

QuantStudio™ 3 and 5 Real-Time PCR Systems

Pub. No. MAN0011002 Rev. H.0

Planned Maintenance is a procedure designed to protect the operational performance of the QuantStudio™ 3 / QuantStudio™ 5 Real-Time PCR System.

Customer and service information

Customer organization name:

Customer contact name:

Customer contact title:

Customer laboratory address:

Planned Maintenance date:

Planned Maintenance performed by:

Service Order Number:

Instrument information

Instrument model: QuantStudio™ 3 Real-Time PCR Instrument (96-Well 0.1 mL Block)
 QuantStudio™ 3 Real-Time PCR Instrument (96-Well 0.2 mL Block)
 QuantStudio™ 5 Real-Time PCR Instrument (96-Well 0.1 mL Block)
 QuantStudio™ 5 Real-Time PCR Instrument (96-Well 0.2 mL Block)
 QuantStudio™ 5 Real-Time PCR Instrument (384-Well 0.02 mL Block)

Instrument serial number:

Responsibilities

Customer Responsibilities: Customers should ensure that all necessary operating supplies and consumables are available. The instrument must be available for the planned maintenance activities.

Note: Thermo Fisher Scientific is not responsible for customer-supplied computers.

Engineer Responsibilities: The Thermo Fisher Scientific Field Service Engineer (FSE) or authorized service provider should obtain all parts and tools needed to complete this service. Wear appropriate personal protective equipment.

Recommended parts and tools

Part number	Description
4385338	0.02 mL, 9-channel 384-well TVK and Probe
4373997	0.1 mL, 9-channel 96-well VeriFlex™ TVK and Probe
4377669	0.2 mL, 9-channel 96-well VeriFlex™ TVK and Probe
N/A	FSE Laptop with ServiceStudio or MTSS software
MAN0010407	<i>QuantStudio™ 3 and 5 Real-Time PCR Systems Installation, Use, and Maintenance Guide</i>
MAN0010998	<i>QuantStudio™ 3 and 5 Real-Time PCR Systems Software/Firmware Compatibility and User Documents Reference</i>
Varies	Appropriate ROI and background plates kit and spectral calibration plates for the instrument that you are servicing.
4461591	HID systems with optical calibration only. 96W STD CALIBRATION PLATE W/ABY DYE
4461593	HID systems with optical calibration only. 96W STD CALIBRATION PLATE W/JUN DYE

Planned maintenance procedure

Any deviations from this procedure, plus any parts that are used in addition to the parts listed above, must be noted on an accompanying service report. Any parts replaced that are not included above are considered billable via a customer purchase order, unless the equipment is covered under a Thermo Fisher Scientific service contract or warranty.

Service contract verification

✓	Task
<input type="checkbox"/>	<p>Check the serial number of the QuantStudio™ 3 / QuantStudio™ 5 Real-Time PCR System, and ensure that the system is under contract.</p> <p>The system is on a service contract:</p> <p><input type="radio"/> Yes <input type="radio"/> No</p> <p>If there is no service contract, a purchase order must be issued for this visit.</p> <p>This service is covered by a purchase order:</p> <p><input type="radio"/> Yes <input type="radio"/> No</p> <p>If applicable, enter the purchase order #: <input type="text"/></p>

Pre-planned maintenance

✓	Task
<input type="checkbox"/>	<p>Review with customer if they have any system concerns. List their concerns in the Comments section below. Note that resolving some customer concerns may require a separate billable service call.</p>
<input type="checkbox"/>	<p>Check the status of open ECOs, upgrades, and service tickets for this QuantStudio™ 3 / QuantStudio™ 5 Real-Time PCR Instrument.</p> <p><input type="radio"/> The QuantStudio™ 3 / QuantStudio™ 5 Real-Time PCR Instrument does not have open ECOs, upgrades, or service tickets.</p> <p><input type="radio"/> The QuantStudio™ 3 / QuantStudio™ 5 Real-Time PCR Instrument has open required ECOs, upgrades, or service tickets.</p> <p>Perform all open required ECOs, upgrades, and/or service tickets. The work and parts required for ECOs, upgrades, or service tickets should be performed and accounted for under separate service call. List all ECO/upgrade/service tickets completed, and the corresponding Service Order Number(s). If there are no open issues for this instrument, then enter "Not applicable" below.</p> <p>Note: Due to system validation concerns, some customers may not want the latest upgrades installed. If the customer requests not to install upgrades, enter this information below.</p> <p><input type="text"/></p>

Environment inspection

✓	Task
<input type="checkbox"/>	<p>Visually assess the location of the instrument for anything that may interfere with optimal instrument performance (for example, a hot room, obstruction of vents, sharing the instrument's electrical circuit with other equipment, etc.). Notify the customer of potential problems.</p>

Computer information and maintenance

✓	Task
<input type="checkbox"/>	<p>The QuantStudio™ 3 / QuantStudio™ 5 Real-Time PCR System includes the optional Thermo Fisher Scientific-supplied computer? <input type="radio"/> Yes <input type="radio"/> No</p> <p>If Yes, complete the tasks in this section. If No, skip the tasks in this section.</p>
<input type="checkbox"/>	<p>Record the computer hardware and software information.</p> <p>Computer model: <input style="width: 300px; height: 20px;" type="text"/></p> <p>Service tag number: <input style="width: 300px; height: 20px;" type="text"/></p> <p>Computer operating system build or operating system and service pack versions: <input style="width: 300px; height: 20px;" type="text"/></p> <p>Select the software that the customer is using on this computer, then record the version:</p> <p> <input type="radio"/> QuantStudio™ Design and Analysis Software <input type="radio"/> Diomni™ Software^[1] <input type="radio"/> Other^[2] </p> <p>Only if you selected Diomni™ Software above, then report the function of the Thermo Fisher Scientific-supplied computer:</p> <p> <input type="radio"/> Client PC <input type="radio"/> Host Computer </p> <p>Only if you selected Diomni™ Software above, then record the SAE Administrator Console Dx version^[3]: <input style="width: 300px; height: 20px;" type="text"/></p> <p>Notify the customer if the QuantStudio™ Design and Analysis Software, or Diomni™ Software and SAE Administrator Console Dx Software, and operating system versions are not in accordance with the specifications. For specifications, refer to the <i>QuantStudio™ 3 and 5 Real-Time PCR Systems Software/Firmware Compatibility and User Documents Reference</i>.</p>
<input type="checkbox"/>	<p>Verify with the customer that any anti-virus software auto-scan and auto-update options are disabled.</p> <p>If, contrary to Thermo Fisher Scientific requirements, the customer chooses to enable any of the above options, note here:</p> <div style="border: 1px solid black; height: 20px; width: 80%; margin-top: 5px;"></div>

^[1] QuantStudio™ 5 Real-Time PCR Systems only

^[2] Record the software and software version.

^[3] Diomni™ Software and SAE Administrator Console Dx Software should be installed in the Thermo Fisher Scientific-supplied computer if that is set up as the Host Computer. In that case, Design and Analysis Software cannot be installed there too since DA SAE and Diomni SAE cannot coexist in the same computer

General maintenance

✓	Task
<input type="checkbox"/>	Check the instrument touchscreen software version. If it is not the latest version, then discuss the upgrade with the customer before downloading and installing the latest version, if applicable. Record the instrument touchscreen software version: <input style="width: 150px; height: 20px;" type="text"/>
<input type="checkbox"/>	IMPORTANT! Ensure that the instrument is unplugged, then remove the instrument covers and inspect all interior surfaces and wiring. <ul style="list-style-type: none"> <input type="checkbox"/> Wipe any dust or debris from surfaces. <input type="checkbox"/> Inspect all fans of dust and debris, then clean if needed. <input type="checkbox"/> Ensure that cables are routed correctly, that they are properly secured and not being crimped or pinched, and that electrical connections are tight.
<input type="checkbox"/>	For a LAN connection, ensure that there is only one type of connection from the network to the instrument - either an Ethernet cable or the wireless adaptor.
<input type="checkbox"/>	For a LAN connection, ensure that the appropriate wireless or wired icon displays in the bottom left of the instrument touchscreen.
<input type="checkbox"/>	Touch Settings ▶ Maintenance and Service ▶ Monitoring to check the status of the optional Remote Monitoring Service. If Remote Monitoring Service is not enabled, ask the customer if assistance or more information about the service is required. Remote Monitoring Service enabled? <input type="radio"/> Yes <input type="radio"/> No
<input type="checkbox"/>	Run the System Self Tests. Troubleshoot and repair as necessary, following the standard service procedures.
<input type="checkbox"/>	Create an Instrument backup using the Backup/Restore function on the touchscreen before you start the Thermal cycler maintenance.

Thermal cycler maintenance

✓	Task
<input type="checkbox"/>	Record the temperature verification tool information. Note: Record the serial numbers located on the temperature verification probe and meter, not the serial number of the calibration certificate. Probe serial number: <input style="width: 300px; height: 25px;" type="text"/> Probe calibration date: <input style="width: 60px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/> Probe calibration expiration date: <input style="width: 60px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/> Meter serial number: <input style="width: 300px; height: 25px;" type="text"/> Meter calibration date: <input style="width: 60px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/> Meter calibration expiration date: <input style="width: 60px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/>
<input type="checkbox"/>	Select the software used to perform the temperature verification tests: <input type="radio"/> ServiceStudio <input type="radio"/> Manufacturing Test and Service Suite (MTSS) Tools Software If you selected ServiceStudio , record the version: <input style="width: 250px; height: 25px;" type="text"/>

✓	Task				
<input type="checkbox"/>	<p>Run the Heated Cover Temperature Accuracy Test. The test passes if the heated cover temperature is within $\pm 5.00^{\circ}\text{C}$ at the 105°C set point.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Set point</th> <th style="width: 80%;">Result</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">105°C</td> <td style="text-align: center;"><input style="width: 90%; height: 20px;" type="text"/></td> </tr> </tbody> </table>	Set point	Result	105°C	<input style="width: 90%; height: 20px;" type="text"/>
Set point	Result				
105°C	<input style="width: 90%; height: 20px;" type="text"/>				

For 96-Well 0.1 mL and 96-Well 0.2 mL blocks only. If not applicable, select "N/A" below, then skip to the next section in this table.

N/A

<input type="checkbox"/>	<p>Run the Block Temperature Accuracy Verification Test. The test passes if the average temperature reading of each of the zones and overall is $\pm 0.25^{\circ}\text{C}$ for each temperature set point of 85°C and 45°C.</p> <p>Note: The QuantStudio™ 3 Instrument reports values for Zones 1, 2, and 3 only. If testing a QuantStudio™ 3 Instrument, then enter "N/A" in Zones 4, 5, and 6.</p>							
Set point	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Overall (isothermal)	
85°C	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 90%; height: 20px;" type="text"/>	
45°C	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 90%; height: 20px;" type="text"/>	

<input type="checkbox"/>	<p>Run the Block Temperature Non Uniformity (TNU) Verification Test. The test passes if the calculation $(T_{\max} - T_{\min}) / 2 \leq 0.50$ is true for each of the zones and overall for each temperature set point of 95°C (UpTNU) and 60°C (DnTNU):</p> <p>Note: The QuantStudio™ 3 Instrument reports values for Zones 1, 2, and 3 only. If testing a QuantStudio™ 3 Instrument, then enter "N/A" in Zones 4, 5, and 6.</p>							
Set point	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Overall (isothermal)	
95°C	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 90%; height: 20px;" type="text"/>	
60°C	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 90%; height: 20px;" type="text"/>	

For 384-Well 0.02 mL block only. If not applicable, select "N/A" below, then skip to the next section in this document.

N/A

<input type="checkbox"/>	<p>Run the Block Temperature Accuracy Verification Test. The test passes if the average temperature reading overall is $\pm 0.25^{\circ}\text{C}$ for each temperature set point of 85°C and 45°C.</p>	
Set point	Overall (isothermal)	
85°C	<input style="width: 90%; height: 20px;" type="text"/>	
45°C	<input style="width: 90%; height: 20px;" type="text"/>	

<input type="checkbox"/>	<p>Run the Block Temperature Non Uniformity (TNU) Verification Test. The test passes if the calculation $(T_{\max} - T_{\min}) / 2 \leq 0.50$ is true overall for each temperature set point of 95°C (UpTNU) and 60°C (DnTNU):</p>	
Set point	Overall (isothermal)	
95°C	<input style="width: 90%; height: 20px;" type="text"/>	
60°C	<input style="width: 90%; height: 20px;" type="text"/>	

Optical calibrations

Optical calibrations must be performed unless the customer purchased a discounted Planned Maintenance without optical calibration. If the customer purchased the discounted service, select "N/A" below, then skip to the next section in this document.

N/A

✓	Task
<input type="checkbox"/>	<p>Complete the ROI, background, and uniformity calibrations.</p> <p>ROI: <input type="checkbox"/> Passed</p> <p>Background: <input type="checkbox"/> Passed</p> <p>Uniformity: <input type="checkbox"/> Passed</p> <p>Note: If the background calibration fails, clean the block according to the instructions in the <i>QuantStudio™ 3 and 5 Real-Time PCR Systems Installation, Use, and Maintenance Guide</i>.</p>

For 96-Well 0.1-mL and 96-Well 0.2-mL blocks only. If not applicable, select "N/A" below, then skip to the next section in this table.

N/A

<input type="checkbox"/>	<p>Pure Dye calibration:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Plate</th> <th style="width: 60%;">Dyes</th> <th style="width: 30%;">Result</th> </tr> </thead> <tbody> <tr> <td>Plate 1</td> <td>FAM™, VIC™, ROX™, SYBR GREEN™</td> <td style="text-align: center;"><input type="checkbox"/> Passed</td> </tr> <tr> <td>Plate 2</td> <td>ABY™, JUN™, MUSTANG PURPLE™</td> <td style="text-align: center;"><input type="checkbox"/> Passed</td> </tr> <tr> <td>Plate 3</td> <td>NED™, TAMRA™, Cy5™</td> <td style="text-align: center;"><input type="checkbox"/> Passed</td> </tr> </tbody> </table> <p>HID systems only. If this service is for an HID system, then complete the additional Pure Dye calibration. Custom dye calibration with these two plates is required to complete the planned maintenance service for HID systems. If this service is not for an HID system, select "N/A" below, then skip to the next section in this document.</p> <p><input type="checkbox"/> N/A</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Plate</th> <th style="width: 40%;">Dyes</th> <th style="width: 45%;">Result</th> </tr> </thead> <tbody> <tr> <td>Plate 1 (Part No. 4461593)</td> <td>JUN™</td> <td style="text-align: center;"><input type="checkbox"/> Passed</td> </tr> <tr> <td>Plate 2 (Part No. 4461591)</td> <td>ABY™</td> <td style="text-align: center;"><input type="checkbox"/> Passed</td> </tr> </tbody> </table>	Plate	Dyes	Result	Plate 1	FAM™, VIC™, ROX™, SYBR GREEN™	<input type="checkbox"/> Passed	Plate 2	ABY™, JUN™, MUSTANG PURPLE™	<input type="checkbox"/> Passed	Plate 3	NED™, TAMRA™, Cy5™	<input type="checkbox"/> Passed	Plate	Dyes	Result	Plate 1 (Part No. 4461593)	JUN™	<input type="checkbox"/> Passed	Plate 2 (Part No. 4461591)	ABY™	<input type="checkbox"/> Passed
Plate	Dyes	Result																				
Plate 1	FAM™, VIC™, ROX™, SYBR GREEN™	<input type="checkbox"/> Passed																				
Plate 2	ABY™, JUN™, MUSTANG PURPLE™	<input type="checkbox"/> Passed																				
Plate 3	NED™, TAMRA™, Cy5™	<input type="checkbox"/> Passed																				
Plate	Dyes	Result																				
Plate 1 (Part No. 4461593)	JUN™	<input type="checkbox"/> Passed																				
Plate 2 (Part No. 4461591)	ABY™	<input type="checkbox"/> Passed																				

For 384-Well 0.02-mL block only. If not applicable, select "N/A" below, then skip to the next section in this document.

N/A

<input type="checkbox"/>	<p>Pure Dye calibration:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Plate</th> <th style="width: 60%;">Dyes</th> <th style="width: 30%;">Result</th> </tr> </thead> <tbody> <tr> <td>Plate 1</td> <td>FAM™, VIC™, ROX™, TAMRA™, SYBR GREEN™</td> <td style="text-align: center;"><input type="checkbox"/> Passed</td> </tr> <tr> <td>Plate 2</td> <td>ABY™, JUN™, MUSTANG PURPLE™, NED™, Cy5™</td> <td style="text-align: center;"><input type="checkbox"/> Passed</td> </tr> </tbody> </table>	Plate	Dyes	Result	Plate 1	FAM™, VIC™, ROX™, TAMRA™, SYBR GREEN™	<input type="checkbox"/> Passed	Plate 2	ABY™, JUN™, MUSTANG PURPLE™, NED™, Cy5™	<input type="checkbox"/> Passed
Plate	Dyes	Result								
Plate 1	FAM™, VIC™, ROX™, TAMRA™, SYBR GREEN™	<input type="checkbox"/> Passed								
Plate 2	ABY™, JUN™, MUSTANG PURPLE™, NED™, Cy5™	<input type="checkbox"/> Passed								

System maintenance closeout

✓	Task
<input type="checkbox"/>	<p>Use the Backup/Restore function on the touchscreen to create an Instrument Backup onto a USB drive, then save a copy to the instrument controlling computer, or label the USB drive and leave it with the instrument.</p>

Maintenance recommendations

✓	Task
<input type="checkbox"/>	Recommend that the customer reviews and follows the instructions in Chapter 5 "Maintain the instrument" in the <i>QuantStudio™ 3 and 5 Real-Time PCR Systems Installation, Use, and Maintenance Guide</i> (Pub. No. MAN0010407).
<input type="checkbox"/>	Recommend that the customer reviews <i>Customer Computer Support Policy Information</i> (Pub. No. MAN0017286) if they have questions about computer maintenance or support.

Completion

✓	Task
<input type="checkbox"/>	Update the customer contact information, if needed.
<input type="checkbox"/>	Ensure that the customer knows how to request support for their system. See thermofisher.com/support , if needed.
<input type="checkbox"/>	Review the Planned Maintenance Checklist with the customer, and obtain customer signature.

Comments

If you have no comments, enter "Not applicable" below.

Approval

FSE Name:

FSE Signature:

Date:

Customer Name:

Customer Signature:

Date:



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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).

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Revision history: Pub. No. none

Revision	Date	Description
H.0	1 February 2024	Added "Other" option for software in Computer information and maintenance section.
G.0	31 October 2023	Updated preplanned maintenance, computer information and maintenance, general maintenance, thermal cyclers maintenance, maintenance recommendations and completion tasks.
F.01	13 July 2023	Updated the date field range and removed an extraneous note. No change to form, fit, or function.
F.0	9 July 2023	Added Diomni™ Software information.
E.0	6 September 2018	Added support for HID systems and clarified the results to record for temperature verification tests.
D.0	4 May 2017	Corrected heated cover temperature specification.
C.0	7 February 2017	Added an "N/A" checkbox and instructions for skipping an inapplicable section.
B.0	4 January 2017	Updated template, added fields to record each individual zone measurement in temperature accuracy and TNU tests, added acceptance criteria for each block type in the block cycle rate verification tests, and removed plate part number, lot number, and expiration date fields from optical calibrations.
A.0	25 April 2016	New document.

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

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