

## TSP Ambient Shield



### Product description

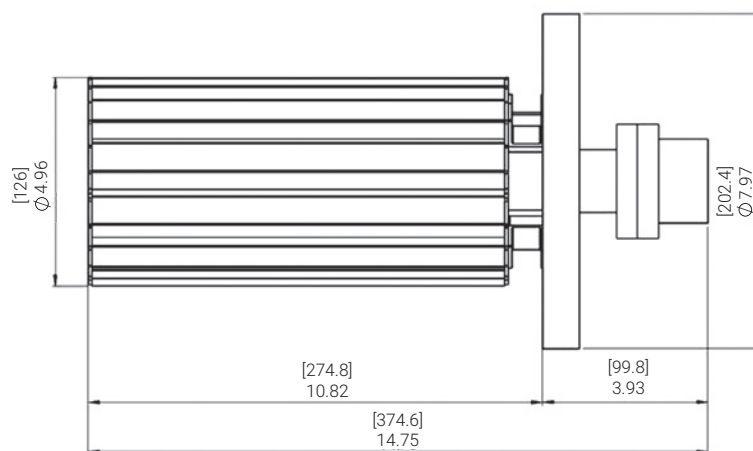
The TSP Ambient Shield is an evolution of the TSP cryopanel. It has been designed to increase the surface for sublimated titanium in applications where cooling is not possible, practical, or simply not desired. The internal dimensions of the TSP Ambient Shield generate a total surface area of 1300 cm<sup>2</sup> (201.5 in.<sup>2</sup>).

The shape of the 12 wings and the shield at the opposite side of the inlet flange are designed to prevent line of sight migration of titanium that could coat the insulators (if present in the system). This therefore creates an electrical path that could lead to leakage or short circuiting in the worst case.

Using the 8-inch ConFlat flange, the Ambient Shield can be inserted into the Ion Combination pump body. The extra 2.75-inch flange installed on the Ambient Shield allows the TSP cartridge to be inserted into the combi system.

Agilent Combination pump configurations are available for the Vaclon Plus 150, 300, or 500 models and include the Ambient Shield, and an extra side- or bottom-mounted 8-inch ConFlat flange port.

### Outline drawing



Dimensions: inches [millimeters]  
3D drawings available

## How it works

Titanium sublimation pumping is accomplished by coating the inner surfaces of a vacuum system with sublimated titanium films.

Since it involves a chemical reaction, this kind of pumping is very useful when active gases are present.

The pumping speed per unit area depends on the reactive gas species, as shown in the table on the right.

Sublimated titanium forms a thin layer with a high pumping speed for reactive gases. These gases are either absorbed or form a chemical compound with the layer of titanium.

By cooling the surfaces with water or liquid nitrogen, the pumping speed can be further increased.

With the TSP Ambient Shield working at ambient temperatures, the pumping speed is lower compared to the speed produced by the cold surface of the Cryopanel, cooled with water or liquid nitrogen. The optimized geometry of the Ambient Shield means greater pumping speeds can be achieved than when the TSP is inserted inside in a cylindrical chamber of similar diameter and length, or when the cryopanel is working at ambient temperature.

## Typical pumping speed per square centimeter (per square inch) of titanium sublimation surface for various gases

The Ambient Shield with Titanium Sublimation Pump is particularly suitable for gases such as H<sub>2</sub>, N<sub>2</sub>, H<sub>2</sub>O, CO, CO<sub>2</sub>, and O<sub>2</sub>.

This table shows the pumping speed expected for each gas according to the available surface of the inner ambient shield.

Gas	H <sub>2</sub>	N <sub>2</sub>	O <sub>2</sub>	CO	CO <sub>2</sub>	H <sub>2</sub> O	CH <sub>4</sub>	Ar	He
<b>Typical pumping speed per unit area, in L/s·cm<sup>2</sup> (L/s·in<sup>2</sup>)</b>	3.1 (20)	4.7 (30)	9.3 (60)	9.3 (60)	7.8 (50)	3.1 (20)	0	0	0
<b>Estimated pumping speed (L/s)</b>	4030	6110	12090	12090	10140	4030	0	0	0

**Note:** Ambient shield inner pumping surface: 1300 cm<sup>2</sup> - 201.5 in<sup>2</sup>.  
Ambient temperature: 20°C.

## Ordering information

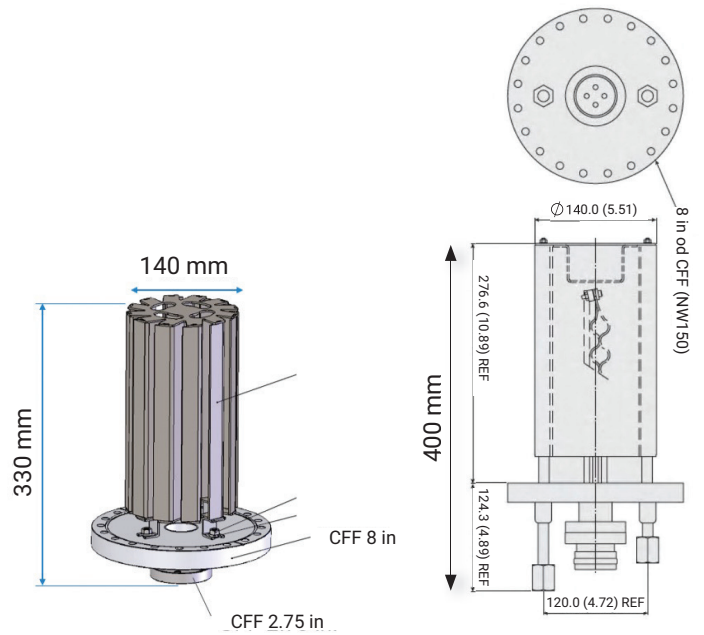
Part Number	Description
9190180M001	TSP Ambient Shield
	<b>Ion Combi Pump with Ambient Shield</b>
9192510M100	Vaclon Plus 150 Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192511M100	Vaclon Plus 150 Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192520M100	Vaclon Plus 150 Noble Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192521M100	Vaclon Plus 150 Noble Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192540M100	Vaclon Plus 150 Starcell, with side-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192541M100	Vaclon Plus 150 Starcell, with side-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192610M100	Vaclon Plus 300 Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192611M100	Vaclon Plus 300 Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192621M100	Vaclon Plus 300 Noble Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192640M100	Vaclon Plus 300 Starcell, with side-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192641M100	Vaclon Plus 300 Starcell, with side-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192612M100	Vaclon Plus 300 Diode, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192613M100	Vaclon Plus 300 Diode, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192622M100	Vaclon Plus 300 Noble Diode, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192623M100	Vaclon Plus 300 Noble Diode, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192642M100	Vaclon Plus 300 Starcell, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192643M100	Vaclon Plus 300 Starcell, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192710M100	Vaclon Plus 500 Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192711M100	Vaclon Plus 500 Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192720M100	Vaclon Plus 500 Noble Diode, with side-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192740M100	Vaclon Plus 500 Starcell, with side-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192741M100	Vaclon Plus 500 Starcell, with side-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192712M100	Vaclon Plus 500 Diode, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192713M100	Vaclon Plus 500 Diode, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192722M100	Vaclon Plus 500 Noble Diode, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192723M100	Vaclon Plus 500 Noble Diode, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 220 V
9192742M100	Vaclon Plus 500 Starcell, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 120 V
9192743M100	Vaclon Plus 500 Starcell, with bottom-mounted Ambient Shield, TSP Cartridge and installed heater 220 V

## Summary

### Ambient Shield is designed to:

- Be used in combination with TSP (Titanium Sublimation Pump)
- Economically increase the surface area when cooling (water/liquid nitrogen) is not available
- Have an inner surface available for coating of 130 cm<sup>2</sup> (201.5 in<sup>2</sup>)
- Have overall dimensions very similar to the Cryopanel
- Be perfectly integrated into new and existing Agilent Vaclon Combi pumps thanks to its 8-inch CFF (DN150) flange

## Ambient Shield vs Cryopanel dimensions



[www.agilent.com/chem/vacuum](http://www.agilent.com/chem/vacuum)

**United States and Canada**

Agilent Technologies  
121 Hartwell Avenue, Lexington MA 02421, USA  
Tel: +1 781 861 7200  
Toll free: +1 800 882 7426  
vpl-customer@agilent.com

**Europe and other countries**

Agilent Technologies Italia SpA  
via F.lli Varian 54, 10040 Leini, (Torino), Italy  
Tel: +39 011 9979 111  
Toll free: 00 800 234 234 00  
vpt-customer@agilent.com

This information is subject to change without notice.

© Agilent Technologies, Inc. 2020  
Published in the USA, August 3, 2020  
5994-2266EN

