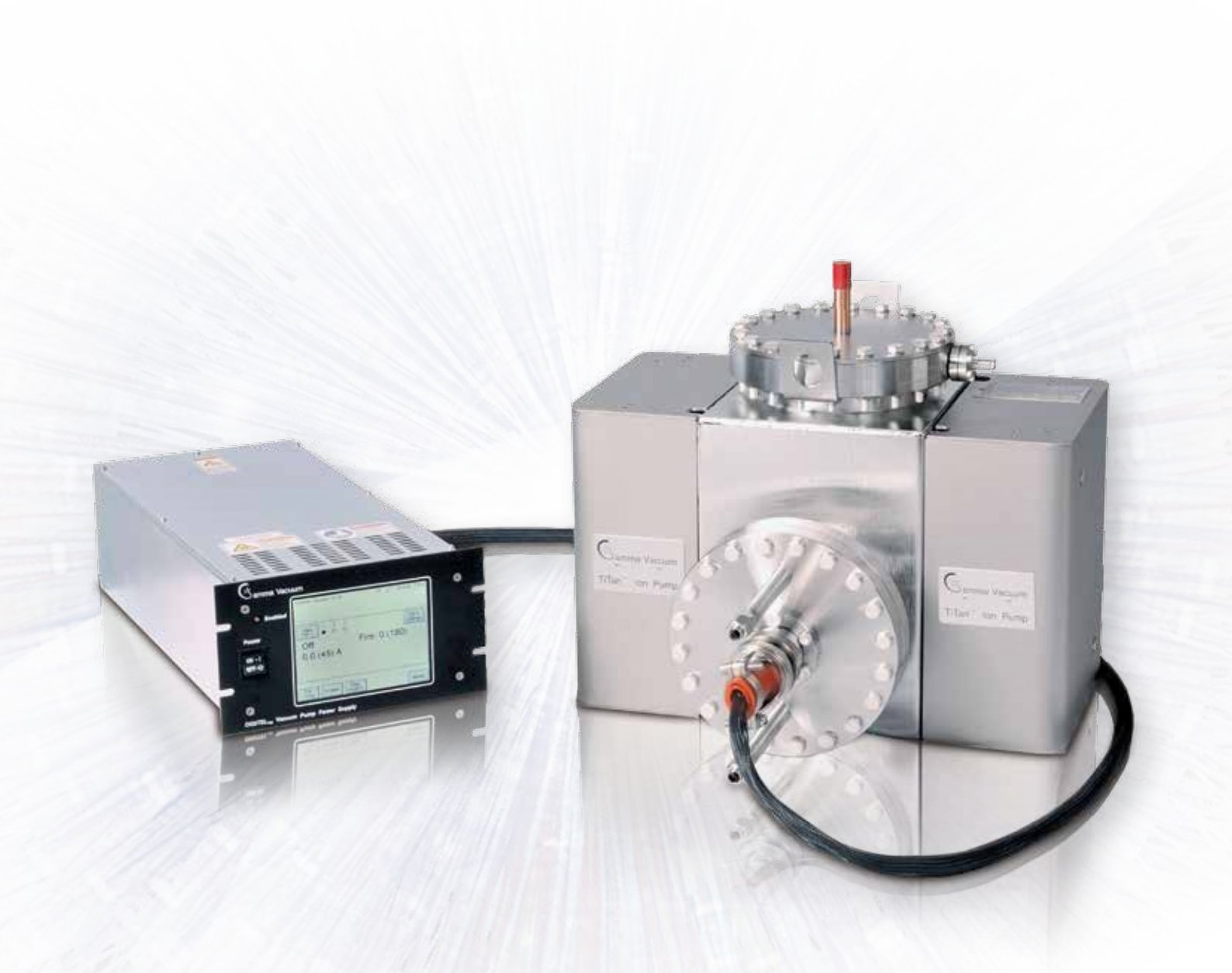
Leybold

Titanium Sublimation Pumping (TSP)



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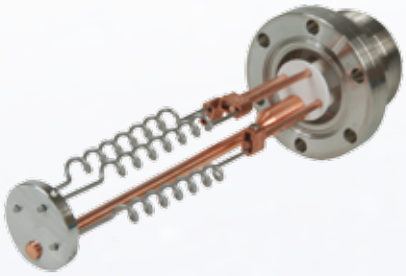
Titanium Sublimation Pumpin

Remove reactive gases from the va

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 (DN 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 (DN 150) or a 6 in. CFF (NW 100).

DIGITEL™ TSP / NEG Controller

A TSP or NEG can be fully operated from the LCD touchscreen of the QPC or MPC. They can be fired manually or automatically based on the pressure of either ion pump the controller is monitoring. Timed modes also let the user have full control over exact parameters of operation. A single remote controller can operate up to eight TSP filaments or two NEG pumps.

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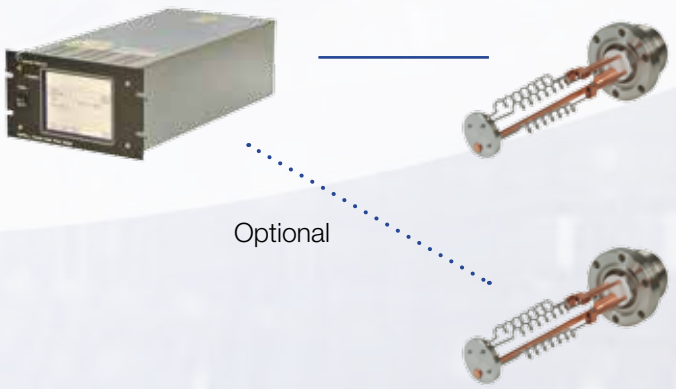
acuum environment

DIGITEL™ Flexibility

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

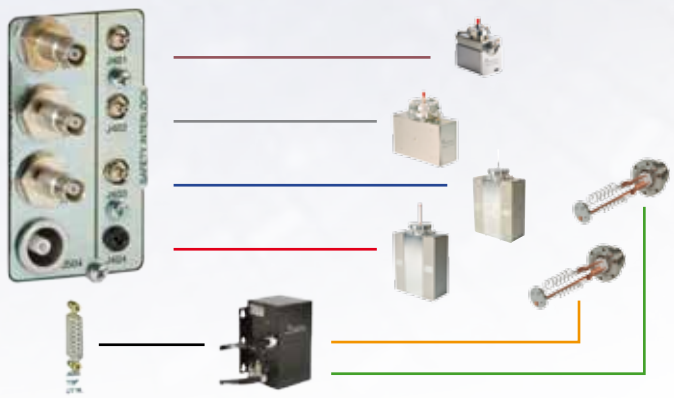
Example Configuration 1

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



Example Configuration 2

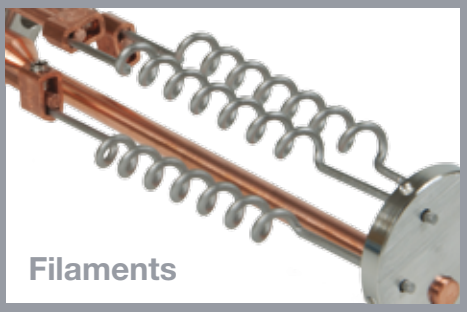
Three parallel diode ion pumps, one triode ion pump, and dual TSP/NEG operation from the MPC.



Benefits

Ease of Use

The TSP/NEG and MPC 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.

Technical Data

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	touchscreen LCD via MPC/QPC
	Readouts	Current, on-time, and programmable options	Current, on-time, and programmable options via MPC/QPC
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 Ethernet Serial: 232, 422, 485	Local/Remote/Full via MPC/QPC Ethernet via MPC/QPC Serial: 232, 422, 485 via MPC/QPC
Conformity to Norms		EN 55011 Class A, IEC 801-2 EN 801-3, IEC 801-4, EN 61010-1	EN 55011 Class A, IEC 801-2 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 438 mm (17.2 in.) deep	293 x 219 x 130 mm (min) (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 MPC/QPC

Typical TSP Pumping Speeds

			H_2		CO		H_2O	
	Area (cm²/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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