ThermoScientific™

KingFisher Duo Prime

Brief User Manual

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Release history:

March 2015: First release for KingFisher Duo Prime

For Research Use Only. Not for use in diagnostic procedures.

WEEE Compliance

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:

Thermo Fisher Scientific has contracted with one or more recycling or disposal companies in each European Union (EU) Member State, and these companies should dispose of or recycle this product. Contact Thermo for further information on Thermo Fisher Scientific's compliance with these Directives and the recyclers in your country.

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Preface

About This Guide

This Brief User Guide is intended for the Thermo Scientific™ KingFisher® Duo Prime instrument. It aims to give you a short introduction on installing the instrument and Thermo Scientific BindIt™ Software as well as starting a purification protocol from the internal software.

The complete user manual for the KingFisher Duo Prime instrument is available on the KingFisher User Manuals CD. For instructions on the BindIt Software, see the BindIt Software for KingFisher Instruments CD. Read the user manuals in their entirety before operating the instrument.

For details and ordering information on plastic consumables, such as plates, tip combs, elution strips and such used with the KingFisher Duo Prime instrument, see the List of accessories and consumables in the Thermo Scientific KingFisher Duo Prime Technical Manual (Cat. no. N16621).

Reagents

There is a wide selection of optimized Thermo Scientific KingFisher Pure Kits available for purification of DNA or RNA. A large variety of starting materials can be used, such as blood, cells, tissues or cell-free body fluids. The DNA or RNA purified with the KingFisher Pure Kits is of high quality and free of proteins, nucleases, and other contaminants or inhibitors.

For more information, see the list of KingFisher Pure Kits in the KingFisher Duo Prime Technical Manual.

Thermo Scientific™ Pierce™ Protein Research Products are available for protein applications. For more information on available kits, visit `www.thermoscientific.com/pierce`.

The KingFisher Duo Prime is an open system, which also enables the use of other magnetic particle kits. The optimal magnetic particle size for the KingFisher Duo Prime is approximately 0.8–10 µm.

Contacting Us

For the latest information on products and services, visit our website at:

`http://www.thermoscientific.com/kingfisher`

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Introduction to KingFisher Duo Prime

Intended Use

The KingFisher Duo Prime magnetic particle processor is intended for professional research use by trained personnel. The instrument is intended for automated transfer and processing of magnetic particles in a microplate format. Use for self-testing is excluded. It is recommended that Good Laboratory Practice (GLP) is followed to guarantee reliable analyses.

Operation Principle

The patented technology of the KingFisher Duo Prime system is based on the use of magnetic rods covered with a disposable, specially designed tip comb and plates. The instrument functions without any dispensing or aspiration parts or devices.

Samples and reagents, including magnetic particles, are dispensed into the plates according to the corresponding instructions. The protocol that is selected by the user with the keypad and display has already been transferred onto the onboard software. BindIt Software can be used to create and run protocols.

Figure 1 illustrates the KingFisher Duo Prime instrument and its parts (listed in the table that follows).

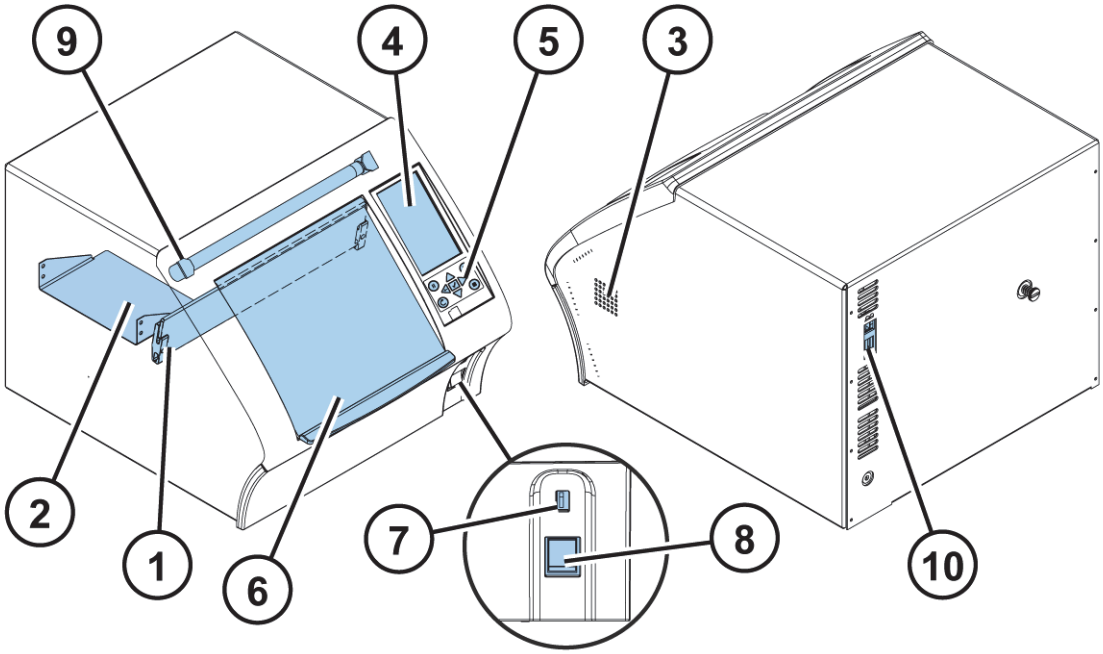


Figure 1. KingFisher Duo Prime magnetic particle processor

Item number	Item	Item number	Item
1	Maintenance door	6	Front lid (closed)
2	Shield plate	7	USB port for memory stick or barcode reader. USB port also at the back of the device.
3	Cooling air outlet	8	On/off switch
4	Display	9	UV lamp
5	Keypad	10	USB port and barcode reader connection (preferred location)

To keep the instrument in the best condition for maximum reliability, follow the preventative maintenance instructions provided in KingFisher Duo Prime Technical Manual. A poorly maintained instrument does not give the best results.

Installation

This chapter briefly describes the installation of the KingFisher Duo Prime instrument.

WARNING This product contains very strong permanent magnets. People wearing a pacemaker or metallic prostheses should not use this product. A pacemaker or prostheses may be affected or damaged if it comes in close contact (10 cm or 3,9 inches) with a strong magnetic field.

CAUTION The heating blocks are specifically designed for the plastic consumables listed to ensure even heating during the sample process. Using other plastics than those recommended may damage the instrument, diminish the application performance and cause cross-contamination due to the divergent well volume and bottom height of the plate.

CAUTION Do not place the KingFisher Duo Prime heads on any metal surfaces. Keep the KingFisher Duo Prime heads always in their respective plastic boxes when not in use. It is very important to keep the KingFisher Duo Prime heads away from each other and other magnets at all times. Clashing of the magnets together may cause serious damage to the magnets.

CAUTION Do not keep the KingFisher Duo Prime head in close proximity to magnetic tapes, computer discs or other magnetic storage systems, such as credit cards, as these can be damaged by the strong magnetic field of the KingFisher Duo Prime heads. Do not hold the KingFisher Duo Prime heads close to a PC display as this may cause damage to the display. Do not use metal tools when handling the KingFisher Duo Prime heads.

WARNING Risk of burns. The heating block and/or the elution block surface can be hot. The warning lights are lit if the temperature rises above 50°C.

Unpacking Equipment

Move the packed instrument to its site of operation. To prevent condensation, leave the instrument in its protective, antistatic plastic wrapping until the ambient temperature has been reached. Unpack the KingFisher Duo Prime instrument and accessories carefully with the arrows on the transport package pointing upwards. Remove the instrument from the package and place it on a level surface.

The following notes and instructions are sent with the instrument and are immediately available when you open the package:

- BindIt Software installation CD including Thermo Scientific™ BindIt™ Software for KingFisher Instruments User Manual
- Manuals CD containing the following documents:
  - Brief User Manual (this manual) with translations
  - KingFisher Duo Prime Technical Manual
  - Thermo Scientific User Awareness of Symbols
  - Declaration of Conformity document

Note It is recommended to save the user manuals on the installation CD as backup files on your PC.

Note Do not touch or loosen any screws or parts other than those specifically designated in the instructions. Doing so might cause misalignment and will void the instrument warranty.

CAUTION The KingFisher Duo Prime weighs approximately 17 kg [37,5 lbs.] without the transport package, and must be lifted with care. It is recommended that two persons lift the instrument together, taking the proper precautions to avoid injury.

To lift the instrument, place your fingers under the bottom of the device on both sides and lift it with your back straight.

Removing Internal Cushions

When you have opened the package, open the front lid of the instrument and remove the two internal cushions. First remove the larger cushion in the middle, and then remove the smaller cushion which protects the UV lamp. To remove the smaller cushion, carefully pull it outwards and then down. For illustrations, see the following figures.

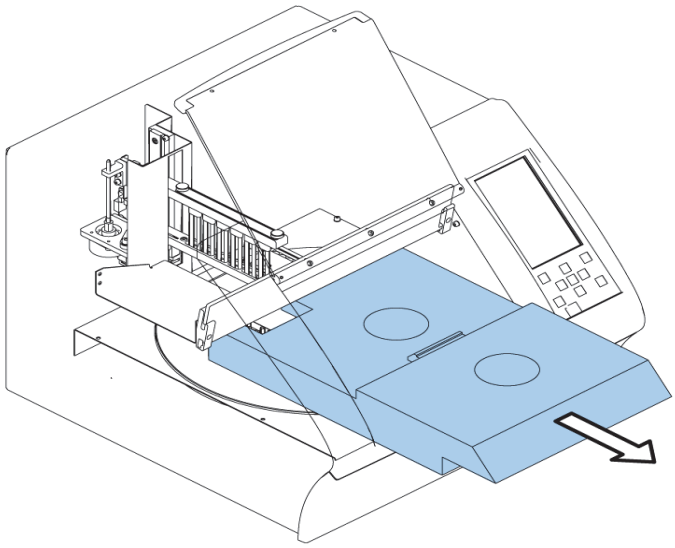


Figure 2. Removing internal cushions

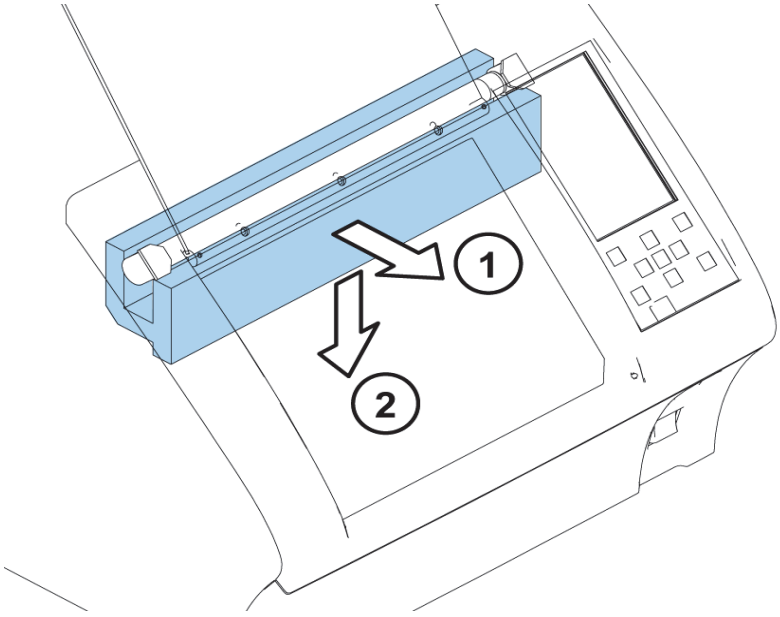


Figure 3. Removing the UV lamp protection

Releasing Transport Lock

The instrument comes with one transport lock. Release the transport lock before you put the instrument into operation.

To release the transport lock, unscrew the transport lock finger screw with spring suspension counterclockwise (see the following figure). The loosened finger screw stays in the same location by spring force. It is possible to use a suitable tool, such as a screwdriver or a coin to unscrew the transport lock.

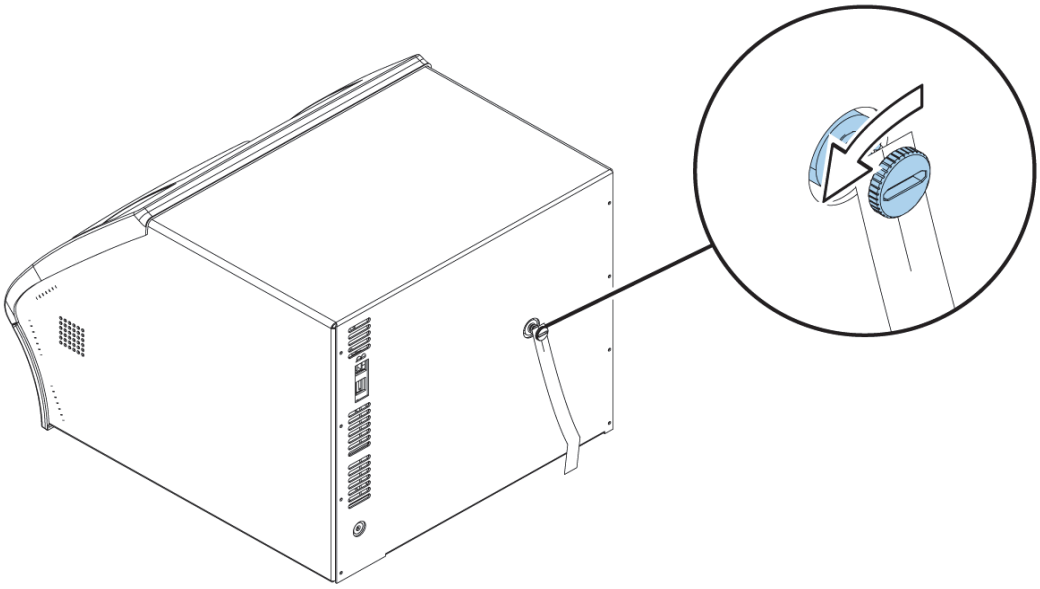


Figure 4. Releasing the transport lock

Connecting Power Supply Cable

WARNING Make sure that the main switch (see point 8 in Figure 1 on page 2) on the front panel is in the OFF position. Never operate your instrument from a power outlet that has no ground connection. Never use a power supply cable other than the Thermo Scientific power supply cable designed for your region.

❖ **To connect the power supply cable:**

1. Connect the power supply cable to the power supply connector and plug in the instrument (see the following figure).

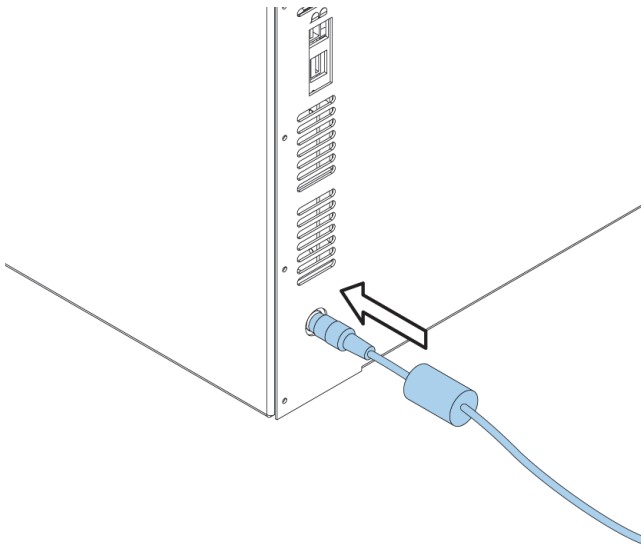


Figure 5. Power supply cable connected

2. Connect the power supply to a correctly installed line power outlet with a grounded conductor.

Turn the power switch to the ON position to perform the next task. The instrument performs initialization tests and adjustments.

Setting Up

Before running KingFisher Duo Prime, you need to set up the instrument by inserting heating blocks and the magnet head.

Inserting Heating Blocks

❖ **To insert the heating blocks:**

1. Insert the first heating block according to the used plate type. Set it into the plate position and snap it into place (see the following figure).

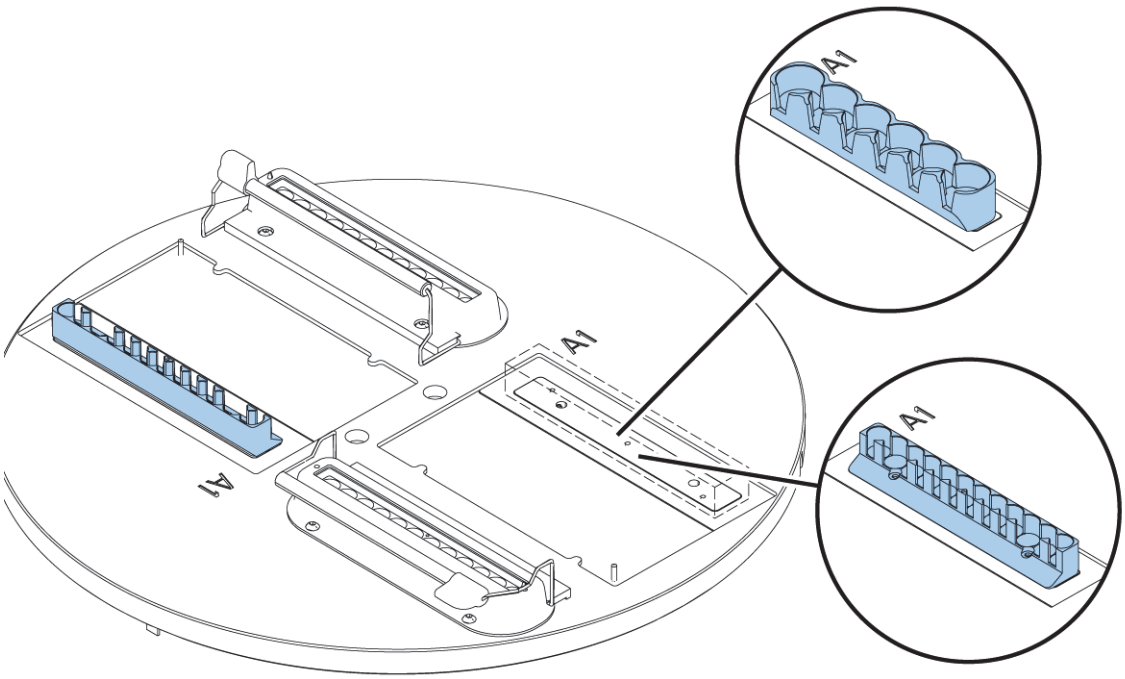


Figure 6. Inserting the heating block

2. Press the **ROTATE** button to get the other heating block in the front.
3. Insert the second new heating block by setting it and snapping it into place.
4. To change the heating blocks, take away the heating block by lifting it and repeat Steps 1–3.

Inserting Magnet Head

❖ **To insert the magnet head:**

1. Open the maintenance door by lifting it up and turning it to the front
2. To fit the magnet head, choose the `Change_magnet_head` protocol under the **Maintenance** menu using the Up and Down arrow keys. Follow the instructions shown on the screen.
3. Press the **START** key. The procedure stops to a pause.

4. Insert the magnet head by slotting it into the tip comb holder and by fitting the two finger screws on top of the magnet head (see the following figure).

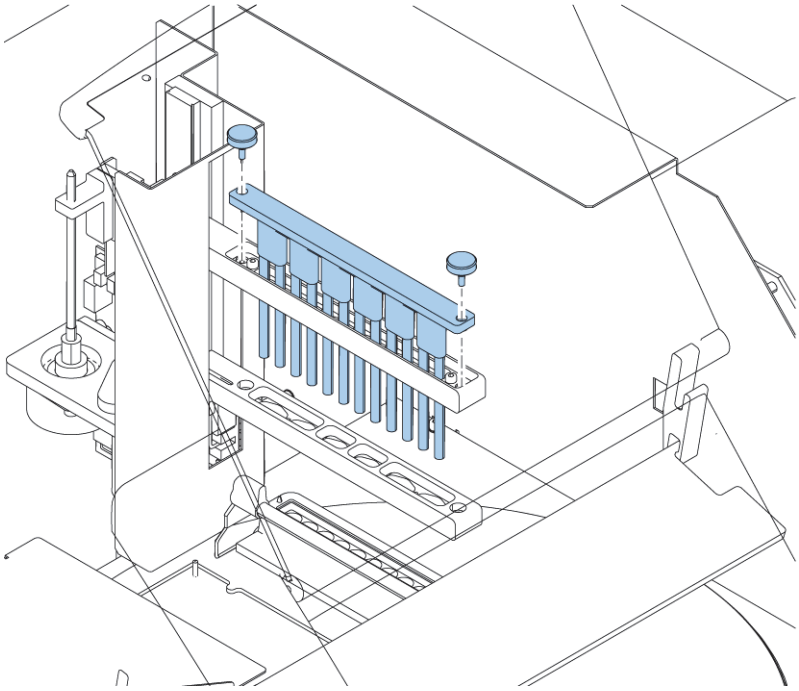


Figure 7. Inserting the magnet head

5. Continue the process. The magnets move on top of the shield plate at the end of the changing process.

6. Close the maintenance door by lifting it up to and push it to its slot.

When you change the magnet head, take away the magnet head by turning the two finger screws on top of the magnet head clockwise. When you remove the KingFisher Duo Prime head, be careful not to damage the magnet rods against the tip comb holder frame.

Note When changing the magnet head, run the `Change_magnet_head` protocol under **Maintenance**.

Operational Check

To verify proper instrument operation, it is recommended that you carry out a check run using a maintenance protocol. Run the check protocol (Check_12-tip or Check_6-tip according to the magnet head) under the **Maintenance** menu. If there are no problems, proceed with your own runs.

Installing BindIt Software

Start the installation of the BindIt software by following the instructions given in this section. For detailed instructions on installing and using the BindIt Software, see the BindIt Software for KingFisher Instruments User Manual (Cat. No. N07974).

Note the following before you start installing the software:

- BindIt Software cannot be installed on a network drive.
- To be able to install the BindIt Software, you must be logged on to your computer with administrator rights.

❖ **To install the BindIt software:**

1. Insert the BindIt Software installation CD into the CD-ROM drive of your PC.
   The BindIt Installer dialog opens automatically.
   If the dialog does not open, start the installation from the CD by double-clicking the `Setup.exe` file.
2. Close all other programs on your computer and click **Install** to begin the installation process. To cancel the installation and exit the installer, click **Close**.

Note If you have an existing instance of Microsoft™ SQL Server™ 2008 R2 Express Edition on your computer, you can choose to use the existing instance or create a new one. If you are uncertain of the compatibility, create a new instance by clicking **Yes**. If you do not wish to create a new instance, click **No**.

Note The installation of a new database engine does not affect any other installed database engines.

3. To start the Setup Wizard, click **Install**. The wizard guides you through the installation procedure. To continue, click **Next**.
4. Read the end user license agreement and tick the selection box to accept the terms.
   - Click **Next** to continue.
   - To print a copy of the license agreement, click **Print**.
5. Select the destination folder for the BindIt Software installation files.
   The Setup Wizard suggests a location for the files. Using the default file location is recommended.
   - To select another folder or drive, click **Change**.
   - Click **Next** to continue.
     The Setup Wizard is now ready to install the BindIt Software on your computer.
6. Click **Install** to start the installation. The installation files are copied to the selected folder. The installation progress dialog opens.
7. The BindIt Software has now been installed. Click **Finish** to finalize the installation and to configure the database.

- The BindIt Installer continues by installing the database engine. If existing SQL server instances are detected on the computer, click **Yes** to install a new instance or **No** to use an existing instance.

Note Creating several concurrent SQL server instances may slow down your computer. We recommend using an existing THERMO instance, if available.

- If no previous SQL server instances are detected, Microsoft SQL Server 2008 R2 Express Edition is installed on to your computer. Installing a new instance of the SQL server takes some time.

8. Check the server and database names in the *Database Configuration* dialog.
9. Click **Configure**.

   The installation proceeds with the database configuration. Wait until it has

   finished. This may take several minutes.
10. When the installation is complete, a confirmation message is shown.

    Click **OK** to complete the installation process.

Importing Protocols Using USB Memory Device

You can import a protocol into the KingFisher Duo Prime using a USB memory device.

Note If you export device reports, run logs and/or protocols to a blank USB device, the exported items go to the `KingFisher Duo Prime` folder which is automatically created on the USB memory device. If you import protocols from the USB memory device to the instrument, they must already be in the correct folder named `KingFisher Duo Prime`.

Operation

Keypad

The keys and control buttons are shown in the following figure and described in Table 1.

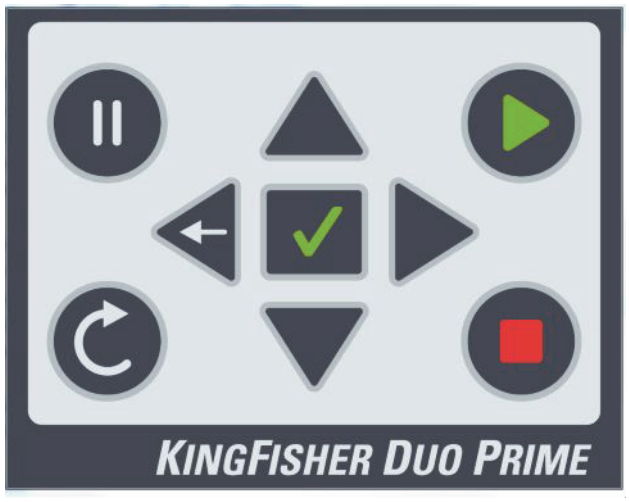


Figure 8. KingFisher Duo Prime keypad

Table 1. Keys and control buttons

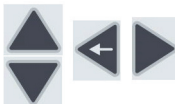
Key	Description
	Use the Up, Down, Left and Right arrow keys to select a protocol and to navigate on the display.
	Use the OK button to accept the selection and to confirm a performed step in the protocol (for example, plate loading or removal).

Table 1. Keys and control buttons

Key	Description
	Use the Start button to initiate the run.
	Use the Stop button to terminate the protocol(s).
	Use the Pause button to stop the run. The run pauses at the end of the ongoing processing step
	Use the Rotate button to rotate the turntable.

Navigating

This section visualizes navigation in the KingFisher Duo Prime user interface.

The main view changes according to the selections you make either with the Up or Down arrow keys or the **OK** button. To move into the submenus, use the **OK** button. The available buttons and their function are shown on the info text bar.

The color of the items, for example, the icon and main view row, in the main view changes when they are selected (active/inactive).

To move from one menu to another, make sure you are in the main view of one of the menus and use the Left and Right arrow keys.

To return from the submenus to the main views, use the Left-arrow key.

The main views of each menu tab are shown in the following figure.

Figure 9. Main views of menu tabs

Starting KingFisher Duo Prime

You can have two runs ongoing at the same time.

❖ **To start the instrument:**

1. Select a protocol by using the arrow keys and press **START** or use the BindIt Software to run the desired protocol on the PC. If you have the 2D Barcode reader for KingFisher (N16640) connected (see Figure 1 on page 2), use the barcode reader to read the barcode of consumables and/or samples. To check the barcode reader status, select the **Maintenance** menu and then click the **Barcode Reader** row.
   - Use the Up and Down arrows to select the wanted row and to read the respective barcode.

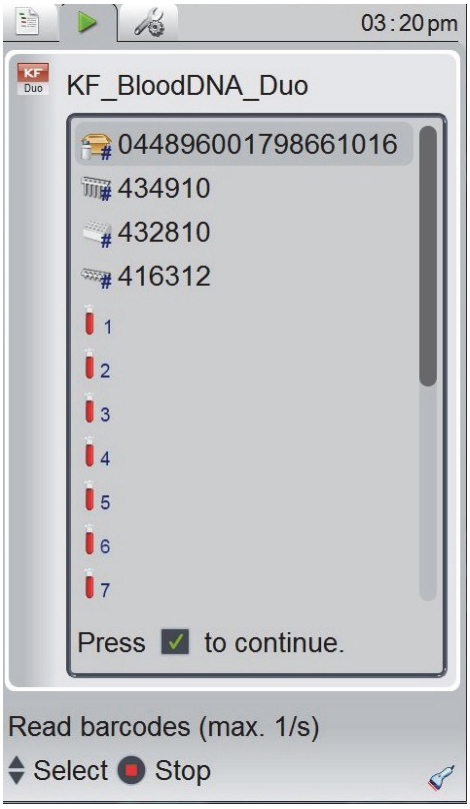


Figure 10. Using the barcode reader to read the barcodes

2. Press the **OK** button.
3. Make sure that the front lid is open.
4. Load the plate(s) and elution strip(s) in the order that the protocol requests.
   - Place the plate into the device so that the A1 corner is in the inner circle in the upper right corner (see Figure 11 on page 17).
   - Use the elution strip holder to hold the elution strip in place (illustrated in Figure 11 on page 17). There is a tap that helps placing the elution strip correctly (see the following figure).

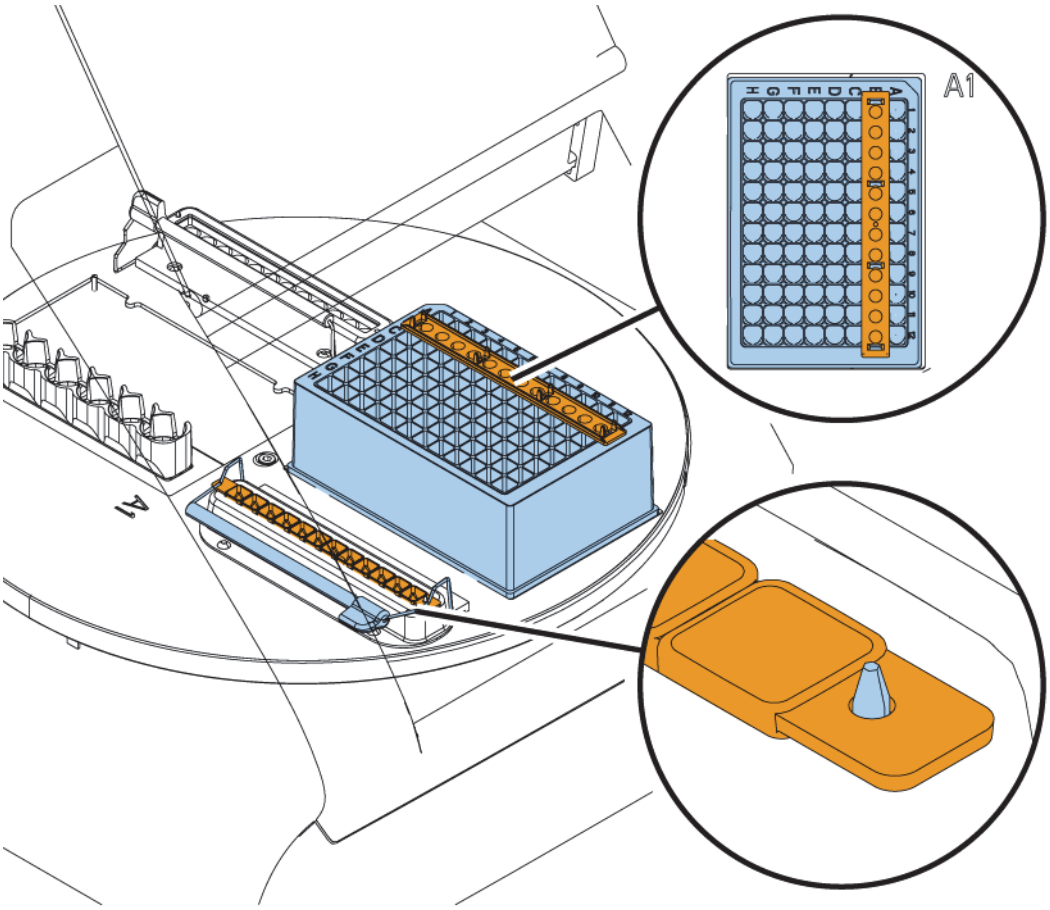


Figure 11. Loading the plate and the elution strip

5. When you have loaded the requested plates into their respective plate positions, press the **OK** button.
   - The instrument functions with either one or two plates depending on the number of steps.
   - The tip comb always has to be placed manually onto the KingFisher DW plate row B (see the previous figure). Only one tip comb can be placed onto a KingFisher plate during one run.

Note When the instrument is in its basic position, plate position 1 is under the Thermo Scientific™ KingFisher™ Duo Prime head. At the end of a protocol run, the turntable may stop in a different position than the starting position.

   - The tip comb automatically locks onto the tip comb holder from the plate.
   - When the turntable rotates, the magnet head moves on top of the fixed shield plate that forms a protective cover.

6. Close the front lid. The front lid protects the instrument against environmental contamination.

Note You can leave the front lid open if desired. This action does not break the run.

7. When the run is finished, remove the plate(s) and strip(s) according to the protocol request.

CAUTION Remove any plates, strips or tip combs still in the instrument. Dispose of all microplates, strips and tip combs as biohazardous waste.

Tip You can start another run normally while the previous run is ongoing.

Switching UV Lamp On

You can use the UV lamp to decontaminate the process chamber. If you open the front lid, the UV lamp shuts down. Note that UV treatment is not a substitute for cleaning the instrument.

❖ **To switch on the UV lamp:**

1. Go to the **Maintenance** menu.
2. Select the **UV Lamp** row and press the **OK** button.
3. To set the time of the UV lamp, select the **Set time row** and press the **OK** button.
4. Use the Up and Down arrows to set the wanted duration. To accept the setting and to move to the minute setting, press the **OK** button. You can set the duration in hours between 00 and 16 and the duration in minutes between 00 and 59. When you open the setting, the time shown is the previously set time for the UV lamp usage. The default time is 00:30.

Technical Specifications

Thermo Fisher Scientific reserves the right to change any specifications without prior notice as part of our continuous product development program.

General Specifications

Table 2. General specifications

Condition	Value
Operating conditions (indoor use)	+4°C to +40°C; maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C For indoor use only.
Mains power supply	100–240 Vac, 50/60 Hz, nominal Automatic voltage detection
Power consumption	96 VA max.; 10 VA standby

Safety Specifications

Safety specifications are in conformity with the requirements.

In addition to or in excess of those stated in the operating conditions, the safety specifications are also met under the environmental conditions listed in the following table.

Table 3. Safety specifications

Condition	Value
Altitude	Up to 2000 m
Temperature	+4°C to +40°C
Humidity	Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
Mains supply fluctuations	±10% from nominal

Table 3. Safety specifications

Condition	Value
Installation category (overvoltage category)	II according to IEC 60664-1 (see Note 1)
Pollution degree	2 according to IEC 60664-1 (see Note 2)

Note 1: The installation category (overvoltage category) defines the level of transient overvoltage which the instrument is designed to withstand safely. It depends on the nature of the electricity supply and its overvoltage protection means. For example, in CAT II which is the category used for instruments in installations supplied from a supply comparable to public mains, such as hospital and research laboratories and most industrial laboratories, the expected transient overvoltage is 2500 V for a 230 V supply and 1500 V for a 120 V supply.

Note 2: The pollution degree describes the amount of conductive pollution present in the operating environment. Pollution degree 2 assumes that normally only nonconductive pollution, such as dust, occurs with the exception of occasional conductivity caused by condensation.