

Calibration Laboratory accredited by the Swiss Accreditation Service  
 Von der Schweizerischen Akkreditierungsstelle akkreditierte Kalibrierstelle  
 Laboratoire d'étalonnage accrédité par le Service d'Accréditation Suisse

S Accreditation No. **SCS 0112**  
 C Akkreditierungs-Nr. **SCS 0112**  
 S No. d'accréditation

The Swiss Accreditation Service (SAS) is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

**CERTIFICATE OF CALIBRATION**  
**KALIBRIER - ZERTIFIKAT**  
**CERTIFICAT D'ETALONNAGE**

SPECIMEN

<b>Customer</b> Kunde Client	HUG - Hôpitaux Universitaires de GE	<b>Order No. / Date</b> Auftrags-Nr. / Datum No. de commande / Date	CGR 46021/31.10.18
<b>Object</b> Gegenstand Objet	Piston-operated volumetric apparatus - Single-channel air displacement pipette of type A		
<b>Manufacturer</b> Hersteller Fabricant	SOCOREX ISBA S.A., 1024 Ecublens, Switzerland		
<b>Model / Ref.</b> Modell / Ref. Modèle / Réf.	ACURA 825.1000	<b>Serial No.</b> Seriennummer No. de série	23092041
<b>Remarks</b> Bemerkungen Remarques			
<b>Date of calibration</b> Datum der Kalibrierung Date de l'étalonnage	14-Nov-2018		

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 Dieses Kalibrierzertifikat dokumentiert die Rückverfolgbarkeit auf nat. Normale zur Darstellung der physikalischen Einheiten (SI).  
 Ce certificat d'étalonnage confirme le raccordement aux étalons nationaux qui matérialisent les grandeurs physiques (SI).

The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages and are part of the certificate.  
 Messresultate, Messunsicherheiten mit Vertrauensbereich und Messverfahren sind auf den folgenden Seiten aufgeführt und sind Teil des Zertifikats.  
 Les résultats, les incertitudes avec le niveau de confiance et les méthodes de mesure sont donnés aux pages suivantes et font partie du certificat.


**Certificate No.**  
Zertifikat-Nr.  
No. de certificat

B-09139443

**Head of the Calibration Laboratory**  
 Leiter der Kalibrierstelle  
 Responsable du Laboratoire d'Etalonnage

**Stamp and date**  
 Stempel und Datum  
 Timbre et date

SOCOREX ISBA S.A.  
 Case postale  
 CH-1024 ECUBLENS  
 14. 11. 18

  
 Dominique Serratore

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**CERTIFICATE OF CALIBRATION**  
**KALIBRIER - ZERTIFIKAT**  
**CERTIFICAT D'ETALONNAGE**

**CUSTOMER** HUG - Hôpitaux Universitaires de GE  
**CERTIFICATE NO.** B-09139443  
**INSTRUMENT**  
**MODEL/CAT. NO.** ACURA 825.1000  
**VOLUME RANGE** 100-1000 µl  
**SERIAL NO.** 23092041  
**UNCERTAINTY**

**CALIBRATION, CONDITIONS AND EQUIPMENT**

- Gravimetric method based on ISO 8655
- Test room humidity: 60% ±10% / Humidity trap
- Forward mode

**BALANCE ID** XP205/B011018720  
**AIR TEMP.** between 20-25°C (+/- 0.5 °C)  
**AIR PRESSURE** 981 hPa (+/- 5 hPa)  
**WATER TEMP.** 22.4°C (+/- 0.2°C)  
**LIQUID DENSITY (calculated)** 0.997677 g/cm3  
**CONVERSION FACT. Z (calc.)** 1.003346  
**CERTIFIED TIPS** Qualitip® 3190.1000R

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%.

TEST RESULTS (After Calibration)	VOLUME 1	VAL. / MEAN	VOLUME 2	VAL. / MEAN	VOLUME 3	VAL. / MEAN
	100 µl	100.23 µl	500 µl	498.36 µl	1000 µl	998.63 µl
		100.33 µl		498.96 µl		1001.04 µl
		100.03 µl		498.16 µl		997.63 µl
		100.33 µl		498.36 µl		997.83 µl
		100.23 µl		498.36 µl		997.83 µl
		100.03 µl		498.46 µl		997.33 µl
		99.93 µl		498.16 µl		997.43 µl
		100.03 µl		498.56 µl		997.02 µl
		100.03 µl		497.96 µl		997.43 µl
		99.73 µl		498.46 µl		997.02 µl
	Mean >	100.09 µl	Mean >	498.38 µl	Mean >	997.92 µl

	ACTUAL	SPECIFICATIONS	ACTUAL	SPECIFICATIONS	ACTUAL	SPECIFICATIONS
<b>INACCURACY</b>	E 0.09 µl	1.50 µl	E -1.62 µl	5.00 µl	E -2.08 µl	5.00 µl
	E 0.09 %		E -0.32 %		E -0.21 %	
<b>UNCERTAINTY (K=2)</b>	U +/- 0.27 µl		U +/- 0.48 µl		U +/- 0.87 µl	

Accuracy error (E) of piston-operated volumetric device complies with maximum permissible error (MPE - specifications based on manufacturer data's) without taking uncertainty (U) into consideration.  
 $|E| < \text{or} = \text{MPE}$

**STATUS** Passed Passed Passed

IMPRECISION	SD	CV	SD	CV	SD	CV
	0.19 µl	0.19 %	0.27 µl	0.05 %	1.19 µl	0.12 %
	0.50 µl		2.00 µl		2.00 µl	

Experimental standard deviation < or = max. permissible error specified by ISO 8655 or better

**STATUS** Passed Passed Passed

E = Mean error SD = Standard deviation CV = Coefficient of variation

**OPERATOR NAME** P. Varga  
**CONTROL DATE** 14-Nov-2018

**OPERATOR SIGNATURE**

This certificate is stored for 5 years.