

CapaciTorr® Pumps



HIGHLIGHTS

General Features

- Extremely compact and low weight
- High pumping speed for all active gases
- High sorption capacity and lifetime
- Constant pumping speed in UHV and XHV
- Operation at room temperature without power after activation
- Oil free and vibration free
- Operation in presence of high magnetic fields
- Reversible pumping of hydrogen and its isotopes

Applications

- Improving ultimate vacuum in combination with ion, diffusion, cryogenic or turbomolecular pumps
- Particle accelerators, synchrotron radiation sources
- Scanning/Transmission electron microscopes
- Portable vacuum instrumentation
- Surface analysis systems
- Process pumps for vacuum devices and deposition chambers
- Pumping, storing and releasing hydrogen isotopes

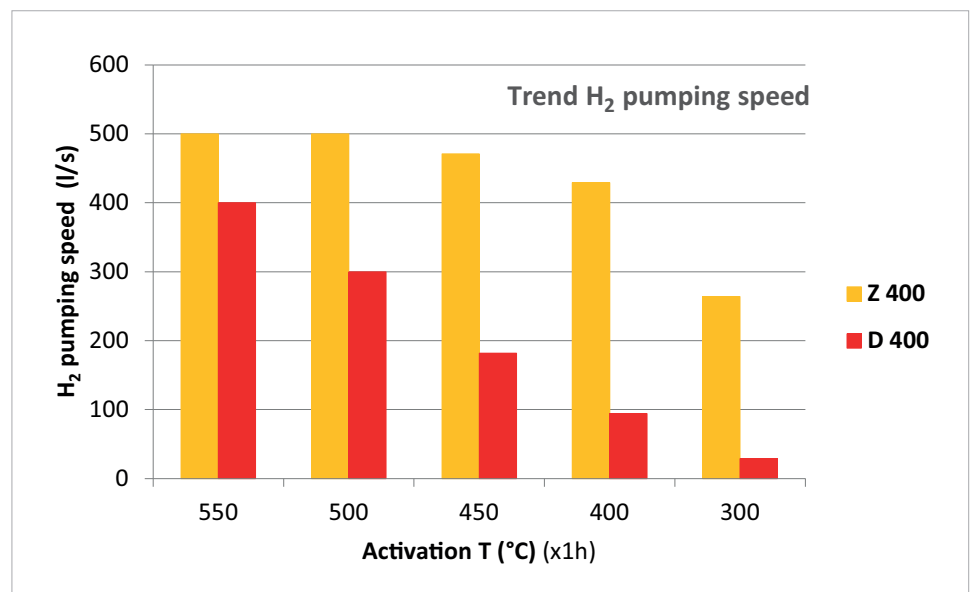
CapaciTorr® are flanged pumps using porous sintered NEG disks.

In UHV/XHV pressure level (10^{-9} Torr and lower), two main CapaciTorr series can be supplied:

- CapaciTorr “D” series, based on St 172 NEG material, operating in the field of UHV/XHV applications since early '90s.
- CapaciTorr “Z” series, based on the new ZAO® UHV NEG alloy, which further improves the pumping performance for H₂, enhances the mechanical robustness of the disks, and reduces the outgassing during the thermal activation process (typically lasting 1 hour).

Furthermore, the ZAO NEG alloy features far better pumping speed than the St 172 when activated at lower temperature, as shown in the graph here below.

Pumping speed for H₂ at various activation temperature: Z 400 vs D 400



CapaciTorr pumps featuring different dimensions and pumping performance are available, as reported in the tables below:

General features and dimensions

Product description	Alloy Type	Mass (g)	Activation Power (W)	Base Flange	NEG length (mm)
CapaciTorr D 50	St 172	7.8	32	CF35 (2.75")	44
CapaciTorr D 100	St 172	13.5	45	CF35 (2.75")	65
CapaciTorr D 200	St 172	28	58	CF35 (2.75")	88
CapaciTorr D 400	St 172	45	90	CF35 (2.75")	132
CapaciTorr D 1000	St 172	136	190	CF63 (4.5") - CF100 (6")	145
CapaciTorr D 2000	St 172	225	500	CF100 (6") - CF150 (8")	195
CapaciTorr D 3500	St 172	395	360	CF150 (8") - CF200 (10")	198
CapaciTorr Z 100	ZAO	30	40	CF35 (2.75")	65
CapaciTorr Z 200	ZAO	58	50	CF35 (2.75")	88
CapaciTorr Z 400	ZAO	96	87	CF35 (2.75")	132
CapaciTorr Z 1000	ZAO	280	190	CF63 (4.5") - CF100 (6")	145
CapaciTorr Z 3500	ZAO	705	360	CF150 (8") - CF200 (10")	198

Notes:

The models D 1000, D 2000, D 3500 and Z 3500 are equipped with a thermocouple.

The models D 400, D 1000, D 2000, D 3500 and Z 3500 feature replaceable NEG cartridge.

The activation power are referred to the "nude" configuration (NEG cartridge completely immersed in the vacuum chamber).

The "NEG length" reported in the last column is the length of the NEG cartridge from the base flange.

Pumping speed and capacity for the main gas species

Product description	Pumping Speed (l/s)				Sorption Capacity (Torr l)			
	H ₂	H ₂ O	N ₂	CO	H ₂	H ₂ O	N ₂	CO
CapaciTorr D 50	55	45	22	30	78	3.4	0.04	0.15
CapaciTorr D 100	100	85	40	60	135	5	0.1	0.25
CapaciTorr D 200	200	180	60	125	280	10	0.25	0.6
CapaciTorr D 400	400	290	95	180	450	16	0.5	1
CapaciTorr D 1000	1000	900	330	600	1360	60	1.5	4
CapaciTorr D 2000	2000	1600	420	1000	2250	84	2	5
CapaciTorr D 3500	3500	2600	900	1600	3950	>200	4.1	12
CapaciTorr Z 100	150	100	40	65	600	5	0.15	0.35
CapaciTorr Z 200	290	195	75	130	1160	10	0.3	0.65
CapaciTorr Z 400	500	320	125	210	1920	16	0.6	1.2
CapaciTorr Z 1000	1250	900	360	550	5600	70	1.7	3.5
CapaciTorr Z 3500	3900	2100	900	1400	14100	>200	5.1	10

Notes:

The values for H₂O are estimated.

Pumping speed data refer to the initial values in nude configuration.

Capacity based on speed at 5% of the initial value in nude configuration.

>100 reactivations (sorption cycles) are possible.

CapaciTorr® Pumps

The SAES Group manufacturing companies are ISO9001 certified, the Asian and Italian companies are also ISO14001 certified. Full information about our certifications for each company of the Group are available on our website at: www.saesgroup.com

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CapaciTorr® HV Pumps



HIGHLIGHTS

General Features

- Extremely compact and low weight
- High pumping speed for all active gases
- High sorption capacity and lifetime
- Constant pumping speed in HV and UHV
- Oil free and vibration free
- Operation in presence of high magnetic fields
- Reversible pumping of hydrogen and its isotopes
- Fast pumpdown after air venting and without baking
- Capable of coping with large air leaks
- Suitable for viton-sealed systems

Applications

- Improving ultimate vacuum in combination with ion, diffusion, cryogenic or turbomolecular pumps
- Particle accelerators, synchrotron radiation sources and related equipment
- Scanning/Transmission electron microscopes
- Portable vacuum instrumentation
- Surface analysis systems
- Process pumps for vacuum devices and deposition chambers
- Thin films deposition systems
- Pumping, storing and releasing hydrogen isotopes
- Impurities removal in rare gas filled devices



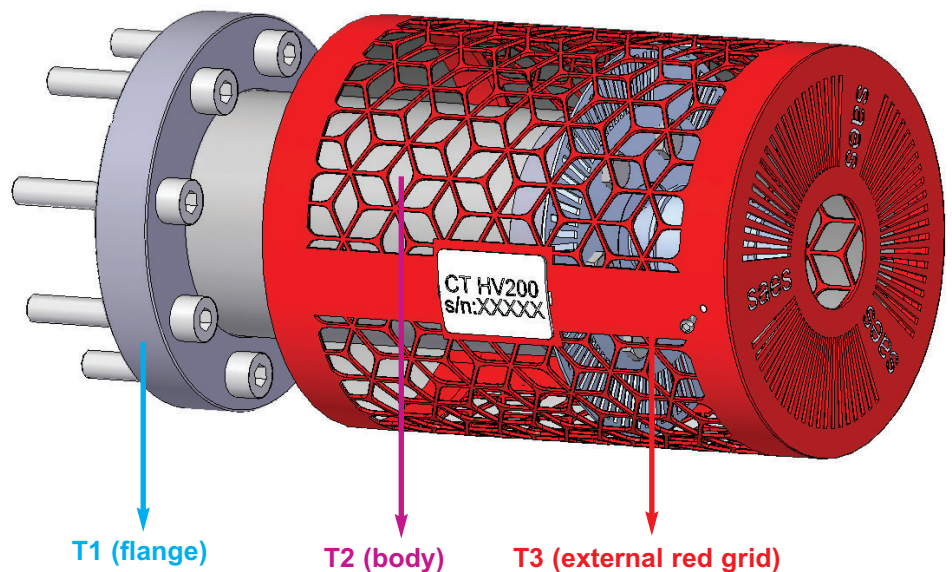
The CapaciTorr® HV pumps integrate the new ZAO® high vacuum NEG alloy specifically conceived to sorb large gas throughput at pressure levels as low as 10^{-7} Torr.

CapaciTorr HV benefits:

- utmost capacity for all active gases
- possibility to start the activation at low vacuum

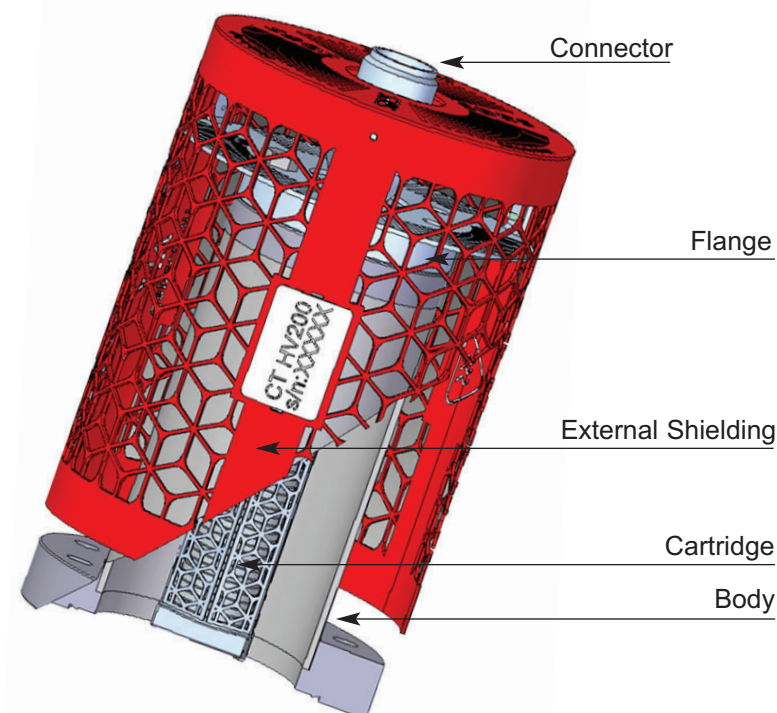
In order to exploit these benefits, the CapaciTorr HV pumps have to be operated permanently warm at around 200 °C.

All the available models feature easily replaceable NEG cartridge.



	Working T (°C)	Power (W)	T ₁ (°C)	T ₂ (°C)	T ₃ (°C)
CapaciTorr HV 200	200	8	30	40	RT
CapaciTorr HV 1600	200	36	35	50	RT
CapaciTorr HV 2100	200	38	35	50	RT

CapaciTorr® HV Pumps



Four CapaciTorr pumps featuring different dimensions and pumping performance are available, as reported in the tables below:

General features and dimensions

Product description	Alloy Type	Getter Mass (g)	Activation Power (W)	Working Power (W)	Nipple inlet flange	Nipple length (mm)
CapaciTorr HV 200 (CF35)	ZAO	140	52	7.5	CF35 (2.75")	245
CapaciTorr HV 200 (CF63)	ZAO	140	61	8.6	CF63 (4.5")	195
CapaciTorr HV 1600	ZAO	690	368	36	CF150 (8")	258
CapaciTorr HV 2100	ZAO	1130	363	38	CF200 (10")	266

Notes:

The models HV 1600 and HV 2100 are equipped with a thermocouple.

All the available pumps feature replaceable NEG cartridge.

The nipple length reported in the last column is the distance between the nipple inlet and the base connector (without cable).

Pumping speed and capacity for the main gas species

Product description	Pumping Speed (l/s)					Sorption Capacity (Torr l)				
	H ₂	H ₂ O	O ₂	N ₂	CO ₂ *	H ₂	H ₂ O	O ₂	N ₂	CO ₂ *
CapaciTorr HV 200 (CF35)	105	40	32	30	25	2800	400	200	200	40
CapaciTorr HV 200 (CF63)	210	120	90	60	65	2800	400	200	200	40
CapaciTorr HV 1600	1700	1000	800	470	620	13800	1600	800	800	160
CapaciTorr HV 2100	2100	1500	1250	625	880	22600	2600	1300	1300	260

Notes:

Pumping speed data refer to the initial values measured at pump inlet.

The capacity values (except for H₂) are intended as the recommended absorbed quantity per run at around 200 °C, allowing to perform more than 20 sorption cycles. In case of operation under lower gas loads or at RT, the pump can be reactivated 100 times or more.

The values for H₂O are estimated.

(*) The values for CO can be assumed very similar to those reported for CO₂.

The SAES Group manufacturing companies are ISO9001 certified, the Asian and Italian companies are also ISO14001 certified. Full information about our certifications for each company of the Group are available on our website at: www.saesgroup.com

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