

# Calibration Certificate

## Volumetric KF Titrator V20 / V30

### Customer

Company: 瑞士商梅特勒托利多股份有限公司台灣分公司  
Address: 內湖區舊宗路二段171巷17號2樓  
City: 台北市 Zip/Postal: 114  
State/Province: Cust. ID No.: 97171937

### Device

Certified Titrator: V30  
Serial No.: 5129432780 Firmware Ver.: 3.0.3  
Main Board Chip ID: 0108CB4213000087 MB Firmware Ver.: 1.1  
Asset Number:

### Procedure

The equipment detailed in this document has been calibrated and certified according to the METTLER TOLEDO certification guideline. The certification guideline document is METTLER TOLEDO's internal document, intended for exclusive use by METTLER TOLEDO service specialists.

The measurements were carried out under ambient conditions and the results on the following pages of this certificate were obtained under the conditions prevailing at the time of the calibration.

Building  
Floor  
Room: LAB  
Date: 29-09-2020  
Next Certificate Date: 28-09-2021



Service Technician:

*Phil Huang*  
Phil Huang

瑞士商梅特勒托利多  
(股)台灣分公司  
校正專用

### Acceptance Summary

Overall Result:  Passed

Type	Chip ID	FW Ver.	As Found	As Left
Sensor Board	018E26821200007B	1.0		N/A
Internal Burette Drive	018E26821200007B	1.0		N/A

**Polarized Voltametric Sensor - As Found**

**Current Source**

Certified Value of Resistor [Ω]	Measured at Target Current [μA]	Positive Voltage Value* [mV]	Negative Voltage Value* [mV]	Measured Current [μA]	Target Current [μA]	MPE [μA]	Result
9996.67	10.00	100.47	-100.58	10.06	10.00	1.00	✓
	20.00	198.91	-199.04	19.90	20.00	1.00	✓

**Sensor Input**

Measured at Target Current [μA]	Average Voltage [mV]	Voltage Sensor Input [mV]	Difference Found [mV]	MPE [mV]	Result
10.00	100.53	100.60	-0.07	2.00	✓
20.00	198.98	199.90	-0.92	2.00	✓

\* Reading from the DVM

**Stroke of Burette Drive As Found**

Serial Number: 5129432780

**Measured Values at 10% Burette Stroke**

Measured	Zero Point [μM]	Max Value [μM]	Actual Value [μM]	Set Value [μM]	Deviation [μM]
1	0	5002	5002	5000	2
2	-2	4999	5001	5000	1
3	-2	4999	5001	5000	1
$\bar{X}$	-1.33	5000.00	5001.33	5000	1.33

**Measured Values at 30% Burette Stroke**

Measured	Zero Point [μM]	Max Value [μM]	Actual Value [μM]	Set Value [μM]	Deviation [μM]
1	-2	15002	15004	15000	4
2	-1	15003	15004	15000	4
3	-1	15003	15004	15000	4
$\bar{X}$	-1.33	15002.67	15004.00	15000	4.00

**Measured Values at 50% Burette Stroke**

Measured	Zero Point [μM]	Max Value [μM]	Actual Value [μM]	Set Value [μM]	Deviation [μM]
1	-1	25006	25007	25000	7
2	-1	25006	25007	25000	7
3	-1	25006	25007	25000	7
$\bar{X}$	-1.00	25006.00	25007.00	25000	7.00

**Measured Values at 100% Burette Stroke**

Measured	Zero Point [μM]	Max Value [μM]	Actual Value [μM]	Set Value [μM]	Deviation [μM]
1	-1	50013	50014	50000	14
2	-1	50013	50014	50000	14
3	-1	50013	50014	50000	14
$\bar{X}$	-1.00	50013.00	50014.00	50000	14.00

These values are transferred to "Summary of the burette stroke measurements." In the summary, deviation values are shown as absolute values and two digits are added to the computed mean value to reduce rounding errors.

**Summary of Burette Stroke Drive Measurements As Found**

Burette Drive	10%	30%	50%	100%
Set Stroke [ $\mu\text{M}$ ]	5000	15000	25000	50000
Actual Stroke [ $\mu\text{M}$ ]	5001.33	15004.00	25007.00	50014.00
Absolute Deviation [ $\mu\text{M}$ ]	1.33	4.00	7.00	14.00
Volume error calculated for 10mL burette [ $\mu\text{L}$ ]	0.27	0.80	1.40	2.80
Max. Permissible Error [ $\mu\text{M}$ ]	15	15	25	50
Result	✓	✓	✓	✓

## Test Equipment

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### Digital Voltmeter

Serial No:	78845177	Certificate No:	A109-01-220-01
Model Type:	187	Last Certification Date:	16-01-2020
Supplier	FLUKE		

### KF Resistor Unit

Serial No:	TC02A0314	Certificate No:	49981
Supplier	METTLER TOLEDO	Last Certification Date:	13-05-2019

### Micrometer

Serial No:	7E 007 02	Certificate No:	166740
Model Type:	DIGICO 2	Last Certification Date:	29-04-2019
Supplier	TESA		

### Test Unit

Serial No:	5129350029	Certificate No:	N/A
Supplier	METTLER TOLEDO	Firmware Version:	2.0
Chip ID:	01347082120000B		

## Remarks

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N/A

This document is issued to record completion of the work performed by METTLER TOLEDO on the subject device in accordance with agreed standards. It does not guarantee the continued performance of the subject device. Any measurements recorded are based on the subject device's performance at a given time as tested by METTLER TOLEDO and, except where explicitly stated otherwise, do not express an opinion as to the sufficiency of any customer designed procedures used to test the device. This document is not a warranty, either implied or express. METTLER TOLEDO expressly disclaims any liability arising from the use of the information in this document for any purpose other than as specified herein.