

HIRSCHMANN®



opus® titration

High-class in motor-powered
titration

opus® titration

Drop by drop towards precise analysis results

opus® titration combines accuracy with time-saving and user-friendliness. Electronic control of titration enables the achievement of reproducible results and precisely defined dynamics each time. Time-saving rapid titration with subsequent fine titration enhances accuracy and efficiency. The titration impulse triggered by the motor enables the achievement of a droplet break-up with output volumes from 10 µl to 99.999 ml and delivers resolutions up to the third decimal place. The titration procedure is configured on the intuitive TFT touchscreen.

The user is guided through menu functions which are easily legible and comprehensible. Nine different titration procedures with their complete settings can be saved in the method memory and reactivated at any time if required.

opus® titration is available in three sizes: as a 10 ml, 20 ml or 50 ml basic unit.

The opus® 10 ml enables titration in the smallest steps from 10 µl to 99.999 ml, delivering resolutions up to the third decimal place. Extremely slow suctioning and dispensing speeds (from 0.01 ml/s to 2 ml/s) can be selected for working with viscous media.

Overview of details

- Electronic control and dispensing of volumes
- Titration impulse triggered by the motor enables the achievement of a droplet break-up from 10 µl for precision determination
- PIN function: adaptation of unit function range for users with different authorisations
- Media recirculating system for simple and rapid venting without reagent loss
- Free rotation
- TFT touchscreen with user-friendly menu
- Method memory for nine different titration procedures with storage of their complete settings
- USB and RS232 interface for PC connection
- Integration in automated procedures possible



opus® – professional support in the daily laboratory routine

Uncomplicated

Titration directly from the laboratory bottle

high precision

Motorised volume dispensing,
individual droplets from 10 µl

Quick-Cal

Individual, simple and time-saving calibration

economical

Comfortable media recirculating system

enduring

Mains operation, optional battery

interactive

USB and RS232 interface for PC connection

reliable

Secure piston sealing with
PTFE compound sealing lip system

flexible

Enables integration in automated processes

user independent

Inaccuracies caused by
manual operation are ruled out

secure

PIN function: adaptation of unit function
range for users with different authorisations

Reliability at the push of a button

Clear, self-explanatory, menu-guided - titration is configured on the external control module with TFT touchscreen, from volume configuration to individual calibration.

The user is guided through menu functions which are easily legible and comprehensible.

Nine different titration procedures with their complete settings (e.g. volume, speed and cycle times) can be saved in the method memory and reactivated at any time if required. Titration itself is triggered by lightly touching the keys on the touch screen. The last setting is automatically saved when the unit is deactivated, enabling continuous further working when it is restarted.

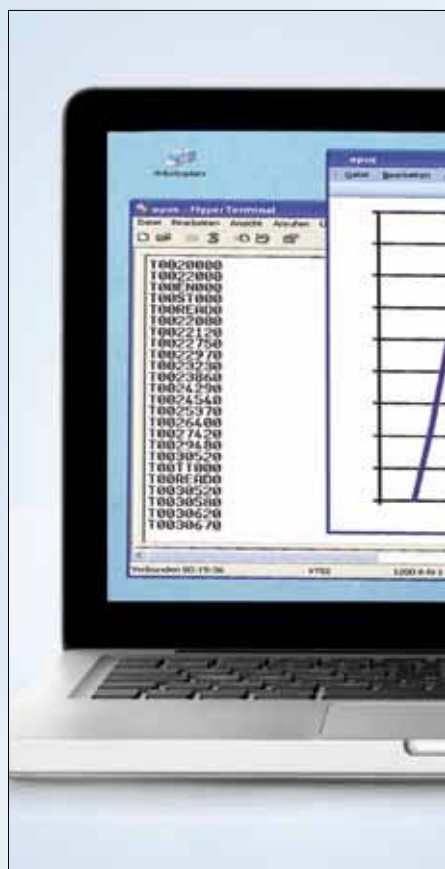
Perfect titration



Sophisticated functionality that never fails to impress

opus® is distinguished during laboratory work by its sophisticated functions and innovative details. This range from media recirculating system for simple and rapid venting without reagent loss to a USB and RS232 interface for direct PC connection. opus® dispenser units are ergonomically conceived, practical during use and distinguished by an aesthetic design.

Its excellent design and sophisticated functionality have earned opus® accolades on several occasions at prestigious international design competitions.



USB and RS232 interface for direct PC connection.

opus® can be actuated and all data read directly on the PC via the serial connection (RS232/USB) - aiding direct further processing and documentation.



Light protection window for light-sensitive media. Titrating a light-sensitive medium? No problem for opus®: A light protection window for the valve block is also included in the scope of delivery - simply replace if needed.



Free rotation: flexible and secure.

A valuable detail for daily working routines: opus® can be freely rotated on the bottle. This means that the bottle label is always pointing towards the user, and you can keep an eye on everything.



Universal Luer connector.

Perfection in detail ensures efficient, professional working: dry tube, filters and similar parts can be connected directly via the Luer connection.



The Hirschmann recirculation system:

User, environmentally and budget friendly. The comfortable Hirschmann recirculation system facilitates rapid aeration without loss of reagent.

Award-winning design and handling excellence.

opus® is a good example of the design philosophy behind Hirschmann laboratory devices. Innovative functions, ergonomically optimised handling and impressive styling complement each other to form a design which

can also attract attention at international design competitions. Hirschmann laboratory devices are regularly among the nominees or even winners at prestigious national and international design competitions.

opus® has been nominated for or numbers among the winners of the following prizes:



2011 – German Design Award (Designpreis Deutschland),
Design Council – nominee

2010 – German Design Award (Designpreis Deutschland),
Design Council – nominee



2010 – Gute Gestaltung 11



2009 – Good Design, USA



2009 – International Design Award
(Internationaler Designpreis) Baden-Württemberg,
Focus Open in silver



2009 – red dot



2009 – iF Design Award, Hanover

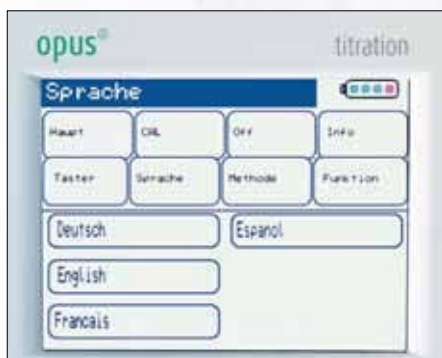
2008 – iF Design Award, China



Award-winning quality

Standard features which facilitate work

opus® dispensing units have also been developed with ergonomic aspects in mind. A simple menu guide and intuitive control on the external control module with TFT touchscreen save time and make laboratory routines easier. All values can be configured rapidly, simply and comfortably. A light key touch of the appropriate function symbol leads directly to the menu functions.



 enables you to access the selection menu. Calibration, operating language selection, activation of the method memory? A further push of the button and you can access the respective configuration menu



PIN for enhanced security. The unit can be configured with a PIN inquiry function to protect against accessing by unauthorised persons or for enabling only selected functions.



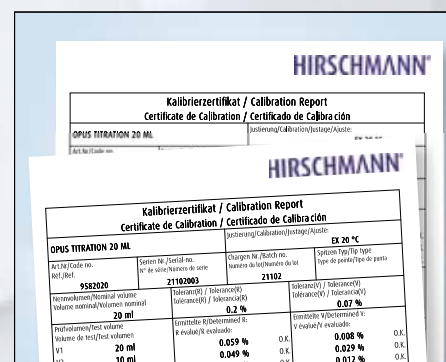
Enter the desired values as usual at the push of a button in the configuration menu. Tick it off  and opus® works according to your specifications.



The Quick-Cal configuration menu enables individual calibration, easily and reliably.



Mouse.
For extremely sensitive medium dispensing.



Quality inspection for reliability.
Quality inspection with certificate pursuant to DIN EN ISO 8655.

Focus on quality

Hirschmann laboratory devices are manufactured to the strictest quality criteria. They are developed and designed to the highest standards of precision and reliability.

In addition to this, we also offer the inspection and calibration of devices to our customers in the context of quality service. The Hirschmann calibration laboratory was accredited in 2002 pursuant to DIN EN ISO/ IEC 17025.

Professional from A to Z



Newly developed accessory range for maximum adaptability



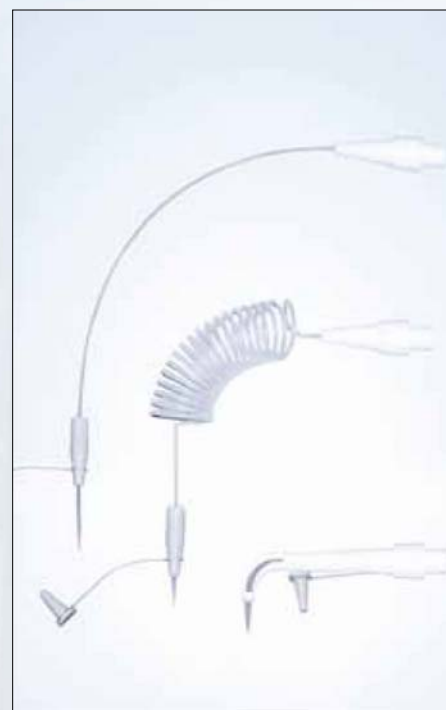
Ground adapter for direct reagent extraction from a ground bottle

The NS 29/32 ground adapter enables secure use of the basic unit on standard ground bottles.



Adapter with NS 12/21 filling tube for funnel

The adapter with standard ground 12/21 filling tube enables problem-free filling of medium through a funnel - without unscrewing the basic unit.



Ejection units with fine tips

These even finer tips facilitate precision realisation of the finest droplets. Variable and spiral ejection units with fine tips allow the user to achieve exactly the results required in practically every area of application.



Base support instead of bottle attachment

The base support enables suctioning of the medium directly from a separate storage container using a hose.



System platform for secure standing of storage bottles up to 135 mm in diameter.

Non-slip depositing surface for opus® control unit, incl. cable guide.



Stand clip for fixing the basic unit

The stand clip also facilitates use of opus® in a stand assembly.

Order number	Category/Article designation
	Threaded adapters
931 35 23	PP A 45 to A 28
931 35 24	PP A 45 to A 38/430
931 36 21	ETFE A 45 to A 32
931 36 23	ETFE A 45 to A 28
931 36 24	ETFE A 45 to A 38/430
931 36 25	ETFE A 45 to A 38
931 36 27	ETFE A 45 to S 40

	Valves
931 60 05	Discharge valve, valve seat/ball made of glass, spring made of Hastelloy Hastelloy
931 60 28	Discharge valve, valve seat/ball made of ceramic, spring made of platinum-iridium (HF)
931 60 29	Discharge valve, valve seat/ball made of glass, spring made of platinum-iridium
931 65 28	Suction valve, valve seat/ball made of ceramic, spring made of platinum-iridium (HF)
931 65 29	Suction valve, valve seat/ball made of glass, spring made of platinum-iridium
931 66 26	Recirculation valve, valve seat/ball made of ceramic, spring made of platinum-iridium (HF)
931 66 29	Recirculation valve, valve seat/ball made of glass, spring made of platinum-iridium

	Ejection units
931 30 25	Ejection unit
956 30 04	Ejection unit, titration, variable, with hose clip, 400 mm, FEP
931 30 26	Ejection unit, flexible, spiral shaped
931 30 27	Ejection unit, flexible, spiral shaped
931 30 28	Ejection unit, with Luer lock connector
931 30 29	Ejection unit, with Luer lock connector

	Suction / Recirculation hoses
931 50 07	Suction hose with screw fitting

	Control
956 40 05	RS232 connection cable
956 40 06	USB connection cable
956 40 02	Pedal switch for triggering dispensing
956 40 03	Control cable for external actuation of dispensing (e.g. for integration in automatic processes)
956 40 04	Mouse for extremely sensitive medium dispensing.

	Miscellaneous
990 37 04	Round filter set (with plug connection on one side)
958 60 01	opus® system platform, grey
958 70 02	opus® data power cable, connection cable between basic unit and control unit
958 7003	opus® data power cable, connection cable between basic unit and control unit
958 71 00	opus® battery pack, for opus® operation without mains power
958 72 00	opus® touchscreen film, protective film for the display
958 60 60	Brown light protection window



opus® titration High-class in motor-powered titration

Performance data Basic unit	10 ml	20 ml	50 ml
Unit type	Microprocessor-controlled, motorised piston lift system with recirculation		
Volume range	0.01 ml - 99.99 ml and 0.010 - 99.999 ml (max.piston lift 10 ml, automatic addition), resolution: <10 µl	0.01 ml- 200 ml (max. piston lift 20 ml, automatic addition), resolution: <1 µl	1.00 ml- 500 ml (max. piston lift 50 ml, automatic addition), resolution: <2 µl
Volume accuracy	R = 0.2%, CV = 0.07%	R = 0.2%, CV = 0.07%	R = 0.2%, CV = 0.05%
Velocity	in 16 stages from 0.01 ml/s to 2 ml/s independently adjustable for suctioning and dispensing speed	in 10 stages from 0.1 ml/s to 4 ml/s independently adjustable for suctioning and dispensing speed	in 10 stages from 1 ml/s to 10 ml/s independently adjustable for suctioning and dispensing speed
Operating temperature range	+4 °C to +40 °C		
Power supply	Plug-in mains unit 15V, 850 mA (optional via battery in control unit)		
Optional battery operation	Battery charge for an average of 2.5 to 3 h continuous operation. Battery capacity indicated on TFT display, charging time 6.5 h, intelligent electronics prevent overloading and deep discharging		
Materials	Housing made of PA6 reinforced glass fibre, all parts in contact with liquid are made of chemically inert material		
Cleaning, sterilisation	Motorised rinsing function, can be disconnected without tools, media-conveying components are suitable for steam sterilisation (121 °C)		
Aeration	Automatic at the push of a button		
Dimensions/ Weight	320 mm x 80 mm x 63 mm (H x D x W)/ 660 g		
Quality control	in compliance with DIN EN ISO 8655		
Documentation	DIN EN ISO 9001 compliant certification through unit protocol with serial number		

Performance data Control unit	10 ml	20 ml	50 ml
Module type	External control module incl. touch screen control		
Touchscreen	3.5" with 320 X 240 pixel, most important functions directly accessible from main screen		
Titration volume preselection	Up to 10 ml	Up to 20 ml	Up to 50 ml
Rapid titration	For rapid medium dispensing at beginning of titration process		
Droplet titration	With 1 droplet per button push, accelerating if button is pressed		
Quick-Cal	Calibration of other temperature or medium possible		
Method memory	Up to 9 different unit configurations can be saved		
Languages	4 languages (D, GB, F, S) integrated as standard option		
PC interface	USB or RS232		
Remote control	Unit can be remotely controlled via an additional cable-connected device		
Dimensions/ Weight:	55 mm x 130 mm x 110 mm (H x D x W) /230 g		

Scope of delivery
opus® with A 45 internal thread and additional A 32, A 38 and S 40 threaded adapters
Suction hose with union nut, recirculation hose, titration ejection unit, valve fitting wrench, touchscreen control unit "dispenser", brown light protection window, power supply unit, data power cable, operating manual and individual quality certificate

Order number	Article designation
958 20 10	opus® titration 10 ml, power supply unit with Euro plug 230 Volt
958 21 10	opus® titration 10 ml, power supply unit with UK plug 230 Volt
958 22 10	opus® titration 10 ml, power supply unit with US plug 120 Volt
958 20 20	opus® titration 20 ml, power supply unit with Euro plug 230 Volt
958 21 20	opus® titration 20 ml, power supply unit with UK plug 230 Volt
958 22 20	opus® titration 20 ml, power supply unit with US plug 120 Volt
958 20 50	opus® titration 50 ml, power supply unit with Euro plug 230 Volt
958 21 50	opus® titration 50 ml, power supply unit with UK plug 230 Volt
958 22 50	opus® titration 50 ml, power supply unit with US plug 120 Volt

opus® 10 ml, 20 ml, 50 ml

HIRSCHMANN®

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