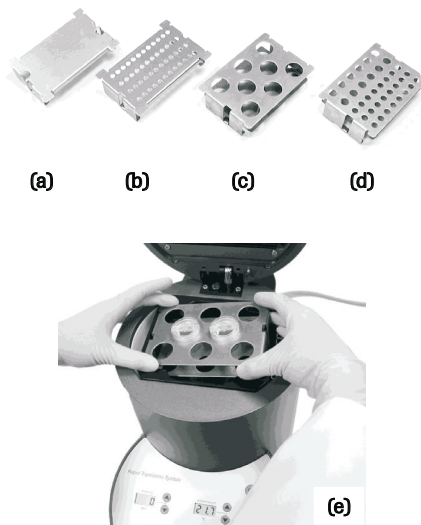


Fig. 3: Inserts used for adapting the RTS ProteoMaster Instrument to (a) microtiter plate (b) RTS 100 tube (c) RTS 500 device and (d) microcentrifuge tube reactions. (e) Placing an insert into the reaction chamber.

Warning:

When the tubes or devices are too high or the insert is not properly placed into the reaction chamber there is a serious risk that the lid cannot close properly. In such cases, shaking can cause significant damage to the instrument and even cause a complete break-down. Please pay attention to the compatibility of the reaction tubes with the RTS ProteoMaster Instrument before running an experiment. When properly installed, compatible devices and tubes will not protrude from the top of the reaction chamber.

2.4.2 Functions of the Control Unit

| | |
|--|---|
| On/Off Switch | <p>The on/off switch activates/deactivates the instrument.</p> <ul style="list-style-type: none">• On: LCD and LED indicators are activated.• Off: Deactivation sets the instrument in stand-by mode but does not disconnect it from the mains. To disconnect it from the mains, turn off the instrument with the main power switch at the back of the instrument. |
| Start/Stop Switch | <p>The start/stop switch activates/deactivates a run.</p> |
| Parameter Keys and LCD Displays | <p>Time, temperature and shaking speed settings can be adjusted with the aid of the up and down keys next to the corresponding LCD displays.</p> <ul style="list-style-type: none">• When the LCD is active, the current values for time, temperature, and shaking speed will be displayed.• By pressing one of the up or down keys briefly, the respective target setting will be shown. After 5 seconds, the current values will appear again.• By pressing the up or down keys for more than two seconds, the respective settings can be changed.• Only one parameter can be set at a time. |
| Two-Colored LED Indicator | <p>The LED is located next to the start/stop button.</p> <ul style="list-style-type: none">• LED glows red<ul style="list-style-type: none">- before a run is started,- after a run has been manually stopped.• LED shows green<ul style="list-style-type: none">- during a run,- in the cooling mode. |

2.5 Programming a Run

Connecting the Instrument

Plug in the instrument and turn on the main switch at the back of the instrument as described in section 2.3.

Press the on/off switch.

- LCD displays will show default settings for 5 seconds.
 - After 5 seconds, the LCD will display the current settings.
 - Start/stop LED indicator glows red.
-

Two Running Modes

There are two optional running modes:

- 1 Continuous run times: The run has to be stopped manually.
 - 2 Set run times: Run stops automatically after the desired run time; the instrument then reverts to the cooling mode at 8°C unless the run is terminated by pressing the stop key manually.
-

Setting Times

- Adjust the time with the up and down keys next to the reaction time display unit
 - Use default setting 00:00 for continuous run or
 - Set run times between 00:01 and 99:59 [hh:mm]
 - Continuous mode
 - If default setting 00:00 [hh:mm] is selected, the instrument will operate in the continuous mode.
 - The LCD indicator will count forward, indicating the elapsed run time starting from 00:00.
 - The run has to be stopped manually by pressing the start/stop key.
 - Set run-time mode
 - If any setting between 00:01 and 99:59 [hh:mm] has been selected, the instrument will operate in the set run-time mode.
 - The LCD indicator will count backwards, indicating the time left until the end of the run.
 - The run stops automatically; the instrument then reverts to the cooling mode (8°C) until the stop key is pressed manually.
-

Setting Temperatures

Set the temperatures with the up and down keys next to the temperature-display unit.

- The default setting is 30°C.
 - Temperatures can be set between 20° and 50°C.
 - Temperatures are monitored and displayed in increments of 0.1°C.
-

Setting Shaking Frequency

Set shaking frequency with the up and down keys next to the shaking frequency-display unit.

- Shaking frequency is indicated as rounds per minute (rpm).
 - The default setting is 600 rpm.
 - The range is between 120 and 990 rpm and can be set in 10 rpm increments.
-

Operation without shaking

The RTS ProteoMaster Instrument can also be operated without shaking. Press the down key when the shaking frequency is at the lowest possible setting (120 rpm). The shaking function will then be switched off, while heating and timing functions stay functional. In this mode, the RTS ProteoMaster Instrument can be pre-heated or be used as an incubator without shaking.

continued on next page

2.5 Programming a Run, continued

Starting a Run

- Press the start/stop switch.
 - All settings become active.
 - Start/stop LED indicator glows green.

Stopping a Run Manually

- Press start/stop switch.
 - Shaking stops The stepper motor will decrease its velocity down to zero within a few seconds.
 - Heating/cooling is inactivated.
 - Start/stop LED indicator glows red.

Programmed Stop with Subsequent Cooling Mode

- After set run-time has elapsed, the instrument reverts to the cooling mode.
 - Shaking stops.
 - Temperature decreases to 8°C and is maintained until the start/stop key is manually pressed.
 - The timer starts counting the time in the cooling mode.
 - Start/Stop LED indicator glows green.

Note: If the start/stop key is pressed before the programmed stop, the cooling mode will be deactivated.

Changing Parameters during a Run

Changing parameters is possible during a run.

- Using the up and down keys; the settings can be changed during a run.

Note: In the set run-time mode, the run automatically stops when the set time has elapsed; the instrument then reverts to the cooling mode.

Opening the Lid during a Run

Opening the lid of the RTS ProteoMaster Instrument during a run will end the run and stop the heating/cooling system, but the current values of reaction time, shaking frequency and temperature settings will be saved.

When the lid is closed again, the run will continue under the same conditions as before and last for the rest of the programmed reaction time.

Please note: Depending on the length of interruption, it may take some minutes until the reaction temperature reaches the previously set value again.

3. How to Contact Roche Applied Science

3.1 Three ways to contact us

To contact Roche Applied Science for technical assistance, choose one of the following:

| IF you are using... | THEN... |
|----------------------------|---|
| the Internet | access our web-site at: http://roche-applied-science.com or at http://www.proteinexpression.com |
| E-mail | please refer to the address that corresponds to your particular location on the last page of this instruction manual. |
| telephone | please refer to the telephone number that corresponds to your particular location on the last page of this instruction manual |

| E-mail Address | Country | E-mail Address | Country |
|--|----------------|----------------------------------|----------------------|
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<http://www.roche-applied-science.com/pack-insert/3265650a.pdf>

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