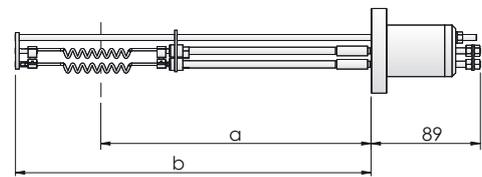


# TSP

## TITANIUM SUBLIMATION PUMP



### DESCRIPTION

The Titanium Sublimation Pump (TSP) is a true UHV pump.

It is used to supplement the pumping action of other UHV pumps (normally Ion pumps and turbo molecular pumps) as it can be more effective at pumping certain gases. The main advantage of this pump is that it is simple, inexpensive, and can produce high pumping speeds. The TSP consists of 3 removable hairpin shaped filaments. They are made from an alloy of Titanium and Molybdenum and are mounted in a simple carrier designed to have low electrical resistance. A high current, from an external power supply, is passed through the filament so that it glows red hot. At this temperature, Titanium is sublimated directly from the filament. This sublimated evaporant then coats the nearby walls of the chamber.

### FEATURES

- Can operate in any orientation
- To increase pumping speed the TSP can be equipped with a shield (option). Shields are available with and without LN<sub>2</sub> cooling. Orientation of the shield with LN<sub>2</sub> cooling must be specified at the time of order.

### TECHNICAL DATA

TSP mounting flange	DN 40CF	
Lengths	a [mm]	b [mm]
TSP 220 mm DN 40CF	220	289.5
TSP 200 mm DN 40CF	200	266.5
TSP 180 mm DN 40CF	180	246.5
TSP 170 mm DN 40CF	170	236.5
TSP 160 mm DN 40CF	160	226.5
Shield mounting flange		
▪ without cooling	DN 100CF	
▪ with LN <sub>2</sub> cooling	DN 160CF	



TSP shield without cooling



TSP shield with LN<sub>2</sub> cooling



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# TSP04-PS

## TITANIUM SUBLIMATION PUMP POWER SUPPLY



### DESCRIPTION

The TSP04-PS Titanium Sublimation Pump Power Supply is configured for constant filament current operation and features a high efficiency up to 92% sine wave inverter circuit for long-term and trouble-free TSP operation. Depending on the purchased variant device can be configured to operate single pump or two pumps alternately. New case design improves space efficiency as TSP04 takes only 2HU half rack. Unit can be remotely controlled via RS232/485 or Ethernet interfaces. The unit is equipped with autosave function (the device save your parameters preset and apply them automatically after restart).

### APPLICATIONS

The Titanium Sublimation Pump Controller regulates the quantity of material sublimated from the filaments, compensating for changing conditions and eliminating the need for operator attendance or adjustment. Depending on the device variant up to 2 processes can be set up, each using a separate 3 filament pump. Separate safety interlock for each pump is available. One filament at the time can be operated to avoid the fracture of the Ti filament due to the thermal stress or the structural change of Ti, ramp time and max. current for each filament can be set. All parameters of each filament can be set individually (max current, ramp time, filament number etc.).

### ACCESSORIES

#### TITANIUM SUBLIMATION PUMP

The Titanium Sublimation Pump (TSP) is a true UHV pump. It is used to supplement the pumping action of other UHV pumps (normally Ion pumps and turbo molecular pumps) as it can be more effective at pumping certain gases. The main advantage of this pump is that it is simple, inexpensive, and can produce high pumping speeds.



### TECHNICAL DATA

Supply voltage	110-240 V, 50 Hz/60 Hz (power consumption max 750 W)
Output current	regulated at 1 to 56 A, RMS $\times$ 1 A
Output voltage	determined by the lead - max 10 V at 50 A
Timing	sublimation period: 1 s to 15 min $\times$ 1 s delay interval: 1 min to 99 h $\times$ 1 min degas time: 1 s to 15 min $\times$ 1 s operate time: 99 d 23 h 59 min
Communication interface	RS232/485, Ethernet
Communication protocol	MODBUS-TCP
User interface	5" TFT display with touchscreen
Interface languages	English, Polish
Dimensions	242 x 87 x 450 mm (W $\times$ H $\times$ D)
Weight (approx.)	6.65kg

### ADDITIONAL INFORMATION

3 filament outputs with common ground connection. Simple, robust, reliable and easy to service design. All output switching is by semiconductor devices. Lownoise: complies with EC EMC and LV Directives. Vacuum interlock input. The TSP04-PS is a 19" rack mounted unit (half-width, 2U height).

### TSP CONTROL APPLICATION



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TSP04-PS