

# TurboVap<sup>®</sup>

Second Generation Solvent Evaporators



# We've Listened – Here it Is

TurboVap® is a second generation product which builds on the solid foundations of the historic TurboVap product line and incorporates many new customer-driven features. It still features the highly efficient patented gas vortex shearing technology, which is synonymous with the TurboVap brand.



The patented gas vortex shearing technology is what makes TurboVap® evaporators so effective.

## New Customer-driven Features

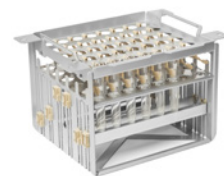
The new TurboVap® is designed around a common chassis with interchangeable accessories, allowing users to switch quickly between configurations for a wide range of sample sizes and applications. The TurboVap® EH setup allows seamless use of Extrahera sample/collection racks in the new system. The TurboVap® P+ setup allows transfer of samples processed on a Biotage® PRESSURE+ 48 without having to swap racks.

Notable enhancements include a well-lit glass tank for much greater visibility, removable/replaceable nozzles on the lid, on-the-fly nozzle adjustment, easily exchangeable manifolds to extend functionality, programmable evaporation flow gradients, easy access drain port and user friendly touch screen interface. The system can be vented from the bench or placed in a fume hood. Because the footprint is noticeably smaller on the modern unit, less space is required.

For demanding applications involving the use of aggressive acids and bases we offer an upgraded version of the standard TurboVap LV and II instruments which features a PTFE coated manifold and treated nozzles.

## Flexible Rack System





A novel and innovative feature of the new TurboVap family is the Multi Rack that can be fully adjusted for a range of tube and vial sizes. By using the series of Multi Racks, TurboVap LV will accommodate tube and vial sizes from 1.5 mL up to 60 mL. Two versions of the 48 position rack are available to accommodate most common glassware sizes. When used in the 24 position mode, the 24 position Multi Rack will accommodate 24 x I-Chem/ASE/EPA vials, 24 x 50 mL centrifuge tubes/Greiner or 24 x TurboVap II, 50 mL, 0.5 or 1.0 mL End Point Tubes. TurboVap II accommodates both 50 mL and 200 mL end point sensor tubes using two separate racks.



The flexible Multi Racks allow evaporation of samples in virtually any tube size. See page 6–7.



# Biotage Evaporation System Selection Guide

	TurboVap® II	TurboVap® LV	TurboVap® EH	TurboVap® P+
				
<b>Part Number</b>	415001 or 416201*	415000 or 416200*	415540	N/A
<b>Vial Capacity</b>	6	24 or 48	2 x 24	48
<b>Sample Volume</b>	50 or 200 mL	1.5–60 mL	All 75 mm Extrahera Collection tubes	Various
<b>End-point Detection</b>	0.5 or 1.0 mL	N/A	N/A	N/A
<b>Key Applications</b>	Food, water, soil and environmental solvent extraction.	Forensic, clinical chemistry, food, and pharmaceutical laboratories for concentration of solvents following SPE cleanup of drug samples or pesticide extracts.	Evaporation of samples processed on Biotage® Extrahera™.	Evaporation of samples processed on Biotage® PRESSURE+ 48.

\* Acid resistant version



# TurboVap®

## One Platform, Four Configurations

### TurboVap® LV

Evaporation of up to 48 samples with independent control of flow in each row. Can be used in either 24 or 48 position mode. Compatible with tube sizes ranging from 10 to 32 mm (outer diameter) and from 32 up to 165 mm in length. Acid resistant version available.

#### Read More

■ TurboVap® LV Product Note (PPS440) 



### TurboVap® II

Evaporates six 50 or 200 mL samples with independent vial control. Automatic sensors detect when the solvent reaches the end-point volume and automatically stop the evaporation. Acid resistant version available.

#### Read More

■ TurboVap® II Product Note (PPS442) 



### TurboVap® EH

Jump seamlessly from Biotage® Extrahera™ to TurboVap® EH without moving tubes from one rack to another. TurboVap® EH takes 48 samples up to 18 x 75 mm.



### TurboVap® P+

Process your samples on Biotage® PRESSURE+ 48 Positive Pressure Manifold and transfer straight into the TurboVap® P+. Streamline your workflow. (Not available as a base unit. Manifold and racks available separately)



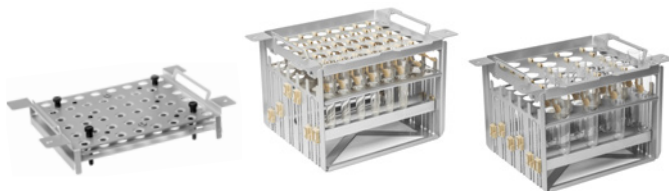
**Acid Resistant Versions available for TurboVap II and LV.**



# Configurations

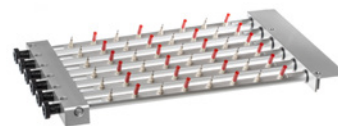
## Multi Racks

### TurboVap® LV



48-position rack for 10–16 mm mini vials, PN **415489**.  
48-position rack for 10–20 mm tubes, PN **414964**.  
24-position rack for 21–32 mm tubes, PN **415129**.

## Gas Manifolds



48-nozzle manifold, PN **415408SP**.  
48-nozzle PTFE manifold, PN **416129SP**.

### TurboVap® II

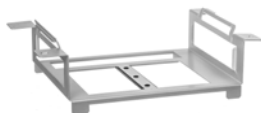


6-position rack with end-point sensors for 200 mL tubes, PN **415100**.  
6-position rack with end-point sensors for 50 mL tubes, PN **415535**.  
6-position rack for 50 or 200 mL tubes, PN **415494**.



6-nozzle manifold, PN **415222**.  
6-nozzle PTFE manifold, PN **415830SP**.

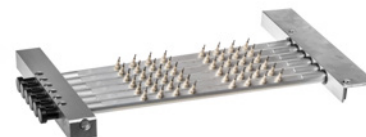
### TurboVap® EH



Rack holder for two sample/collection tube racks, PN **415510**.



24-position sample/collection racks for 12 mm tubes, PN **415491**.  
24-position sample/collection racks for 16 mm tubes, PN **415585**.  
24-position sample/collection racks for 18 mm tubes, PN **415492**.

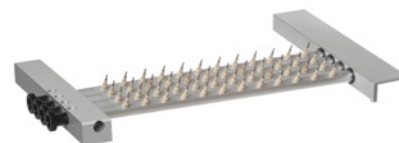


2x24-nozzle manifold, PN **415490SP**.

### TurboVap® P+



48-position rack for 12–13 mm tubes, PN **415690SP**.  
48-position rack for 16 mm tubes, PN **415675SP**.



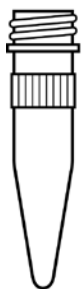
48-nozzle manifold, PN **415682SP**.

# Tube and Rack Compatibility

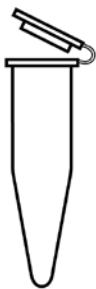
Test Tube	Biotage Tube P/N	Matching TurboVap® II Rack	Matching TurboVap® LV Rack	Matching TurboVap® EH Rack	Matching TurboVap® P+ Rack
Evaporation Tube TurboVap II, 50 mL 0.5 mL End Point	C128508	415535	415129*		
Evaporation Tube TurboVap II, 50 mL 1 mL End Point	C128511	415535	415129*		
Evaporation Tube TurboVap II, 200 mL 0.5 mL End Point	C128507	415100			
Evaporation Tube TurboVap II, 200 mL 1 mL End Point	C128506	415100			
Test Tubes 10 x 75 mm Capacity 3.7 mL Maximum advised capacity 3.0 mL	C48985		414964		
Test Tubes 12 x 75 mm Capacity 6.5 mL Maximum advised capacity 5.5 mL	C44651		414964	415510 in combo with 415491	415690SP
Test Tubes 13 x 100 mm Capacity 10.5 mL Maximum advised capacity 9.3 mL	C40707		414964		415690SP
Test Tubes 16 x 75 mm Capacity 11.3 mL Maximum advised capacity 9.7 mL	413282		414964	415510 in combo with 415585	
Test Tubes 16 x 100 mm Capacity 15.5 mL Maximum advised capacity 13.7 mL	C40708		414964		415675SP
Test Tubes 16 x 125 mm Capacity 19.6 mL Maximum advised capacity 18.0 mL	C45273		414964		
Test Tubes 18 x 75 mm Capacity 14.4 mL Maximum advised capacity 12.4 mL	414574		414964	415510 in combo with 415492	
Test Tubes 18 x 150 mm	N/A		414964		
Test Tubes 20 x 150 mm Capacity 36.5 mL Maximum advised capacity 34.0 mL	C40709		414964		
Test Tubes 25 x 150 mm	N/A		415129		
Test Tubes 15 mL Conical	C44941		414964		
Test Tubes 10 mL Conical	C47811		414964		
Test Tubes 15 mL Conical	C47816		415129		
IChem/ASE/EPA Vials 40 mL (28 x 98 mm)	415148		415129		
Test Tubes 50 mL Centrifuge	C128512		415129		
50 mL centrifuge tubes or Greiner	N/A		415129		
GC/LC autosampler vials 12 x 32 mm	N/A		415489		
Screw and crimp cap vials 4 mL 15 x 45 mm	N/A		415489		
Flip cap microcentrifuge tubes 1.5 mL 42 x 11 mm	N/A		415489		
Flip cap microcentrifuge tubes 2.0 mL 42 x 11 mm	N/A		415489		
Screw cap microcentrifuge tubes 1.5 mL 46 x 11 mm	N/A		415489		
Screw cap microcentrifuge tubes 2.0 mL 46 x 11 mm	N/A		415489		

\* End point detection not available when using this configuration.

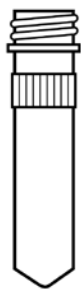
# Tubes



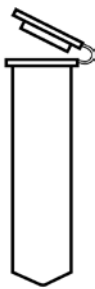
1.5 mL  
Screw Cap  
46 x 11 mm



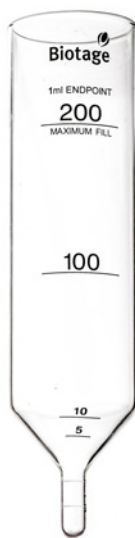
1.5 mL  
Flip Cap  
42 x 11 mm



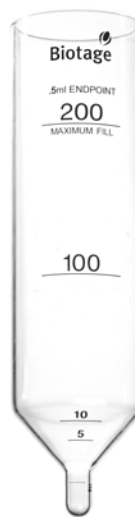
2 mL  
Screw Cap  
46 x 11 mm



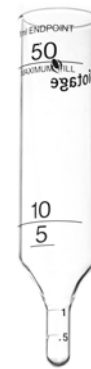
2 mL  
Flip Cap  
42 x 11 mm



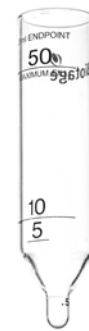
200 mL  
1 mL endpoint  
C128506



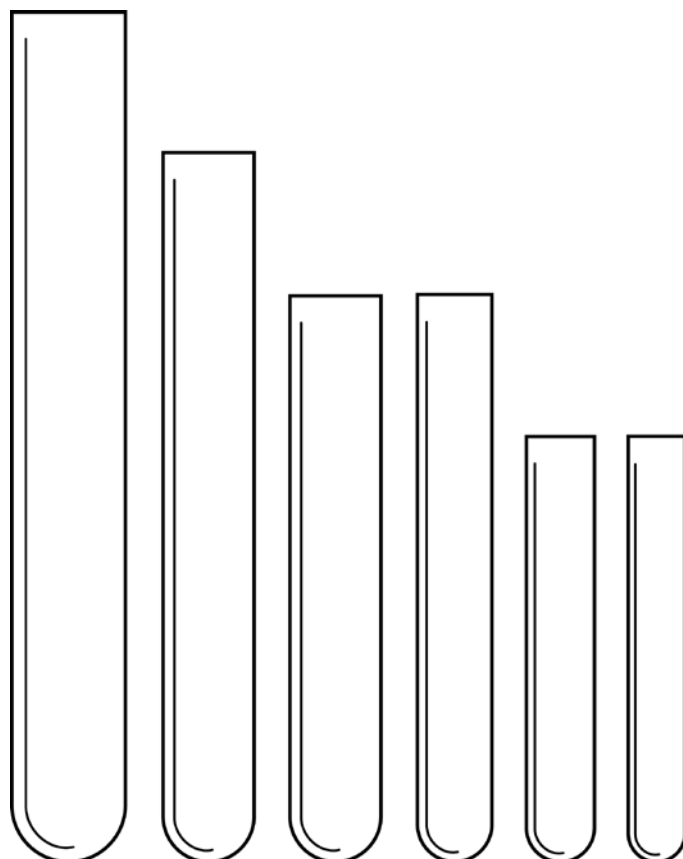
200 mL  
0.5 mL endpoint  
C128507



50 mL  
1 mL endpoint  
C128511



50 mL  
0.5 mL endpoint  
C128508



20 x 150 C40709	16 x 125 C45273	16 x 100 C40708	13 x 100 C40707	12 x 75 C44651	10 x 75 (mm) C48985
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<b>Capacity (mL)</b>	36.5	19.6	15.5	10.5	6.5	3.7
<b>Max. Advised Capacity (mL)</b>	34.0	18.0	13.7	9.3	5.5	3.0



# Technical Specifications

## Evaporation

<b>Gas Supply</b>	The system should operate using inert gas. Compressed air can be used but is not recommended with some solvents due to the possible risk of explosion.
<b>Gas Connection</b>	The gas inlet tube supplied with the system has a 6 mm outer diameter. The system is also shipped with two connectors for conversion to 1/4" or 3/8" outer diameter.
<b>Gas Regulator</b>	Not included. Available separately as an optional accessory (P/N 352281SP Pressure Regulator, and P/N 353480SP Supply Connection Set).
<b>Minimum Pressure</b>	4 bar (0.4 MPa, 58 PSI)
<b>Pressure Required for Full Capability</b>	6 bar (0.6 MPa, 87 PSI)
<b>Maximum Pressure</b>	9 bar (0.9 MPa, 130 PSI)
<b>Required Supply Flow</b>	Required supply flow for TV Classic equivalent capability for each manifold: <ul style="list-style-type: none"><li>» 48 positions: 160 liters/min</li><li>» 24 positions: 120 liters/min</li><li>» 6 positions: 35 liters/min</li></ul> Required supply flow for full flow capability for each manifold: <ul style="list-style-type: none"><li>» 48 positions: 200 liters/min</li><li>» 24 positions: 160 liters/min</li><li>» 6 positions: 50 liters/min</li></ul>
<b>Water Temperature Range</b>	Ambient to 90 °C
<b>Heating Duration</b>	40 min. (from 20 °C to 55 °C)
<b>Max Gas Flow</b>	» 48 positions: 3.5 litres/min » 24 positions: 5.5 litres/min » 6 positions: 7 litres/min
<b>Solvent Compatibility</b>	» Acetone » Acetonitrile » Chloroform » Dichloromethane » Diethyl ether » Dimethylformamide » Dimethylsulfoxide » Ethanol » Ethyl acetate » Heptane » Hexane » Isooctane » Isopropanol » Methanol » Methyl tert-butyl ether » Pentane » Tetrahydrofuran » Toluene » Water

## Chemical Resistance

- » Trifluoroacetic acid (TFA) 2%\*
  - » Trichloroacetic acid (TCA) 2%\*
  - » Formic acid 5%
  - » Acetic acid 10%
  - » Butyric acid 5%
  - » Phosphoric acid 5%
  - » Hydrochloric acid 0.1M\*
  - » Nitric acid 0.1M\*
  - » Propionic acid 5%
  - » Ammonium Hydroxide 5%
  - » Triethylamine (TEA) 5%
- \* Acid Resistant Systems Only

## Compatible Racks and Tube Sizes

<b>TurboVap LV</b>	» 48 positions for 10–16 mm (OD) x <45 mm (length) mini vials » 48 positions for 10–20 mm (OD) x 75–165 mm (length) tubes » 24 positions for 21–32 mm (OD) x 75–165 mm (length) tubes
<b>TurboVap II</b>	6 positions for 50 and 200 mL evaporation tubes with 0.5 and 1 mL end-point
<b>TurboVap EH</b>	» 24 Positions, 12 x 75 mm tubes » 24 Positions, 16 x 75 mm tubes » 24 Positions, 18 x 75 mm tubes  » 48 Positions, 12 x 75 mm tubes » 48 Positions, 13 x 100 mm tubes
<b>TurboVap P+</b>	» 48 Positions, 16 x 100 mm tubes

## Interfaces

<b>Touch Screen</b>	7 inch touch screen
<b>Auxiliary</b>	Connection for end-point detection

## System

<b>Fume Hood/Ventilation</b>	The system must be either connected to a ventilation system using the exhaust outlet at the rear of the system or placed in a well-ventilated fume hood or an equivalent enclosure to reduce the risk of exposure to harmful solvent vapours. The ventilation system or fume hood must be capable of exhausting 1 m <sup>3</sup> /min (35.3 ft <sup>3</sup> /min).
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<b>Connection</b>	The exhaust hose supplied with the system is 3.8 meters (12.5 feet) and has a 50.8 mm (2") inner diameter.
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<b>Operating Temperature</b>	18 °C to 32 °C
<b>Storage Temperature</b>	-25 °C to 60 °C
<b>Humidity</b>	20% to 90% RH (non-condensing)
<b>Electrical Supply</b>	100–127 V and 220–240 V at 50/60 Hz
<b>Fuses</b>	F10 A at the power inlet (1 required)
<b>Max Power Consumption</b>	1000 VA
<b>Weight</b>	17 kg (37.5 lbs) when the water bath is empty and maximum 29 kg (63.9 lbs) with deionized water, rack, and tubes.
<b>Dimensions (W X D X H)</b>	400 x 400 x 390 mm (15.7" x 15.7" x 15.4") including the hinges at the side and exhaust at the rear. The height with the lid open is 590 mm (23.2").
<b>Max Sound Level</b>	75 dB(A)
<b>Certifications</b>	CE marked and CB and NRTL certified

# Ordering Information

Part Number	Description
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## Base Systems

<b>415000</b>	TurboVap LV (includes 415408 Manifold, but no rack)
<b>415001</b>	TurboVap II (includes 415222 Manifold, but no rack)
<b>415540</b>	TurboVap EH (includes 415490 Manifold, but no rack)

## Acid Resistant Base Systems

<b>416200</b>	TurboVap LV - PTFE Coated Manifold (Rack must be ordered separately)
<b>416201</b>	TurboVap II - PTFE Coated Manifold (Rack must be ordered separately)

## TurboVap® LV Configuration

<b>415408SP</b>	TurboVap LV Manifold (48 Nozzles)
<b>416129SP</b>	TurboVap LV Manifold (48 Nozzles) - PTFE Coated (for upgrade of 415000)
<b>415489</b>	TurboVap LV Multi Rack (48 Positions, 10-16 mm Mini Vials)
<b>414964</b>	TurboVap LV Multi Rack (48 Positions, 10-20 mm Tubes)
<b>415129</b>	TurboVap LV Multi Rack (24 Positions, 21-32 mm Tubes)

## TurboVap® II Configuration

<b>415222</b>	TurboVap II Manifold (6 Nozzles)
<b>415830SP</b>	TurboVap II Manifold (6 Nozzles) - PTFE Coated (for upgrade of 415001)
<b>415100</b>	TurboVap II Rack with End-Point Sensors (6 Positions, 200 mL Tubes)
<b>415535</b>	TurboVap II Rack with End-Point Sensors (6 Positions, 50 mL Tubes)
<b>415494</b>	TurboVap II Multi Rack without End-Point Sensors (6 Positions, 50/200 mL Tubes)
<b>C42566</b>	Auxiliary Rack 50 mL Evaporation Tubes TurboVap II
<b>C42567</b>	Auxiliary Rack 200 mL Evaporation Tubes TurboVap II

## TurboVap® EH Configuration

<b>415490SP</b>	TurboVap EH Manifold (2 x 24 Nozzles)
<b>415510</b>	TurboVap EH Sample/Collection Rack Holder (2 Positions)
<b>415491</b>	Sample/Collection Rack (24 Positions, 12 x 75 mm Tubes)
<b>415585</b>	Sample/Collection Rack (24 Positions, 16 x 75 mm Tubes)
<b>415492</b>	Sample/Collection Rack (24 Positions, 18 x 75 mm Tubes)

## TurboVap® P+ Configuration

<b>415682SP</b>	TurboVap P+ Manifold (48 Nozzles)
<b>415675SP</b>	TurboVap P+ Rack (48 Positions, 16 x 100 mm Tubes)
<b>415690SP</b>	TurboVap P+ Multi Rack (48 Positions, 12-13 mm Tubes)

Part Number	Description
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## Tubes and Caps

<b>C48985</b>	10 x 75 mm Test Tube 1000-pack
<b>C44651</b>	12 x 75 mm Test Tube 1000-pack
<b>C40707</b>	13 x 100 mm Test Tube 1000-pack
<b>413282</b>	16 x 75 mm Test Tube 1000-pack
<b>C40708</b>	16 x 100 mm Test Tube 1000-pack
<b>C45273</b>	16 x 125 mm Test Tube 1000-pack
<b>414574</b>	18 x 75 mm Test Tube 304-pack
<b>C40709</b>	20 x 150 mm Test Tube 500-pack
<b>C47811</b>	10 mL Conical Centrifuge Test Tube 125-pack
<b>C44941</b>	15 mL Conical Centrifuge Test Tube 125-pack
<b>C47816</b>	15 mL Volumetric Test Tube for AutoTrace 12-pack
<b>C44942</b>	Snap Caps for 15 mL Conical Centrifuge Test Tubes (Polypropylene) 500-pack
<b>C128506</b>	Evaporation Tube TurboVap II 200 mL, 1 mL End-Point 12-pack
<b>C128507</b>	Evaporation Tube TurboVap II 200 mL, 0.5 mL End-Point 12-pack
<b>C128508</b>	Evaporation Tube TurboVap II 50 mL, 0.5 mL End-Point 12-pack
<b>C128511</b>	Evaporation Tube TurboVap II 50 mL, 1 mL End-Point 12-pack
<b>C128512</b>	Test Tube 50 mL, Centrifuge 12-pack

## Spare Parts

<b>414892SP</b>	Replacement Nozzle for TurboVap 8-pack
<b>416164SP</b>	Replacement Nozzle for TurboVap, Treated, Qty 8
<b>C46811</b>	Nozzle Plug for TurboVap 25-pack
<b>415231SP</b>	Multi Rack Vial Spring 10-pack
<b>415232SP</b>	Multi Rack Height Adjustment Handles (Pair)
<b>415229SP</b>	Replacement End-Point Sensor for TurboVap II
<b>415656SP</b>	Aqua Stabil, 100 mL
<b>C43067</b>	Venting Hose 50.8 mm (2") ID, 3.8 meters (12.5 feet) long
<b>414742SP</b>	Fuse, 10AF/250VAC Fast, 6.3 x 32 mm
<b>415814SP</b>	Air/N <sub>2</sub> Inlet Tubing, 6 mm OD
<b>352281SP</b>	Pressure Regulator
<b>353480SP</b>	Supply Connection Set



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