GAMMA VACUUM

TITANIUM SUBLIMATION PUMPING (TSP)

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Titanium Sublimation Pumps (TSPs) are often used in combination with ion pumps or independently to remove reactive gases from the vacuum environment. Combined with an ion pump, the TSP allows for low ultimate pressures in a shorter amount of time. All TSP components are bakeable to 400 °C.

TSP FILAMENT CARTRIDGE

The filament cartridge is mounted on a 2- 3/4" CFF (NW 35). The feedthrough supports three titanium-molybdenum filaments and a return path for ground isolation. Each filament contains 1.5 grams of usable titanium and averages 20 hours of operation.

LIQUID CRYOSHROUD

The liquid cryoshroud consists of a double walled, type 304L stainless steel cylinder with two liquid nitrogen feedthroughs (.375 in. diameter) with flare type fittings. It provides 1578 cm^2 (245 $in.^2$) of liquid nitrogen cooled surface area that provides pumping speeds up to 12,000 l/s for hydrogen (see table). The shroud is mounted on an 8 in. CFF (NW 150).

AMBIENT SPUTTER SHIELD

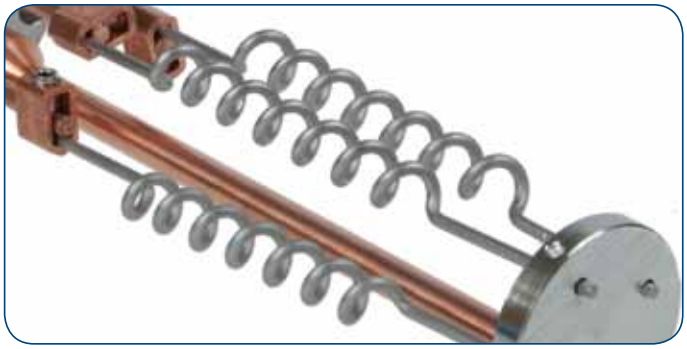
The ambient sputter shield economically maximizes surface area when cooling is not practical or possible. It provides 827cm^2 (128 $in.^2$) of ambient temperature surface area that provides pumping speeds up to 2200 l/s for hydrogen (see table). The shield is mounted on an 8 in. CFF (NW 150) or a 6 in. CFF (NW 100).

DIGITEL™ TSP/NEG CONTROLLER

The TSP/NEG controller has an easy-to-read touchscreen LCD display that displays all manual or programmed firing paramenters. Manual operation is as simple as pressing one button. Programming is just as easy by viewing all programming options on one screen. The TSP/NEG controller can operate up to 8 TSP filaments or 2 NEG pumps.

Ease of Use

The TSP/NEG and MPCe controllers are each fully controlled with an intuitive touch panel LCD.



Filaments

Each titanium molybdenum filament contains 1.5 grams of usable titanium and averages 20 hours of operation.

Connectivity

TSP/NEG cables have MS style connectors that are bakeable and radiation resistant.

Safety

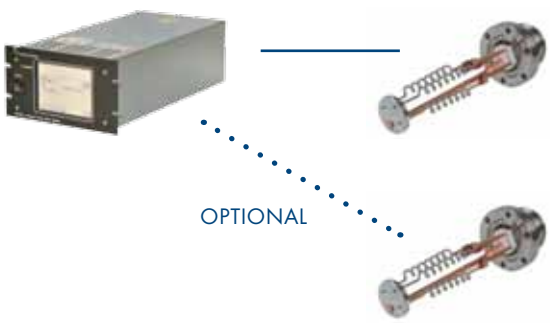
High currents travel over distances up to 10 meters through bakeable and radiation-resistant insulated and strain relief cabling.

DIGITEL™ FLEXIBILITY

The DIGITEL™ line is flexible enough to control a wide variety of ion pump and TSP configurations. The LPCe and MPCe can operate up to four ion pumps simultaneously or independent operation of one or two ion pumps respectively. The MPCe is capable of controlling one or two TSP/NEG cartridges independently from the Remote TSP/NEG controller or internal TSP (ITSP).

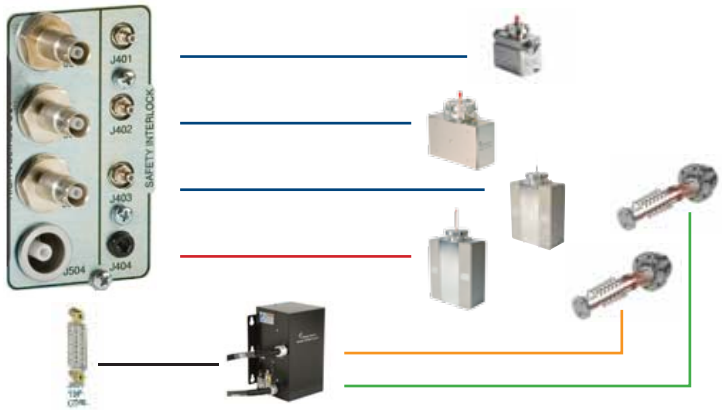
Example Configuration 1

Single or dual TSP operation from the TSP/NEG Controller.



Example Configuration 2

Three parallel diode ion pumps, one triode ion pump, and dual TSP/NEG operation from the MPCe.



TSP/NEG CONTROLLER SPECIFICATIONS

SPECIFICATIONS		DIGITEL TSP/NEG	REMOTE TSP/NEG
INPUT POWER	Voltage	90-130 or 200-240 volts	90-130 or 200-240 volts
	Frequency	48-62 Hz	48-62 Hz
OUTPUT POWER	Independent Outputs	1	1
	Open Circuit Voltage	+17 vac	+17 vac
	Current (maximum)	55A	55A
	Watts (maximum)	800 (max)	800 (max)
	Resolution	0.1A	0.1A
HIGH CURRENT CONNECTIONS		1-2 MS Style, Configurable	1-2 MS Style, Configurable
DISPLAY	Type	1/4 VGA touchscreen LCD	1/4 VGA touchscreen LCD via MPCe
	Readouts	Current, on-time, and programmable options	Current, on-time, and programmable options via MPCe
ANALOG OUTPUTS	Voltage	linear configurable	linear configurable
	Current/Pressure	linear or logarithmic, configurable	linear or logarithmic, configurable
CONTROL MODES		Manual, programmed, or remote	Manual, programmed, or remote
COMMUNICATIONS		Local/Remote/Full	Local/Remote/Full via MPCe
		Ethernet	Ethernet via MPCe
		Serial: 232, 422, 485	Serial: 232, 422, 485 via MPCe
CONFORMITY TO NORMS		EN 55011 Class A, IEC 801-2	EN 55011 Class A, IEC 801-2
		EN 801-3, IEC 801-4, EN 61010-1	EN 801-3, IEC 801-4, EN 61010-1
WEIGHT, KG (LBS)		16.8 (37)	13.1 (29)
SIZE		3U high. 1/2 rack wide	293 x 219 x 130 mm (min)
		438 mm (17.2 in.) deep	(12 x 9 x 5 in)
			293 x 219 x 150 mm (max)
			(12 x 9 x 6 in)
ADDITIONAL FEATURES		TSP Enable	TSP Enable via MPCe

TYPICAL TSP PUMPING SPEEDS

			H_2		CO		H_2O	
	AREA ($cm^2/in.^2$)	TEMPERATURE (°C)	RATE (L/S/CM²)	SPEED (L/S)	RATE (L/S/CM²)	SPEED (L/S)	RATE (L/S/CM²)	SPEED (L/S)
LIQUID CRYOSHROUD (8 in.)	709/110	20° C	2.6	1,843	8.2	5,814	7.3	5,176
	1578/245*	-195° C	17	12,053	11	7799	14.6	23,039
AMBIENT SPUTTER SHIELD (8 in.)	827/128	20° C	2.6	2,150	8.2	6,780	7.3	6,037
AMBIENT SPUTTER SHIELD (6 in.)	621/96	20° C	2.6	1,614	8.2	5,092	7.3	4,533

**Applies to H_2O speed only.*

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