

Ultravap[®]
Mistral

porvair
sciences

FULLY AUTOMATION-COMPATIBLE BLOW DOWN EVAPORATORS



Ultravap Mistral

Fully automation-compatible blow down evaporators from Porvair Sciences

- Fully liquid handling robot-compatible dry down station
- Plate shuttle sends/retrieves plates from robot deck
- Adjustable shuttle position and height
- Intuitive graphical colour touch screen display
- Up to 15 stored evaporation programmes
- Up to five programmable steps per method
- On board gas management
- Master & multiple slave configuration supported
- Remote control from PC option
- Reversible screen for integration at side of robot
- Built-in fume management and duct connector
- Faster evaporation times
- Choice of 24-, 48-, 96- and 384-well heads
- Small footprint to fit in your hood
- Energy-saving Eco mode extends heater and fan life



The **Ultravap Mistral from Porvair Sciences** is designed to remove the traditional laboratory 'bottleneck' of solvent evaporation from microplates. Fully automating the dry-down step has always been impossible because it is difficult to interface liquid handling robots with traditional centrifugal-type evaporators. The Ultravap Mistral design, by dispensing with the rotating arm of the centrifuge and offering a fully-flat front profile, overcomes this problem and is much better positioned to link with your robot. With more than 20 years' experience in producing deep well microplates, Porvair Sciences has thoroughly researched the problems of drying down organic solvents in plates. This has led to the ultimate microplate blow down evaporator – the Ultravap Mistral.

The Ultravap Mistral is the most sophisticated automation-friendly model yet, giving significant throughput advantages to laboratories looking to optimise microplate sample preparation. Faster than centrifugal evaporation for single plates, significant increases in sample throughput are achieved through advanced evaporator head technology and an innovative manifold design, which directly injects heated nitrogen into each individual well of the microplate simultaneously. Installation requires only connection to a gas supply and mains electricity. Safety of operation is ensured as this CE-marked compact unit fits into all fume cupboards and boasts full integral fume management within the unit.

The Ultravap Mistral may be operated with a supply of clean, dry compressed air in place of nitrogen, if the chemistry allows. The new Ultravap Mistral is the latest development of Porvair Sciences' highly successful Ultravap line of blow down evaporators and sample concentrators. It has been designed in close co-operation with the leading suppliers of laboratory liquid handling robots and is suitable for integration directly with the following manufacturers' robots:

- *Hamilton Robotics – Star*
- *Tecan – Freedom Evo*
- *Perkin Elmer – Janus*
- *Beckman Coulter – Biomek*

The Ultravap Mistral offers a plate shuttle which can serve and retrieve plates from the deck of most liquid handlers. The colour touch-screen controlled dry down station accepts interchangeable 24-, 48-, 96- or 384-needle heads. It comes complete with clear safety



screens and integral fume management leading to a 4 inch duct adaptor that incorporates a fan for high speed fume removal.

◀ *Fully-flat front profile and reversible screen allow the Mistral to be positioned directly against the robot enclosure.*

Flexible programming

The Ultravap Mistral has been designed to allow robots with standard gripper arms to place and remove microplates directly onto the shuttle. In comparison with previous models, the Ultravap Mistral has a smaller footprint, allowing better access and saving valuable bench space.

The evaporation table is able to rise under the control of a stepper motor as the drying process proceeds. This can be programmed at a suitable rate for each solvent type being evaporated. In addition, gas temperature, pressure and flow rate can all be programmed individually and stored in up to thirty multi-step programmes on the Ultravap Mistral controller. Each programme allows the table to rise in up to five distinct ramped phases, so that a fast initial drying period can be followed by a gentler final drying phase. The new Ultravap Mistral is usually located on the right-hand side of the robot deck. Control commands are sent directly from the robot controller to the Mistral. These standard commands are listed in the manual, but most robot manufacturers have drivers available to control the Mistral, making integration a seamless process.



▲ An industry standard plate nest accepts all standard SLAS/ANSI footprint plates with heights up to 60mm and features positive plate detection. The extendable rails can reach up to 240mm in front of the Mistral for ease of integration with other equipment.



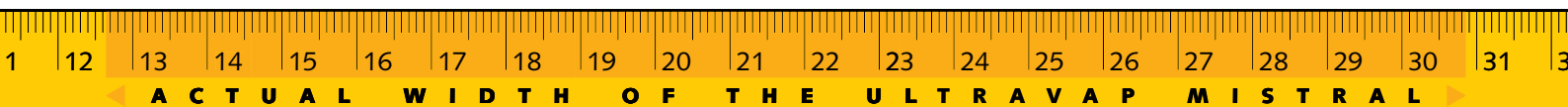
▲ All parameters can be programmed through the large colour touch screen display, using the stylus provided.

	Start mm	End mm	Time min	Temp °C
Demo 1	17.50	40.00	5	60
Run Test	0.00	30.00	8	60
Cool Down	0.00	10.00	1	55
Heat Test	0.00	18.00	8	60
Demo 5	0.00	30.00	8	60

▲ Up to 15 methods with full alphanumeric names may be stored, edited and recalled. Methods may be sent over the CAN bus to slave units or via RS232 to/from an external computer.

Demo 1					
	Start MM	End MM	Minutes	°C	L/min
Stage 1:	17.50	17.50	1	40	30
Stage 2:	17.50	25.00	1	45	35
Stage 3:	25.00	30.00	1	50	40
Stage 4:	30.00	35.00	1	55	45
Stage 5:	35.00	40.00	1	60	60

▲ Each method consists of five sectors, allowing control of time, gas temperature, gas flow rate and stage height for each sector.



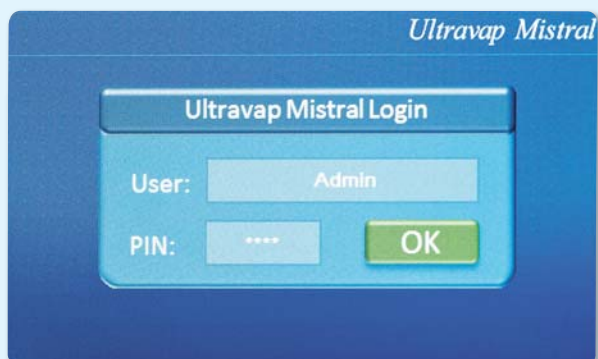
Flexibility in the production environment

The Ultravap Mistral software has been specially designed and written to allow the control of several Mistral 'slave' units from one 'master' evaporator. Using the latest CAN interface technology, any number of Mistral units can be connected together in series. A method selected on a master unit will be automatically distributed over the CAN Bus to all the slave units, which will then begin to run the programme simultaneously.

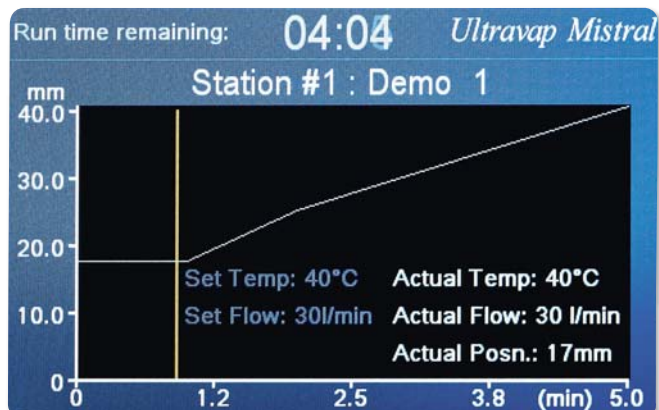
In addition, a master can be operated directly over the built-in RS232 link, so that programming can be carried out remotely and start/stop commands sent from a network. Again, all slave units will respond to these commands, making the instrument highly flexible in the production environment. Station I.D. numbers can be set and stored for each master and slave unit. Units can easily be taken out of remote control mode, without disconnecting the CAN bus, for maintenance or where a random-access programme is required.

Method security

Authority to change or edit stored methods is controlled by a password-protected administrative user level in the Mistral software, ensuring that unauthorised users cannot tamper with stored protocols. Other users may only recall and run stored methods approved by the administrator.



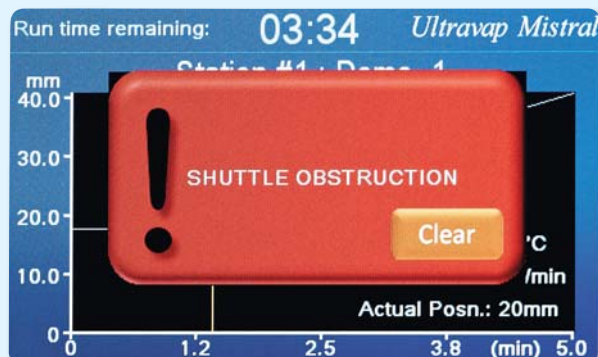
▲ Administrative and user levels can be set and protected by PIN code to prevent unauthorised method editing.



▲ The informative run-time display shows the progress of each evaporation run with real-time information on gas temperature, gas flow rate, stage position and remaining run-time, with an easy to read cursor display.

Smart safety

The Ultravap Mistral has been designed to protect you from harm, to protect your robot and to look after your samples. The moving plate shuttle has no fewer than six sensitive micro-switches to detect obstacles or obstructions, both on and off the robot deck. Triggering this safety system automatically stops the Mistral and prompts the user to clear the obstruction before re-setting the shuttle. In addition to the safety role, this system also provides positive plate detection for the robot and is able to confirm correct placement of a plate.



▲ Audible and visual warning of any obstruction is clearly shown and must be cleared by the user or the remote operating system for maximum safety.



Solvent compatibility

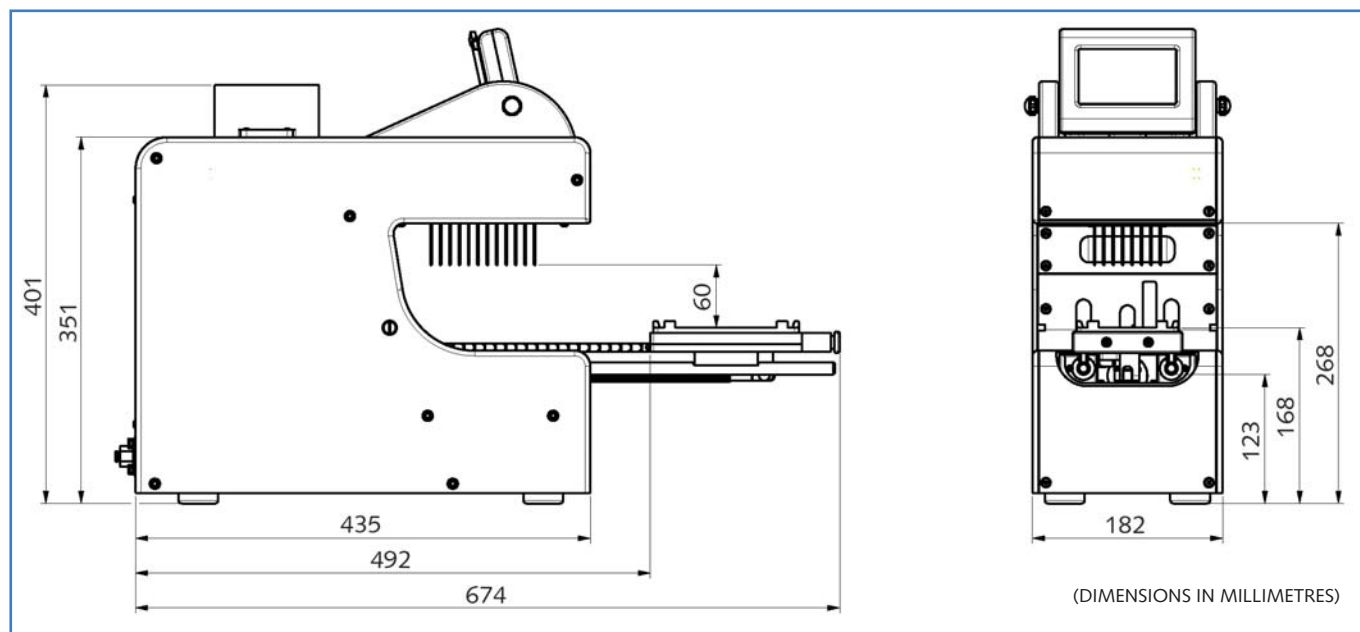
With a choice of 96 straight or 96 spiral needles, plus 24, 48 and 384 straight needles, the sphere of application for Ultravap Mistral is huge. Most common chromatography solvents can be evaporated with ease, including dichloromethane, methanol, acetonitrile and hexane. The nitrogen blow-down method is not, however, suitable for high-boiling point solvents such as DMF, DMSO and water. It is not recommended for use with acids or acid chlorides, as special corrosion-resistant systems are needed for this work. The choice of straight or spiral needles allows the user to choose between faster dry down (spiral) and better final drying in V-well plates (straight). The spirals cause a vortex to form in the solvent, increasing the surface area and thus speeding up the rate of evaporation. Spiral needles are only suitable for use with square-well plates and larger vials.

Evaporator system requirements

The new Ultravap Mistral is designed to run from 110V or 220V at 50/60Hz using an auto-ranging power supply. A built in digital gas flow meter controls the flow rate and switches off the heaters if the gas supply drops below 30L per minute for maximum safety. Between 30 and 5L per minute, the Levante may be operated without heating using gas at input temperature only. Similarly, if the pressure exceeds 7 bar, safety valves will shut down the system to prevent damage. Optimal gas supply is 70L per minute at 6 bar.

Ordering information

Cat. No.	Description	Qty/Pack
500147	Ultravap Mistral fully robot-compatible blowdown evaporator with 96 spiral needles, 110/230V	1
500148	Ultravap Mistral fully robot-compatible blowdown evaporator with 96 straight needles, 110/230V	1
500149	Ultravap Mistral fully robot-compatible blowdown evaporator without needle head, 110/230V	1
500193	Mistral CAN bus interface cable with RS232 initiator and CAN terminator plugs	1
500194	Replacement fume extractor fan complete plug-in assy with housing	1



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