

# Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Kit

## USER GUIDE

Multiplex RT-dPCR assay for SARS-CoV-2 from wastewater  
samples

for use with QuantStudio™ Absolute Q™ Digital PCR Software v6.3 or later

**Catalog Number** A55241

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For descriptions of symbols on product labels or product documents, go to [thermofisher.com/symbols-definition](https://www.thermofisher.com/symbols-definition).

**Revision history: MAN00026597 B.0 (English)**

Revision	Date	Description
B.0	24 October 2023	Updated to reflect changes needed for use with v6.3 or later of the QuantStudio™ Absolute Q™ Digital PCR Software.
A.0	5 August 2022	New document for the Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Kit.

The information in this guide is subject to change without notice.

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# Product Information

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**Note:** For safety and biohazard guidelines, refer to the "Safety" section in the *QuantStudio™ Absolute Q™ Digital PCR System Installation, Use, and Maintenance Guide* (Pub. No. MAN0028562).



**WARNING!** Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. Safety Data Sheets (SDSs) are available from [thermofisher.com/support](https://www.thermofisher.com/support).

## Product description

The Applied Biosystems™ Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Kit is a multiplex reverse transcription-digital PCR (RT-dPCR) assay and master mix. It enables surveillance of the levels of SARS-CoV-2 in wastewater.

The kit is for use on the QuantStudio™ Absolute Q™ Digital PCR System.

RNA is isolated from wastewater samples. The recommended kits for RNA isolation are the MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit (Cat. No. [A52606](#)) or the MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit with Virus Enrichment (Cat. No. [A52610](#)).

The kit contains the Absolute Q™ 1-Step RT-dPCR Master Mix. The master mix is also sold separately (Cat. No. [A55146](#)).

The master mix allows reverse transcription of the RNA to cDNA, and then the cDNA is amplified to detect the targets.

The kit contains an assay with primers and probes to detect the following targets:

- Two different regions from the N gene of the SARS-CoV-2 virus (N gene region 1 and N gene region 2)
- Pepper mild mottle virus (PMMoV) to provide the option to normalize the results of the N gene targets to the amount of human fecal material in the wastewater sample

Quality control data are obtained from the ROX™ dye channel. This quality control data ensures that only properly filled microreaction chambers are used for analysis by evaluating the ROX™ dye signal for each microreaction chamber.

The following dyes are used:

Dye	Target	Purpose
FAM™ dye	N gene region 1	Measurement of SARS-CoV-2
VIC™ dye	N gene region 2	Measurement of SARS-CoV-2
ABY™ dye	PMMoV	Fecal normalization
ROX™ dye	—	Quality control

A fifth channel is available for additional multiplexing with a custom assay for your target of interest. This can be an RNA extraction control or an assay for variant detection. An assay with a JUN™ dye or a Cy® 5 dye can be used in this channel.

To use the additional channel, primers and probes must be ordered as a custom order. They are added to the dPCR reaction mix.

To order custom primers and probes, go to [thermofisher.com/customprimersprobes](https://thermofisher.com/customprimersprobes).

## Contents and storage

Table 1 Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Kit (Cat. No. [A55241](#))

Component	Amount	Storage
Absolute Q™ 1-Step RT-dPCR Master Mix (4X)	450 µL	-25°C to -15°C
Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Assay (20X)	100 µL	Protect from light

## Required materials not supplied

Unless otherwise indicated, all materials are available through [thermofisher.com](https://thermofisher.com). "MLS" indicates that the material is available from [fisherscientific.com](https://fisherscientific.com) or another major laboratory supplier.

Catalog numbers that appear as links open the web pages for those products.

Item	Source
<b>Digital PCR System</b>	
QuantStudio™ Absolute Q™ Digital PCR System	<a href="#">A52864</a>
<b>Equipment</b>	
Centrifuge, table top	MLS
Vortex mixer	MLS
Pipette, P20	MLS
Filter pipette tips, P20	MLS

(continued)

Item	Source
<b>Consumables and reagents</b>	
RNA extraction kit or RNA extraction reagents, the following kits are recommended: <ul style="list-style-type: none"> <li>• MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit</li> <li>• MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit with Virus Enrichment</li> </ul>	<a href="#">A52606</a> <a href="#">A52610</a>
QuantStudio™ Absolute Q™ MAP16 Plate Kit, includes the following components: <ul style="list-style-type: none"> <li>• 12 QuantStudio™ Absolute Q™ MAP16 Digital PCR Plates</li> <li>• 60 QuantStudio™ Absolute Q™ MAP plate gasket strips</li> <li>• 3 mL QuantStudio™ Absolute Q™ Isolation Buffer</li> </ul>	<a href="#">A52865</a>
Low bind microcentrifuge tubes	MLS
Microcentrifuge tube rack	MLS
Nuclease-free water	MLS

## Workflow

### Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Kit

**Prepare the digital PCR reaction mix (page 10)**

**Load the reaction mix into the MAP plate (page 11)**

**Set up the experiment (page 16)**

**Set up the plate for analysis (page 20)**





# Prepare an experiment

- Guidelines for RNA isolation ..... 9
- Prepare the digital PCR reaction mix ..... 10
- Load the reaction mix into the MAP plate ..... 11

This section provides a procedure for preparing a dPCR reaction mix and setting up the experiment on the QuantStudio™ Absolute Q™ dPCR System.

For detailed instructions on preparing and running digital PCR (dPCR) experiments, see the *QuantStudio™ Absolute Q™ Digital PCR System Installation, Use, and Maintenance Guide* (Pub. No. MAN0028562).

## Guidelines for RNA isolation

The MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit is recommended for RNA isolation. There are multiple procedures for this kit.

See the following resources:

- “Related documentation” on page 28
- *Multiple workflow options for detection of SARS-CoV-2 in wastewater samples Application Note* ([assets.thermofisher.com/TFS-Assets/BID/Application-Notes/detection-sars-cov-2-wastewater-samples-app-note.pdf](https://assets.thermofisher.com/TFS-Assets/BID/Application-Notes/detection-sars-cov-2-wastewater-samples-app-note.pdf))

Each procedure obtains nucleic acid at a different concentration. The concentration of the nucleic acid must be within the dynamic range of the instrument in order to provide a concentration. Each laboratory must determine which procedure is optimal for their own wastewater samples.

The concentrations of PMMoV and SARS-CoV-2 can be significantly different.

If the amount of PMMoV is low and SARS-CoV-2 is not detected, the sample preparation must be adjusted in order to obtain sufficient nucleic acid.

If the amount of PMMoV is high, only the maximum value is provided by the instrument (saturation). The sample must be diluted in order for the instrument to provide a concentration.

## Prepare the digital PCR reaction mix

Gather the following materials:

- P10 or P20 pipette and filter pipette tips
- Absolute Q™ 1-Step RT-dPCR Master Mix (4X)
- Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Assay
- Nuclease-free water

Thaw all reagents on ice or at 4°C.

The volume of the dPCR reaction can be adjusted depending on experimental requirements. Scale the components proportionally according to the number of reactions and include 10% overage.

### IMPORTANT!

- Throughout this procedure, protect reagents from light when not in use.
- For best results, perform the run within 1 hour of reaction preparation.
- Store prepared reactions on ice or at 4°C.

1. Pulse vortex the Absolute Q™ 1-Step RT-dPCR Master Mix and the Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Assay at high speed for 10 seconds.
2. Combine the following reagents in the order listed.

Reagent	Final concentration	Volume per reaction (with 10% overage)	Volume for 4 reactions (with 10% overage)
Absolute Q™ 1-Step RT-dPCR Master Mix (4X)	1X	2.5 µL	10 µL
Absolute Q™ dPCR SARS-CoV-2 Wastewater Surveillance Assay (20X)	1X	0.5 µL	2 µL
RNA sample	1–4,000 copies/µL	Variable	Variable
Nuclease-free water	—	Fill to 10 µL	Fill to 40 µL
<b>Total reaction volume</b>	—	<b>10 µL</b>	<b>40 µL</b>

3. (Optional) If a custom assay is being used for the fifth channel for additional multiplexing, add it to the reaction mix for a final concentration of 1X.  
Reduce the amount of nuclease-free water to achieve a total reaction volume of 10 µL per reaction. This includes a 10% overage.
4. Mix the dPCR reagents well by performing one of the following actions:
  - Pipet mix 10–20 times without creating bubbles.
  - Pulse vortex 3–5 times for 1 second each.

5. Centrifuge for 1 minute with a benchtop centrifuge to collect the contents at the bottom of the tube.
6. Perform the run within 1 hour of reaction preparation.  
Store on ice or at 4°C if the run is not started immediately.

## Load the reaction mix into the MAP plate

At a clean lab bench, gather the following materials.

- P10 or P20 pipette and filter pipette tips
- Prepared dPCR reaction mix
- QuantStudio™ Absolute Q™ Isolation Buffer
- MAP plate with sufficient unused columns for the experiment
- MAP plate gasket strips (unused)

---

**IMPORTANT!** At least 1 column of the MAP plate must be used for each run and all wells in the column must contain a sample (or water plus isolation buffer if there is insufficient sample to fill all wells). Columns cannot be reused, but a MAP plate with unused columns can be used for subsequent experiments. If the MAP plate has unused columns, when the experiment is complete, place it back into its pouch for storage.

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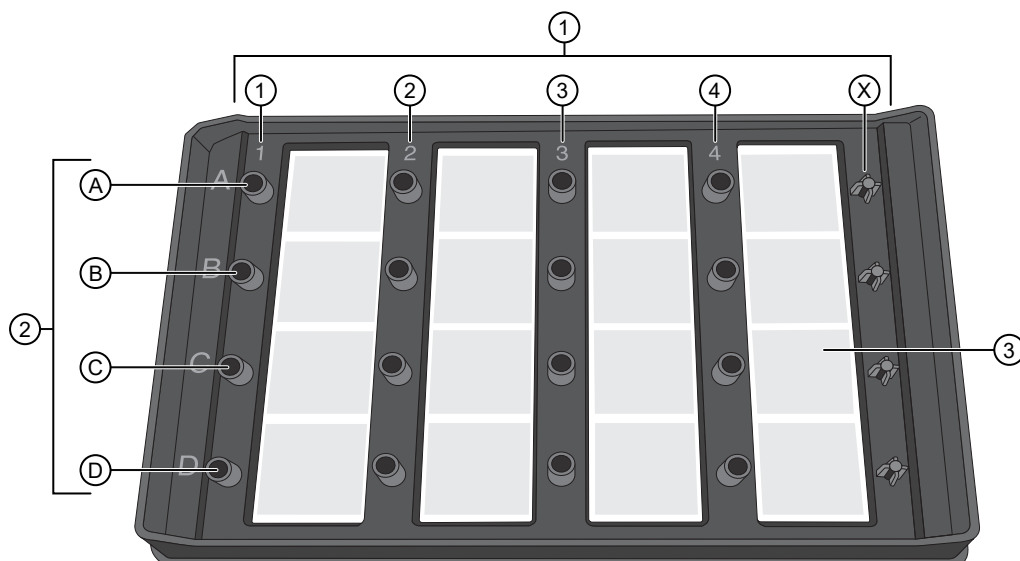
**Note:** The MAP plate follows SBS standard plate format, allowing for use with an automated liquid handling workflow.

---

1. Just prior to use, remove the MAP plate from its package.

**Note:**

- Leave the MAP plate in the package until ready to load sample.
  - Be careful to handle the MAP plate by its frame.
  - Place the MAP plate back into the package when not in use.
-



**Figure 1** MAP plate without MAP plate gasket strips

- ① Columns 1–4 and column X
- ② A–D represent wells A1–D1 associated with column 1
- ③ Array associated with well 4C

2. Place the MAP plate on a level, dust-free, dry surface.
3. Using a new pipette tip for each well, holding the pipette at a 45° angle, load 9  $\mu$ L of the dPCR reaction mix to the bottom of the well. Pipet the mixture only to the first stop to prevent bubble formation.

---

**IMPORTANT!** To avoid the transfer of contents from the bottom of the centrifuged dPCR reaction mix tube, do not pipet from the bottom of the tube.

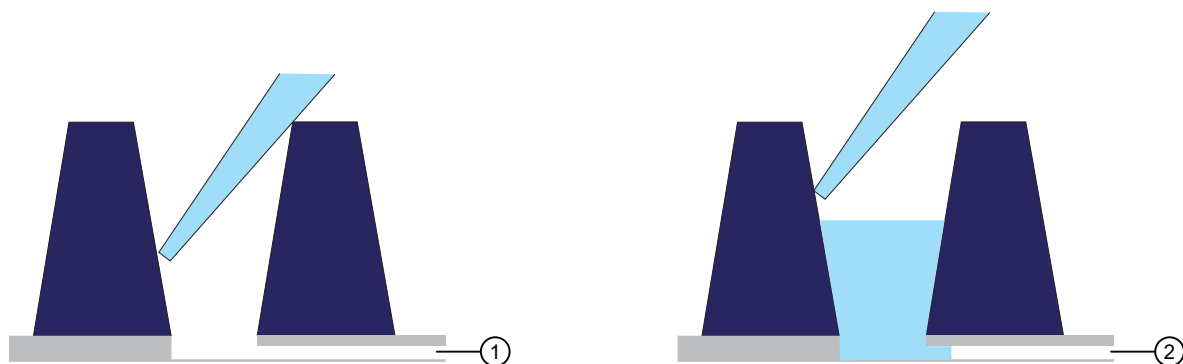
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**IMPORTANT!** Do not contact bottom of well with the pipette tip or puncture the thin film at the bottom of the well.

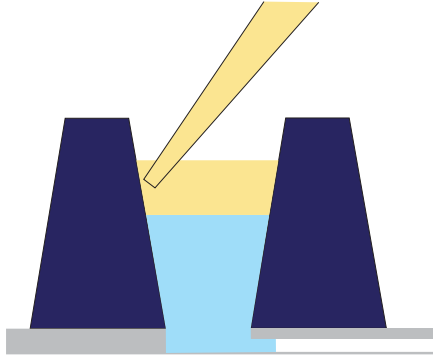
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- ① Microfluidic channel to the microchamber array
- ② Reaction mix remains in the well until the instrument pushes it into the microchamber array during the run

- Using a new pipette tip for each well, at a 45° angle, load 15 µL of the Absolute Q™ Isolation Buffer on the side of the well above the top of the reaction mix. Carefully overlay the buffer on top of the reaction mix to prevent mixing or bubble formation. Pipet only to the first stop.

The isolation buffer sits on top of the reaction mix, preventing contamination and evaporation.

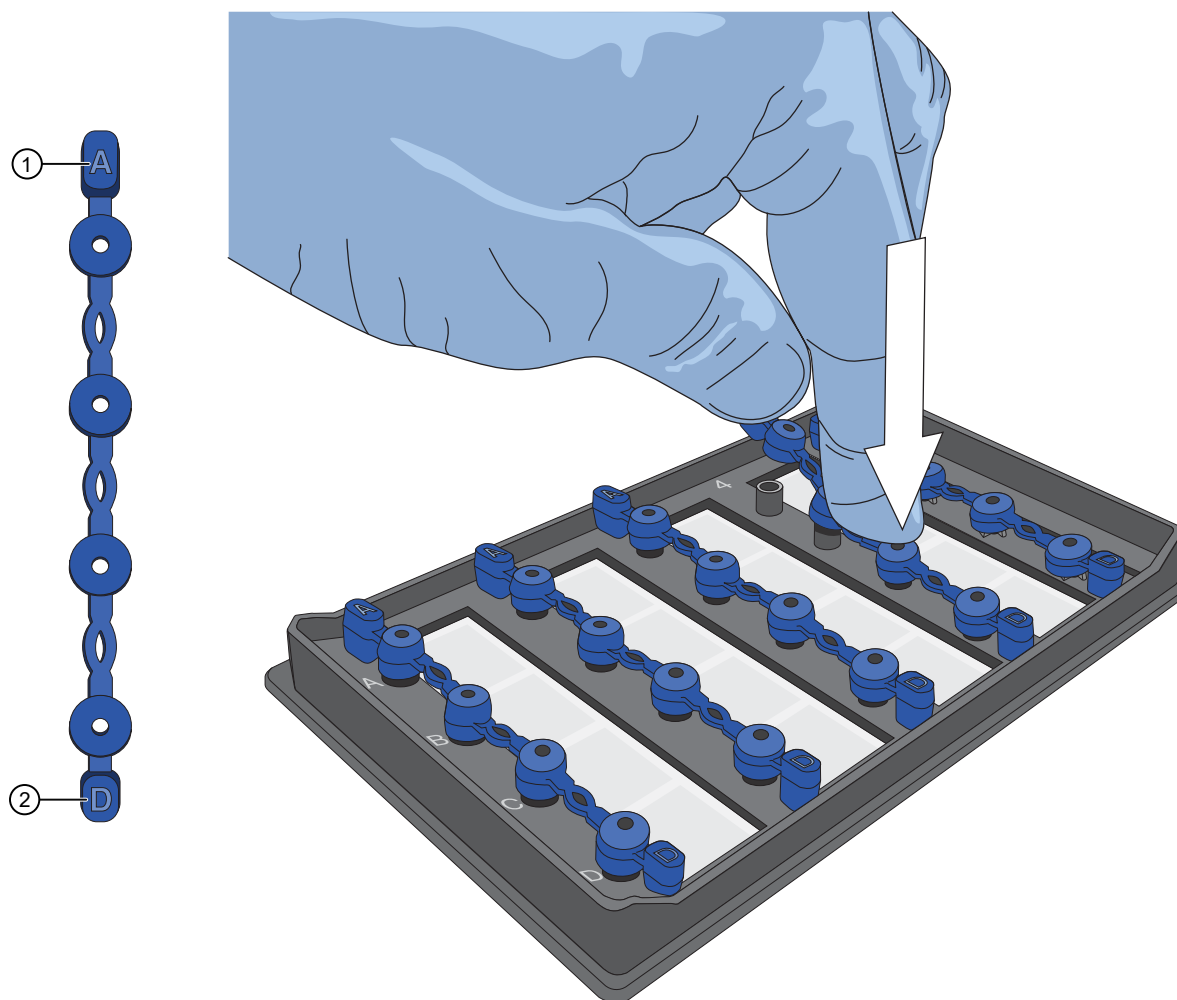


- Place a total of 5 MAP plate gasket strips on all 4 columns of wells and the X-shaped posts of column X on the right side of the plate. Orient the MAP plate gasket strip so that the side labeled A–D aligns with rows A–D marked on the plate. Be sure to cover the columns completely and press the MAP plate gasket strips firmly into place.

---

**IMPORTANT!** MAP plate gasket strips must be placed on all columns, including unused columns. Failure to do so can produce poor results.

---



**Figure 2** Place the MAP plate gasket strips firmly into place

- ① Place this end of the MAP plate gasket strip on row A
- ② Place this end of the MAP plate gasket strip on row D

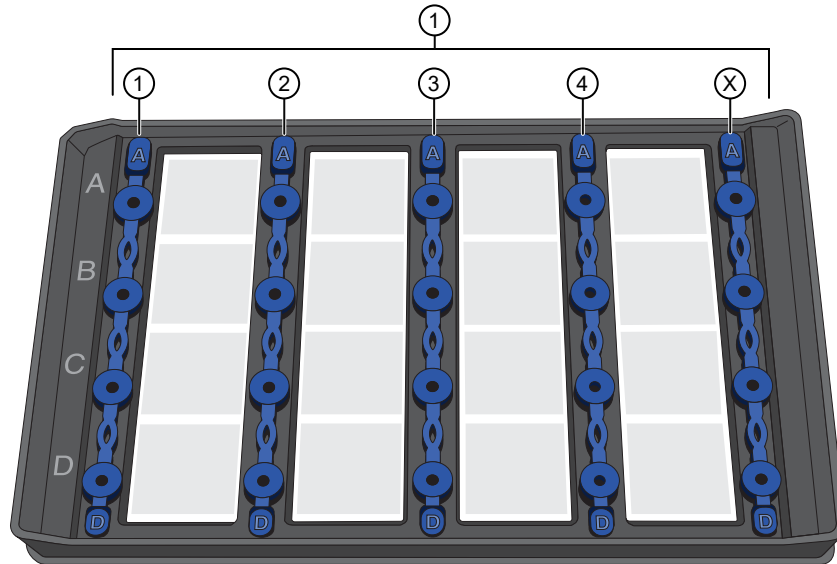


Figure 3 MAP plate with MAP plate gasket strips in place

① MAP plate gasket strips on columns 1–4 and column X

6. Move the MAP plate to the instrument.

---

**IMPORTANT!** Do not tip, invert, or shake the filled MAP plate.

---

# 3

## Run an experiment

- Set up the experiment ..... 16
- Create a run ..... 18
- Run the experiment ..... 18

This section provides information for running experiments on the QuantStudio™ Absolute Q™ Digital PCR Instrument in a non-automated implementation.

For detailed instructions about preparing and running digital PCR (dPCR) experiments for implementations with or without automation, see the *QuantStudio™ Absolute Q™ Digital PCR System Installation, Use, and Maintenance Guide* (Pub. No. MAN0028562).


### Set up the experiment

This section provides information about setting protocol parameters and plate setup configurations by creating a template.

---

**Note:** If you have an existing template for the assay with the required protocol and plate setup configuration, you can proceed to create a run from that template. See “Create a run” on page 18.

---

1. From the left pane of the QuantStudio™ Absolute Q™ Digital PCR Software click  to open the **Templates** list page.
2. Select **CREATE TEMPLATE** from upper-right corner of the **Templates** list page.
3. When prompted, enter a template name, then click **CREATE TEMPLATE**.  
The new template opens in the **PROTOCOL** tab.
4. In the thermal protocol settings area, enter the following settings.
  - a. Select **RNA-RT**, then set it to **55°C for 10 minutes**.
  - b. Set the **Preheat** setting to **96°C for 10 minutes**.
  - c. Set step one to **96°C for 5 seconds**.
  - d. Change step two to **60°C for 10 seconds**.
  - e. Set the **Cycles** to **40**.



f. Ensure that **Preheat** is selected.

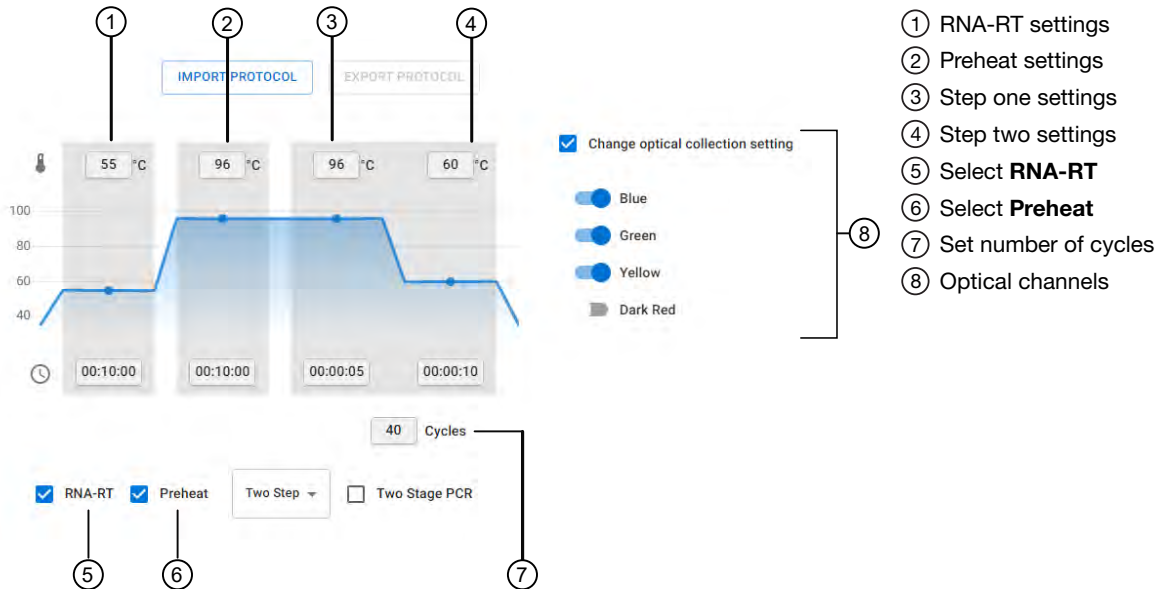



Figure 4 Thermal protocol

5. Select the **SETUP** tab to modify the plate configuration.
6. In the **Sample Groups** area, click  in the group to be edited to select the appropriate optical channels for the assay.
7. Toggle the following optical channels to the on position. Toggle the remaining optical channels to the off position:
  - **FAM**
  - **VIC**
  - **ABY**

**Note:** If you are running a custom assay with JUN™ dye or Cy®5 dye, toggle the appropriate channel to the on position.

Color	Excitation filter peak	Emission filter peak	System dyes
Blue	466	520	FAM™ dye
Green	514	560	VIC™ dye
Yellow	549	589	ABY™ dye
Dark Red	630	684	Cy®5 dye ( <i>recommended</i> ) JUN™ dye

8. Modify the **Target**, **Analysis**, and **Default threshold** options if needed.
9. Ensure that the correct grouping option is selected, then click **CONTINUE**.

10. On the **SETUP** page, modify the plate settings if needed, then click **SAVE**.
11. Proceed to “Create a run” on page 18.

## Create a run



This section provides information about creating a run from the **Templates** or **Runs** pages.

---

**IMPORTANT!** A template for the assay must be set up before creating a run for the assay. See “Set up the experiment” on page 16.

---

1. Use one of the following options to create a run.

Option	Actions
Create a run from the <b>Templates</b> page.	<ol style="list-style-type: none"> <li>1. From the left pane, click  to open the <b>Templates</b> list page.</li> <li>2. From the template list, select the template for this assay.</li> <li>3. In the <b>Select action</b> dialog, select <b>Create run from template</b>.</li> <li>4. When prompted, enter a name for the run, then click <b>CREATE RUN</b>.</li> </ol>
Create a run from the <b>Runs</b> page.	<ol style="list-style-type: none"> <li>1. From the left pane, click  to open the <b>Runs</b> list page.</li> <li>2. In the upper-right corner of <b>Runs</b> list page, click <b>CREATE RUN</b>.</li> <li>3. When prompted, enter the following information, then click <b>CREATE RUN</b>. <ul style="list-style-type: none"> <li>• <b>Run name:</b> Enter a name for the run.</li> <li>• <b>Template:</b> From the dropdown list, select the template for this assay.</li> </ul> </li> </ol>

2. On the **PROTOCOL** page, ensure that the settings are correct. See “Set up the experiment” on page 16.
3. Select the **SETUP** tab to modify the plate configuration if needed, then click **SAVE**.


---

**IMPORTANT!** Ensure that only the columns with samples are selected before beginning the experiment.

---

4. Proceed to “Run the experiment” on page 18.

## Run the experiment

1. From the left pane click  to open the **Runs** list page.
2. From the **RUNS, DRAFT** page, select the run, then click **START RUN**.

The **Start run** dialog box opens and the instrument door opens to receive the loaded MAP plate.

---

**IMPORTANT!** Ensure that gaskets are placed on all columns of the MAP plate, including unused columns. Ensure that gaskets have been placed on all wells and on the column X posts on the far right as shown on the screen. Failure to do so can produce poor results.

---

---

**Note:** See callout 5 in the following figure for the location of column X.

---



3. Carefully load the MAP plate in the plate nest.

---

**IMPORTANT!** Be sure to load the MAP plate gently to avoid damage to the plate nest.

---

4. Select **CLOSE DOOR**, then **START RUN**.

The door closes and the MAP plate barcode is scanned.

---

**Note:** If the barcode number does not match the number entered, or the instrument cannot scan the barcode, you are prompted to add it in the **Plate barcode** field of the **Start Run** dialog box.

---

When the run has successfully started, the **Runs** page returns to the **DRAFT** tab and the status of the selected run displays **IN PROGRESS**.

# 4

## Analyze data

- Guidelines for normalization ..... 20
- Set up the plate for analysis ..... 20
- Post-analysis procedure ..... 21
- View the results ..... 24
- Export the results ..... 25

For detailed information about performing analysis, see the *QuantStudio™ Absolute Q™ Digital PCR System Installation, Use, and Maintenance Guide* (Pub No. MAN0028562).

### Guidelines for normalization


Fecal normalization is recommended in order to account for possible changes in the dilution of wastewater and relative human waste input over time ([cdc.gov/healthywater/surveillance/wastewater-surveillance/testing-methods.html](https://www.cdc.gov/healthywater/surveillance/wastewater-surveillance/testing-methods.html)).

Fecal normalization is calculated with the ratio of SARS-CoV-2 to PMMoV.

$$= \text{Concentration (copies)}_{\text{SARS-CoV-2}} / \text{Concentration (copies)}_{\text{PMMoV}}$$

*D'Aoust, PM, et al. (2021). Quantitative analysis of SARS-CoV-2 RNA from wastewater solids in communities with low COVID-19 incidence and prevalence. Water Research, 188. <https://doi.org/10.1016/j.watres.2020.116560>*

### Set up the plate for analysis

1. In the QuantStudio™ Absolute Q™ Digital PCR Software, in the left pane click  to open the **Runs** list page.
2. On the **COMPLETED** tab, use the search field to find a run or select a run from the list. The run opens on the **SETUP** tab.
3. In the **Sample groups** area, click + **ADD GROUP**, then in the **Group name** field, enter a name for the group.
4. In the **Analysis** column, select **Signal** for the optical channels for the reactions.
  - **FAM**
  - **VIC**
  - **ABY**

---

**Note:** ROX™ dye is set to QC by default.

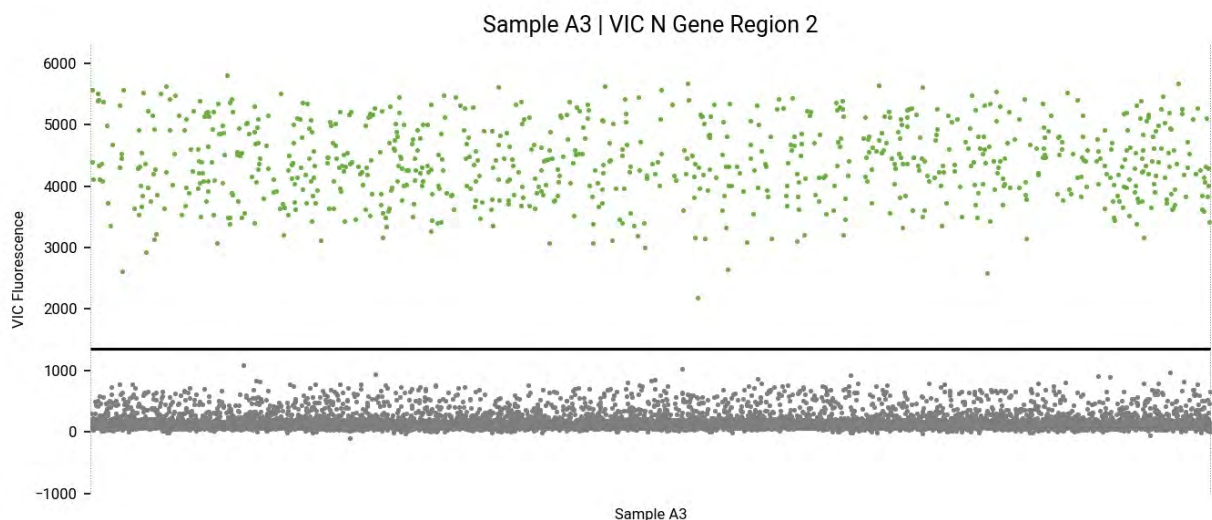
---

5. (Optional) If an additional target was added to the reaction, select **Signal** for the applicable channel.  
The additional channel can be **JUN** or **CY5**, depending on the dye that was used when ordering the primers and probes.
6. For all other channels in the **Analysis** column, set the toggle to the off position to exclude them from analysis.
7. Select **CONTINUE** to return to the **SETUP** tab, then click **SAVE**.
8. On the **Runs** page, select the **RESULTS** tab and verify that the total number of analyzed microchambers in the array is >20,000.  
Consider omitting or rerunning arrays with fewer than 20,000 analyzed microchambers.

## Post-analysis procedure

When the run has completed, ensure that the automatic threshold is above the negative population. If the threshold is not automatically adjusted above the negative population, manually adjust the threshold to the desired position.

For information about adjusting thresholds on samples, see “Adjust the threshold on samples” on page 22.



**Figure 5** Automatic threshold for a single sample

The group feature can be used to set thresholds for all samples within a group. Adjust the group threshold so that it is above the negative population (lower band).

For information about adjusting thresholds on sample groups, see “Adjust the threshold on sample groups” on page 23.

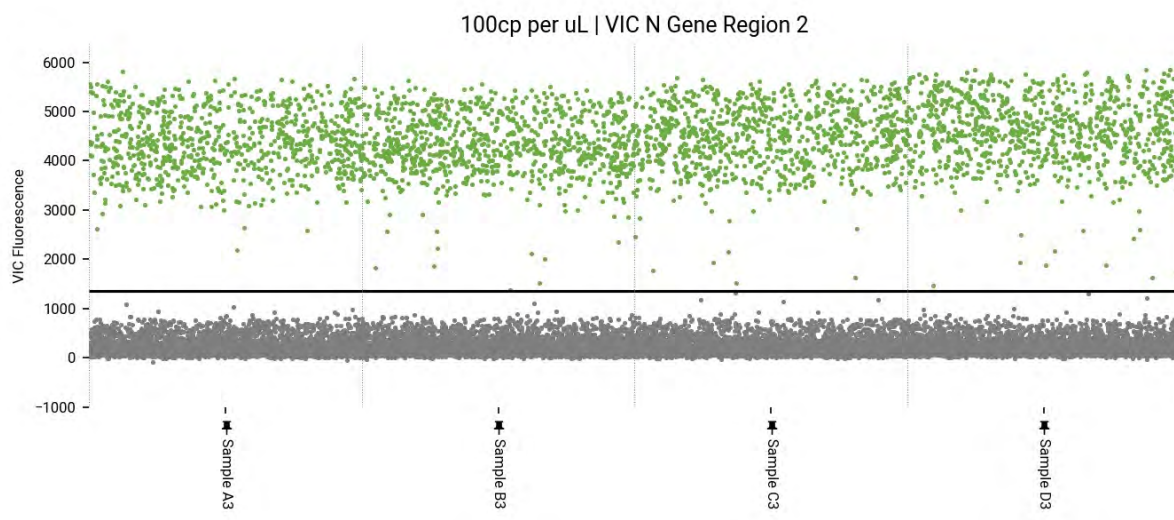




Figure 6 Automatic threshold for a group

## Adjust the threshold on samples



1. In the QuantStudio™ Absolute Q™ Digital PCR Software, in the left pane click  to open the **Runs** list page.
2. On the **COMPLETED** tab, use the search field to find a run or select a run from the list. The run opens on the **SETUP** tab.
3. Click the **ANALYSIS** tab to display the run data. By default the first sample group is selected in the **Analyze by** area and the plots are in 1D Scatter format.
4. (Optional) To change the plot type to 2D Scatter, click .
5. In the **Analyze by** area, click **Sample Group**, then select the group to be analyzed.
6. To see the detail view of a channel, select a channel plot in the gallery.

7. To change the threshold of the sample data, use one of the following options.

**Note:** When changes are made to the data, the plots turn gray to indicate that the data are outdated and must be saved to recalculate the plot.

Option	Action
<b>AUTO GROUP</b> —The software sets the threshold for the channel group.	<ol style="list-style-type: none"> <li>1. Click <b>AUTO GROUP</b>.</li> <li>2. Click <b>SAVE</b>.</li> </ol>
<b>AUTO SAMPLE</b> —The software sets the threshold for each sample in the channel group.	<ol style="list-style-type: none"> <li>1. Click <b>AUTO SAMPLE</b>.</li> <li>2. Click <b>SAVE</b>.</li> </ol>
<b>MANUAL</b> —Manually set the threshold for the channel group.	<ol style="list-style-type: none"> <li>1. Click <b>MANUAL</b>.</li> <li>2. Use one of the following options to set the threshold. <ul style="list-style-type: none"> <li>• Drag the threshold bar in the plot to the desired value.</li> <li>• Enter a value in the <b>Group threshold</b> field at the top of the table.</li> </ul> </li> <li>3. Click <b>SAVE</b>.</li> </ol>

## Adjust the threshold on sample groups

1. In the QuantStudio™ Absolute Q™ Digital PCR Software, in the left pane click  to open the **Runs** list page.
2. On the **COMPLETED** tab, use the search field to find a run or select a run from the list. The run opens on the **SETUP** tab.
3. Click the **ANALYSIS** tab to display the run data. By default the first sample group is selected in the **Analyze by** area and the plots are in 1D Scatter format.
4. (Optional) To change the plot type to 2D Scatter, click .
5. In the **Analyze by** area, click **Sample Group**, then select the group to be analyzed.
6. To see the detail view of a channel, select a channel plot in the gallery.

- To change the threshold of the sample data, use one of the following options.

**Note:** When changes are made to the data, the plots turn gray to indicate that the data are outdated and must be saved to recalculate the plot.

Option	Action
<b>AUTO GROUP</b> —The software sets the threshold for the channel group.	<ol style="list-style-type: none"> <li>Click <b>AUTO GROUP</b>.</li> <li>Click <b>SAVE</b>.</li> </ol>
<b>AUTO SAMPLE</b> —The software sets the threshold for each sample in the channel group.	<ol style="list-style-type: none"> <li>Click <b>AUTO SAMPLE</b>.</li> <li>Click <b>SAVE</b>.</li> </ol>
<b>MANUAL</b> —Manually set the threshold for the channel group.	<ol style="list-style-type: none"> <li>Click <b>MANUAL</b>.</li> <li>Use one of the following options to set the threshold. <ul style="list-style-type: none"> <li>Drag the threshold bar in the plot to the desired value.</li> <li>Enter a value in the <b>Group threshold</b> field at the top of the table.</li> </ul> </li> <li>Click <b>SAVE</b>.</li> </ol>


## View the results

- Select the **RESULTS** tab.
- To view results, perform one of the following tasks:

Option	Actions
View results for all optical channels.	<ol style="list-style-type: none"> <li>From the list of active optical channels above the concentration table, select <b>ALL</b> to view all channels.</li> <li>Use the scroll bar at the bottom of the concentration table to scroll through concentration table data for all channels.</li> <li>Use the scroll bar on the side of the page to scroll down to see the plot data for all channels.</li> <li>Toggle between <b>SAMPLE</b> and <b>GROUP</b> to change the display of the plot data.</li> <li>Use the scroll bar at the bottom of the plot area to scroll through the plot data for all channels.</li> </ol>
View results for a specific optical channel.	<ol style="list-style-type: none"> <li>From the list of active optical channels above the concentration table, select the desired channel.</li> <li>Use the scroll bar on the side of the page to scroll down to see the concentration table data for the channel.</li> <li>Use the scroll bar on the side of the page to scroll down to see the plot data for the channel.</li> <li>Toggle between <b>SAMPLE</b> and <b>GROUP</b> to change the display of the plot data.</li> </ol>



## Export the results

1. Select the **RESULTS** tab.
2. From the list of active optical channels above the concentration table, select **ALL** to view all channels.
3. To export the data, from the **RESULTS** tab, in the concentration table area, click  **DOWNLOAD DATA**.
4. When prompted, navigate to the location to save the file and select **Save**.
5. From the **RESULTS** tab, click **GENERATE REPORT**.  
The **Generate report** dialog opens and **All Groups** is selected by default to be included in the report.
6. *(Optional)* Click **Select Groups**, then from the list of groups, select the checkbox next to each group to be included in the report. Any combination of groups can be selected.
7. *(Optional)* Click **QC Channel** to include the QC channel data for all samples.
8. Click **GENERATE REPORT**.
9. When prompted, navigate to the location to download the report, then click **Save**.



## Chemical safety



**WARNING! GENERAL CHEMICAL HANDLING.** To minimize hazards, ensure laboratory personnel read and practice the general safety guidelines for chemical usage, storage, and waste provided below. Consult the relevant SDS for specific precautions and instructions:

- Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. To obtain SDSs, see the "Documentation and Support" section in this document.
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing).
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with sufficient ventilation (for example, fume hood).
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer cleanup procedures as recommended in the SDS.
- Handle chemical wastes in a fume hood.
- Ensure use of primary and secondary waste containers. (A primary waste container holds the immediate waste. A secondary container contains spills or leaks from the primary container. Both containers must be compatible with the waste material and meet federal, state, and local requirements for container storage.)
- After emptying a waste container, seal it with the cap provided.
- Characterize (by analysis if needed) the waste generated by the particular applications, reagents, and substrates used in your laboratory.
- Ensure that the waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.
- **IMPORTANT!** Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

## Biological hazard safety



**WARNING! Potential Biohazard.** Depending on the samples used on this instrument, the surface may be considered a biohazard. Use appropriate decontamination methods when working with biohazards.



**WARNING! BIOHAZARD.** Biological samples such as tissues, body fluids, infectious agents, and blood of humans and other animals have the potential to transmit infectious diseases. Conduct all work in properly equipped facilities with the appropriate safety equipment (for example, physical containment devices). Safety equipment can also include items for personal protection, such as gloves, coats, gowns, shoe covers, boots, respirators, face shields, safety glasses, or goggles. Individuals should be trained according to applicable regulatory and company/ institution requirements before working with potentially biohazardous materials. Follow all applicable local, state/provincial, and/or national regulations. The following references provide general guidelines when handling biological samples in laboratory environment.

- U.S. Department of Health and Human Services, *Biosafety in Microbiological and Biomedical Laboratories (BMBL)*, 6th Edition, HHS Publication No. (CDC) 300859, Revised June 2020  
[www.cdc.gov/labs/pdf/CDC-BiosafetymicrobiologicalBiomedicalLaboratories-2020-P.pdf](http://www.cdc.gov/labs/pdf/CDC-BiosafetymicrobiologicalBiomedicalLaboratories-2020-P.pdf)
- Laboratory biosafety manual, fourth edition. Geneva: World Health Organization; 2020 (Laboratory biosafety manual, fourth edition and associated monographs)  
[www.who.int/publications/i/item/9789240011311](http://www.who.int/publications/i/item/9789240011311)



# Documentation and support

## Related documentation

Document	Pub. No.
<i>QuantStudio™ Absolute Q™ Digital PCR System Installation, Use, and Maintenance Guide</i>	MAN0028562
<i>Absolute Q™ 1-Step RT-dPCR Master Mix (4X) User Guide</i>	MAN0026596
<b>RNA isolation</b>	
<i>MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit User Guide</i> (from 200-µL pre-concentrated wastewater samples)	MAN0025693
<i>MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit User Guide</i> (from sludge and 1-mL direct or pre-concentrated wastewater samples)	MAN0025694
<i>MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit User Guide</i> (from 10-mL wastewater samples, using Dynabeads™ Wastewater Virus Enrichment beads)	MAN0025695
<i>MagMAX™ Wastewater Ultra Nucleic Acid Isolation Kit User Guide</i> (from filtered 50–500 mL wastewater samples)	MAN0026482

## Customer and technical support

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  - User guides, manuals, and protocols
  - Certificates of Analysis
  - Safety Data Sheets (SDSs; also known as MSDSs)

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**Note:** For SDSs for reagents and chemicals from other manufacturers, contact the manufacturer.

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## Limited product warranty

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