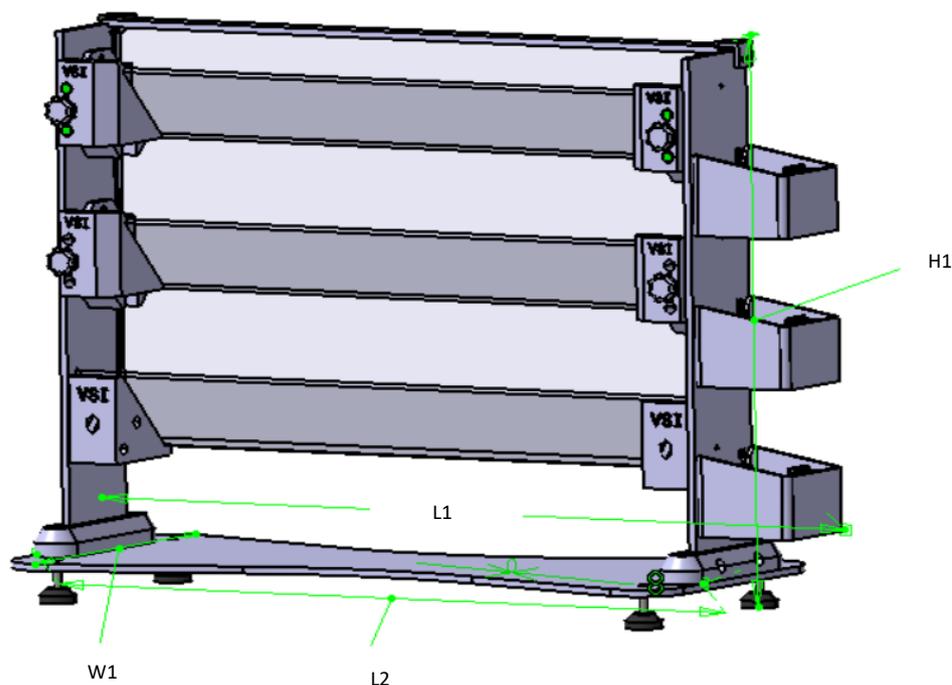


VSI IR-604 (Pupae Sex Separator)

Vienna Scientific Instruments GmbH
 Heiligenkreuzerstraße 466, 2534 Alland, AT
 Email: office@vienna-scientific.com

Specifications

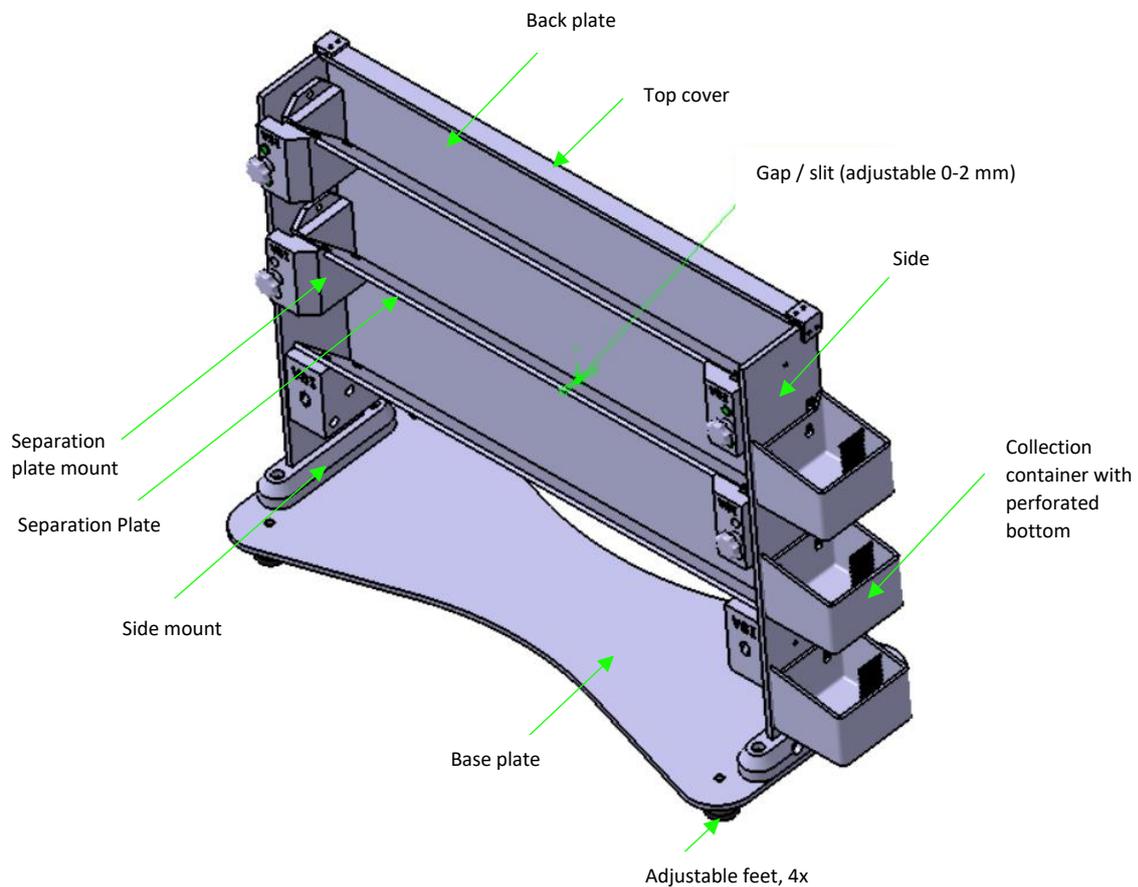
Length, with collection containers attached [L1]	558 mm
Length, without collection containers [L2]	500 mm
Width [W1]	212 mm
Height [H1]	408 mm
Weight	ca. 5 kg
Back plate [1]	
Separation Plates [5]	3x adjustable glass plates to form different-sized gaps/slits towards the backplate [10] to separate different growth stages and sexes via size dimorphism
Separation plate mount [6]	3D-printed part to mount the separation plates; to adjust the gap/slit size (see above), there is a screw which allows to set an adjustable distance from 0 to 2mm between the separation plate and the back plate (thickness gauge included)
Collection container [7]	3D-printed part which collects the larvae/pupae at each level; every container is equipped with a printed sieve allowing for drainage of excess water; the container is detachable to collect the respective fraction
Base plate with adjustable feet [9]	The base plate is equipped with adjustable feet to adjust the angle of the Sex Separator, ensuring that some water is channelled to the collection containers (to transport the pupae/larvae)



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Part list

Part number	Part	Material
IR-604	Pupae sex separator, with three glass separation plates and collection containers	
IR-604.1	Base plate, incl. 4 adjustable rubber feet	AlCuMgPb, Plastic
IR-604.2	Sides, 2x, incl. side mounts 2x	AlCuMgPb
IR-604.3	Top cover	AlCuMgPb
IR-604.4	Back plate	Glass
IR-604.5	Separation Plates, 3x	Glass
IR-604.6	Plate mount	Plastic
IR-604.7	Collection container with perforated bottom, 3x; detachable	Plastic
IR-604.8	Sides mount	Plastic
IR-604.9	Thickness gauge	Plastic



Cleaning and Storage

Clean carefully with distilled or tap water after use. Do not use excessive force, and abrasive or chemically aggressive cleaning materials! If required, EtOH can be used to surface-sterilize the device before rinsing with water. Potentially extend the gap/slit width to allow stuck objects to be rinsed. Use a soft water jet to clean the perforated bottom of the detached, inverted container.

Dry completely before storing! Store at dry, temperate conditions! Do not store exposed to the sun or other UV sources!

Manual

These instructions do not purport to cover all details or variations in the equipment and do not claim to provide for every possible contingency met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to Vienna Scientific Instruments or the supplier.

General Safety



- Ensure all national, provincial, and local safety codes are followed when using this equipment!
- Make sure all operators of this equipment have been trained for safe working practices. Operators must wear safety glasses, gloves and any other personal protective equipment necessary!



- Do not use damaged equipment and maintain the device regularly!
- Handle with care – GLASS PARTS! Do not use excessive force when adjusting the glass separation plates; especially do not try to close the gap between the separation plates and the back plate completely by force! Do not drop / place down roughly! The glass plates may shatter! Only transport / ship in appropriate containers!

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Pupae (larvae) separation by size dimorphism (/sex)

Male and female pupae are often of slight but consistent different sizes. Larvae might be of another size depending on species. This allows the fractions to be sorted mechanically by using two sheets of rigid, waterproof material (i.e. glass) forming a slight gap/slit between each other. Normally, pupae larger than the pre-set gap size are washed inside storage containers, smaller pupae (and larvae, dirt etc.) are washed down to the next level (which should form a gap of smaller size) allowing for another level of size-based sorting etc. The device might be used to separate four size fractions (incl. larvae, male pupae and female Pupae), 1 size fraction larger than the gap of each separation plate level (3x) plus everything smaller than the smallest gap (i.e. drainage at bottom).

Preparations

- 1) **Check sex separator for damages, especially the glass separation / back plates.**
- 2) The correct gap/slit sizes should be known / determined by trial and error for each application. The suitable gap sizes should be noted to facilitate subsequent resetting; record the gap/slit size according to the provided thickness gauge.
- 1) **Adjust gap size of all three levels.** Adjust gap of sorting levels 3 to 1 (work your way up) by turning the knobs of plate mounts clock or counter-clockwise until target gap size is reached. Control gap size with provided thickness gauge. Minimum gap size is 0.05 mm, maximum gap size is 2 mm; steps in-between are set to 0.1 mm. For common separation tasks, the set gap size is set largest at the topmost level and smallest at the lowest level
- 3) **Place the three collection containers in position** (interchangeable), make sure they are clean
- 4) **Place the separator into a sink or large container**, allowing for free drainage of water from the collection containers (and optional the additional sieve)
- 5) **Adjust the level of the 4 feet** by turning them (counter-) clockwise, set a slight downward slope towards the collection containers to facilitate flushing of specimen (too large to pass thru the slit/gap) into the collection containers; the required angle depends largely on the desired flow rate and/or the pouring speed and/or the density of the poured "breeding bowls" and has to be identified by trial and error
- 6) *Optional: If 4 levels of separation are required, place a fine sieve underneath the last separation level (on top of the base plate)*

Separation procedure

- 1) The content of a **breeding bowl is poured onto the top level** of the separator in fairly rapid succession
 - a. The top cover will partially reduce the amount of water splashing upwards while pouring, however, pouring uniformly is recommended
 - b. It is advisable not to pour too many specimens at the same time as e.g. a few male pupae / larvae might be being mechanically held back by the large mass of female pupae and that the use of smaller batches in the separator might allow these to pass through to the smaller-sized 'male' fraction on lower levels.
- 2) When a fair number of specimens have been collected in each collection container, the containers are detached and the differently sized fractions are flushed with clean water (applied from the bottom of the inverted containers) into a separate container.
- 3) The accuracy of separation into the "right" fraction should be determined constantly (if visually possible, e.g. between larvae and pupae) and gap/slit sizes should be adjusted accordingly.