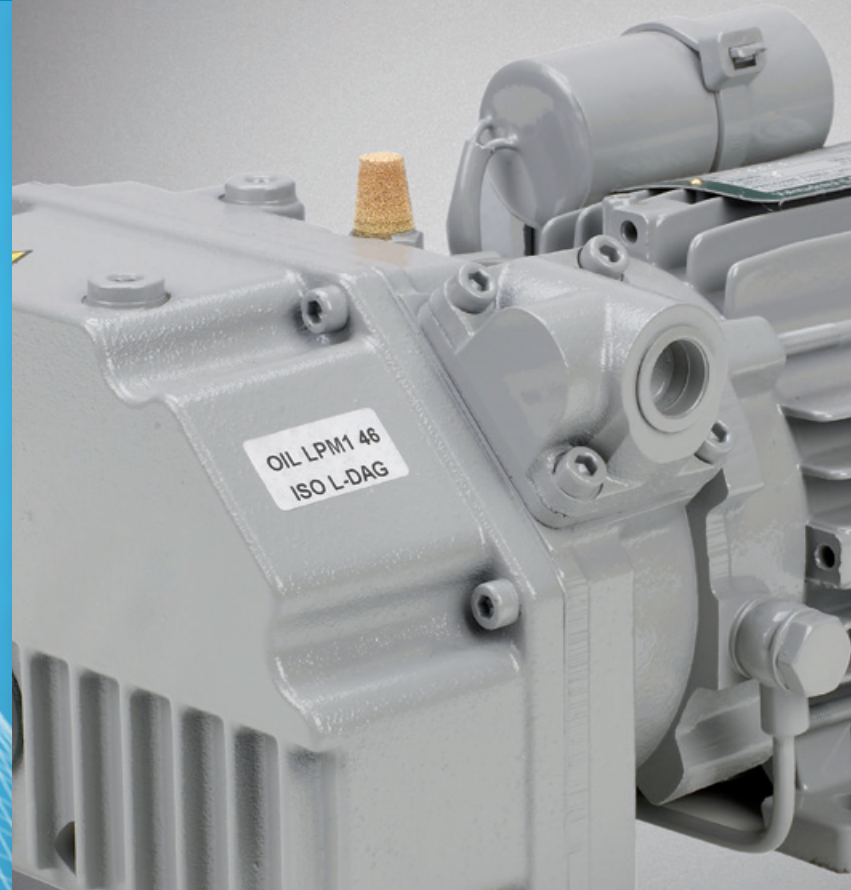




AGILENT ROUGH VACUUM PUMPS

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Agilent Technologies

P.V.R. is now Agilent Technologies expanding its Vacuum Products portfolio

With the acquisition of P.V.R., Agilent Vacuum Products Division expands its vacuum products offer for industrial applications.

P.V.R.'s products complement Agilent's existing vacuum portfolio, which includes high vacuum pumps, dry and wet primary pumps, and vacuum instrumentation. Joining together as one company will increase the ability to serve customers faster and better with a broader range of vacuum solutions.



Agilent VPD Plant, Valmadrera (LC), Italy.



Agilent VPD Plant, Lexington, MA.



Agilent VPD Plant, Torino, Italy.



Agilent VPD Plant, Penang, Malaysia.



Food Industry

- Packaging machines
- Packaging machines with modified atmosphere
- Vacuum chambers
- Thermoforming machines
- De-aeration tunnels
- Tumblers machines
- Bottle fillings
- Milk production
- Freezing chambers
- Evisceration systems
- Meat extruders
- Central vacuum systems
- Pneumatic conveying systems



Chemical & Pharmaceutical

- Oil recovering plants
- Chemical processes
- Degassing materials
- Varnish mixers
- Drying medicinal products
- Pneumatic conveying plants
- Solvent recovery systems
- Distillation systems



Electrical Industry

- Drying transformer systems
- Motor/transformer impregnation process
- Granule conveying systems
- Plastic extruders
- Pick & place systems
- Oil recovery systems



Medical

- Hospital central vacuum
- Dental equipments



Paper & Wood Industry

- Wood drying chambers
- CNC Routers machines
- Pick & place systems
- Printing machines
- Packaging materials

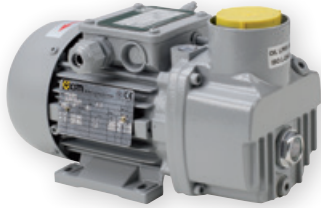


Other Applications

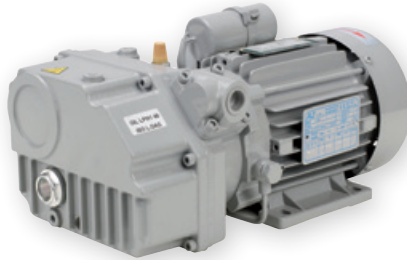
- Soil decontamination
- Brick and pottery industries
- Marble and agglomerates
- Water waste recovery systems
- Glass industry
- Pneumatic conveying
- Battery industry
- Laminated materials
- Watches industry

COMPACT SINGLE STAGE ROTARY VANE PUMPS

► EM Series



EM 4



EM 8



EM 20

The single stage oil lubricated vacuum pumps of the EM series have been designed to meet the requirements of OEM customers for the various industrial fields.

Main features: Compact size and reduced weight - Gas ballast

valve (except for EM 4) - Check valve (except for EM 4) - Multivoltage and multifrequency motors - Quiet running - High pumping speed - Easy to install - Continuous operation at poor vacuum levels (/B version).

Technical Specifications

		EM 4	EM 8	EM 12	EM 20	EM 28	EM 40
Nominal capacity (m³/h)	50 Hz	4	8.5	12.5	18	28	42
	60 Hz	4.8	10	15	21	33	51
Ultimate pressure (abs) (mbar)	EM	2	2	2	2	2	2
	EM/B*	20	20	20	20	20	20
Motor power (kW)	50 Hz ~ 3	0.12	0.25	0.37	0.55	0.75	1.10
	50 Hz ~ 1	0.12	0.25	0.37	0.55	1.10	1.40
	60 Hz ~ 3	0.15	0.30	0.44	0.66	0.90	1.30
	60 Hz ~ 1	0.12	0.25	0.44	0.66	1.30	1.40
Motor speed (min⁻¹)	50 Hz	3000	3000	3000	3000	3000	3000
	60 Hz	3600	3600	3600	3600	3600	3600
Dimensions (mm) (l x h x w)	50 Hz ~ 3	236x139x110	302x137x161	281x190x214	298x190x221	332x224x266	415x224x266
Total weight (kg)	50 Hz ~ 3	5.4	11.4	13	17	26	30

* Constant high pressure operating model.

► Ox Series



Ox pumps are used in food packaging installations where Oxygen gas is used during the packaging process. The use of materials that are compatible with the pumped gas as well as

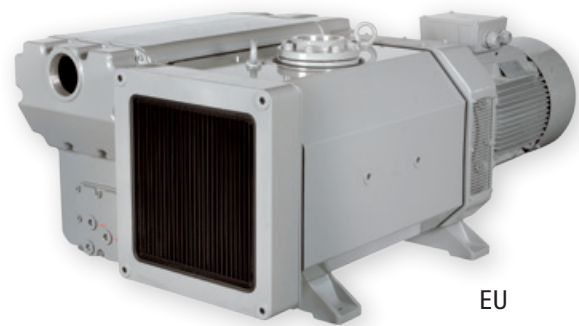
the use of special synthetic oil allow these pumps to handle gases with high concentration of Oxygen assuring efficient performance and safety level during the process.

Technical Specifications

		Nominal capacity (m ³ /h)	Ultimate pressure (abs) (mbar)
PVL 15 Ox	50 Hz	18	0.5
	60 Hz	21	0.5
EU 45 Ox	50 Hz	48	0.5
	60 Hz	58	0.5
EU 65 Ox	50 Hz	69	0.5
	60 Hz	83	0.5
EU 105 Ox	50 Hz	105	0.5
	60 Hz	126	0.5
EU 160 Ox	50 Hz	152	0.5
	60 Hz	182	0.5
EU 205 Ox	50 Hz	207	0.5
	60 Hz	248	0.5
EU 300 Ox	50 Hz	300	0.5
	60 Hz	360	0.5
PVL 401 Ox	50 Hz	417	0.5
	60 Hz	500	0.5
PVL 541 Ox	50 Hz	553	0.5
	60 Hz	663	0.5
EU 650 Ox	50 Hz	660	0.5
	60 Hz	792	0.5
EU 1000 Ox	50 Hz	1033	0.5
	60 Hz	1239	0.5

SINGLE STAGE ROTARY VANE PUMPS

► PVL/EU Series



Agilent makes use of advanced engineering techniques onto CNC machines. Within Agilent vacuum pumps high quality materials and economical features match together to achieve: High pumping speed in a range of absolute vacuum - between 850 and 0,5 mbar - Low noise level - No pollution - Air-cooled - Rugged construction - Easy to service.

The vacuum pumps PVL/EU series are single-stage oil lubricated rotary vane vacuum pumps with oil recirculation system. They are used for the suction of air also in presence of water vapour and for continuous industrial use. Two different versions are available, depending on the application vacuum range. According to Pneurop 6602, the whole range extends from 18 m³/h to 1,239 m³/h nominal capacity.

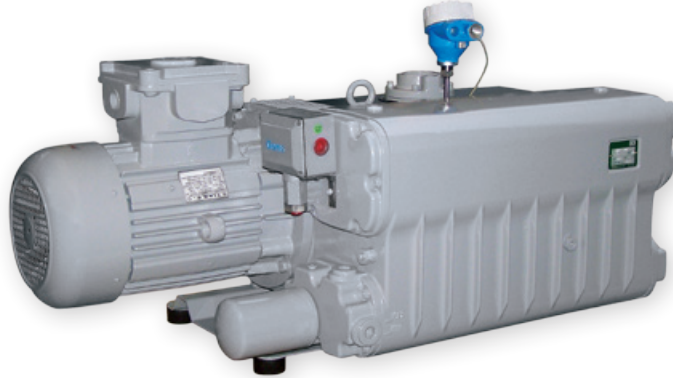
Technical Specifications

		PVL 15	PVL 35	EU 45	EU 65	EU 105	EU 160
Nominal capacity (m³/h)	50 Hz	18	35	48	69	105	152
	60 Hz	21	42	58	83	126	182
Ultimate pressure (abs) (mbar)	PVL - EU	0.5	0.5	0.5	0.5	0.5	0.5
	PVL/B* - EU/B*	20	20	10	10	10	10
Motor power (kW)	50 Hz ~ 3	0.55	0.75	1.10	1.50	2.20	3.00
	50 Hz ~ 1	0.75	1.10	1.50	2.20	–	–
	60 Hz ~ 3	0.75	1.10	1.50	2.20	3.00	4.00
	60 Hz ~ 1	0.75	1.10	1.50	2.20	–	–
Motor speed (min⁻¹)	50 Hz	1500	1500	1500	1500	1500	1500
	60 Hz	1800	1800	1800	1800	1800	1800
Total weight (kg)	50 Hz ~ 3	25	38	52	60	82	104
	50 Hz ~ 1	27	42.5	56	66	–	–
	60 Hz ~ 3	26	40	54	65	86	110
	60 Hz ~ 1	27	42.5	56	66	–	–

		EU 205	EU 300	PVL 401	PVL 541	EU 650	EU 1000
Nominal capacity (m³/h)	50 Hz	207	300	417	553	660	1033
	60 Hz	248	360	500	663	792	1239
Ultimate pressure (abs) (mbar)	PVL - EU	0.5	0.5	0.5	0.5	0.5	0.5
	PVL/B* - EU/B*	10	10	10	10	–	10
Motor power (kW)	50 Hz ~ 3	4.0	5.5	7.5	11.0	15.0	22.0
	60 Hz ~ 3	5.5	7.5	11.0	15.0	18.5	30.0
Motor speed (min⁻¹)	50 Hz	1500	1500	1500	1500	1000	1000
	60 Hz	1800	1800	1800	1800	1200	1200
Total weight (kg)	50 Hz	161	188	305	330	580	862
	60 Hz	171	192	337	354	620	922

* Constant high pressure operating model.

► **Ex Series**



Agilent has developed a range of vacuum pumps meeting the 94/9/EC standards, certified for ATEX zone 1 internal/external and temperature class T3 (200 °C), in answer to the

frequent requests for pumps capable of operating in hazardous environments.

Technical Specifications

		Nominal capacity (m ³ /h)	Ultimate pressure (abs) (mbar)
EU 45 Ex	50 Hz	48	0.5
EU 65 Ex	50 Hz	69	0.5
EU 105 Ex	50 Hz	105	0.5
EU 160 Ex	50 Hz	152	0.5
EU 300 Ex	50 Hz	300	0.5

DUAL STAGE OIL LUBRICATED ROTARY VANE PUMPS

► DS-Series and PHV-K Series



Thanks to a very simple and highly reliable design, these field proven rotary vane pumps provide excellent vacuum performance. Agilent's quality and manufacturing standards

ensure that the Rotary Vane Pumps provide high pumping stability for light gases, low noise, minimal oil backstreaming, and a long operating life.

Technical Specifications

		DS 102	DS 202	DS 302	DS 402	DS 602	PHV 50K	PHV 75K
Nominal capacity (m³/h)	50 Hz	5.7	9.6	14.22	20.52	30.24	50	75
	60 Hz	6.84	12	17.1	24.6	36.3	60	90
Ultimate pressure (abs) (mbar)	Gas ballast closed	2x10 ⁻³	2x10 ⁻³	2x10 ⁻³	2x10 ⁻³	2x10 ⁻³	1x10 ⁻³	1x10 ⁻³
	Gas ballast pos.1	2x10 ⁻²	2x10 ⁻²	2x10 ⁻²	1x10 ⁻²	1x10 ⁻²	7x10 ⁻³	7x10 ⁻³
Motor power (kW)	50 Hz	0.45	0.45	0.45	0.75	0.75	1.50	2.20
	60 Hz	0.55	0.55	0.55	0.90	0.90	1.50	2.20
Motor speed (min⁻¹)	50 Hz	1500	1500	1500	1500	1500	1500	1500
	60 Hz	1800	1800	1800	1800	1800	1800	1800
Total weight (kg)		22	25	25	35	35	68	84

► **DRY Series**



Claw type pumps from the DRY series have been designed for those applications where the handled medium must remain contaminant free during the process.

The absence of wear parts in these pumps offers considerable savings in maintenance and associated down time.

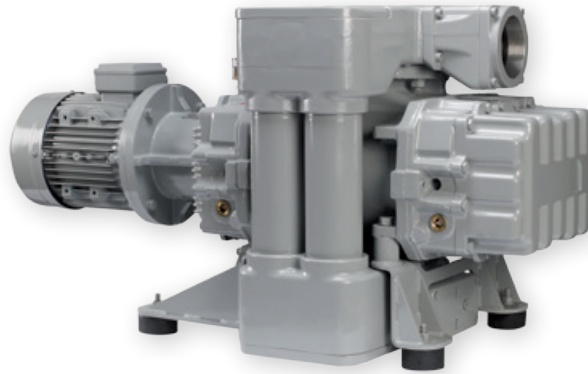
Technical Specifications

		DRY 100	DRY 300
Nominal capacity (m ³ /h)	50 Hz	100	300
	60 Hz	120	360
Ultimate pressure (abs)* (mbar)		150	200
Motor power (kW)	50 Hz	2.2	5.5
	60 Hz	2.2	7.5
Motor speed (min ⁻¹)	50 Hz	3000	3000
	60 Hz	3600	3600
Noise level (dB(A))	50 Hz	78	80
	60 Hz	82	84
Total weight (kg)	50 Hz	100	215
	60 Hz	100	219

* Continuous operation.

ROOTS VACUUM PUMPS WITH BYPASS VALVE

► HV/BP Series



Roots vacuum pumps series HV/BP complete with bypass valve are mainly used coupled to our lubricated vacuum pumps to speed up pumping down times and to achieve vacuum level up to 0.02 mbar abs.

Bypass valve allows to start the Roots pump at the same time as the backing vacuum pump, protecting the Roots pump from any operation at high pressure.

Technical Specifications

		GMa 11.3 HV/BP	GMa 11.4 HV/BP	GMa 12.5 HV/BP	GMa 12.6 HV/BP	GMa 13.7 HV/BP	GMa 13.8 HV/BP
Nominal capacity (m³/h)	50 Hz	500	730	1000	1400	2000	2840
	60 Hz	600	880	1200	1700	2420	3420
Ultimate pressure (abs)* (mbar)		0.02	0.02	0.02	0.02	0.02	0.02
Motor power (kW)	50 Hz	1.5	2.2	3.0	4.0	5.5	7.5
	60 Hz	2.2	3.0	4.0	5.5	7.5	11.0
Motor speed (min⁻¹)	50 Hz	3000	3000	3000	3000	3000	3000
	60 Hz	3600	3600	3600	3600	3600	3600
Noise level (dB(A))	50 Hz	71	71	72	72	75	75
	60 Hz	72	72	73	73	76	76
Weight (single phase/3-ph.) (kg)	50 Hz	178	184	232	295	387	513
	60 Hz	184	189	246	317	410	526

* Final vacuum is the vacuum achieved by coupling a Roots pump to a "Agilent" manufactured vacuum pump.

▶ HV Series



Rough Vacuum Pumps

Vacuum blowers series HV have been designed for conveying air and neutral gases and are especially used in industrial high vacuum technology. With a total of 19 sizes, the blowers

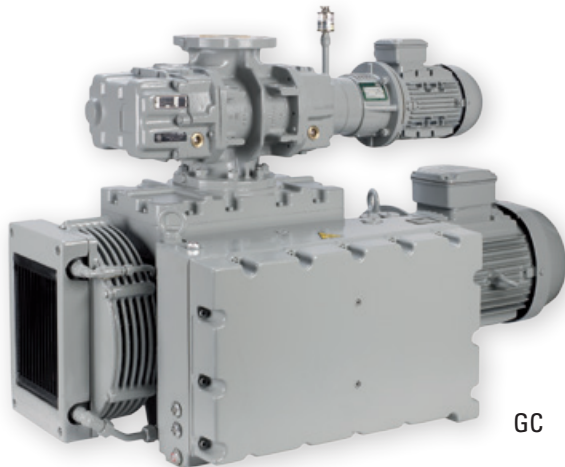
cover a theoretical nominal intake volume flow from 180 m³/h to 97,000 m³/h and pressure ranges 10⁻³ mbar abs up to approx. 200 mbar abs.

Technical Specifications

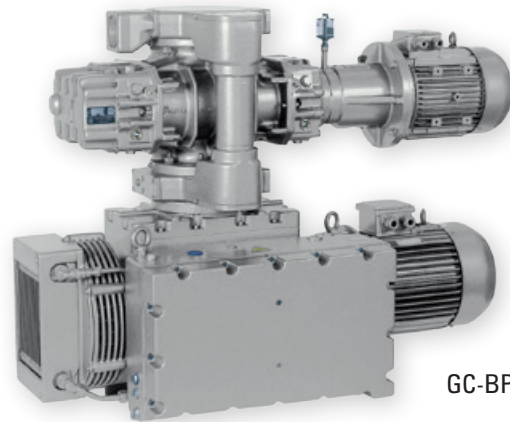
		Theoretical suction volume (m ³ /h)	Max. admissible diff. pressure for motor power (mbar)	Motor power (kW)	Speed (1/min)
GMa/GLa 10.0 HV	50 Hz	180	130	0.75	3000
	60 Hz	250	130	0.75	3600
GMa/GLa 10.1 HV	50 Hz	250	140	1.10	3000
	60 Hz	300	140	1.10	3600
GMa/GLa 10.2 HV	50 Hz	365	130	1.50	3000
	60 Hz	450	130	1.50	3600
GMa/GLa 11.3 HV	50 Hz	500	140	2.20	3000
	60 Hz	600	140	2.20	3600
GMa/GLa 11.4 HV	50 Hz	750	130	3.00	3000
	60 Hz	900	130	3.00	3600
GMa/GLa 12.5 HV	50 Hz	1000	130	4.00	3000
	60 Hz	1200	130	4.00	3600
GMa/GLa 12.6 HV	50 Hz	1430	130	5.50	3000
	60 Hz	1700	130	5.50	3600
GMa/GLa 13.f7 HV	50 Hz	2000	110	7.50	3000
	60 Hz	2400	110	7.50	3600
GMa/GLa 13.8 HV	50 Hz	2900	100	11.00	3000
	60 Hz	3450	100	11.00	3600
GMa/GLa 14.9 HV	50 Hz	3900	80	11.00	3000
	60 Hz	4700	80	11.00	3600
GMa/GLa 15.10 HV	50 Hz	5600	80	15.00	3000
	60 Hz	6700	80	15.00	3600
GMa/GLa 15.11 HV	50 Hz	7500	80	18.50	3000
	60 Hz	9000	80	18.50	3600
GMa/GLa 16.f13 HV	50 Hz	8150	75	18.50	1500
	60 Hz	9800	75	18.50	1800
GMa/GLa 16.13 HV	50 Hz	9750	75	22.00	1500
	60 Hz	11700	75	22.00	1800
GMa/GLa 17.15 HV	50 Hz	16000	60	30.00	1500
	60 Hz	18825	60	30.00	1800

COMPACT VACUUM GROUPS

▶ HV Series



GC



GC-BP

Given the proven performance of our PVL401/PVL541 vacuum pumps and the HV series of Roots-type pumps, we have designed pumping groups that conveniently combine the benefits of both in high performance compact packages. The new GC packages provide the following significant benefits: Integral pipe-work allowing easier installation - Max. ultimate

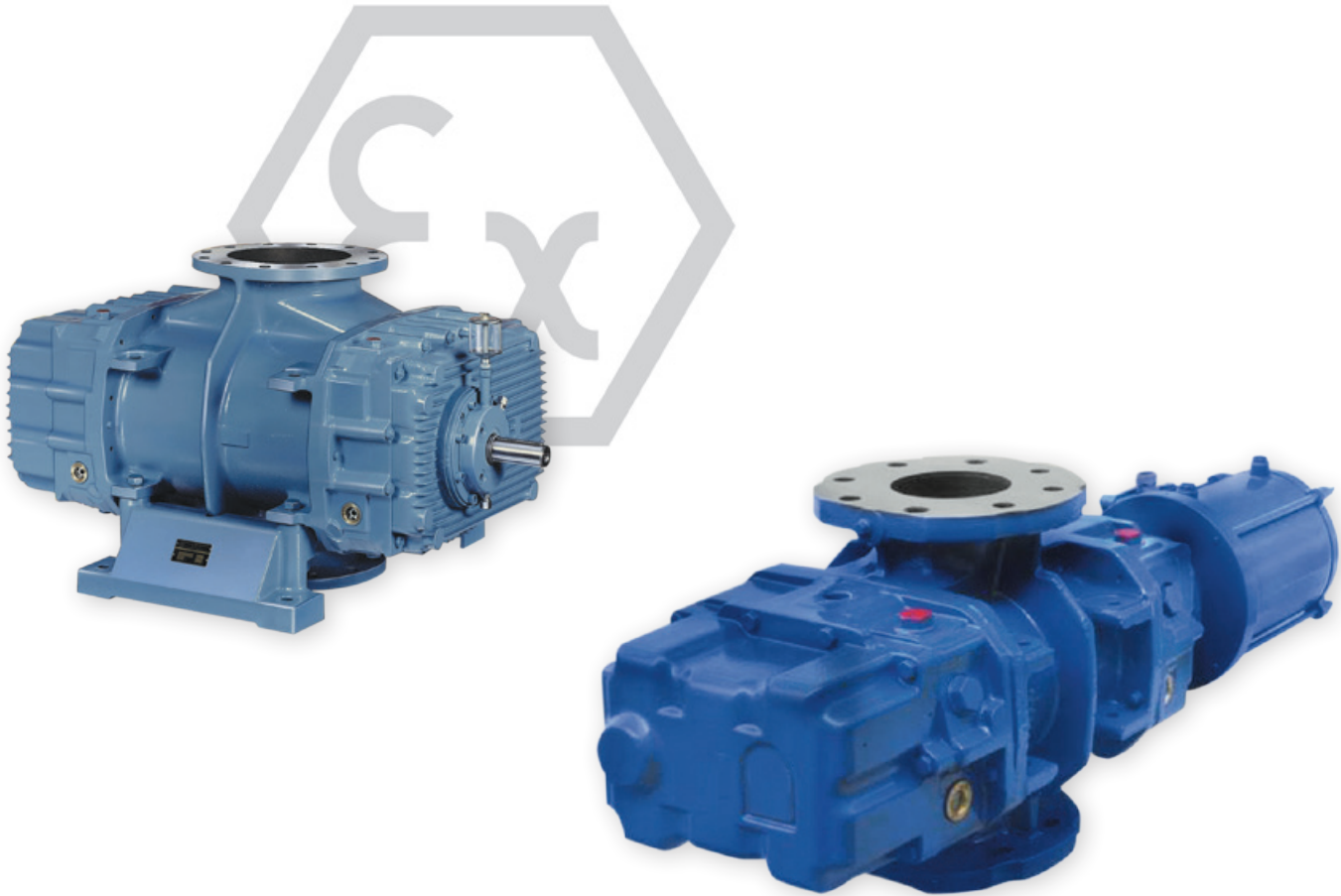
vacuum 0.02 mbar abs. - max. capacity 1,700 m³/h. - Energy savings resulting from low motor rating - Compact footprints - Much reduced operating and maintenance costs. The GC vacuum packages can be further enhanced with accessories such as electrical panels to EC standards, process control options, inlet filters.

Technical Specifications

Pump type		GC 11.3-401	GC 11.4-541	GC 12.5-401	GC 12.6-541
		GMa11.3HV	GMa11.4HV	GMa12.5HV	GMa12.6HV
Vane vacuum pump		PVL401	PVL541	PVL401	PVL541
Effective capacity at 1 mbar (m ³ /h)	50 Hz	452	655	860	1200
	60 Hz	542	786	1030	1440
Ultimate pressure (mbar)		0.02	0.02	0.02	0.02
Motor power (kW)	50 Hz	9.7	14.0	11.5	16.5
	60 Hz	13.2	18.0	15.0	20.5
Noise level (dB(A))	50 Hz	79	79	79	80
	60 Hz	80	80	80	81
Weight (kg)	50 Hz	435	505	535	610
	60 Hz	474	537	589	642

Pump type		GC 12.5BP-401	GC 12.6BP-541
		GMa12.5HV/BP	GMa12.6HV/BP
Vane vacuum pump		PVL401	PVL541
Effective capacity at 1 mbar (m ³ /h)	50 Hz	840	1200
	60 Hz	1008	1440
Ultimate pressure (mbar)		0.02	0.02
Motor power (kW)	50 Hz	10.5	15.0
	60 Hz	15.0	20.5
Noise level (dB(A))	50 Hz	79	80
	60 Hz	80	81
Weight (kg)	50 Hz	542	630
	60 Hz	588	676

► **CM-ATEX Series**



Blowers HV series and CM series (fitted with canned motor), have been approved according to 94/9/EC standards, certified

for ATEX Zone 0 (internal) temperature class T3 (200 °C) and Zone 1 (external) for temperature class T4 (135 °C).

CUSTOMIZED VACUUM SYSTEMS

► Pumping Systems



Vacuum groups are systems designed for customers which need to couple single stage or two-stage vane vacuum pumps to Roots pumps.

This solution allows to get large capacity related to very high ultimate pressure (up to 10^{-5} mbar) in relatively limited room.

Those systems are usually used for degassing process, heat treatments, drying systems, freeze-drying process, closed chamber pumping down, etc.

The group characteristics are defined depending on customer requirements.

► **MEDISYSTEM Series**



Rough Vacuum
Pumps

Thanks to our experience developed in over forty years of vacuum pumps manufacturing, we have designed central vacuum systems series MEDISYSTEM. Manufactured in observance of EN ISO 7396-1 standards, these systems meet the requirements of all those medical structures, such as hospitals, clinics, nursing homes, analysis laboratories, etc. MEDISYSTEM groups are mainly formed by: three pumps systems able to guarantee the continuity of operation also in

case of emergency - vacuum tank fitted with vacuum switches - control panel, with 'touch-screen' system to check and schedule the complete group - antibacterial filter group with support and bypass system according to EN ISO 7396-1 standards - base-plate for all the components. MEDISYSTEM can be supplied as turnkey systems or as single component for the integration of already existing groups.

Technical Specifications

		CTV 500-15/H CTV 500-15B/H	CTV 500-45/H CTV 500-45B/H	CTV 500-65/H CTV 500-65B/H
Tank (l)		500	500	500
Nominal capacity (m³/h)	50 Hz	3x18	3x48	3x69
	60 Hz	3x21	3x58	3x83
Ultimate pressure (abs) (mbar)		0.5 (20)	0.5 (10)	0.5 (10)
Motor power (kW)	50 Hz ~ 3	3x0.55	3x1.1	3x1.5
	50 Hz ~ 1	3x0.75	3x1.5	3x2.2
	60 Hz ~ 3	3x0.75	3x1.5	3x2.2
	60 Hz ~ 1	3x0.75	3x1.5	3x2.2
Dimensions (mm) (l x h x w)	50 Hz ~ 3	1425x2322x912	1425x2322x912	1425x2322x912

		CTV 900-105 CTV 900-105BB/H	CTV 900-160/H CTV 900-160B/H	CTV 900-300/H CTV 900-300B/H
Tank (l)		900	900	900
Nominal capacity (m³/h)	50 Hz	3x105	3x152	3x300
	60 Hz	3x126	3x182	3x360
Ultimate pressure (abs) (mbar)		0.5 (10)	0.5 (20)	0.5 (10)
Motor power (kW)	50 Hz ~ 3	3x2.2	3x3	3x5.5
	50 Hz ~ 1	—	—	—
	60 Hz ~ 3	3x3.0	3x4	3x7.5
	60 Hz ~ 1	—	—	—
Dimensions (mm) (l x h x w)	50 Hz ~ 3	2413x2433x1123	2413x2433x1123	2413x2433x1123

CENTRAL VACUUM SYSTEMS

▶ CSZ/CDZ Series



Agilent offers a wide range of central vacuum systems including vessel and either one or two vacuum pumps. Our central vacuum systems are offered with horizontal or

vertical vessel, to maximize floor space. Customized central vacuum systems having different characteristics than those shown on the standard catalogue are available on request.

Technical Specifications

		Nominal capacity (m ³ /h)	Ultimate pressure (abs) (mbar)	Tank (l)
CSZ100-15(/B)	50 Hz	1x18	0.5 (20)	100
	60 Hz	1x21	0.5 (20)	100
CSZ100-35(/B)	50 Hz	1x35	0.5 (20)	100
	60 Hz	1x42	0.5 (20)	100
CSZ300-45(/B)	50 Hz	1x48	0.5 (10)	300
	60 Hz	1x58	0.5 (10)	300
CSZ300-65(/B)	50 Hz	1x69	0.5 (10)	300
	60 Hz	1x83	0.5 (10)	300
CSZ500-105(/B)	50 Hz	1x105	0.5 (10)	500
	60 Hz	1x126	0.5 (10)	500
CSZ500-160(/B)	50 Hz	1x152	0.5 (10)	500
	60 Hz	1x182	0.5 (10)	500
CSZ500-205(/B)	50 Hz	1x207	0.5 (10)	500
	60 Hz	1x248	0.5 (10)	500
CSZ500-300(/B)	50 Hz	1x300	0.5 (10)	500
	60 Hz	1x360	0.5 (10)	500

ROUGH VACUUM PUMPS



Technical Specifications

		Nominal capacity (m ³ /h)	Ultimate pressure (abs) (mbar)	Tank (l)
CDZ300-15(/B)	50 Hz	2x18	0.5 (20)	300
	60 Hz	2x21	0.5 (20)	300
CDZ300-35(/B)	50 Hz	2x35	0.5 (20)	300
	60 Hz	2x42	0.5 (20)	300
CDZ500-45(/B)	50 Hz	2x48	0.5 (10)	500
	60 Hz	2x58	0.5 (10)	500
CDZ500-65(/B)	50 Hz	2x69	0.5 (10)	500
	60 Hz	2x83	0.5 (10)	500
CDZ500-105(/B)	50 Hz	2x105	0.5 (10)	500
	60 Hz	2x126	0.5 (10)	500
CDZ500-160(/B)	50 Hz	2x152	0.5 (10)	500
	60 Hz	2x182	0.5 (10)	500
CDZ900-205(/B)	50 Hz	2x207	0.5 (10)	900
	60 Hz	2x248	0.5 (10)	900
CDZ900-300(/B)	50 Hz	2x300	0.5 (10)	900
	60 Hz	2x360	0.5 (10)	900

ACCESSORIES

▶ L Series



LUBRICANTS - We are able to offer a wide range of mineral and synthetic oils which allow the use of our vacuum pumps in several fields, from food to chemical one.

▶ KM Series



SERVICE KITS - Agilent offers service kits with all the necessary spare parts. Routine and major service kits are available to allow you to maintain the pumps.

▶ F Series



AIR FILTERS - Agilent dust filters are vacuum tight. Their housing is made of printed steel and their filtering cartridge is made of treated paper with 7 micron filtration power. They can be supplied with 60 micron stainless steel cartridge.

▶ FSC Series



FILTER WATER TRAP - The filter water trap is recommended for those applications where the pump sucks small quantity of liquid/s.

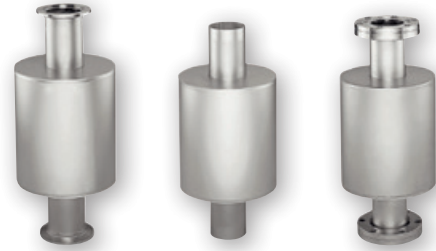
ROUGH VACUUM PUMPS

▶ CMV Series



MEDICAL FILTERS - Antibacterial filters series CMV ensure high filtration power able to avoid virus and bacteria propagation to environment. The filter elements have an efficiency $\geq 99,999\%$.

▶ Foreline Roughing Traps



Agilent's new traps are designed to prevent the backstreaming of mechanical pump fluids. Copper and stainless steel gauze inserts are designed to reduce oil backstreaming.

Rough Vacuum
Pumps

▶ Exhaust Filters /TMF Series



OIL MIST TRAPS - Oil mist traps get rid of the oil mist easily by using a double filtering system in order to get the working environment free from polluting agents.

