

Turbo Molecular Pumps for PVD application



Magnetically Suspended
Turbo Molecular pump
with integrated control unit

TGkine



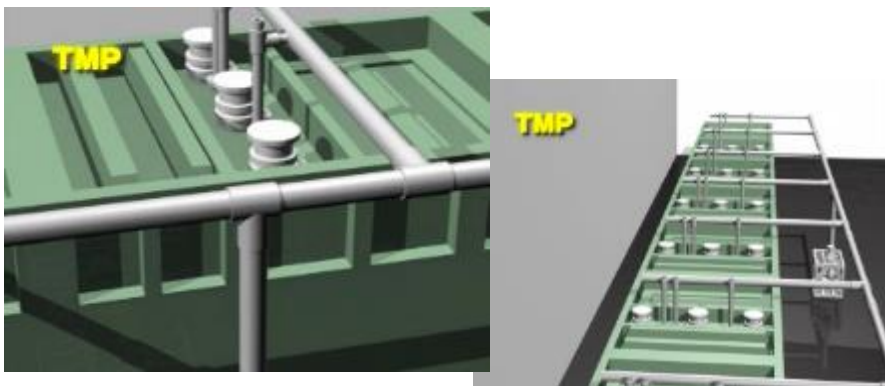


Field-proven.....PVD application

Osaka Vacuum TMP

(TG-M/TG series)

Delivery record : over 21,000 units



Features and Benefits

- **Superior power consumption and running cost**

Max. power: 0.9~1.0kVA

(around **30% reduction** compared to competitors)

- **Withstand severe environmental conditions**

Trouble-free from electrical parts issue caused by environments thanks to Dust-proof/Splash-proof protection(**IP54**)

- **Sputtering** (Disk, HDD, Glass, Roll to Roll, Solar)

Canon-Anelva, Shibaura Mechatronics, Shincron, ULVAC, Optrun, Showasinku, kobelco, Choshu Industry

- **Vaper deposition** (Lens, Mirror, FPD/OLED, Solar, EMS)

Canon-Tokki, Shibaura Mechatronics, Showashinku, Optrun, ShinMaywa, Chugai-Ro, Shinko Seiki

- **Ion plating** (Decorative, tools)

Kobelco, Ulvac, Shyowashinku, Tsukishima Kikai



Ecology TGkine series

- Compilation of experience and technologies over 40 years
(Compound rotor, High temp resistant type, Environmentally responsible)
- Provides **Low CoO** (Cost of Ownerships)

- Experience and Superior function **Effective**
 - Adept IP54 protection to withstand severe environmental conditions
 - High temp resistant type available for tools with heat source inside
- Reduced power consumption/wiring/footprint **Economical**
 - Integrated controller w/pump completely
 - Low power consumption
ex.) TGkine4200M 1.0kVA (33~41% less power compare to competitors)
- Light weight / multi communication interface **Excellent**
 - Easy install/ more safety/ help total system weight down
ex.) TGkine4200M weight 75kg (28~44 % less weight compare to competitors)
 - Multi communication interface (RS232C/485C, Profibus, DeviceNet)





Features and Benefits (1)

Effective – Withstand severe environmental conditions!

Operable in harsh environment with high reliability including the integrated controller

- Conductive dust environment
 - **[IP54] protection as dust proof**
- Environment with drop/splash/dew-condensation water
 - **[IP54] protection as water proof**
- High cooling water temperature
 - **Operable at wide cooling water temperature range 15-30°C**
- Tool with high temperature heat source
 - **Operable with its rotor facing ~1000C* heat source**
 - **Heat shield Not necessary in front of TMP rotor, thus no conductance loss**



* The verification test is conducted under our assumed condition.



Features and Benefits (2)

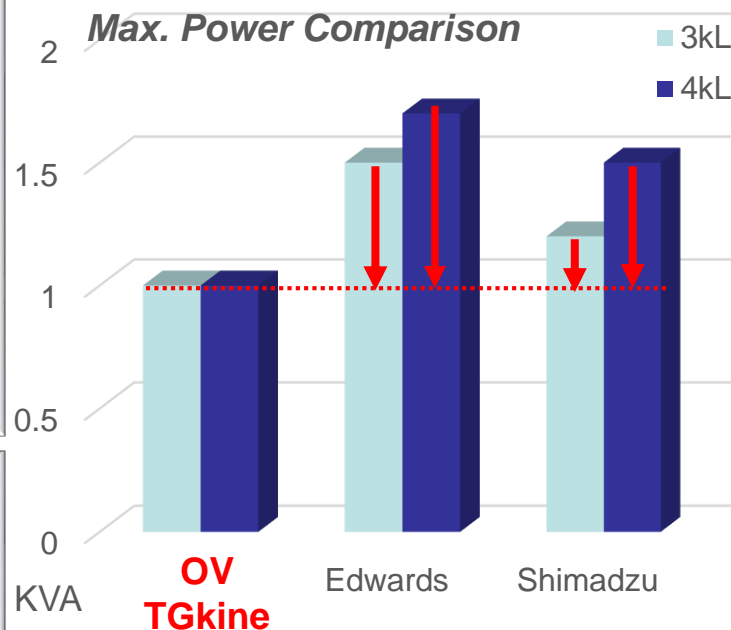
Economical – Lower running cost & installation cost !

- Low power consumption
 - TGkine 3300M Max. power 1.0kVA
(**16~33%** reduction v.s. competitors)
 - TGkine 4200M Max. power 1.0kVA
(**33~41%** reduction v.s. competitors)

- Reduces space / initial / installation cost

(compared to a rack-mount controller type)

- Eliminates cables(s) between pump and controller
 - Reduces cable space and installation labor
- Eliminates the controller rack
 - Reduces controller space and cost of rack





Feature and Benefit (3)

Excellent – Not only performance !

- Light weight design
 - Significant weight reduction by using Al to main structural components
 - **Reduces total system weight**
 - **Easy installation**
 - **Increases safety level**

TGkine3300M weight**69kg** (reduce **17~27%** v.s. competitors)

TGkine4200M weight**75kg** (reduce **28~44%** v.s. competitors)

- Adept multi communication interface
I/O remote, RS232C/485, DeviseNet, Profibus
- Connection lines to tools are positioned in one area
(outlet port, water ports, power line, communication port)



Specifications (TGkine series)

Model		TGkine 2200M_WB	TGkine 3300M / 3400M_WB	TGkine 4200M_WB
Flanges	Inlet	VG250 / ISO-B250	VG300 / ISO-B320 / VG350	VG350
	Outlet	KF40/KF50	KF40/KF50	KF40/KF50
Max. pumping speed	N2	2200 L/s	3300 L/s	4200 L/s
	N2 with inlet screen	2100 L/s	3100 L/s	4000 L/s
	H2	1800 L/s	2700 L/s	2800 L/s
Max. gas throughput	N2	4400 sccm	2100 sccm	2500 sccm
	Ar	2600 sccm	1600 sccm	1400 sccm
Max. compression ratio	N2	$> 2 \times 10^8$	$> 1 \times 10^8$	$> 2 \times 10^8$
	H2	3×10^3	3×10^3	2×10^3
Ultimate pressure		$< 2 \times 10^{-7}$ Pa	$< 2 \times 10^{-7}$ Pa	$< 5 \times 10^{-7}$ Pa
Max. foreline pressure		220Pa	170Pa	220Pa
Max. power consumption		Max.0.9 kVA	MAX 1.0 KVA	MAX 1.0 KVA
Weight		62 kg	69/ 70/ 72 kg (VG300/ISO-B320/VG350)	75 kg

Safety standard : CE, UL, SEMI S2
 Response to Euro RoHS, China RoHS



Summery

Comparative advantages of TGkine

- Low power consumption (~▲41% compare to competitors)
- Safety design
 - Light weight (~60kg lighter than competitors)
 - Possible to secure at the inlet flange only
- Max. gas throughput for Ar
 - (~330% better than competitor's 2000l/s class)
- Dust proof, splash proof protection (rated IP54)
- Detachable controller for servicing
 - Serviceman who qualified by OV is able to work on-site.



Another advantage

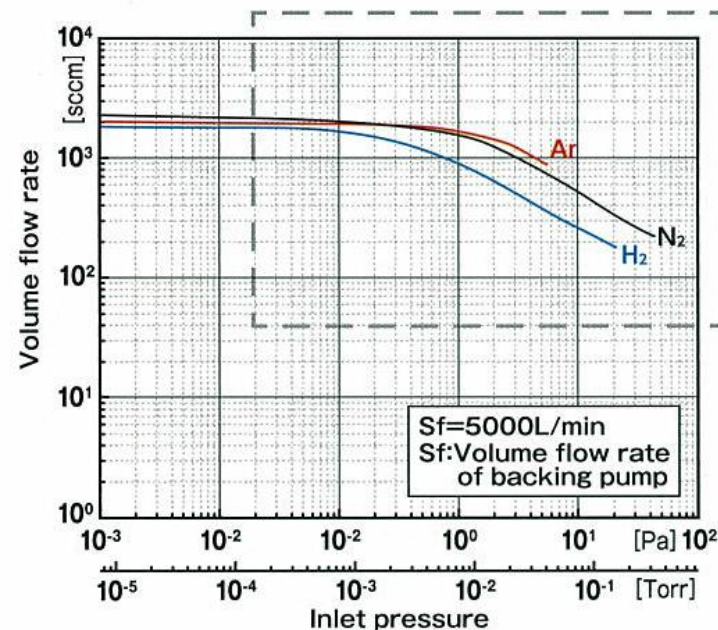
H₂ pumping speed performance

Higher H₂ pumping speed performance (in case of TGkine3300M)

Compare to competitors: 15% better

- Fast pump down – achieve target pressure in shorter time
- H₂ partial pressure is lower

Quality up for thin film coating and higher efficiency



TGkine3300M
pumping speed curve



Wide range of options for customer requirement

- High temp. resistant type
 - Operable its rotor facing ~1000C* heat source
 - No conductance loss (No necessity of heat shield plate)
- Anti-corrosive type
- Heated type for condensation prevention
- Special coating for Ga gas
- Multi communication interface
 - Parallel I/O, RS232C/485C, Profibus, or DeviceNet,
- N₂ purge options
 - Purge gas restrictor
 - Variants of purge port connection types (KF/VCR/Swagelok)
 - Slow vent valve

* The verification test is conducted under our assumed condition.