ProFlex™ PCR System Installation and Operation

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This document summarizes the procedures for installing and using the ProFlex™ PCR System, including "better than gradient™" VeriFlex™ technology, that are described in detail in the *ProFlex™ PCR System User Guide* (Pub. no. MAN0007697).

Figure 1 ProFlex™ 3 × 32-Well PCR System

Note: For safety and biohazard guidelines, see the "Safety" appendix in the *ProFlex™ PCR System User Guide* (Pub. no. MAN0007697). Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.

How to install the ProFlex™ PCR System

Materials required:
- Can of compressed air

  Note: The can of compressed air is used to deliver a blast of air into each well of a sample block to remove particles that may have collected during shipping of the product.

- *(Optional)* Electrical protective devices

  Note: We support the use of one or more of the following electrical protective devices:
  - Power line regulator (1.5-kVA)
  - Surge protector/line conditioner (10-kVA)
  - Uninterruptible power supply (1.5-kVA)

Set up the ProFlex™ PCR System

IMPORTANT! Save the packing materials and box in case you need to ship the instrument to us for service.

1. To unpack the ProFlex™ PCR System, open the shipping crate. You would have received three boxes for the ProFlex™ System, one containing the base module, a second containing the block module, and the third containing accessories.

2. Remove the packing material, then inspect the instrument for shipping damage.

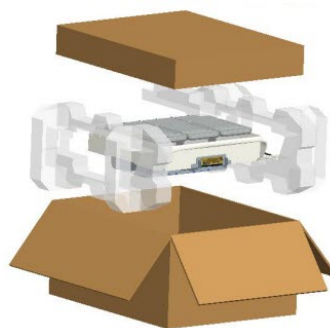Figure 2 ProFlex™ Base packing

Figure 3 ProFlex™ 3x32-Well Sample Block packing

3. Move the ProFlex™ System to an installation site that:
   - Meets the spatial and weight requirements for the ProFlex™ System (see "Technical specifications" on page 9)
   - Is within 1 m (3 ft) of a 800 VA power receptacle

Thermo Fisher
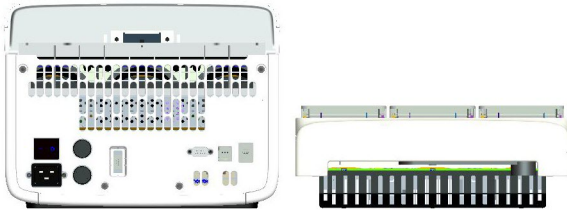SCIENTIFIC

4. Face the unit away from you.

Figure 4   Rear view of ProFlex™ Base and ProFlex™ 3x32-Well Sample Block

5. Place the block (ProFlex™ 96-Well Sample Block or ProFlex™ 3x32-Well Sample Block) on top of the ProFlex™ Base with the latching mechanism to the right hand side.
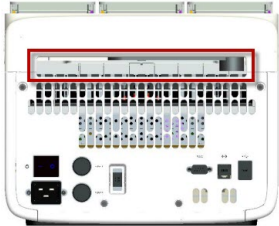

Figure 5   Latching mechanism during installation

6. Push the latching mechanism all the way to the left to secure the block onto the base.
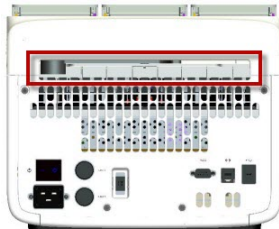

Figure 6   Latching mechanism securing the ProFlex™ 3x32-Well Sample Block to the ProFlex™ Base

7. Connect the ProFlex™ System:
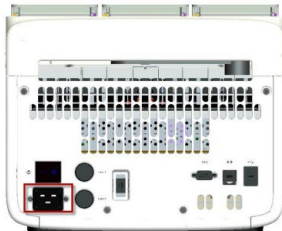
   a. Connect the power cord to the ProFlex™ System.

Figure 7   Power cord insertion point

   b. Install any desired electrical protective devices.

   c. Connect the power cord to an 800 VA power receptacle.

   d. In the absence of the ethernet cable or the ethernet port, you can connect the instrument to the network via the USB-enabled Wi-Fi Card (Part no. 4483658) as shown in the following graphic.

   Insert the Wi-Fi Card into the USB port at the back of the ProFlex™ System. For instructions on setting up the wireless connection, see "How to set up the wireless connection in the ProFlex™ System" on page 3.

Figure 8   USB-enabled Wi-Fi Card port

8. Press the power button, then wait for the instrument to start up. Proceed with the installation after the touchscreen displays the Main Menu, indicating that the ProFlex™ System startup is complete.

   When you power on the instrument, the instrument may require about 30 seconds to start up.
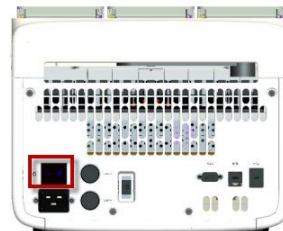

Figure 9   Location of the power button

The Home screen will display following successful installation.

Note: The following screenshot displays the Home screen of the ProFlex™ 3x32-Well System. In the ProFlex™ 96-Well System, the ProFlex™ Dual 96-Well System, and the ProFlex™ Dual Flat PCR System, the Home screen displays only one dial.
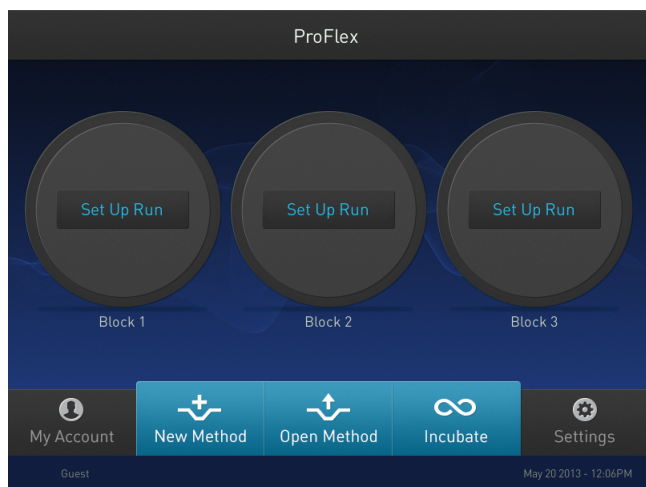
Figure 10   ProFlex™ 3x32-Well System Touchscreen Home

How to set up the wireless connection in the ProFlex™ System

See "Set up the ProFlex™ PCR System" on page 1 on connecting the USB-enabled Wi-Fi Card into the ProFlex™ System. To set up the wireless connection:

1. Power on the ProFlex™ Instrument, and in the Home screen, touch **Settings**.

2. In the Settings screen, touch **Device Settings**.

3. In the Device Settings screen, touch **Network Connection**. In the Network Connection Type screen, touch **Wireless**. The Search Wireless Network screen will come up and the wireless symbol will appear active. Touch **Cancel** to exit the screen.

   Note: During initial setup, if you selected the Wired option in the Network Connection Type screen, you will be required to enter your IP address if you selected the Static IP wired option. If you selected the Dynamic IP wired option, the IP address is automatically populated.

4. Once a wireless connection has been detected, a list of the available networks will be displayed in the Choose Network screen. Touch the network name of your choice or touch **Join Other Network**.

5. In the Find and Join a Network screen, enter the name and security type of the network.

   Note: When you touch in the Network Name field, a keypad will come up to facilitate making the entry.

6. From the Security type drop-down menu, touch to select the security type and enter the relevant information in the screen.

   Note: Contact your IT Systems Administrator for information on security type.

   You can select from the following options:
   - WEP
   - WPA Personal
   - WPA2 Personal
   - WPA Enterprise
   - WPA2 Enterprise

7. Touch **Join** to continue or **Cancel** to exit from the Find and Join a Network screen.

8. Depending on the security type you have selected, enter the appropriate passwords and touch **Join**. If you entered the correct information, the Network Connection Complete screen will appear. Touch **OK** to continue. If you entered incorrect information, the Network Connection Failed screen will come up and you will require to go back to security type screen to resolve the issue. Touch **OK** to continue.

Set up mobile and cloud connectivity to ProFlex™ instrument and your mobile device

Create an account on Thermo Fisher Connect

1. From your internet browser, visit **thermofisher.com/cloud**

2. If you already have an Thermo Fisher Scientific account, login on the Cloud page.

3. If you do not already have a Thermo Fisher Scientific account, follow the prompts to create a new one.

4. Once you have logged in to **thermofisher.com/cloud**, an email will automatically be sent to you to verify your email address.

5. Open your email and click on the link to visit the cloud page for the first time.

6. If you have done this successfully, you will receive a confirmation email telling you that you have connected to the Thermo Fisher Connect.

Set mobile and cloud connectivity in the ProFlex™ Instrument

1. Connect your ProFlex™ System to the internet using a wireless or wired connection.

   Note: See "How to set up the wireless connection in the ProFlex™ System" on page 3 for setting up a wireless connection or refer to the *ProFlex™ PCR System User Guide* (Pub. no. MAN0007697) for setting up a wired connection in the ProFlex™ System.

2. Turn on the connectivity to the Thermo Fisher Scientific Server.

   a. In the Home screen, touch **Settings** to open the Settings screen.

   b. In the Settings screen, touch **Device Settings**.

c. In the Device Settings screen, touch **Remote Service**.

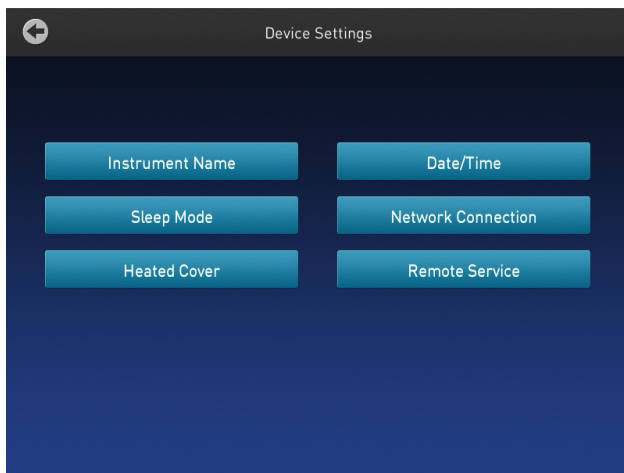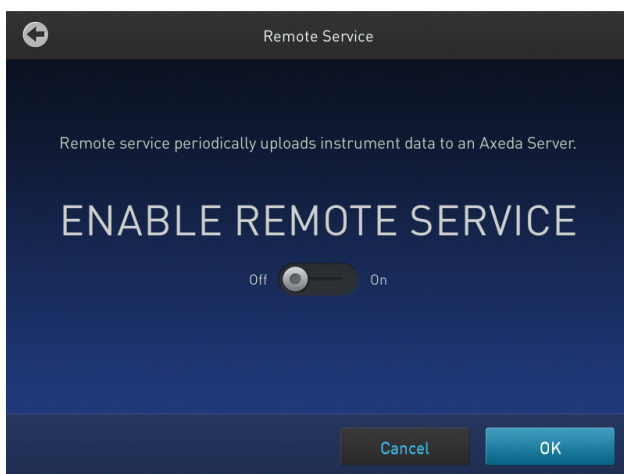
Figure 11 ProFlex™ PCR System Device Settings screen

d. Using the On-Off toggle button, enable the Remote Service. Touch **OK**.

Login as the Administrator login to link the instrument to the Cloud

1. Touch **Sign In** from the Main screen.

2. Touch **Sign In** from the Sign In screen.

3. Touch **Administrator** when asked to choose screen name.

4. Enter the password for the Administrator account. By default, the password is "password".

5. You will then be redirected back to the home screen.

6. Touch **My Profile** from the Main screen.

7. Touch on the **Cloud** tab.

8. Enter your Thermo Fisher Connect user name and password and select **Link Account**. Create an account on **thermofisher.com** if you have not done so already.

9. Upon successful authentication, the Administrator is linked to Thermo Fisher Connect. Subsequently, any user can log in and proceed to perform linking the instrument to their Thermo Fisher Connect account.

   Note: The administrator account must be activated first to connect the instrument to the Cloud. Afterwards, many users can create unique user profiles using their own log in information. Each unique profile must have a unique Thermo Fisher Connect account.

Create a new user profile on the instrument

In the home screen:

1. Touch 👤 **Sign In**.

2. Touch **Get Started**.

3. Touch **Name**, then enter a username and touch **Enter**.

4. Touch **Password**, then enter password and touch **Enter**.

5. Touch **Confirm Password** and repeat the previous step.

6. Touch **Create profile**.

   Note: You can link your instrument profile to your Thermo Fisher Connect account at this point, or you can link after signing in.

7. Sign in to the profile you just created.

Sign in

In the home screen:

1. Touch 👤 **Sign In**.

2. Touch **Sign In**, then select your username.

3. Enter your password, then touch **Enter**.

Link your instrument profile to Thermo Fisher Connect once signed in.

Sign out

In the home screen:

1. Touch 👤 **My Profile**.

2. Touch **Sign Out**.

Link instrument profile to your Thermo Fisher Connect account

Linking your profile to your Thermo Fisher Connect account allows you to:

• Download methods stored in your Cloud account to the instrument.

• Transfer methods from the instrument to your Cloud account.

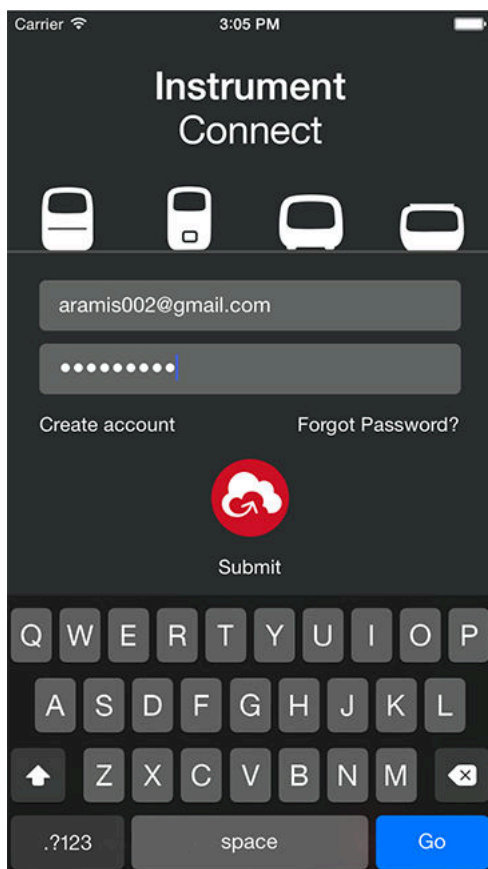Link your instrument profile to Thermo Fisher Connect

1. Sign in to your instrument profile.

2. Touch 👤 **My Profile**.

3. Touch **Cloud**.

4. Enter your Thermo Fisher Connect username and password, then touch **Link Account**.

5. Touch **Done** to exit the confirmation screen.

Your instrument profile will link to your Thermo Fisher Connect account.

Set up mobile connectivity on a mobile device

Download the "Instrument Connect Mobile Application" on your mobile device.

1. For an iPad™ or an iPhone™, download the application from the iTunes™ music store or by searching for Instrument Connect by Thermo Fisher Scientific.

2. For Android devices, download the application from Google™ Play by searching for Instrument Connect by Thermo Fisher Scientific.

3. Log in to the instrument connect mobile application using your Thermo Fisher Connect login and password.

How to use the ProFlex™ System

You can operate the ProFlex™ System from the touchscreen. For detailed instructions on using the ProFlex™ System, refer to the *ProFlex™ PCR System User Guide* (Pub. no. MAN0007697), available at **thermofisher.com** .

In the Home screen for the Touchscreen, you can set up a run by creating a new method for a run. To set up a run using a new method:

1. Touch **New Method** or where it says Set Up Run on an available block.

2. Select a template.

3. In the edit mode, edit the parameters of the method template such as temperature, time, number of steps/stages.

4. To reach advanced editing options, touch **Manage Steps**, followed by touching **Advanced Options**. Advanced editing options include: VeriFlex™ for optimization, simulation modes, ramp rates, and AutoDelta.

5. Save the new method in a folder or directly start a run by touching **Start Run**

   Note: In case of the ProFlex™ 3x32 Well PCR System, you will need to choose a block prior to starting a run.

How to maintain the ProFlex™ System

To ensure proper operation:

- Regularly:
  - Wipe the ProFlex™ System surfaces with a lint-free cloth.
  - Clean the vents, touchscreen, and sample block of the ProFlex™ System.
  - Clean the sample wells with 100% isopropanol.

- **Use correct consumables.**
  Use only consumables recommended for the ProFlex™ System. Use of consumables that are larger or smaller than the specified volume can damage the instrument, contaminate the sample block, and/or decrease the PCR yield (due to inefficient thermal transfer).

- **Do not use sharp objects on the touchscreen.**
  Use only your fingers or blunt objects to enter commands on the ProFlex™ instrument touchscreen. Sharp and/or pointed objects such as writing utensils can damage the surface of the touchscreen.

- **Back up frequently.**
  Routinely back up the configurations and files of your ProFlex™ System to a USB drive. Regular backups protect against data loss caused by user error, power failure, or instrument error. For more information, refer to the *ProFlex™ PCR System User Guide* (Pub. no. MAN0007697).

Prevent crushing tubes

IMPORTANT! Prevent crushing tubes in the thermo cycler by using retainer/tray systems.

The lid on the thermo cycler provides significant downward pressure on the plastic plates and tubes. When only using a small amount of tubes, it is possible that the pressure from the lid can cause tubes to crush and deform. To prevent this tray/retainers must be used.

ProFlex™ 3 × 32-Well PCR System

IMPORTANT! The retainer is essential and we recommend its usage at all times along with the ProFlex™ 3 × 32-Well PCR System.

Figure 12   MicroAmp™ 3x32-Well Retainer (Part Number 4481669)
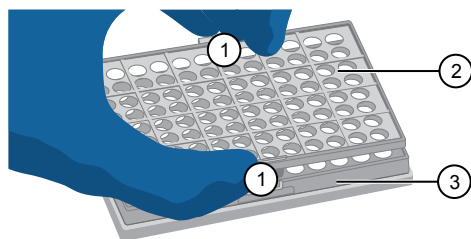
ProFlex™ 96-well PCR System

IMPORTANT! The retainer is essential and we recommend its usage at all times with the ProFlex™ 96-well PCR System.

How to use MicroAmp™ tube strips

When using strip tubes or single tubes with detached caps, use the blue retainer tray found in the instrument's starter pack.
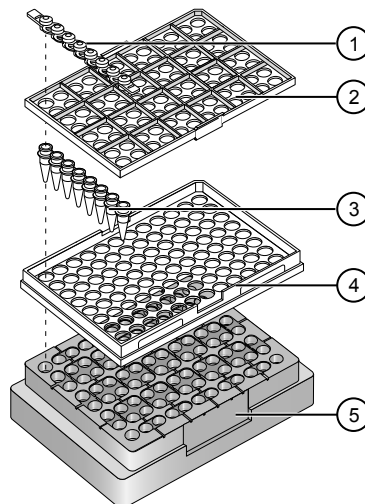
Fill, seal, and load tube strips

1. Separate the tray from the retainer by releasing the catch as indicated in the graphic.

① Release catch
② MicroAmp™ 96-Well Retainer
③ MicroAmp™ 96-Well Tray

2. Place the tray on the splash-free 96-well base.

3. Load the tube strips on the tray.

4. Place the retainer over the tubes.

5. Pipette the sample into the tubes.

6. Seal the tube strip using the MicroAmp™ strip caps. See "Seal tubes strips with cap strips" on page 6 for instructions.

7. Remove the splash-free base and place the sealed tube strips along with the retainer into the instrument.

① MicroAmp™ 8-Cap strip
② MicroAmp™ 96-Well Retainer
③ MicroAmp™ 8-Tube Strip (0.2-mL) or MicroAmp™ Reaction Tube without Cap (0.2-mL)
④ MicroAmp™ 96-Well Tray
⑤ MicroAmp™ Splash Free 96-Well Base

Seal tubes strips with cap strips

IMPORTANT! Apply significant downward pressure on the sealing tool in all steps to form a complete seal on top of the tubes.

1. Align and place the cap strips on the tubes.

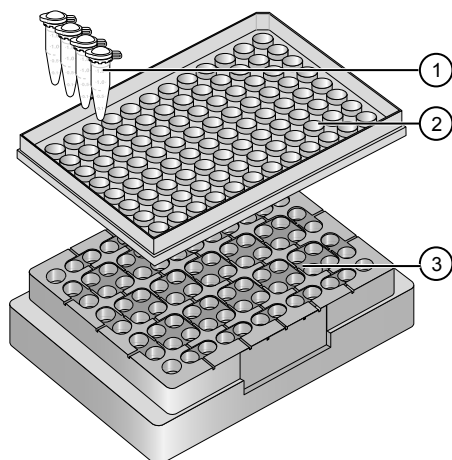2. Seal the cap strips using the rocking capping tool:

   a. Slip your fingers through the handle with the holes in the tool facing down.

   b. Place the holes in the tool over the first eight caps in a row.

   c. Rock the tool back and forth a few times to seal the caps.

   d. Repeat for remaining caps in the row, then for all remaining rows.

How to use MicroAmp™ tubes

When using strip tubes or single tubes with attached caps, use the black retainer tray found in the instrument's starter pack.

Fill, seal, and load tubes

1. Set the 96-well tray on a splash-free 96-well base.

2. Place the reaction tubes in the tray.

① MicroAmp™ Reaction Tube with Cap (0.2-mL)
② MicroAmp™ 96-Well Tray for VeriFlex™ Blocks
③ MicroAmp™ Splash Free 96-Well Base

3. Pipette the samples into the reaction tubes.

4. Cap the tubes.

5. Place the sealed reaction tubes and tray into the instrument without the splash-free base.

Consumables

IMPORTANT! In Table 1, the Model/ Format column indicates the model(s) of the ProFlex™ System that are compatible with the associated kit or disposable. Before ordering, verify that your ProFlex™ System supports the kit or disposable.

Table 1   ProFlex™ PCR System Consumables

Consumable	Model/ Format	Cat. No.
Single Tubes[1]		
MicroAmp™ Reaction Tube with Cap, 0.2-mL	32-Well, 96-Well, and 2x96 Well	N8010540
		N8011540
MicroAmp™ Reaction Tube with Cap, Assorted Colors, 0.2-mL		N8010840
MicroAmp™ Reaction Tube with Cap, Autoclaved, 0.2-mL		N8010612
MicroAmp™ Reaction Tube without Cap, 0.2-mL		N8010533
		N8011533
MicroAmp™ Reaction Tube without Cap, Assorted Colors, 0.2-mL		N8010833
MicroAmp™ Optical Tube without Cap, 0.2-mL		N8010933
MicroAmp™ 96-Well Reaction Tube/Tray/Retainer Set, 0.2-mL	96-Well and 2x96-Well	403083
		403086
Reaction Trays		
MicroAmp™ 96-Well Reaction Tray for VeriFlex™ Systems	0.2 (96-Well and 2x96-Well)	4379983

Consumable	Model/ Format	Cat. No.
MicroAmp™ 96-Well Reaction Tray/ Retainer for VeriFlex™ Systems		4381850
MicroAmp™ 3x32-Well Retainer for VeriFlex™ Systems		4481669
Seals and Covers		
MicroAmp™ Clear Adhesive Film	0.2 (96-Well, 2x96-Well, and 2x384-Well)	4306311
MicroAmp™ Optical Adhesive Film		4360954
		4311971
MicroAmp™ Optical Adhesive Film Kit		4313663
96-Well Plates		
MicroAmp™ Optical 96-Well Reaction Plate	0.2 (96-Well and 2x96-Well)	N8010560
		4316813
MicroAmp™ Optical 96-Well Reaction Plate with Barcode		4306737
		4326659
MicroAmp™ Optical 96-Well Reaction Plate with Barcode and Optical Caps		403012
MicroAmp™ Optical 96-Well Reaction Plate with Barcode and Optical Adhesive Films		403012
384-Well Plates		
EnduraPlate™ Optical 384-Well Plates (20 Plates)	2x384-Well	4483285
EnduraPlate™ Optical 384-Well Plates (500 Plates)		4483273
MicroAmp™ Optical 384-Well Reaction Plate with Barcode (50 Plates)		4309849
MicroAmp™ Optical 384-Well Reaction Plate with Barcode (500 Plates)		4326270
MicroAmp™ Optical 384-Well Reaction Plate with Barcode (1000 Plates)		4343814
MicroAmp™ Optical 384-Well Reaction Plate (1000 Plates)		4306311
Dual Flat Block Consumables		
QuantStudio™ 3D Digital PCR Chip Adapter for Dual Flat Block Thermal Cycler (1 kit)	Dual Flat Block	4485513
QuantStudio™ 3D Digital PCR Chips (12 Chips)		4485507
8-Well Strips[2]		
MicroAmp™ 8-Tube Strip, 0.2-mL	0.2 (32-Well and 96-Well)	N8010580
MicroAmp™ 8-Tube Strip, Assorted Colors, 0.2-mL		N8010838
MicroAmp™ Optical 8-Tube Strip, 0.2-mL		4316567
MicroAmp™ 8-Cap Strip		N8011535
MicroAmp™ 8-Cap Strip, Assorted Colors		N8010835
MicroAmp™ Optical 8-Cap Strip		4323032

[1] There are no 32-well Microplates available for use with the ProFlex™ 3x32-Well PCR System. Instead, single tubes with caps are used for running the PCR samples.
[2] There are no 32-well Microplates available for use with the ProFlex™ 3x32-Well PCR System. Instead, tube strips with caps or cap strips are used for running the PCR samples.

Table 2 ProFlex™ PCR System sample handling supplies

| Part Name	Cat. No.
MicroAmp™ Adhesive Film Applicator	4333183
MicroAmp™ Multi-Removal Tool	4313950
MicroAmp™ Cap Installing Tool (Handle)	4330015
MicroAmp™ 96-Well Base	N8010531
MicroAmp™ Splash Free 96-Well Base	4312063
MicroAmp™ Centrifuge Adapter	N8013822

Technical specifications

The following table displays the system specifications for the ProFlex™ PCR System using the ProFlex™ 96-Well Sample Block, ProFlex™ 3x 32-Well Sample Block, ProFlex™ 2x 96-Well Sample Block, ProFlex™ 2x Flat Sample Block, ProFlex™ 2x 384-Well Sample Block

Table 3 ProFlex™ PCR System technical specifications: ProFlex™ 96-Well Sample Block, ProFlex™ 3x32-Well Sample Block, ProFlex™ 2x 96-Well Sample Block, ProFlex™ 2x Flat Sample Block, ProFlex™ 2x 384-Well Sample Block

Specification	Block format				
	ProFlex™ 96-Well Sample Block	**ProFlex™ 3x 32-Well Sample Block**	**ProFlex™ 2x 96-Well Sample Block**	**ProFlex™ 2x Flat Sample Block**	**ProFlex™ 2x 384-Well Sample Block**
Maximum block ramp rate	6.00°C/sec		3.00°C/sec	1.60°C/sec	3.00°C/sec
Maximum sample ramp rate	4.40°C/sec		1.60°C/sec	N/A	1.60°C/sec
Temperature accuracy	±0.25°C (35 to 99.9°C)				
Temperature range for protocol run	0°C to 100.0°C				
Temperature uniformity	<0.5°C (30 seconds after reaching 95°C)		**For each block:** <0.5°C (30 seconds after reaching 95°C) **Overall (across two blocks):** <0.75°C (30 seconds after reaching 95°C)		<0.5°C (30 seconds after reaching 95°C)
Dimensions	• Height: 27.2 cm (10.7 in) • Width: 33.0 cm (13 in) • Depth: 56.5 cm (22 in)				
Weight	18.75 kg (41 lb)		19.3 kg (42.5 lb)	19.6 kg (43.2 lb)	20.35 kg (45 lb)
PCR volume range	10 — 80 µL		10 — 100 µL	<1 µL	5 — 20 µL
Instrument memory	USB, on-board				
Display interface	8.4" color TFT LCD				
Power	100-240 V, 50-60 Hz Max: 950 W, Max Current: 12 A **Note:** *For Australia (AU) / New Zealand (NZ) only:* 230 VAC, 50 Hz, Max: 950 W, Max Current: 10 A				
VeriFlex™ blocks	**96-well, 0.2 mL VeriFlex™ block:** 25°C (5°C zone-to-zone), 6 VeriFlex™ zones	**3 x 32-well, 0.2 mL independent control:** 5°C, 2 VeriFlex™ zones	N/A		
Ambient humidity	15% - 80% Relative Humidity, non-condensing (acceptable range)				
Ambient operating temperature	15°C to 30°C (acceptable range)				

Table 4

Port	Description
∼	AC power cable port
(Ethernet icon)	10/100 Fast Ethernet port for connecting to a network
(USB icon)	USB v1.0 port for connecting to an external network drive, jump drive, or other USB storage device
(RS232 icon)	RS232 serial communication port for connecting the probe for the Temperature Verification Kit
(USB Wi-Fi icon)	USB v1.0 port for connecting to USB-enabled Wi-Fi Card

Limited product warranty

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