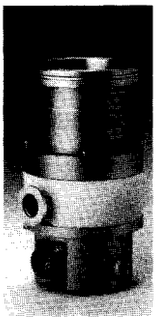
Single-flow standard turbo molecular pumps

Installation attitude from horizontal to vertical

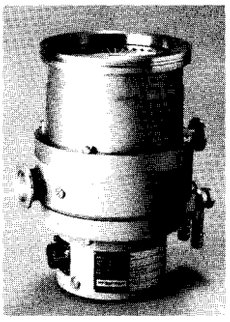
6 sizes

Volume flow rates from 30 to 5500 l/sec

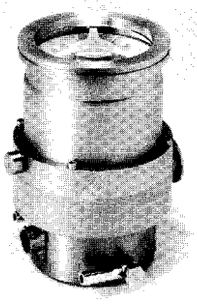
Different flange versions



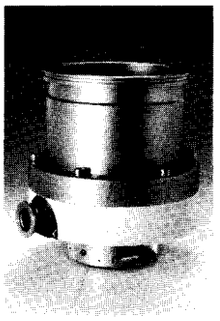
TPH 060



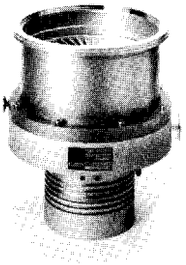
TPH 170



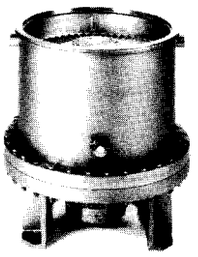
TPH 240



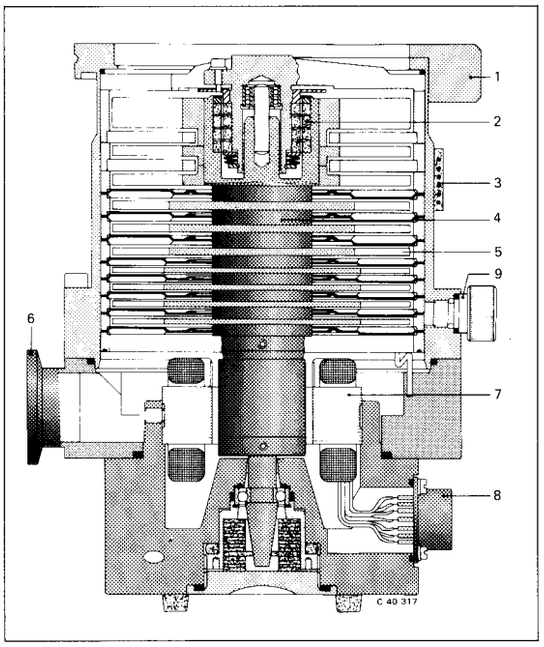
TPH 520



TPH 1500



TPH 5000



Section through the TPH/TPU 240

1 HV or UHV connection flange
2 Permanent magnetic bearing
3 Heater
4 Stator
5 Rotor
6 Backing pump connection
7 Motor
8 Electrical connection
9 Venting connection

Turbo molecular pump	**TPH 060 TPU 060**	**TPH 170 TPU 170**	**TPH 240 TPU 240**	**TPH 520 TPU 520**	**TPH 1500 TPU 1500**	**TPH 5000**
Installation attitude	vertical to horizontal	vertical to horizontal	vertical to horizontal	vertical to horizontal	vertical to horizontal	vertical
Type of bearing						
High-vacuum side	permanent magnet bearing	–	permanent magnet bearing	permanent magnet bearing	–	–
Backing pressure side	wick-lubricated miniature ball bearing	two wick-lubricated ball bearings	wick-lubricated ball bearing	wick-lubricated ball bearing	two wick-lubricated spindle bearings	two circulation-lubricated spindle bearings oil flow monitoring
Bearing replacement [1]	on site	on site	on site	on site	on site	on site
Shipping	with oil filling	with oil filling	with oil filling	with oil filling	without oil filling	without oil filling

[1] Not affecting the rotor/stator adjustment and balancing

Technical data

Turbo molecular pump with small flange clamping flange CF flange		**TPH 060**	**TPH 060**	**TPU 060**	**TPH 170**
Connection diameter					
Inlet		DN 40 ISO-KF	DN 63 ISO-K	DN 63 CF-F	DN 100 ISO-K
Outlet		DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 25 ISO-KF
Volume flow rate for					
Nitrogen N_2	l/s	30	56	56	170
Helium He	l/s	40	52	52	130
Hydrogen H_2	l/s	34	45	45	110
Compression ratio for					
N_2		10^8	10^8	10^8	10^8
He		$7 \cdot 10^3$	$7 \cdot 10^3$	$7 \cdot 10^3$	$8 \cdot 10^3$
H_2		$6 \cdot 10^2$	$6 \cdot 10^2$	$6 \cdot 10^2$	$8 \cdot 10^2$
Recomm. backing pump, min.	m^3/h	1.5	1.5	1.5	1.5
Standard electronic drive unit		TCP 121	TCP 121	TCP 121	TCP 121
Theoretical ultimate pressure [1]	mbar	10^{-11}	10^{-11}	10^{-11}	10^{-11}
Ultimate pressure 1 [2]	mbar	$<1 \cdot 10^{-10}$	$<1 \cdot 10^{-10}$	$<1 \cdot 10^{-10}$	$<1 \cdot 10^{-10}$
Ultimate pressure 2 [2]	mbar	$<1 \cdot 10^{-9}$	$<1 \cdot 10^{-9}$	$<1 \cdot 10^{-9}$	$<1 \cdot 10^{-9}$
Ultimate pressure 3 [2]	mbar	$<1 \cdot 10^{-8}$	$<1 \cdot 10^{-8}$	$<1 \cdot 10^{-8}$	$<1 \cdot 10^{-8}$
Rated speed	rpm	90000	90000	90000	43000
Standby speed	rpm	60000	60000	60000	28700
Run-up time [3]	min	2	2	2	1
Pump fluid					
Filling quantity	cm^3	4	4	4	2 x 6
Type		TL 011	TL 011	TL 011	TL 011
Type of cooling					
Standard [4]		Convection [5]	Convection [5]	Conv. [5]/water	Water
Conversion kit for		Air	Air	Air	Air
Cooling water requirement	l/h	–	–	–/15	15
Heating jacket included		No	No	Yes	No
Power input of heater	W	40	40	40	60
Weight	kg	3.6	3.6	3.8	6.5

Ordering data

	TPH 060	**TPH 060**	**TPU 060**	**TPH 170**
Turbo molecular pump for electronic drive unit				
Pump operated with				
TCP 310	PM P01 402	PM P01 400	PM P01 401	PM P01 210
TCP 5000	–	–	–	–
Turbo molecular pump for mechanical frequency converter				
Pump	–	–	–	–
Accessories				
Protective screen	–	PM 006 597 -R	PM 006 597 -R	PM 006 596 -R
Splinter shield	PM 006 375 -X	PM 006 376 -X	PM 006 376 -X	PM 006 125 -X
Compensator	PM 006 799 -X	PM 006 800 -X	PM 006 801 -X	PM 006 459 -X
Heating jacket				
115/230 V	PM 043 443 -T	PM 043 443 -T	–	PM 043 444 -T
Flutflansch DN 10 ISO-KF	PM 033 737 -T	PM 033 737 -T	PM 033 737 -T	–

[1] Value to which the pressure in the test dome converges asymptotically. It is the lowest pressure which can be attained with the pump (according to DIN 28 428)

[2] Pressure which is attained in the test dome after a maximum bake-out period of 48 hours. For a definition, see page D 2.

[3] Up to 90% of rated speed.

[4] Up to an ambient temperature of 30 °C

[5] When a heater is used, ducted cooling is required.

Note
For pump fluid for turbo molecular pumps, see page D 36.

The program is continued on the next page.

TPU 170	TPH 240	TPU 240	TPH 520	TPU 520	TPH 520	TPU 520
DN 100 CF-F DN 25 ISO-KF	DN 100 ISO-K DN 25 ISO-KF	DN 100 CF-F DN 25 ISO-KF	DN 100 ISO-K DN 25 ISO-KF	DN 100 CF-F DN 25 ISO-KF	DN 160 ISO-K DN 25 ISO-KF	DN 160 CF-F DN 25 ISO-KF
170 130 110	230 240 210	230 240 210	300 400 400	300 400 400	500 500 480	500 500 480
10^8 $8 \cdot 10^3$ $8 \cdot 10^2$	10^8 $3 \cdot 10^4$ $1.5 \cdot 10^3$	10^8 $3 \cdot 10^4$ $1.5 \cdot 10^3$	10^8 $2 \cdot 10^4$ 10^3	10^8 $2 \cdot 10^4$ 10^3	10^8 $2 \cdot 10^4$ 10^3	10^8 $2 \cdot 10^4$ 10^3
1.5	1.5	1.5	16	16	16	16
TCP 121	TCP 121	TCP 121	TCP 310	TCP 310	TCP 310	TCP 310
10^{-11} $<1 \cdot 10^{-10}$ $<1 \cdot 10^{-9}$ $<1 \cdot 10^{-8}$	10^{-11} $<1 \cdot 10^{-10}$ $<1 \cdot 10^{-9}$ $<1 \cdot 10^{-8}$	10^{-11} $<1 \cdot 10^{-10}$ $<1 \cdot 10^{-9}$ $<1 \cdot 10^{-8}$	10^{-11} $<1 \cdot 10^{-10}$ $<1 \cdot 10^{-9}$ $<1 \cdot 10^{-8}$	10^{-11} $<1 \cdot 10^{-10}$ $<1 \cdot 10^{-9}$ $<1 \cdot 10^{-8}$	10^{-11} $<1 \cdot 10^{-10}$ $<1 \cdot 10^{-9}$ $<1 \cdot 10^{-8}$	10^{-11} $<1 \cdot 10^{-10}$ $<1 \cdot 10^{-9}$ $<1 \cdot 10^{-8}$
43000 28700 1	60000 40000 1	60000 40000 1	50000 33000 5	50000 33000 5	50000 33000 5	50000 33000 5
2 x 6 TL 011	8 TL 011	8 TL 011	8 TL 011	8 TL 011	8 TL 011	8 TL 011
Water Air 15	Water Air 15	Water Air 15	Water Air 15	Water Air 15	Water Air 15	Water Air 15
Yes 60	No 60	Yes 60	No 100	Yes 100	No 100	Yes 100
7	8.5	9	12.5	13	12.5	13

TPU 170	TPH 240	TPU 240	TPH 520	TPU 520	TPH 520	TPU 520
PM P01 220 –	PM P01 320 –	PM P01 330 –	PM P01 670 –	PM P01 680 –	PM P01 650 –	PM P01 660 –
–	PM P01 325	PM P01 335	–	–	–	–
PM 006 596 -R PM 006 125 -X PM 006 488 -X	PM 006 596 -R PM 006 125 -X PM 006 459 -X	PM 006 596 -R PM 006 125 -X PM 006 488 -X	PM 006 596 -R PM 006 125 -X PM 006 459 -X	PM 006 596 -R PM 006 125 -X PM 006 488 -X	– PM 006 771 -X PM 006 492 -X	– PM 006 771 -X PM 006 493 -X
– –	PM 043 444 -T PM 033 737 -T	– PM 033 737 -T	PM 033 445 -T PM 033 737 -T	– PM 033 737 -T	PM 033 445 -T PM 033 737 -T	– PM 033 737 -T