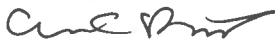


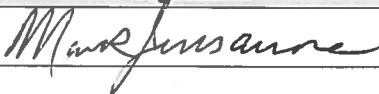
 THE SCIENCE OF WHAT'S POSSIBLE.™		Installation Qualification Report	
Report No: TE82964-1-IQR		Iteration No: 00	SAP No: TE0082964QX

INSTALLATION QUALIFICATION REPORT
For the 2489 Acquity TUV Pre-test Download Station (TE82964-1)

PREPARED BY

Name	Role	Signature	Date
Emma Pierce	Test Validation Engineer		07 Aug 2017

REVIEWED BY

Name	Role	Signature	Date
Mark Jussaume	Senior Test Engineer		07 AUG 2017

APPROVED BY

Name	Role	Signature	Date
Andre Kopoyan	Senior Operations Quality Engineer		07 Aug 2017

The "Prepared By" signature denotes that this document accurately describes the qualification activities.

The "Reviewed By" signature[s] denotes agreement with the description of the qualification activities.

The "Approved By" signature denotes that this document has been reviewed and approved for overall quality and completeness.

REVISION HISTORY

Version	Author	Summary of change
00	Emma Pierce	First document for approval

1.0 Purpose

The 2489 Acquity TUV Pre-test Download Station (TE82964-1) is located in the Flextronix Contractor Manufacturer Site in Singapore. The system is designed to download instrument firmware and assign the instrument serial number for the following part numbers: 186017002, 186248900, and 186002487. The UUT is then tested on a TUV Final Test Station (TE82903). The final test stations at the Flextronix Site used for these part numbers are TE82903-6, TE82903-8, TE82903-9, and TE82903-10.

This Installation Qualification is being performed as required by Project CYAN. This change impacts only the firmware file being loaded to the UUT. The new firmware is verified to download to the UUT correctly via Final Test Records from the TUV Final Test Stations (TE82903-6, TE82903-8, TE82903-9, and TE82903-10).

2.0 Scope of Report

This Installation Qualification Report details the requalification activities undertaken for the 2489 Acquity TUV Pre-test Download Station (TE82964-1) based on the requirements of the Installation Qualification Procedure, 730004135 Ver. 00 and TE82903-13JUL2017-VAF.

This Installation Qualification Report defines the documents used to qualify the 2489 Acquity TUV Pre-test Download Station (TE82964-1).

3.0 Summary of Results - Statement of Fitness for Intended Use

The 2489 Acquity TUV Pre-test Download Station was tested in accordance with the Installation Qualification Procedure, 730004135 Ver. 00. All Test Scripts were performed and all objective evidence requirements have been met. This download station has been classified as Fit for Use before the execution of this report.

Waters now has the necessary documentation in place to ensure that the 2489 Acquity TUV Pre-test Download Station complies with Waters' requirements, the latest relevant quality system regulations, and cGMP practices.

Following the approval of this Qualification Report, the 2489 Acquity TUV Pre-test Download Station (TE82964-1) can be considered fully qualified and fit for intended use.

4.0 Glossary

The following definitions are used in this document:

Term	Explanation
cGMP	Current Good Manufacturing Practice
IQ	Installation Qualification
IQR	Installation Qualification Report
TSP	Test Specification and Procedure
CAL/PM	Calibration/Preventive Maintenance
UUT	Unit Under Test
P/N	Part Number
N/A	Not Applicable
ECR	Engineering Change Request
VAF	Validation Assessment Form
TEQ	Test Equipment Qualification
TEQR	Test Equipment Qualification Report
TUV	Tunable UV/Vis Absorbance Detector

Waters THE SCIENCE OF WHAT'S POSSIBLE.™	Installation Qualification Report		
Report No: TE82964-1-IQR	Iteration No: 00	SAP No: TE0082964QX	

5.0 Training

The operator of the TUV Final Test Station was trained according to the Acquity Arc TUV Final Test Procedure, 735003545, Ver. 01, the TUV Detectors Final Test Procedure, 735001356, Ver. 11, and the 2489 UV/Visible Detector Test Procedure, 735003877, Ver. 01. These training records are provided as Attachment 7.1. The executor of this requalification was trained according to the Installation Qualification Procedure, 7350004135, Ver. 00. This training record is provided as Attachment 7.2.

6.0 Qualification Results

- 6.1 Test Script IQ-01: Associated Documentation Verification was not required to be performed as part of this test equipment qualification according to TE82903-13JUL2017-VAF.
- 6.1.1 This system is classified as fit for use.
- 6.2 Test Script IQ-02: Site Verification was not required to be performed as part of this test equipment qualification according to TE82903-13JUL2017-VAF.
- 6.2.1 This system is classified as fit for use.
- 6.3 Test Script IQ-03: Instrumentation Calibration Verification was not required to be performed according to TE82903-13JUL2017-VAF.
- 6.3.1 This system is classified as fit for use.
- 6.4 Test Script IQ-04: Software and Instrument Firmware Version was performed according to Installation Qualification Procedure 730004135, Ver. 00. The completed Test Script Data Sheet is provided as Attachment 7.3.
- 6.4.1 The 2489 Acquity TUV Pre-test Download Station (TE82964-1) does not have any custom software to be verified.
- 6.4.2 The firmware version listed in ECR #9215283 is version 1.69.2682 all part numbers. The correct firmware download for each part number were verified to match the versions listed on the Final Test Records from each TUV Final Test Station. The Final Test Records for TE82903-6 are provided as Attachment 7.4, the Final Test Records for TE82903-8 are provided as Attachment 7.5, the Final Test Records for TE82903-9 are provided as Attachment 7.6, and the Final Test Records for TE82903-10 are provided as Attachment 7.7.
- 6.4.3 P/N: 289024872 is a sub-assembly of P/N: 186002487 and is tested as P/N: 186002487. The upper level part (P/N: 186002487) is the packaging assembly that contains P/N: 289024872 along with the packing materials, labels, etc. required for shipping. No changes are made to P/N: 289024782 after it is tested.
- 6.5 Test Script IQ-05: General Safety and Alarms was not required to be performed as part of this test equipment qualification according to TE82903-13JUL2017-VAF.
- 6.5.1 This system is classified as fit for use.
- 6.6 Test Script IQ-06: Functional Verification was not required to be performed as part of this test equipment qualification according to TE82903-13JUL2017-VAF.
- 6.6.1 This system is classified as fit for use.
- 6.7 This table provides a summary of each test script as performed according to 7300004135 Ver. 00 along with the attachment location of all objective evidence. The table also indicates any deviation taken from the scripts during qualification.

Script or Section	Pass/Fail	Objective Evidence	Deviations
IQ-04	Pass	Attachments 7.3, 7.4, 7.5, 7.6, and 7.7	None

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Report No: TE82964-1-IQR	Iteration No: 00	SAP No: TE0082964QX	

7.0 Attachments

- 7.1 Completed Operator Training Record 735003545, Ver. 01
- 7.2 Completed Executor Training Record 730004135, Ver. 00
- 7.3 Completed Test Script IQ-04: Software and Instrument Firmware
- 7.4 Objective Evidence IQ-04: Instrument Final Test Records for TE82903-6
- 7.5 Objective Evidence IQ-04: Instrument Final Test Records for TE82903-8
- 7.6 Objective Evidence IQ-04: Instrument Final Test Records for TE82903-9
- 7.7 Objective Evidence IQ-04: Instrument Final Test Records for TE82903-10

8.0 Deviation from Test Equipment Qualification

There were no deviations generated during the execution of the Installation Qualification Procedure 730004135 Ver. 00.

9.0 References

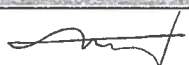
The current approved versions of the following documents are referenced within this report:

Document Number	Document title
730004135, Ver. 00	Installation Qualification Procedure
735003545, Ver. 01	Acquity Arc TUV Final Test Procedure
735001356, Ver. 11	TUV Detectors Final Test Procedure
735003877, Ver. 01	2489 UV/Visible Detector Test Procedure
ECR #9215283	Engineering Change Request for Project CYAN
TE82903-13JUL2017-VAF	Validation Assessment Form for Project CYAN Implementation

Appendix A: TRAINING RECORD

Document No. ① Procedure Title TSP for 7E82903 Version ①
 Training by: SELF SELF N/A
 Printed name Signature Date

By signing you acknowledge that you have reviewed, understand, and agree to comply with the policies and practices of the procedure defined above.

Printed Name	Signature	Initials	Date
JOEL MAMALATED DEDUYO		JMD	03 AUG 17
KWEK CHOCK MENG		KCM	03 AUG 17
Wong KOK VU		WKV	03 AUG 17
Au Weng Onn		AW.O	03 AUG 17
LEE EE SENG		LES	03 AUG 17
N/A 03 Aug 2017			

Copy this Training Record Template as needed

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Template 73000483 V06

Iteration 00

It is the responsibility of the user to verify they are using the current released version.

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Document No.: 7E82904-1-1QR

Attachment: 7.1 Page: 1 of 1

① TSP includes : 735001356 Ver 11
 735003545 Ver 01
 735003877 Ver 00

Type	Syllabus ID	Syllabus	Course ID	Course	Attended	Freq	Expires	Score	Status
Requirement	MILTESTENG	Test Engineering	730001834-VER-03	Test Engineering Management Policy	6/9/2017	0			Completed
Requirement	MILTESTENG	Test Engineering	730001834-VER-02	New Test Equipment Development Procedure	6/12/2017	0			Completed
Requirement	MILTESTENG	Test Engineering	730001835-VER-05	Process Validation Procedure for Milford	6/9/2017	0			Completed
Requirement	MILTESTENG	Test Engineering	730001836-VER-01	Sustaining Test Equipment Procedure	6/13/2017	0			Completed
Requirement	MILTESTENG	Test Engineering	730001936-VER-03	Test Method Validation Protocol	6/14/2017	0			Completed
Requirement	MILTESTENG	Test Engineering	730002232-VER-03	Process Validation Master Plan - Milford	6/14/2017	0			Completed
Requirement	MILTESTENG	Test Engineering	730002738-VER-00	New Product Intro Process - Milford (WIDP)	6/14/2017	0			Completed
Requirement	MILTESTENG	Test Engineering	730004135-VER-00	Installation Qualification Protocol	6/13/2017	0			Completed
Requirement	MILMFGOPSALL	All Milford Manufacturing & Support Personnel	EHS0000-VER-02	EHS Policies	6/6/2017	12	6/6/2018		Completed
Requirement	MILMFGOPSALL	All Milford Manufacturing & Support Personnel	LCDHR01-REV-01	Sexual Harassment Policy	6/9/2017	12	6/9/2018		Completed
Requirement	MILMFGOPSALL	All Milford Manufacturing & Support Personnel	QA0002-REV-01	Good Manufacturing Practices	6/12/2017	0			Completed
Requirement	MILMFGOPSALL	All Milford Manufacturing & Support Personnel	QA0008-REV-01	Quality Management Systems	6/13/2017	0			Completed

Iteration 00
Document No.: TE 82964-1-10R
Attachment: 7.2 **Page:** 1 **of** 1

Title: Installation Qualification Procedure

Document No: 730004135

Version No: 00

Page 7 of 11

IOQ Test name: Test Software and Instrument Firmware Version		Test Script No.: IQ-04		
Equipment No./ID: TE82964-1		Equipment Name: 2489 Acquity TUV Pre-Test Download Station		
Installation Site: Flextronix: Singapore				
Purpose: To verify that the installed firmware/software is correct per the applicable design/operational documents (TSP, ASP, MPR, BOM, and/or other Design documents). Test execution: List all critical instruments/components and/or sub-systems that require software and/or firmware in the Description column. List the associated required software/firmware version, as defined in the applicable design/operational documents, in the Acceptance criteria column. Verify that the software/firmware version on the Test Equipment match the acceptance criteria and are identical. Enter N/A for any parameter or cell that is not used or applicable. Objective evidence: Completed Test Script Data Sheet Identify the applicable design/operational document that defined the required software/firmware version(s) in the associated Installation Qualification Report.				
Description	Acceptance criteria	As found	Pass/Fail	Initial & Date
Test Equipment Software	Version: N/A	Version: N/A	N/A	N/A
Instrument Firmware for P/N: 176017002	Version: 1.69.2682	Version: 1.69.2682	Pass	REP 04 Aug 2017
Instrument Firmware for P/N: 186248900	Version: 1.69.2682	Version: 1.69.2682	Pass	REP 04 Aug 2017
Instrument Firmware for P/N: 186002487	Version: 1.69.2682	Version: 1.69.2682	Pass	REP 04 Aug 2017
	Version: N/A REP 07 Aug 2017	Version:		
	Version:	Version:		
	Version:	Version:		
	Version:	Version:		
Comments: This tester does not have custom software Firmware versions specified in ECR # 9215283 P/N: 186002487 is the upper level part of 289024872 as listed in BOM				
Overall Test Conclusion:		☒ Pass ☐ Fail		

Copy this Test Script as needed

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Template 730000483 V06

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Iteration 00

Document No.: TE82964-1-10R

Attachment: 7.3 **Page:** 1 of 1

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	186017002	Description:	ACQUITY Arc TUV Detector
Tested By:	KWEK CHOCK MENG	Date:	8/3/2017 9:59 AM
Serial Number:	H17VTU746A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -68.4u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 3.1u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 10.2u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 $\pm$ 1 nm) - Actual: 255.20 nm PASS ☒ FAIL ☐
(378.80 $\pm$ 1 nm) - Actual: 378.90 nm PASS ☒ FAIL ☐
(522.40 $\pm$ 1 nm) - Actual: 522.80 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 2.71 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐ Signed: *L. f. 2018* Date: 03/AUG/2017

Notes: TESTED ON TE 82903 - 6 / P3

Drift Count: 1

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 193.123108 Reference Energy: 249.294052

This Test Record and any data contained within it are proprietary to Waters Corporation and must be retained by Waters for the time period prescribed in its Quality Records Retention Policy. If any of the individual tests noted above fail, a note must be referenced that details the work performed to correct that specific deficiency. An overall failure indicates a special circumstance in which case a complete retest is to be done. A second form is required to document that testing; the initial form must be attached and retained.

Iteration 00
Document No.: TE 82964-1-10R
Attachment: 7.4 Page: 1 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	186248900	Description:	2489 UV/Visible Detector
Tested By:	KWEK CHOCK MENG	Date of Manufacture:	8/3/2017 10:01 AM
Serial Number:	H1787E020A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -86.8u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 2.5u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 6u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 +/- 1 nm) - Actual: 254.90 nm PASS ☒ FAIL ☐
(378.80 +/- 1 nm) - Actual: 378.60 nm PASS ☒ FAIL ☐
(522.40 +/- 1 nm) - Actual: 522.40 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 2.93 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐ Signed: Date: 03/AUG/2017

Notes: TESTED ON TE 82903-6 | P4

Drift Count: 3

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 269.920898 Reference Energy: 328.016815

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Iteration 00

Document No.: TE82964-1-18R

Attachment: 7.4 Page: 2 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	289024872	Description:	Assy. Detector 2489
Tested By:	KWEK CHOCK MENG	Date of Manufacture:	8/4/2017 2:37 PM
Serial Number:	H1787E025A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: 46.3u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 4.9u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 7.1u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 +/- 1 nm) - Actual: 255.10 nm PASS ☒ FAIL ☐
(378.80 +/- 1 nm) - Actual: 378.50 nm PASS ☒ FAIL ☐
(522.40 +/- 1 nm) - Actual: 522.50 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 3.12 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐

Signed: *L. J. 2017*

Date: 04/AUG 2017

Notes: TE 82903-6 / P2

Drift Count: 1

Noise Count: 2

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 252.798218 Reference Energy: 291.053589

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Iteration 00
Document No.: TE 82964-1-10R
Attachment: 7.4 Page: 3 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	186017002	Description:	ACQUITY Arc TUV Detector
Tested By:	KWEK CHOCK MENG	Date:	8/3/2017 3:36 PM
Serial Number:	H17VTU747A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -55.9u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 2.4u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 14.4u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 $\pm$ 1 nm) - Actual: 255.00 nm PASS ☒ FAIL ☐
(378.80 $\pm$ 1 nm) - Actual: 378.60 nm PASS ☒ FAIL ☐
(522.40 $\pm$ 1 nm) - Actual: 522.40 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 2.71 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐ Signed: *[Signature]* Date: 04/AUG/2017

Notes: TE 82903 - 8 / p1

Drift Count: 7

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 241.042206 Reference Energy: 313.804626

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• Iteration 00
Document No.: TE82964-1-10R
Attachment: 7.5 Page: 1 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	186248900	Description:	2489 UV/Visible Detector
Tested By:	AU WENG ONN	Date of manufacture:	8/3/2017 3:06 PM
Serial Number:	H1787E022A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -66.2u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 3u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 17.6u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 $\pm$ 1 nm) - Actual: 255.00 nm PASS ☒ FAIL ☐
(378.80 $\pm$ 1 nm) - Actual: 378.60 nm PASS ☒ FAIL ☐
(522.40 $\pm$ 1 nm) - Actual: 522.70 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 3.43 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐

Signed: *Weng Onn* 974694

Date: 03/AUG/2017

Notes: TESTED ON TE82903-8 / P2

Drift Count: 3

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 231.906372 Reference Energy: 251.889740

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Iteration 00
Document No.: TE82964-1-16R
Attachment: 7.5 Page: 2 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	289024872	Description:	Assy. Detector 2489
Tested By:	KWEK CHOCK MENG	Date of Manufacture:	8/4/2017 4:10 PM
Serial Number:	H1787E026A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -2.5u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 4.8u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 11.7u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 $\pm$ 1 nm) - Actual: 255.20 nm PASS ☒ FAIL ☐
(378.80 $\pm$ 1 nm) - Actual: 378.90 nm PASS ☒ FAIL ☐
(522.40 $\pm$ 1 nm) - Actual: 522.40 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 3.07 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐

Signed:

[Signature]

Date: 04/AUG/2017

Notes: TEL 2903 - 8194

Drift Count: 1

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 237.991074 Reference Energy: 275.230774

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Iteration 00
Document No.: TEL2964-1-100
Attachment: 7.5 Page: 3 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	186017002	Description:	ACQUITY Arc TUV Detector
Tested By:	AU WENG ONN	Date:	8/3/2017 3:00 PM
Serial Number:	H17VTU748A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -35.1u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 3.2u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 18.8u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 +/- 1 nm) - Actual: 255.20 nm PASS ☒ FAIL ☐
(378.80 +/- 1 nm) - Actual: 378.80 nm PASS ☒ FAIL ☐
(522.40 +/- 1 nm) - Actual: 522.30 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 2.84 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐ Signed: *[Signature]* Date: 03/AUG/2017

Notes: TESTED ON TE 82903-9 / P2

Drift Count: 1

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 289.291229 Reference Energy: 387.831635

This Test Record and any data contained within it are proprietary to Waters Corporation and must be retained by Waters for the time period prescribed in its Quality Records Retention Policy. If any of the individual tests noted above fail; a note must be referenced that details the work performed to correct that specific deficiency. An overall failure indicates a special circumstance in which case a complete retest is to be done. A second form is required to document that testing; the initial form must be attached and retained.

Iteration 00
Document No.: TE 82964-1-10R
Attachment: 7.6 Page: 1 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	186248900	Description:	2489 UV/Visible Detector
Tested By:	AU WENG ONN	Date of Manufacture:	8/3/2017 3:10 PM
Serial Number:	H1787E030A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: 83u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 2.6u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 6.9u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 $\pm$ 1 nm) - Actual: 255.10 nm PASS ☒ FAIL ☐
(378.80 $\pm$ 1 nm) - Actual: 378.80 nm PASS ☒ FAIL ☐
(522.40 $\pm$ 1 nm) - Actual: 522.60 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 3.20 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐

Signed:

[Signature]

Date: 04/AUG/2017

Notes: TE 82903-9 | P1

Drift Count: 5

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 257.032837 Reference Energy: 326.107758

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Iteration 00
Document No.: TE 82964-1-10R
Attachment: 7.6 Page: 2 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	289024872	Description:	Assy. Detector 2489
Tested By:	LEE EE SENG	Date of Manufacture:	8/4/2017 8:28 PM
Serial Number:	H1787E023A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -77u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 2.5u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 12u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 +/- 1 nm) - Actual: 255.00 nm PASS ☒ FAIL ☐
(378.80 +/- 1 nm) - Actual: 378.50 nm PASS ☒ FAIL ☐
(522.40 +/- 1 nm) - Actual: 522.20 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 2.76 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐ Signed: At 246154 Date: 04/AUG/2017

Notes: TE82903-9 / P1

Drift Count: 2

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 351.178314 Reference Energy: 443.256226

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Iteration 00
Document No.: TE82964-1-70R
Attachment: 7.6 Page: 3 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	186017002	Description:	ACQUITY Arc TUV Detector
Tested By:	KWEK CHOCK MENG	Date:	8/3/2017 5:01 PM
Serial Number:	H17VTU745A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

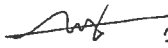
Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -26u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 2.4u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 6.5u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 +/- 1 nm) - Actual: 255.10 nm PASS ☒ FAIL ☐
(378.80 +/- 1 nm) - Actual: 378.70 nm PASS ☒ FAIL ☐
(522.40 +/- 1 nm) - Actual: 522.40 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 2.76 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐ Signed:  246154 Date: 03 / Aug / 2017

Notes: TESTED ON TE82903 - 10 P2

Drift Count: 3

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 224.684494 Reference Energy: 283.401581

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Iteration 00
Document No.: TE82964-1-102
Attachment: 7.7 Page: 1 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	186248900	Description:	2489 UV/Visible Detector
Tested By:	KWEK CHOCK MENG	Date of Manufacture:	8/3/2017 5:03 PM
Serial Number:	H1787E019A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: -88.4u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 2.6u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 25.5u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 $\pm$ 1 nm) - Actual: 254.80 nm PASS ☒ FAIL ☐
(378.80 $\pm$ 1 nm) - Actual: 378.80 nm PASS ☒ FAIL ☐
(522.40 $\pm$ 1 nm) - Actual: 522.40 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 3.55 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐ Signed: L. J. 2017 Date: 04/AUG/2017

Notes: TE 82903-10 (P3)

Drift Count: 4

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 292.027252 Reference Energy: 372.617279

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Iteration 00
Document No.: TE829641-1-10R
Attachment: 7.7 Page: 2 of 3

Waters Corporation

INSTRUMENT FINAL TEST RECORD

Part Number:	289024872	Description:	Assy. Detector 2489
Tested By:	KWEK CHOCK MENG	Date of Manufacture:	8/4/2017 3:05 PM
Serial Number:	H1787E028A	Control Number:	NA
Software Revision:	1.69.2682	Factory Order:	NA

Drift @ 230 nm
($\leq 100 \mu\text{AU}$) - Actual: 77.7u AU PASS ☒ FAIL ☐

Noise @ 230 nm
($\leq 5 \mu\text{AU}$) - Actual: 4.8u AU PASS ☒ FAIL ☐

Dual Noise @ 230/280 nm
($\leq 35 \mu\text{AU}$) - Actual: 6u AU PASS ☒ FAIL ☐

Erbium cuvette scan 200 - 600 nm
(255.00 +/- 1 nm) - Actual: 254.90 nm PASS ☒ FAIL ☐
(378.80 +/- 1 nm) - Actual: 378.60 nm PASS ☒ FAIL ☐
(522.40 +/- 1 nm) - Actual: 522.60 nm PASS ☒ FAIL ☐

Linearity
($\leq 5.0\%$ @ 2.5 AU) - Actual: 3.15 %RSD PASS ☒ FAIL ☐

Instrument Result: PASS ☒ FAIL ☐ Signed: HMC 246231 Date: 04/AUG/2017

Notes: TE82903-10/P3

Drift Count: 5

Noise Count: 1

Dual Noise Count: 1

230 nm Energy [nA]: Sample Energy: 257.527832 Reference Energy: 326.842072

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Iteration 00
Document No.: TE82964-1-12R
Attachment: 7.7 Page: 3 of 3