



# CALIBRATION CERTIFICATE

Number VG 230375

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**Mettler-Toledo S.A.E.**  
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## METTLER TOLEDO



ITEM Piston operated burette

MANUFACTURER Mettler Toledo

MODEL DV 1020

NOMINAL VOLUME 20 ml

IDENTIFICATION B231174736

APPLICANT Tec Instrumental SA  
Blas Parera 1007  
(B1602CTS) Florida-Vte Lopez

Calibration date 12 July 2023

Authorized Signatory

Firmado digitalmente por David Gallardo  
Fecha: 2023.07.13 08:50:45 +02'00'

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Este certificado se expide de acuerdo con las condiciones de la acreditación concedida por ENAC, que ha comprobado las capacidades de medida del laboratorio y su trazabilidad a patrones nacionales o internacionales.

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*This certificate is issued in accordance with the conditions of accreditation granted by ENAC which has assessed the measurement capability of the laboratory and its traceability to national or international standards.*

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### Instrument information

Burette DV 1020  
 Serial number B231174736  
 Nominal volume 20 ml

### Calibration procedure

Procedure PEC/MTE/22 based to the ISO 8655 norm and the METTLER TOLEDO manuals.  
 The measured volume corresponds with delivered volume (Ex) at the reference temperature of 20 °C.

### Calibration conditions

Ambient temperature Min. 20,5 °C Max. 20,5 °C  
 Relative humidity 66,2 % Hr  
 Pressure 1011,1 mbar

Maintenance: Before calibration, seals (references 101003 and 25737) and piston have been replaced, and burette glass has been cleaned.

### Traceability

Standard equipment used

|                    |            |                                  |
|--------------------|------------|----------------------------------|
| Balance            | BAL01      | AT201 - 5 decimal places balance |
| Burette drive      | VAL-T50    | T50                              |
| Water temperature  | TER128     | 0,1 °C resolution                |
| Ambient conditions | REG02      | (air Temp, rH)                   |
| Class III water    | 2301209810 |                                  |

The measured volume has been calculated conform to ISO/TR 20461:2023.

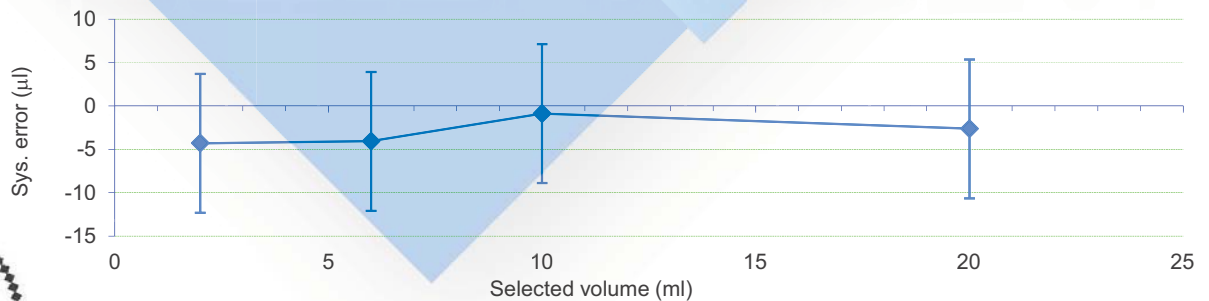
The traceability of measurements are referred to laboratories accredited by ILAC signatories accreditation bodies or national laboratories EURAMET signatories.

### Uncertainty

The reported expanded uncertainty of measurement is stated as the Standard uncertainty of measurement multiplied by the coverage factor  $k = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with document EA-4/02 M: 2022.

### Calibration results (after maintenance)

|                               | 10%         | 30%         | 50%         | 100%        |           |
|-------------------------------|-------------|-------------|-------------|-------------|-----------|
| Burette stroke                | 10%         | 30%         | 50%         | 100%        |           |
| <b>Selected volume</b>        | <b>2</b>    | <b>6</b>    | <b>10</b>   | <b>20</b>   | <b>ml</b> |
| Water temperature             | 20,1        | 20,1        | 20,1        | 20,1        | °C        |
| Measured volume               | 1995,7      | 5995,9      | 9999,1      | 19997,4     | µl        |
| <b>Systematic error</b>       | <b>-4,3</b> | <b>-4,1</b> | <b>-0,9</b> | <b>-2,6</b> | <b>µl</b> |
| Measurement uncertainty       | 8,0         | 8,0         | 8,0         | 8,0         | µl        |
| Random error                  | 0,80        | 0,59        | 0,72        | 0,61        | µl        |
| Max. Permissible Sys. Error   | 40          | 40          | 40          | 40          | µl        |
| Max. Permissible Random Error | 14          | 14          | 14          | 14          | µl        |
| <b>Evaluation*</b>            | <b>Pass</b> | <b>Pass</b> | <b>Pass</b> | <b>Pass</b> |           |



\* Evaluation and permissible errors from ISO 8655-3:2022. According with this norm, uncertainty is not taken into account.

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Technician: D. Gallardo

Remarks: ---