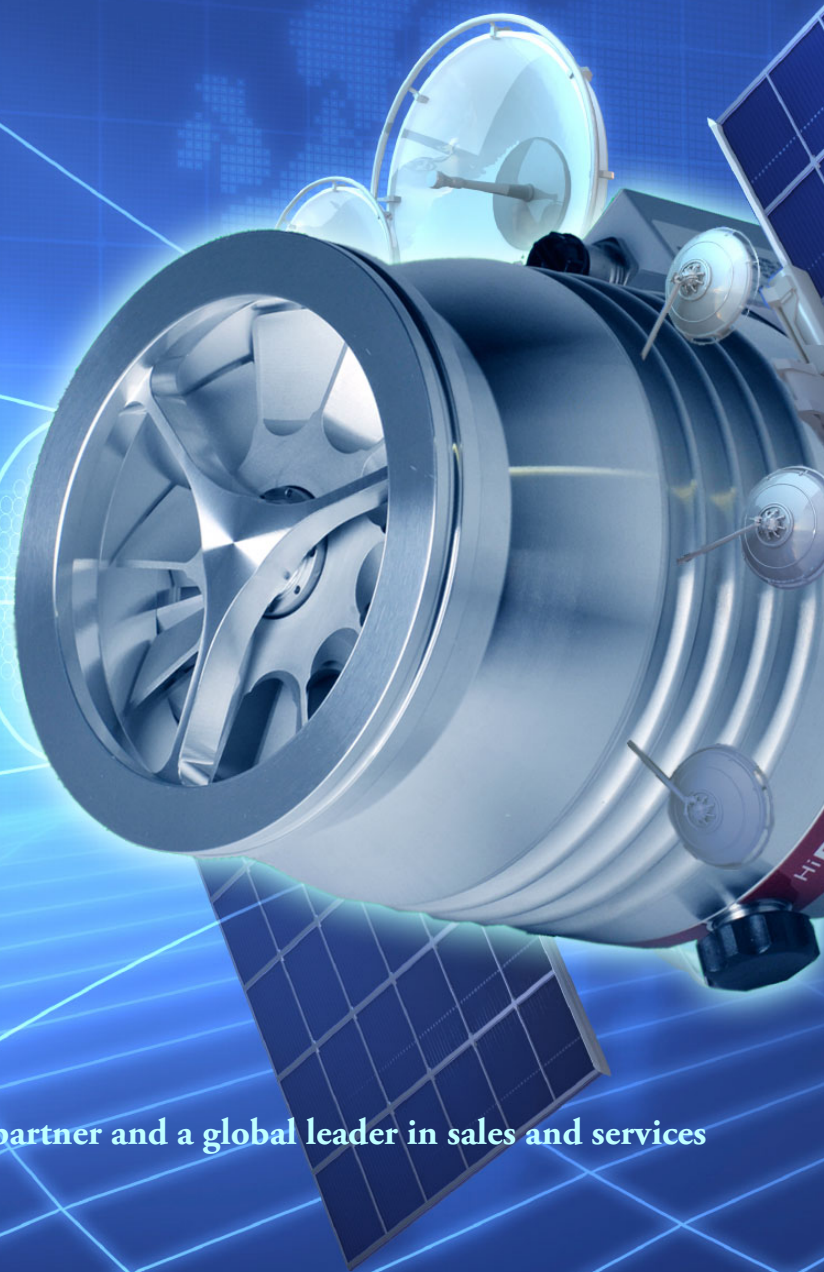


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2000 l/s Compact Turbo



For all applications in industry.
The best choice for high pumping speed!

2000 I/s Compact Turbo

Complete turbo pump series in the 2000 I/s class

Suitable for

- ▶ Highest gas loads
- ▶ Superior pumping of heavy and light gases
- ▶ Short cycle times, fast recovery to full speed
- ▶ Highest uptime in harsh processes like HDPCVD, CBE, implant, photo resist stripping and wear protection

Highest reliability and safety

- ▶ Very robust rotor levitation at both ends, non-cantilever design
- ▶ Highest reliability with proven rotor/bearing concept
 - installed base > 250,000 units
- ▶ Absolute safe operation
 - verified by crash tests/safety calculations

Simple Integration

- ▶ Integrated controller
- ▶ Interface options include:
 - Remote, RS-485, Profibus, DeviceNet
- ▶ Single phase power requirements only
- ▶ Complies to CE, Semi F-47, E-74

Cost reduction

- ▶ Extended maintenance intervals reduce cost of ownership
- ▶ On site maintenance



TPH 2101 – The 2000 I/s ultimate workhorse

Best choice for all vacuum applications with medium gas load and light gas pumping

- ▶ Very robust
- ▶ Large installed base
- ▶ Maximum uptime – MTTF > 200,000 h
- ▶ Lowest operating costs in the market
- ▶ Non-drag stage design and very effective dynamic bearing seal for extended lifetime in harsh duty applications



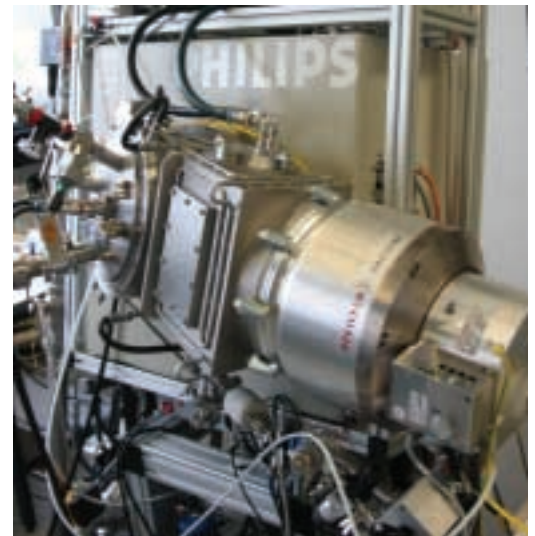
Ophthalmic Coaters
Deposition of anti-reflection films on lenses.
Photo: Courtesy of Satis, Italy

TPH 2301 - The 2000 I/s high gas load turbo

Best choice for all vacuum applications with high gas load and light gas pumping

Benefits same as 2101 – In addition:

- ▶ Increased gas load 1900 sccm Ar (1.7 times higher than TPH 2101)
- ▶ Most advanced rotor geometry for better foreline tolerance and rotor efficiency
- ▶ Extended oil and bearing change intervals to minimize cost of ownership



Pumping high Xenon throughput on extreme ultra violet lithography system.
Photo: Courtesy of Philips Extreme UV, Germany

TPH 2303 – The 2000 l/s maximum performance turbo

Best choice for all vacuum applications with maximum gas load, light gas pumping and fast pressure/cycle changes.

Benefits same as 2101 – In addition:

- ▶ Most advanced rotor geometry for better foreline tolerance and rotor efficiency
- ▶ Extended oil and bearing change intervals to minimize cost of ownership
- ▶ Powerful 3 kW motor for:
 - Maximum gas load at higher inlet pressure 2750 sccm Ar (2.5 times higher than TPH 2101)
 - Fastest process step cycling
 - Fastest recovery to full speed in the 2000 l/s class
 - Shortest run up time in the 2000 l/s class



Higher system utilization due to reduced load lock cycle time on large area coating system.

Photo: Courtesy of Interpane, Germany

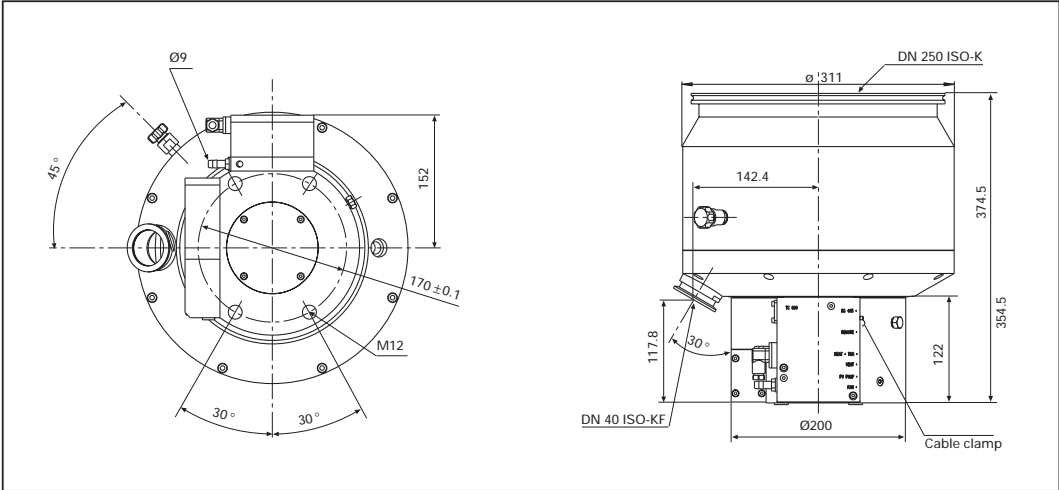
TPH 2303 with 3 kW drive unit TCP 3000



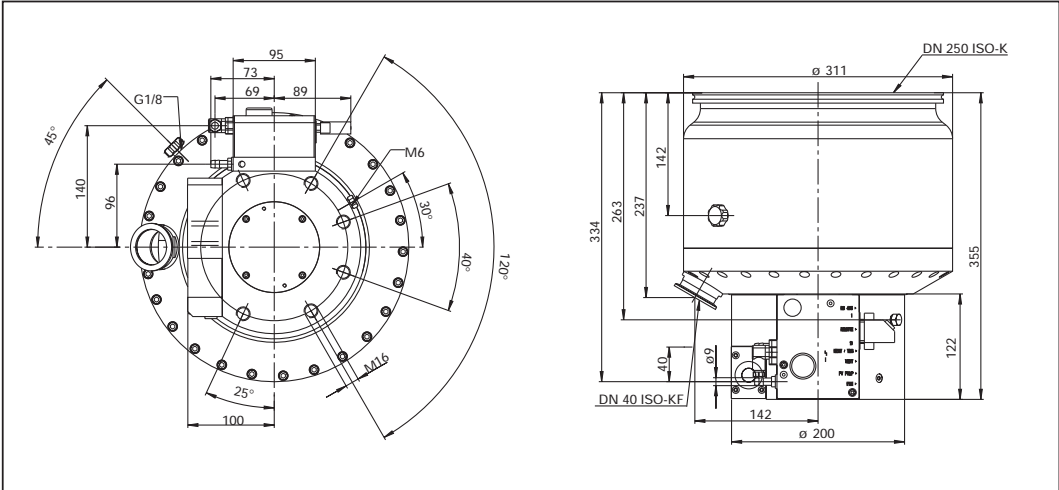
2000 I/s Compact Turbo

Dimensions (in mm)

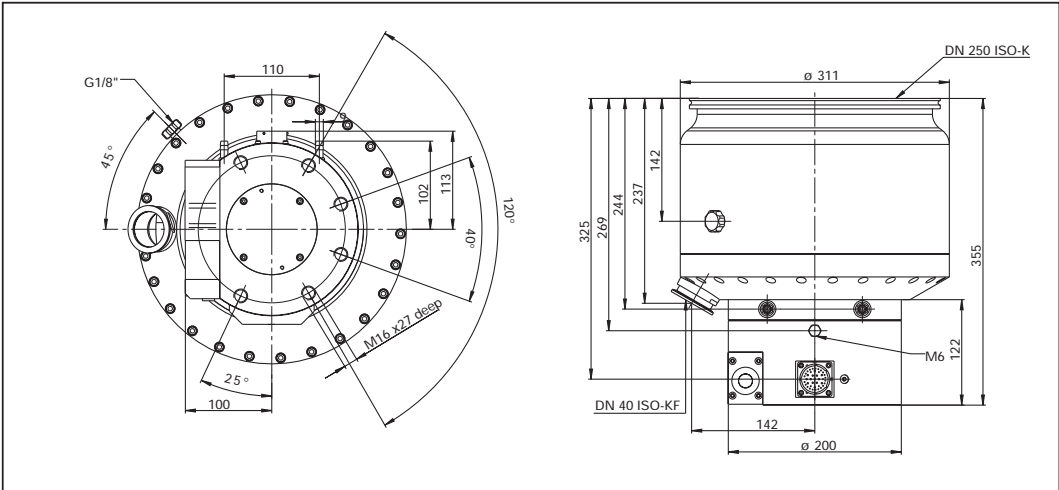
TPH 2101



TPH 2301

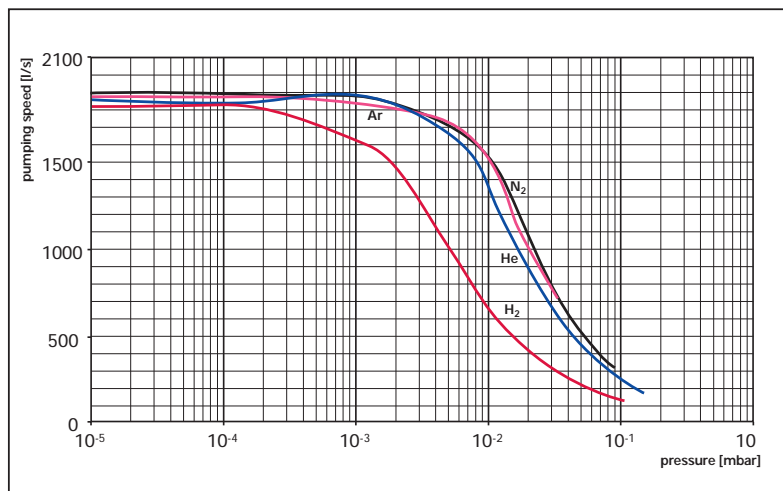


TPH 2303

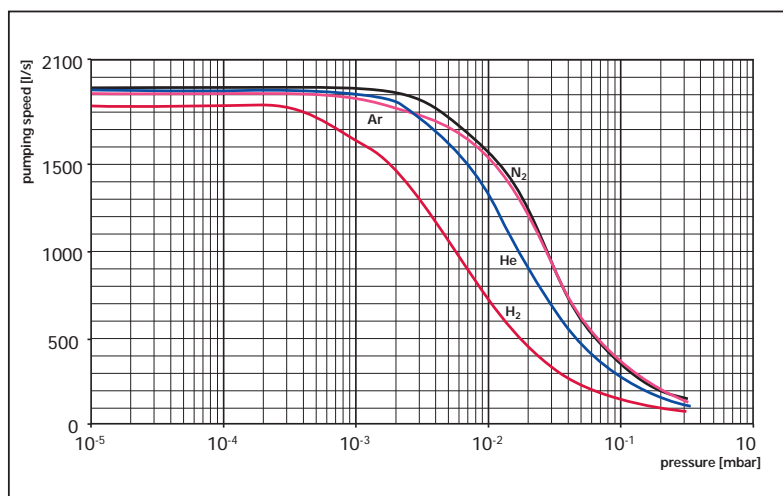


Pumping speed (with DN 250 ISO, Backing Pump 120 m³/h / 70 cfm)

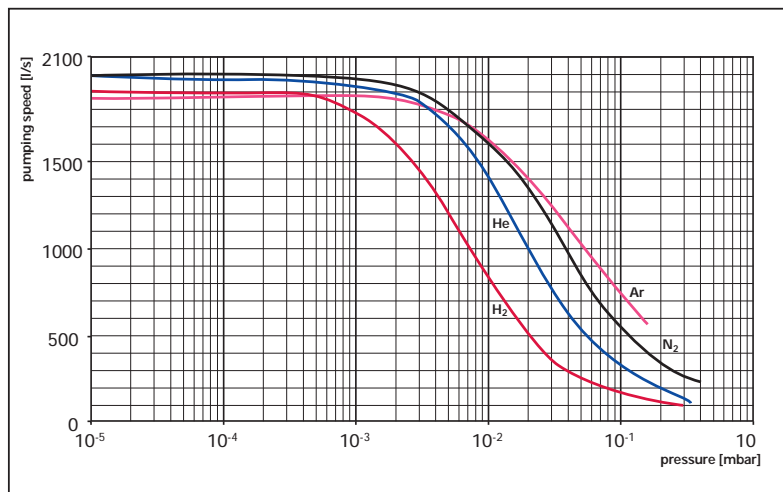
TPH 2101



TPH 2301

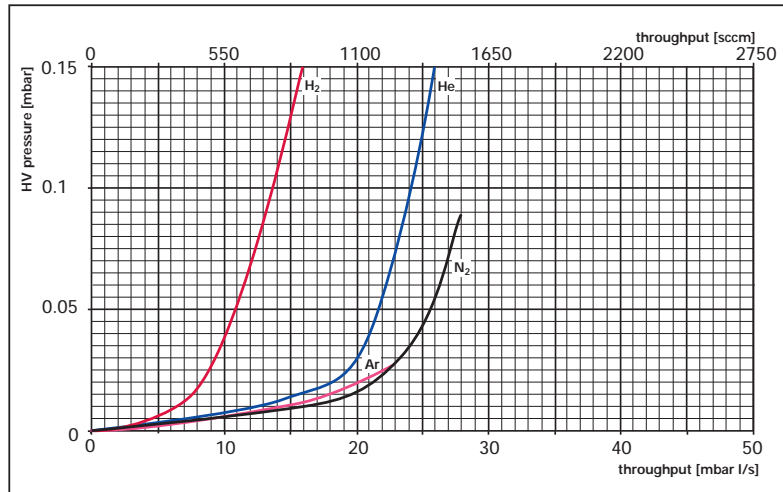


TPH 2303

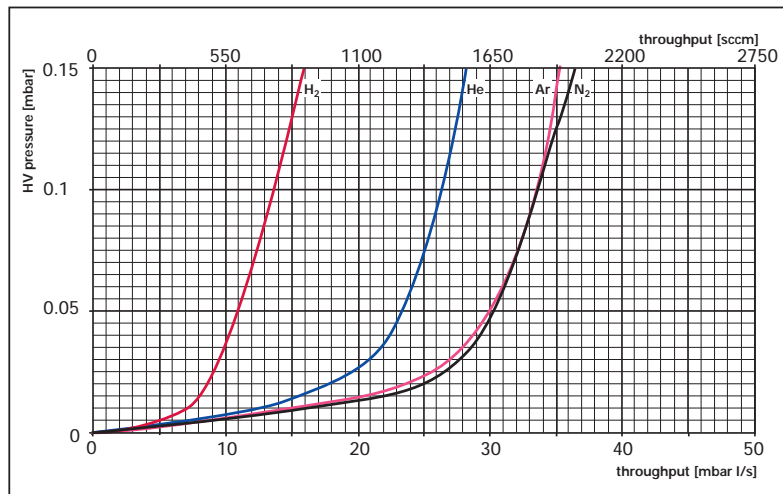


Throughput (with DN 250 ISO, Backing Pump 120 m³/h / 70 cfm)

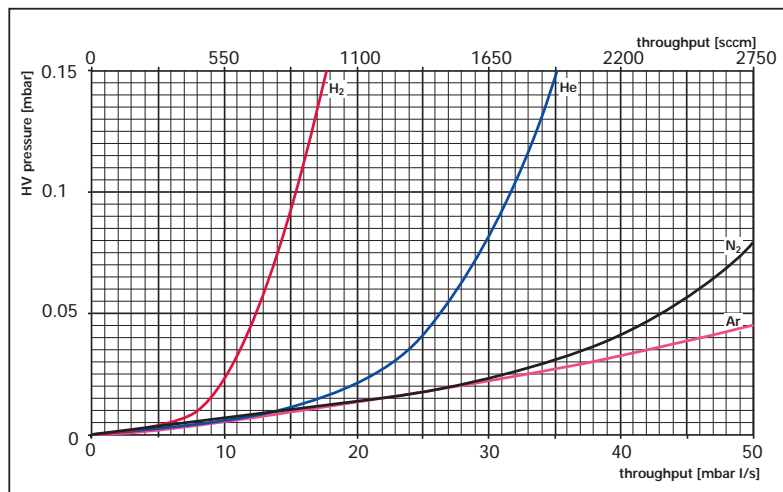
TPH 2101



TPH 2301



TPH 2303 (Peak performance, continuous performance depends on process)



2000 l/s CompactTurbos

Technical Data

CompactTurbo	TPH 2101	TPH 2101
Flange size	DN 250 ISO-K	DN 200 ISO-K
Max. rotational speed (1/min)	31 500	31 500
Run up time (min)	8	8
Pumping speed (l/s)		
for N ₂	1900	1400
for Ar	1900	1400
for H ₂	1850	1650
Compression ratio		
for N ₂	> 1 · 10 ⁸	> 1 · 10 ⁸
for Ar	> 1 · 10 ⁸	> 1 · 10 ⁸
for H ₂	3 · 10 ⁴	3 · 10 ⁴
Throughput at full rotational speed (sccm / mbarl/s)		
for N ₂	825 / 15	825 / 15
for Ar	800 / 14.5	800 / 14.5
Throughput at 0.1 mbar HV (sccm / mbarl/s)		
for N ₂	1100 / 20	1100 / 20
for Ar	1100 / 20	1100 / 20
Fore vacuum tolerance (mbar)		
for N ₂	1.5	1.5
for Ar	1.8	1.8
for H ₂	0.5	0.5
Controller	TC 750 (integrated)	TC 750 (integrated)
Interfaces		
integrated	RS-485, Remote	RS-485, Remote
optional	Profibus	Profibus
Ultimate pressure	< 1 · 10 ⁻⁸	< 1 · 10 ⁻⁸
Weight (kg)	38	39
Height (mm)	355	375
Diameter (mm)	311	311

* Peak performance, continuous performance depends on process

Ordering Numbers

Description	TPH 2101 DN 250	TPH 2101 DN 200
Pump (P)	PM P03 020	PM P03 021
Pump corrosive gas version (PC)	PM P03 022	PM P03 023
Pump upside down (UP)	PM P03 030	PM P03 031
Pump upside down, corrosive gas version (UPC)	PM P03 032	PM P03 033
Controller	integrated (TC 750)	
Power supply for wall and standard mounting	PM 041 815-T (TPS 600)	
Power supply as a 19" rack module	PM 041 821-T (TPS 601)	
Mains cable with German plug (230 V, 3 m)	P 4564 309 ZA	
Mains cable with UL-plug (208 V, 3 m)	P 4564 309 ZF	
Connecting cable power supply - turbopump (3 m)	PM 051 103-T	
Connecting cable power supply - turbopump with shielding (3 m)	PM 051 843-T	
Connecting cable controller - turbopump (3 m)	not necessary	
Centering ring with multi-purpose coating (DN 250)	PM 016 225-U	
Centering ring/splinter shield with multi-purpose coating (DN 250)	PM 016 226-U	
Centering ring/protective screen with multi-purpose coating (DN 250)	PM 016 227-U	
Claw clamps (20 needed for DN 250 ISO-K, 24 needed for DN 200 ISO-K)	PF 300 100-T	
HPU 001, Hand-held Programming Unit	PM 051 510-T	
DCU 001, Display Control Unit	PM 041 816-T	
DCU 600, Display Control Unit incl. power supply	PM C01 697	

TPH 2301	TPH 2301	TPH 2303	TPH 2303
DN 250 ISO-K	DN 200 ISO-K	DN 250 ISO-K	DN 200 ISO-K
31 500	31 500	33 000	33 000
8	8	2	2
1900	1400	2000	1500
1900	1400	1900	1400
1850	1650	1900	1700
$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
$2 \cdot 10^4$	$2 \cdot 10^4$	$4 \cdot 10^4$	$4 \cdot 10^4$
1200 / 22	1200 / 22	$> 2750 / >50^*$	$> 2750 / >50^*$
1000 / 18	1000 / 18	$> 2750 / >50^*$	$> 2750 / >50^*$
1900 / 34	1900 / 34	$> 2750 / >50^*$	$> 2750 / >50^*$
1900 / 34	1900 / 34	$> 2750 / >50^*$	$> 2750 / >50^*$
2	2	2.5	2.5
2.2	2.2	4	4
0.6	0.6	0.6	0.6
TC 750 (integrated)	TC 750 (integrated)	TCP 3000	TCP 3000
RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote
Profibus	Profibus	DeviceNet, Profibus	DeviceNet, Profibus
$< 1 \cdot 10^8$	$< 1 \cdot 10^8$	$< 1 \cdot 10^8$	$< 1 \cdot 10^8$
38	39	47	47
355	375	355	375
311	311	311	311

TPH 2301 DN 250	TPH 2301 DN 200	TPH 2303 DN 250	TPH 2303 DN 200
PM P03 328	PM P03 329	-	-
PM P03 325	PM P03 326	PM P03 333	PM P03 334
PM P03 475	PM P03 476	-	-
PM P03 477	PM P03 478	-	-
integrated (TC 750)		PM C01 731 (TCP 3000)	
PM 041 815-T (TPS 600)		-	
PM 041 821-T (TPS 601)		integrated in TCP 3000	
P 4564 309 ZA		-	
P 4564 309 ZF		P 4564 309 HB	
PM 051 103-T		not necessary	
PM 051 843-T		not necessary	
not necessary		PM 051 863 AT	
PM 016 225-U		PM 016 225-U	
PM 016 226-U		PM 016 226-U	
PM 016 227-U		PM 016 227-U	
PF 300 100-T		PF 300 100-T	
PM 051 510-T		not necessary	
PM 041 816-T		not necessary	
PM C01 697		not necessary	

The vacuum technology experts

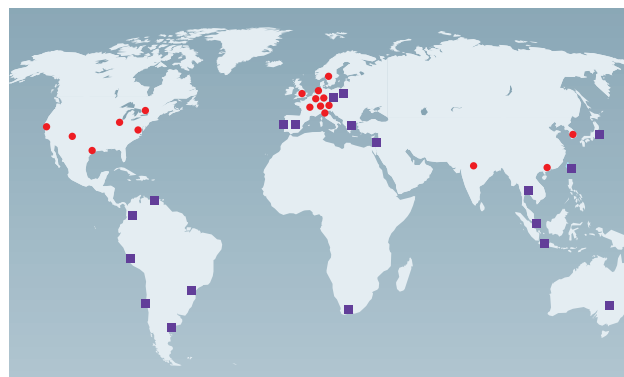


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- ▶ Fast action logistics concept
- ▶ Customized service contracts
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● Sales companies

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