INTEGRA

VACUSIP Operating instructions

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INTEGRA Biosciences AG – 7205 Zizers, Switzerland

declares on its own responsibility that the product | erklärt in alleiniger Verantwortung, dass das Produkt | déclare sous sa responsabilité exclusive, que le produit | declara bajo su propia responsabilidad que el producto | dichiara sotto la propria responsabilità che il prodotto

VACUSIP	**Models: 159 000, 159 010**

in accordance with EC directives | gemäss der EU-Richtlinien | est conforme au terme de la directives CE | de acuerdo con las directivas CE | in conformità alle direttive CE

2006/95/EC	Low Voltage Equipment
2004/108/EC	Electromagnetic compatibility
2002/95/EC	Restriction of Hazardous Substances
2002/96/EC	Waste Electrical and Electronic Equipment
2009/129/EC	Eco Design Directive

is in compliance with the following normative documents: | mit den folgenden normativen Dokumenten übereinstimmt: | aux documents normatifs ci-après: | cumple las documentos normativos: | soddisfa le normative seguenti:

EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - General requirements.
EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements.
UN 38.3	Lithium Battery Testing 4th edition (model 159 000 only)

Standards for Canada and USA

CAN/CSA-C22.2 No. 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - General requirements.
UL Std. No. 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - General requirements.
FCC, Part 15, Class A	Emission

Zizers, 10.1.2011

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English

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1 Introduction

These operating instructions contain all the information required for installation, operation and maintenance of the VACUSIP aspiration system.

The VACUSIP is a vacuum-based system for aspiration of non explosive aqueous solutions, such as biological buffers and media. It is not intended for medical use.

1.1 Safety notes

WARNING
Read these operating instructions carefully before use and pay particular attention to sections containing this symbol.

1.1.1 General

Do not open or modify the VACUSIP in any way.

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1.1.2 Battery (model 159 000)

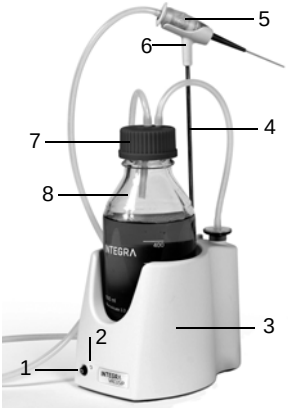
Charge the VACUSIP device using only the charger supplied by INTEGRA Biosciences. The battery may not be replaced or removed by the user. Do not heat the lithium-ion battery or VACUSIP above 60 °C (140 °F).

If despite all safety measures the VACUSIP lithium-ion battery catches fire and toxic (typically dense, white) fumes emanate from the VACUSIP device, immediately evacuate the working area. The VACUSIP housing is made of special flame retardant material that has proven its capability to contain a battery fire. During a battery fire the housing surface may become very hot. Do not touch the housing by hand and wait at least 20 minutes after fumes have disappeared before approaching the device. Do no longer use the VACUSIP device and contact your supplier for safe disposal.

2 Description of the device

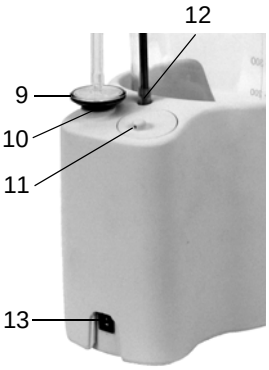
Scope of delivery

- VACUSIP base unit without battery (model 159 010) or with battery (model 159 000)
- Mains adapter
- INTEGRA glass bottle 500 ml with standard GL 45 lid
- GL 45 lid with tube fittings
- Tubing and filter with an additional spare filter
- VACUSIP hand operator
- 8-channel stainless steel tips
- 1-channel stainless steel tip
- 1-channel adapter for disposable tips



1 On/off switch
2 Indicator LED
3 Housing
4 Stainless steel rod
5 VACUSIP hand operator
6 Hand operator mount
7 Lid with tube fittings
8 500 ml bottle for liquid collection

Rear view:



9 Filter
10 Silicone filter adapter
11 Air outlet
12 Opening to insert stainless steel rod
13 Mains connection socket

3 Installation

3.1 Power supply

Insert the mains adapter cable into the VACUSIP mains connection socket (13) and plug it into the power source.

WARNING
Use an original INTEGRA Biosciences mains adapter only (see "Specifications" on page 10 for voltage requirements)

3.2 Charging of VACUSIP battery model

A full charge takes 5 hours but before the first use, VACUSIP should be charged for at least 10 hours.

When the LED (2) starts to blink green, the battery needs to be recharged immediately to prolong battery life. VACUSIP has an integrated overcharge protection.

The VACUSIP can be used while it is being charged.

3.3 Set-up

3.3.1 Installing the VACUSIP hand operator mount

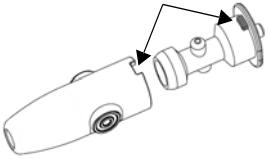
Find the enclosed stainless steel rod (4) and push it into the opening (12).

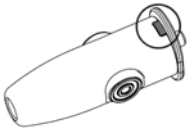
Attach the hand operator mount (6) to the top of the stainless steel rod (4).

WARNING
Do not carry the VACUSIP by holding the rod or the hand operator mount. Always grab the instrument at the back to carry it around.

English

3.3.2 Assembling the hand operator





Insert the innner part in the silicone cover, as shown on the picture beside.

3.3.3 Connecting the filter

Attach the shorter silicone tubing to the filter (9) and then plug the filter into the silicone filter adapter with the blue side facing the instrument.

The VACUSIP should never be used without a filter.

3.3.4 Connecting the silicone tubing

Place the bottle in the instrument and screw on the green lid with tube fittings (7).

Attach the silicone tubing coming from the filter to the fitting on the lid named “FILTER”.

Attach the longer silicone tubing to the fitting in the lid named “LIQ” (liquid) and the other end to the VACUSIP hand operator (5).

4 Operation

4.1 Vacuum activation and notes on use

Switch on the VACUSIP to start the vacuum pump (the LED lights up green).

Attach a suitable adapter to the hand operator.

To aspirate press the soft buttons on both sides of the VACUSIP hand operator.

Once the vacuum is reached, the pump stops until the vacuum falls below threshold.

VACUSIP switches off automatically after the pump has not been running for 10 minutes or 40 minutes after initial switch-on. This feature can be temporarily deactivated by pressing the power button for at least 4 seconds when switching on the instrument. The power-off function is automatically restored after turning off the VACUSIP.

Check the level of liquid in the bottle frequently. The liquid level should never reach the lid.

Prevent liquid or foam overflow from the collection bottle into the filter. In case the filter gets accidently wetted or soiled, exchange it immediately or otherwise the retention of further liquid cannot be guaranteed. Note that the hydrophobic filter holds back aqueous solutions, whereas retention of apolar liquids is limited.

WARNING

When working with dangerous substances, you must comply with the material safety data sheet (MSDS) and the additionally applicable regulations of trade associations, health authorities, supervisory offices, etc. In addition, when working with hazardous volatile substances or biohazardous agents, either place the VACUSIP inside a biosafety cabinet or connect the instrument's air outlet (11) to a safety ventilation by means of a tube (ID=4 mm) and an aspiration needle (Part. No. 155 502).

4.2 Code of indicator LED

LED code	Meaning
Constantly green	Unit is powered on and no errors occurred.
Blinking green	Battery level low.
Blinking red once per second	Leakage detection. Pump turns off if end vacuum has not been reached after 5 minutes.
Blinking red 5 times per second	Vacuum generation is too fast (~100 mbar/s). Indicates a clogged part.
Constantly red	Battery error. Press the power button to continue using the mains power supply.
Blinking red and green	Error in vacuum sensor calibration. Please contact your supplier.

4.3 Troubleshooting

Problem	Probable cause	Remedy
Device is not running.	No electrical power.	Check if mains adapter cable is plugged in or if battery (model 159000) is discharged. Check indicator LED light.
	Unit automatically switched off.	Switch on the unit (LED lights up green). VACUSIP automatically switches off if it is not used or 40 minutes after initial switch-on.
Aspiration speed is low.	Leak in the vacuum system.	Close the bottle lid tightly and attach tubing firmly. Check tubing, filter and hand operator for leaks. If the maximum vacuum is no reached for 5 min, the pump is turned off.
	Liquid overflowed and blocked the filter.	Empty bottle and exchange filter.
	Tubing is blocked.	Clean or exchange the tubing.
	Hand operator is clogged.	Take apart the hand operator to clean it. Use an ultrasonic bath to clean it of debris. Replace the hand operator.
VACUSIP turns off after a few seconds or minutes.	Clogging of a part close to the pump.	The LED blinks red rapidly. Check if filter is blocked and exchange it, if necessary. Check if the filter adapter is blocked.
	Leak in the vacuum system.	The LED blinks red slowly. The pump automatically stops if the end vacuum is not reached after 5 min. Check for leaks in the system and push the power button again.

5 Maintenance

5.1 Cleaning and servicing

To clean the VACUSIP housing use a cloth moistened with soapy water or a 70% ethanol solution.

It is recommended to change the hydrophobic filter regularly, at least once a year. Exchange the filter immediately if liquid has entered.

When working with solvents and other hazardous materials always rinse the hand operator and tubing with water followed by 70% Ethanol.

5.2 Autoclaving and chemical sterilization

5.2.1 Autoclaving

All parts contacting the liquid can be autoclaved: 500 ml glass bottle, lid with tube fittings, silicone tubing and hand operator. The hand operator should be taken apart for optimal decontamination. To disassemble it, hold the silicone cover and pull out the inner part.

Silicone may become brittle after extensive autoclaving. Replace the tubings and the hand operator if they are damaged.

WARNING

The filter and the instrument itself cannot be autoclaved.

5.2.2 Chemical sterilization

Use disinfectants that are free of chlorine or other corrosive agents, especially when corrosive vapors are generated during aspiration. Add the disinfecting agent to a filled bottle (and not to the empty bottle) and let it stand for an appropriate amount of time.

5.3 Equipment disposal

The VACUSIP device must not be disposed of with unsorted municipal waste.

The VACUSIP (159000) contains a polymer lithium-ion battery. Do not dispose of the device in a fire. Dispose of the VACUSIP device in accordance with the laws and regulations in your area governing disposal of devices containing lithium-ion batteries.

English

6 Technical data

6.1 Specifications

Vacuum range	–250 mbar +/- 20%
Flow rate (air)	Pump: 1.5 l/min +/- 30% at ambient pressure
Dimensions (H x W x D)	125 x 120 x 162 mm (unit) Height: unit with bottle and hand operator mount 345 mm
Weight	Unit only: 500 g Unit complete: 970 g (with glass bottle, tubing and hand operator)
Mains adapter	100–240 VAC, 50/60 Hz 9 VDC / 0.5 A
Battery	Li-Ion, 9V
Degree of protection	IP 31
Ambient conditions	Altitude: up to 2000 m Temperature: 5 – 40 °C Humidity: max. rel. humidity 80% for temperatures up to 31 °C decreasing linearly to 50% rel. humidity at 40 °C.

6.2 Chemical compatibility

The table below lists VACUSIP parts that come into contact with the aspirated liquid or its aerosols and vapors, and rates the compatibility of these parts to a few of the chemicals commonly used in laboratories. To determine the compatibility of a component to a chemical not listed in the table, please consult one of the several tables available on the internet. Note that the rating refers to soaking in the concentrated chemical; however, more relevant here is the attenuated effect resulting from vapors and the diluted chemical. It is recommended to test the compatibility of relevant components to a specific chemical prior to extensive use.

INTEGRA Biosciences AG does not warrant that the information in the table is accurate or complete and that any material is suitable for any purpose.

Chemical compatibility chart

Parts		Materials	JAVEL (e.g. NaClO)	Acetic acid	EtOH	Isopropyl alcohol	NaCl	Sodium hydroxide	Sodium acetate (3M, pH 5.2)	Hydrochloric acid (20 %)	Chloroform	Acetone	Ammonium acetate	Nitric acid (20 %)	DMSO	Phenol
Hand operator	Inner part	PP	G	G	G	G	G	G	G	G	F	G	G	G	G	G
	Outer part	Silicone	G	F	G	G	G	G	C	G	C	C	NA	C	G	C
	Adapters	POM	C	C	G	G	G	G	G	F	G	G	G	C	G	G
Tubing		Silicone	G	F	G	G	G	G	C	G	C	C	NA	C	G	C
Bottle	Single-use	PP	G	G	G	G	G	G	G	G	F	G	G	G	G	G
	Lids	PP	G	G	G	G	G	G	G	G	F	G	G	G	G	G
	Gasket	EPDM	G	G	G	G	G	G	G	G	C	G	G	G	G	G
Filter	Membrane	PTFE	G	G	G	G	G	G	G	G	G	G	G	G	G	G
	Housing	PVC	G	C	F	G	G	G	G	G	C	C	G	G	C	F
Filter adapter		Silicone	G	F	G	G	G	G	C	G	C	C	NA	C	G	C
VACUSIP base	Housing	PP	G	G	G	G	G	G	G	G	F	G	G	G	G	G
	Pump housing	POM	C	C	G	G	G	G	G	F	G	G	G	C	G	G
	Pump membrane	NBR	G	F	F	G	G	G	G	G	C	C	G	C	F	C

Compatibility ratings:
G = Good: no or minor effects.
F = Fair: moderate effects, not recommended for continuous use.
C = Critical: not recommended, suitability to be determined by test.

English

7 Accessories and consumables

Accessories		Part No.
Adapter	1-channel stainless steel tip 40 mm	155 502
	1-channel stainless steel tip 280 mm	155 525
	4-channel stainless steel tip 40 mm	155 524
	8-channel stainless steel tips 40 mm	155 503
	1-channel adapter for disposable tips/GripTips (pack of 5)	159 023
	1-channel adapter with ejector for disposable tips	159 026
	8-channel adapter with ejector for disposable tips	159 024
	1-channel adapter with ejector for GripTips	159 027
	8-channel adapter with ejector for GripTips	159 025
Stainless steel rod	For holding the hand operator mount	159 045
VACUSIP hand operator mount	To park the VACUSIP hand operator	159 046
Mains adapter (100 - 240 VAC, 50/60 Hz)	EU	156 631
	US	156 630
	JP	156 634
	UK	156 632
	AU	156 633

Consumables		Part No.
Filter	For protection of the pump, non sterile, 0.45 µm	153 016
Tubing	Silicone, 3 mm ID, 2.5 m	171 023
	Silicone, 3 mm ID, 25 m bulk roll	171 033
Tubing set VACUSIP	Consists of: VACUSIP Hand operator, Silicone tubing 1.2 m, Silicone tubing 0.22 m 1 filter (non-sterile, 0.45 µm)	159 040
Bottle	INTEGRA borosilicate bottle with standard GL 45 blue lid, 500 ml	159 031
	Single-use PP bottle with GL 45 lid, 500 ml (pack of 10)	159 032
	Lid GL 45 with tube fittings (pack of 2)	159 035
Hand operator VACUSIP	To operate VACUSIP and attach adapters	159 020