



# Professional Vacuum Technology for Chemistry, Life Science and Industry

*The future belongs to **her**.*



**Vacuum Pumps, Vacuum Systems, Vacuum Measurement  
and Control, Vacuum Networks**

## ILMVAC - Service

### Qualification

Every member of the ILMVAC workforce is highly qualified. By regular formal training courses we ensure that our staff are familiar with the latest products and applications. Training according to DIN EN ISO guarantees.

### Service Training

We can help you to carry out appropriate maintenance work within the scheduled requirements. The basic training can be given on site or in our workshops and a two day general vacuum and maintenance course is held twice a year.

### Maintenance

We can provide contracted maintenance according to the schedule for your product and process. Of course, maintenance by our qualified engineers is also available as and when you require it. Just call us!



### Repairs

Whether you require routine maintenance or a more thorough repair service, we guarantee a comprehensive service at a fair price. After and initial inspection we give you a complete cost plan. You are then free to consider the repair or discuss with us a replacement product.

### Service/Exchange Options

To reduce your down time we can often bypass the time it takes to service of repair your vacuum equipment by exchanging your returned product with a replacement from our service stock. Call us to discuss the options specific to you.

### Demonstrations and Appraisals

With ILMVAC you need never be left in the dark about the product you are buying. We provide instant access to sales literature and Operation and Maintenance manuals via email. From there we can arrange demonstrations and trial periods to ensure you make the correct purchasing decisions every time.



### Customer Service

With excellent technical knowledge of products and applications, the ILMVAC Customer Care team is always at your service.



### Operator Training

Get the best from your ILMVAC products. We are pleased to provide on site training in the operation of your vacuum systems, at any time.



PROJECT PART-FINANCED BY THE EUROPEAN UNION AND STATE OF THURINGIA



## Dear Customers

The requirements of analytically clean sample preparation for the laboratory continues to grow as analytical technologies become more sensitive. This can only be accomplished if the test is not contaminated by the sample processing. Therefore, ILMVAC has concentrated on the development of dry running vacuum pumps which are free from the possibility of pump lubricant contamination. Currently many Research & Development Laboratories are using rotary vane oil based vacuum pumps which by definition are a potential source for hydrocarbon contamination in the sample. Dry running pumps would guarantee them the elimination of oil or other hydrocarbon contamination from their sample processing when vacuum is required.

This brochure will give you an overview of our products used in the Chemistry, Life Science, Pharmaceutical & Cosmetics, Food & Drink and Environmental Markets. Dry Running Vacuum Pumps are well suited for the typical applications in the Analytical laboratory: Vacuum Filtration, Vacuum Drying, Freeze Drying, Vacuum Centrifugal Concentration, Evaporation Processes, particularly with Rotary Evaporators, Vacuum Distillation and Extraction. However, we would be pleased to provide you with our total Catalog and Technical Data Sheets that will give you detailed information for your specific application need. You can also find our complete product offerings on our web site

[www.ilmvac.com](http://www.ilmvac.com).

We can also offer custom designed systems if your application falls outside our normal product range.

## Analytically pure Vacuum



The Purity-Applied Concept of ILMVAC offers analytically pure vacuum for dry running vacuum pumps and pump stands. With the exception of the oil based rotary vane pumps and oil diffusion pump systems, all products listed in this brochure fulfill the 10 severe Purity-Applied requirements:

1. No oil or hydrocarbon contamination
2. No oil vapor in the pump exhaust
3. Low noise level
4. Low energy requirements
5. Optimized cooling requirements
6. Optimum vacuum level range
7. Simple operation
8. Long pump lifetime
9. Reduced service requirements
10. Components may easily be recycled

### ILMVAC Dry Running Pumps

- Chemical and Standard Diaphragm Pumps
- Chemical Dry Running Scroll Pumps
- Hold Back Pumps
- Laboratory Vacuum Systems LVS
- ILMDEST+ Vacuum Distillation System
- Safety Aspiration Systems BioVac and FluiVac
- AnaVac Anerobic Vacuum System
- SpindelVac Spindel Pumps\*
- Turbomolecular Pump stand Systems

\* Not presented in this brochure



## Scroll Pumps

The new ILMVAC scroll pumps „Dry Run I and II“ are intended for use as dry-running vacuum generators in the laboratory and in industry.

ILMVAC scroll pumps have been designed for applications involving condensable vapors. Integrated gas ballast, combined with the unique vertical shaft technology, ensure that condensates flow easily from the pump chamber through the exhaust port.

The special surface treatment on the wetted surface makes these pumps suitable for a wide range of chemical applications. The drive mechanism and bearings are isolated from the vacuum environment.

- chemical application
- vacuum furnaces
- vacuum drying
- freeze drying
- vacuum concentration
- refrigeration technology
- glove boxes

**Field of application:**

- electron microscopy
- accelerators
- vacuum methods with high degree of purity
- coating
- backing pumps for turbo-molecular pumps
- refrigeration technology

The scroll pump can be operated either as a single pump or in pump combinations.

**Purity  
Applied**



### Scroll Pumps

Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
		(m <sup>3</sup> /h)		l/min				
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz			
Dry Run I	7 x 10 <sup>-2</sup>	10	11	158	186	470/320/440	30,0	460002
Dry Run II	7 x 10 <sup>-2</sup>	15	17	241	286	470/320/440	30,0	460003

## Rotary Vane Pumps

Our superior material selection and optimised design ensures the best performance and reliability. The result is a professional solution for research and industry.

### Advantages of the ILMVAC rotary vane pumps for the users:

- long service intervals
- compact, robust and functional construction
- high water vapor tolerance for chemical applications
- high pumping speed
- low, ultimate pressures is reached quickly
- low noise emission
- free of non-ferrous metals

### Ranges of application:

- vacuum drying
- freeze drying
- vacuum concentration



## Rotary Vane Pumps PK/P-Series

The rotary vane pumps of the PK p series from ILMVAC are characterised by their high water vapour tolerance and reliability. These chemically resistant pumps are ideally suited for use in the laboratory.

## Rotary Vane Pumps with variable Pumping Speed P-F-Series

The pumping speed is controlled without any complicated valve mechanism. The individual parameters can be easily setup. The variable pumping speed pumps are energy saving and have an elongated life time as well as longer service intervals.



## chemvac Combination Pump Systems

The combination of a diaphragm pump with a rotary vane pump was developed to take advantage of the strong points of each type of pump. The result is a pump with the vacuum capabilities of a rotary vane pump combined with the solvent and acid handling capabilities of a PTFE diaphragm pump.

For the fine-vacuum range in special applications, e.g.

- for aggressive gases and vapours
- for evacuation of solvent recovery vapours
- for pumping of vapours which are soluble in oil



### Rotary Vane Pumps PK/P-Series

Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
		(m³/h)		l/min				
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz			
PK 2 DC	1x10 <sup>-2</sup>	2	2	30	37	300/120/150	8,0	302010
PK 4 Dp	2x10 <sup>-3</sup>	5	6	76	91	405/150/210	18,0	302099
PK 6 Dp	2x10 <sup>-3</sup>	6	7	96	110	415/150/210	20,0	302100
PK 8 Dp	2x10 <sup>-3</sup>	7	9	120	143	430/150/210	22,0	302101
P 12 Dp	2x10 <sup>-3</sup>	11	13	183	219	525/180/280	30,0	302314
P 17 Dp	2x10 <sup>-3</sup>	16	19	266	319	525/180/280	33,0	302315
P 23 Dp	2x10 <sup>-3</sup>	21	25	349	418	525/180/280	33,5	302316

NEW  
NEW  
NEW

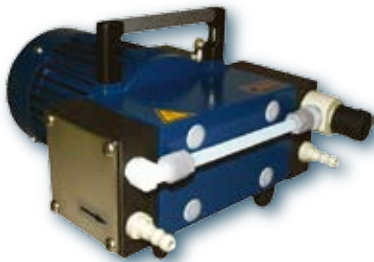
### Rotary Vane Pumps with variable Pumping Speed P-F-Series

P 40 DF	2x10 <sup>-3</sup>	37		614		650/270/270	39,0	302472
P 30 DF	2x10 <sup>-3</sup>	30		498		650/270/270	38,0	302473

### chemvac Combination Pump Systems

6 Dp - 101	3x10 <sup>-3</sup>	6	7	96	110	415/260/340	29,0	109021
12 D - 101	1x10 <sup>-2</sup>	11		183		480/230/380	34,5	109013
23 D - 101	3x10 <sup>-3</sup>	21		349		570/230/380	36,0	109015

## Diaphragm Pumps



For dry, oil-free applications in the rough and medium-high vacuum range ILMVAC diaphragm pumps are used world-wide in production, research and science as well as in industry, laboratory and education. As an economically and ecologically superior alternative to water operated vacuum pumps the ILMVAC diaphragm pump range always offers a versatile, practical solution for many diverse applications between atmosphere and 1 mbar.

- vacuum distillation
- vacuum concentration
- vacuum filtration
- vacuum drying, etc.

### ILMVAC diaphragm pumps offer

- different material for chemical or physical processes
- regulated or unregulated vacuum
- flow rates from 300l/h to 16m<sup>3</sup>/h
- final pressures from 75 to < 1 mbar



### Advantages of the ILMVAC diaphragm pumps for the users:

- compact, practical solution for vacuum range 1000 to 1 mbar
- quick and simple maintenance and service work
- optimised design for excellent final vacuum
- long lifetime
- oil free, low noise levels
- also available as complete diaphragm pumping systems (laboratory vacuum systems LVS) or combination pumping systems (Chemvac)

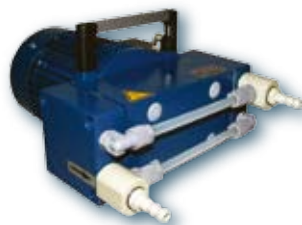
**Purity  
Applied**

## Diaphragm Pumps for physical applications

MP Series diaphragm pumps are compact and designed for oil free evacuation of permanent gasses. They are available in various configurations- one- or multistage, with controlled or uncontrolled suction operation. The long lifetime is typical for this kind of pumps.

### Ranges of application:

- for oil-free applications within the rough vacuum range
- degassing of non-corrosive liquids
- vacuum handling applications, tweezers etc.



## ecoflex Diaphragm Pumps Frequency Controlled

### The new generation of intelligent vacuum engineering.

Ecoflex diaphragm pumps are equipped with the vacuum Controller VCZ and are able to automatically adjust their rotational speed. Thus regulation of flow rate to match demand is achieved and the accuracy of the vacuum level is improved. The vacuum processes run more effectively and reproducibly. A reduction in operating cost of up to 80% is possible, so ecoflex diaphragm pumps guarantee a positive economic and ecological balance.



### Diaphragm Pumps for physical applications

Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
		(m <sup>3</sup> /h)		l/min				
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz			
MP 104 E	60	0,9		15		124/210/223	5,7	400059
MP 201 E	75	2	2	30	33	195/235/145	6,5	400172
MP 601 Ep	75	4	4	63	70	230/265/169	11,2	4000292
MP 1201 Ep	75	8	9	138	151	230/380/169	18,3	4000392
MP 2401 Ep	75	16	17	257	282	540/300/240	32,8	4001532
MP 054 Z	5	0,48		8		124/210/223	5,7	400055
MP 101 Z	8	1	1	17	18	195/235/145	6,5	400170
MP 301 Zp	8	2	3	38	42	230/265/169	11,2	4000282
MP 901 Zp	8	7	8	113	125	230/380/169	18,3	4000322
MP 1801 Zp	8	12	13	199	221	540/300/240	32,8	4001542
MP 201 T	2	2	2	33	37	200/260/150	10,3	400176
MP 601 Tp	2	5	5	75	81	230/380/169	18,3	4000312
MP 1201 Tp	2	8	9	138	151	540/300/240	32,8	4001522
MP 101 V	1	1	1	17	18	200/260/150	10,3	400180
MP 301 Vp	1	2	3	38	42	230/380/169	18,3	4000722

### ecoflex Diaphragm Pumps Frequency Controlled

MP 301 Zp ecoflex	8	2,6		43		260/310/190	15,5	4200102
MP 601 Tp ecoflex	2	4,9		81		260/420/190	22,6	4200142
MP 1201 Tp ecoflex	2	8,3		138		540/300/320	34,0	4200162
MP 301 Vp ecoflex	1	2,6		43		260/420/190	22,6	4200122

## Diaphragm Pumps Chemically Resistant

Chemically resistant diaphragm pump models MPC, are fully suited and to applications where aggressive solvent and acid vapours are present. The diaphragms and other wetted parts are made from compounds of PTFE, PP and PVDF. The pumping and connection heads are carbon fibre reinforced with a small electrical conductivity. This prevents electrostatic loading and minimizes the danger of igniting gas mixtures in the pump by electrostatic breakdown.



## ecoflex Diaphragm Pumps Chemically Resistant Frequency Controlled

**The new generation of intelligent vacuum engineering.**

Ecoflex diaphragm pumps are equipped with the vacuum Controller VCZ and are able to automatically adjust their rotational speed. Thus regulation of flow rate to match demand is achieved and the accuracy of the vacuum level is improved. The vacuum processes run more effectively and reproducibly. A reduction of the operating cost up to 80% is possible, so ecoflex diaphragm pumps guarantee a positive economic and ecological balance.

ecoflex diaphragm pumps in chemically resistant form (MPC), are resistant to aggressive solvent and acid vapours. The diaphragms and wetted parts consist of PTFE or PTFE-Compounds.

The pumping and connection heads are carbon fibre reinforced with a small electrical conductivity. This prevents electrostatic loading and minimizes the danger of igniting gas mixtures in the pump by electrostatic discharge.



## ATEX Approved Diaphragm Pumps

For evacuation of combustible gas or vapor mixtures, a risk assessment should be carried out by the user in accordance with guidelines 1999/92/IEG(ATEX 137).

Where required, ILMVAC provide chemically resistant diaphragm pumps which meet the requirements 94/9/IEG(ATEX 95). The two models have been developed for use in EX category 2 Zone 1, and are approved with rating ATEX 95- II G C IIB T4 X.



Diaphragm Pumps Chemically Resistant									
Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.	
		(m <sup>3</sup> /h)		l/min					
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz				
MPC 201 E	75	2	2	30	33	195/235/145	6,5	400173	
MPC 601 Ep	75	4	4	63	70	230/265/169	11,2	4000492	
MPC 1201 Ep	75	8	9	138	151	230/380/169	18,3	4000532	
MPC 2401 Ep	75	16	17	257	282	540/300/240	32,8	4001792	
MPC 054 Z	5	0,48		8		124/210/223	5,7	400054	
MPC 101 Z	8	1	1	17	18	195/235/145	6,5	400171	
MPC 301 Zp	8	2	3	38	42	230/265/169	11,2	4000482	
MPC 901 Zp	8	7	8	113	125	230/380/169	18,3	4000522	
MPC 1801 Zp	8	12	13	199	221	540/300/240	32,8	4001552	
MPC 201 T	2	2	2	33	37	200/260/150	10,3	400177	
MPC 601 Tp	2	5	5	75	81	230/380/169	18,3	4000512	
MPC 1201 Tp	2	8	9	138	151	540/300/240	32,8	4001782	
ecoflex Diaphragm Pumps Chemically Resistant Frequency Controlled									
MPC 601 Tp ecoflex	2	4,9		81		260/420/190	22,6	4200132	
MPC 1201 Tp ecoflex	2	8,3		138		540/300/320	34,0	4200152	
ATEX Approved Diaphragm Pumps									
MPC 301 Zp Ex ATEX Kat.2	8	2,3		38		240/300/260	22,9	4000481-04	
MPC 601 Tp Ex ATEX Kat.2	2	4,5		75		240/425/272	29,7	4000511-04	



## Diaphragm Pump Systems Chemically Resistant

# Purity Applied

ILMVAC Laboratory Vacuum Systems have been developed to provide optimal vacuum for a variety of applications in the research lab.

Flow rates and final vacuum can be selected for a given process and can easily be reconfigured due to our 'plug and play' pump change over facility.

Designed for chemical applications, all wetted parts are made from high quality chemically resistant materials. We use PTFE, PVDF, PP and clear plastic coated glassware.



### Hold Back Pump

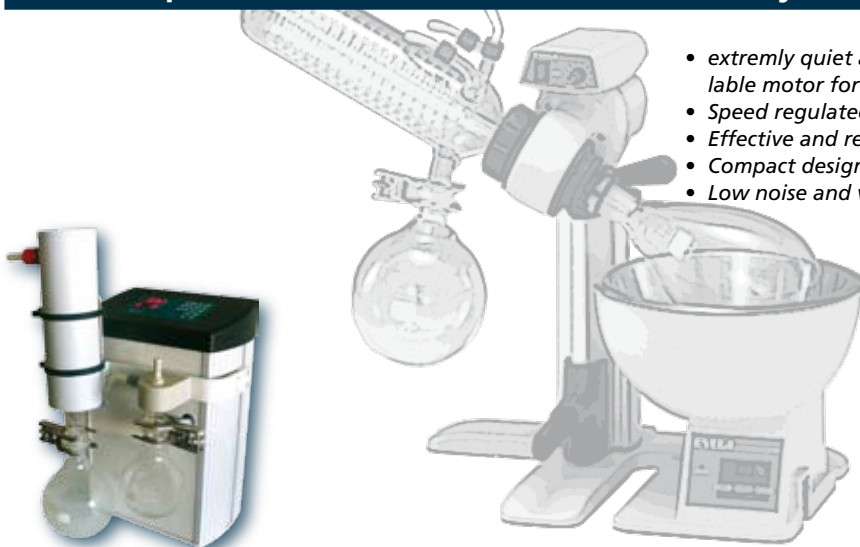
The truly new and unique development for **completely automatic and environmentally friendly vacuum distillations**. The solvent recovery yield of almost 100 % guarantees very low emission rates to the environment.

Hold-Back-Pumps operate without a controller by bringing physical condensation laws into practice. The boiling point of the solvent, or solvent mixture need not be known, monitored or controlled externally. The product is concentrated in just one evaporation cycle, quickly and without loss since the process is maintained at the optimum boiling point. There are no environmentally dangerous emissions, since the whole process is executed in a closed circuit.

Hold-Back-Pumps guarantee a fully-automatic process without any manual adjustment or regulation and without time consuming and costly electronic controller. The distillation result is considerably better and more economically sound than when using a diaphragm pump system with control valve or speed control.

Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
		(m <sup>3</sup> /h)		l/min				
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz			
HBP 101	10	2	3	38	42	310/270/490	18,8	112009

## LVS 110 Tp ecoflex - The Ideal Partner for Rotary Evaporators



- extremely quiet and efficient 24V electronically speed controllable motor for wide range voltage use (90-260 V)
- Speed regulated – point accurate - analytically pure vacuum
- Effective and reproducible processes
- Compact design for an ultimate vacuum of < 2 mbar
- Low noise and vibration

**NEW**

# Purity Applied

Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
		(m <sup>3</sup> /h)		l/min				
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz			
LVS 110 Tp ecoflex <sup>(7,8)</sup>	<2	1,1	1,2	18	20	250/260/435	8,5	113184



## Laboratory-Vacuum-Systems Chemically Resistant with a new design

ILMVAC Laboratory Vacuum Systems have been developed to provide optimal vacuum for a variety of applications in the research lab. Flow rates and final vacuum can be selected for a given process and can easily be reconfigured due to our 'plug and play' pump change over facility. The modular design of the LVS family make upgrades easy. Pumps have a simple plug in interface and can be swapped in minutes to allow for flow rate and ultimate vacuum requirement changes. Designed for chemical applications, all wetted parts are made from high quality chemically resistant materials. We use PTFE, PVDF, PP and clear plastic coated glassware. The use of chemically resistant materials makes LVS suitable for evacuation of solvent and acid vapors as well as permanent gasses. Maintenance is minimised due to dry-running, chemically resistant diaphragm pumps.

According to the application, ILMVAC LVS models can be supplied with or without vacuum control. Three control philosophies are available: The **standard version** being a chemically resistant solenoid valve with two points control.

**economic** Laboratory Vacuum Systems are equipped with our VCZ vacuum controller operating and intelligent stand by mode. When the user defined vacuum range is achieved the pump is switched off and when demand increases it starts automatically. In this way, wear on the pump is greatly reduced resulting in longer life span and service interval. Background noise and operating costs are also greatly reduced.

**ecoflex** Laboratory Vacuum Systems are equipped with our VCZ controller operating as a speed regulator for the chemically resistant pump. The single point, user defined vacuum level is maintained by automatically adjusting the pumping speed to match the vapor load generated by the process.

Maintaining exactly the vacuum level required makes the process operate more efficiently and run times can be reduced by 30%. Wear in the pump is reduced, service intervals and life span extended, and the operating costs can be cut by 80%.

All controlled Laboratory Vacuum Systems are available with a movable control pad.

# Purity Applied

Small dimensions

Movable control pad



### Laboratory-Vacuum-Systems Chemically

Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
		(m <sup>3</sup> /h)		l/min				
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz			
LVS 300 p <sup>(1)</sup>	8	2	3	38	42	310/270/490	16,5	113041
LVS 101 p <sup>(2)</sup>	8	1	1	17	18	310/270/490	12,0	113022
LVS 301 p <sup>(2)</sup>	8	2	3	38	42	310/270/490	16,7	113042
LVS 302 p <sup>(3)</sup>	8	2	3	38	42	310/270/490	17,3	113043
LVS 110 p <sup>(4)</sup>	8	1	1	17	18	310/270/490	13,5	113024
LVS 310 p <sup>(4)</sup>	8	2	3	38	42	310/270/490	18,2	113044
LVS 311 p <sup>(5)</sup>	8	2	3	38	42	310/270/490	18,5	113045
LVS 600 Tp <sup>(1)</sup>	2	5	5	75	81	310/270/490	23,6	113051
LVS 201 Tp <sup>(2)</sup>	2	2	2	30	33	310/270/490	15,8	113032
LVS 601 Tp <sup>(2)</sup>	2	5	5	75	81	310/270/490	23,8	113052
LVS 602 Tp <sup>(3)</sup>	2	5	5	75	81	310/270/490	23,8	113053
LVS 210 Tp <sup>(4)</sup>	2	2	2	30	33	310/270/490	17,3	113034
LVS 610 Tp <sup>(4)</sup>	2	5	5	75	81	310/270/490	25,1	113054
LVS 1210 Tp <sup>(4)</sup>	2	8	9	138	151	540/310/490	36,3	113064
LVS 611 Tp <sup>(5)</sup>	2	5	5	75	81	310/270/490	25,4	113055
LVS 110 Mp economic <sup>(6)</sup>	8	1	1	17	18	310/270/490	13,3	113028
LVS 210 Tmp economic <sup>(6)</sup>	2	2	2	30	33	310/270/490	17,1	113038
LVS 310 Mp economic <sup>(6)</sup>	8	2	3	38	42	310/270/490	18,0	113048
LVS 610 Tmp economic <sup>(6)</sup>	2	5	5	75	81	310/270/490	25,1	113058
LVS 1210 Tmp economic <sup>(6)</sup>	2	8	9	138	151	540/310/490	36,1	113068
LVS 210 Tp ecoflex <sup>(7)</sup>	2	2,2		37		310/270/490	20,4	113124
LVS 310 p ecoflex <sup>(7)</sup>	8	2,6		43		310/270/490	21,3	113074
LVS 610 Tp ecoflex <sup>(7)</sup>	2	4,9		81		310/270/490	28,2	113084
LVS 1210 Tp ecoflex <sup>(7)</sup>	2	9,1		151		540/310/490	37,1	113094

(1) for unregulated vacuum

(2) economic operation an environmentally friendly, includes one uncontrolled connection

(3) for two uncontrolled vacuum applications in one system

(4) one controlled vacuum application

(5) for one controlled and one uncontrolled vacuum application

(6) LVS economic- vacuum on demand

(7) LVS ecoflex – speed regulated – point accurate vacuum

(8) LVS ecoflex – speed regulated – point accurate vacuum with a 24V electronically speed controllable motor for wide range voltage use (90-260 V)

## Univac- Cascade Diaphragm Pump Systems



For the central supply of several vacuum consumers the diaphragm pumping systems type MPKC „Univac“ are particularly well suited.

In a mobile framework up to 8 diaphragm pumps can be accommodated. The measurement and control system is easy to operate and maintain, installed in the switchbox.

The Controller VCZ regulates the pump system with its unique software.

**Purity  
Applied**

### Univac- Cascade Diaphragm Pump Systems

Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
		(m <sup>3</sup> /h)		l/min				
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz			
MPKC 2401 T	2	15		249		380/950/620	98	420105
MPKC 4801 T	2	35		581		380/1570/620	120	420107

## Vacuum-Distillation-System ilmdest<sup>+</sup>



**Purity  
Applied**

The ilmdest is the advanced Hold-Back-Pump combined with a water heating system and lift with round-bottomed flask as a complete vacuum distillation system. ILMVAC offers this product in two forms, as „ilmdest“ - a single unit or as „ilmdest<sup>+</sup>“ - complete with water bath.

The ilmdest is a completely automatic distillation unit developed for cost optimising in the laboratories. Through extensive application tests we have developed an approach which makes it possible to replace a rotary evaporator with a static evaporator flask in the water heating bath. The economics are impressive! You have the same effect as using a rotary evaporator. You can achieve recovery rates of appr. 100 %.

### Vacuum-Distillation-System ilmdest<sup>+</sup>

Type	Ultimate pressure (mbar)	Pumping speed				Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
		(m <sup>3</sup> /h)		l/min				
		at 50 Hz	at 60 Hz	at 50 Hz	at 60 Hz			
ilmdest <sup>+</sup>	10	2	3	38	42	310/550/550	26,8	112008

## Gas-System anavac for Anaerobic Microbiological Analysis

The new anavac Gas-System is consisting of a microprocessor-based controller connected with a diaphragm vacuum pump and a nitrogen gas reservoir. The necessary vacuum, the gas exchange pressure and the number of cycles can be programmed at the keypad of the controller. By simply pressing the start button the process starts and runs fully automatic.

The container will be evacuated to the pressure adjusted, vented with the reaction gas connected to the system and the pre-programmed number of cycles is processed automatically. No additional chemicals are needed to create an anaerobic atmosphere. The anavac system is cost-saving and easy to use. Special click-connectors provide convenient, safe and time-saving operation.

**NEW**

**Purity Applied**



Type	Ultimate pressure (mbar)	Pumping speed m <sup>3</sup> /h at 50/ 60 Hz	Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
ANAVAC 104	<2	0,8/0,9	235/145/345	7	112011

## Aspiration-Systems

The aspiration systems with integrated, chemically resistant, diaphragm pump are ideal to remove liquid and non-explosive remnants of chemical, biological or medical applications safely. It is easy to remove liquids through various kinds of pipettes and glass points which can be inserted into the pipette carrier of the hand piece. The large catch pot is automatically isolated as soon as the maximum filling level is reached. The catch-pot is fitted

with a moulded seal for added safety. Between the catch pot and the pump, there is a filter holder in which diaphragm filters of up to 0.22 µm can be inserted, depending on the application. The degree of separation depends on the porosity of the filter, so that bacteria and viruses can be handled safely. The catch pot and the diaphragm pump are connected via fast locking couplings with integral bi-directional isolation valve.

### Biovac and Fluivac

**Special characteristics:**

- container autoclavable
- catch pot made of vacuum resistant glass

### Vacuum Container

**Special characteristics:**

- aspiration system for house vacuum systems
- container autoclavable
- catch pot made of coated glass, 5 liter
- operation at constant pressure



**NEW**

**Purity Applied**



Type	Ultimate pressure (mbar)	Pumping speed (l/min)	Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
biovac 104 - hand piece, 2 l	100	12	330/170/370	8	112010
fluivac 105 - hand piece with flexible tube, 5 l	100	63	340/300/605	14	112007
Vacuum Container	100		220/220/480	5	112548



## CDK Turbomolecular Pump Systems



The functional units for generating high and ultra-high vacuums are completely mounted in a housing and ready for operation. CDK turbomolecular pump systems are compact and dry running. All CDK turbomolecular pump systems have an automatic switch off device for the fore-vacuum system. The fore-vacuum combination is switched off as soon as the ultimate pressure has been reached in the receptacle. The solenoid valve in the fore-vacuum piping to the turbomolecular pump is closed simultaneously. This prevents reverse venting of the turbomolecular pump and receptacle.

The major advantages of this automatic switch off are:

- The service lives of the diaphragm pump are substantially increased to up to 10,000 operating hours
- The noise level is noticeably reduced by at least 3 dB(A)
- The operating costs for energy consumption are reduced, this becomes especially noticeable when several CDK turbomolecular pump systems are used.

**Purity  
Applied**

### CDK Turbomolecular Pump Systems

Type	Ultimate pressure (mbar)	Pumping speed eff N <sub>2</sub> /He/H <sub>2</sub> (l/s)	Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
CDK 160	1x10 <sup>-7</sup>	40 27 20	170/260/340	10,0	101220
CDK 215	1x10 <sup>-7</sup>	60 30 20	170/260/320	10,0	101221
CDK 250	5x10 <sup>-8</sup>	68 60 45	170/260/335	12,0	101222
CDK 1000	5x10 <sup>-8</sup>	280 230 210	270/450/560	43,0	101223

## Oil Diffusion Pump Systems



Complete ready-to-use Oil Diffusion Pump Systems for the high and ultra high vacuum range using the oil diffusion technique. All Oil Diffusion Pump Systems consist of an oil diffusion pump combined with a two stage rotary vane vacuum pump including Pirani vacuum gauge PIA 1, a high vacuum valve, a baffle, a backing valve and a roughing valve, vacuum pipes all mounted on a coated steel frame.

**Advantages:**

- optimum composition of components
- high pumping speed, the ultimate pressure is reached very quickly due to the optimised design
- low cooling water consumption, cooling water connection with hose nozzles 2x DN 10
- type DPIDM with manual valve operation
- type DPIDP with pneumatic valve operation

Option: Additional high vacuum gauge PEN 100.

### Oil Diffusion Pump Systems

Type	Ultimate pressure (mbar)	Pumping speed eff (l/s)	Dimensions (W/D/H) (mm)	Weight (kg)	Order-No.
DP 63/4DM	1x10 <sup>-6</sup>	110,0	300/300/750	23	100216
DP 100/8DM	1x10 <sup>-6</sup>	210,0	350/350/850	30	100217
DP 63/4DP	1x10 <sup>-6</sup>	110,0	300/300/750	24	100218

## Vacuum measurement and control

The total range of scientifically useful vacuum extends from approx. 1000 mbar (atmospheric pressure) down to  $10^{-12}$  mbar, the ultra high vacuum range.

The instruments for measuring the pressure are vacuum gauges. No one physical measuring technique covers the whole vacuum/pressure range.

Particular sensors and gauges must be used for parts of the whole range, rough, fine, high and ultra high vacuum.

To cover a wider pressure range different systems must be combined.

The selection of the right vacuum gauge depends not only on the measuring range but also on the operating conditions such as mechanical vibrations, chemical contaminations and accuracy required.

The wide range of ILMVAC vacuum gauges covers the different pressure ranges and applications. Some instruments can also be used as controllers due to the intelligent integrated electronics.

### Rough vacuum gauges

Measuring range: atmospheric to 1 mbar

The pressure measurement is independent of the type of gas.

### Fine vacuum gauges

Measuring range: 1 mbar to approx.  $10^{-3}$  mbar

The pressure measurement is dependent on the type of gas.

### High vacuum gauges

Measuring range:  $10^{-3}$  mbar to approx.  $10^{-7}$  mbar

The pressure measurement is dependent on the type of gas.

### Multi-Range Vacuum Gauges

Measuring range: 4000 -  $10^{-5}$  mbar

Combination of "Piezo" and "Pirani"



PIZA 111



Bourdon Gauge



MRV 3000

### Rough Vacuum Gauges 1000 - 1 mbar, Gas Type Independent

Type	Measuring range max. (mbar)	Connection	Diameter (mm)	Order-No.
Bourdon Gauge VMF 16 Aluminium, DN 16 KF	1000 - 1	DN 16 KF	50	600201
Bourdon Gauge VMF 8 Stainless Steel, DN 8	1000 - 1	DN 8 Hose nozzle	50	600201-01
Bourdon Gauge VMF 16 Stainless Steel, DN 16 KF	1000 - 1	DN 16 KF	50	600201-1

### Rough Vacuum Gauges with Capacitive Sensor PIZA

Type	Measuring range max. (mbar)	Connection	Dimensions (W/D/H) (mm)	Order-No.
PIZA 101	1050 - 1		80/36/125	600071

### Fine Vacuum Gauges with Thermal Conductivity acc. to Pirani

NEW

Type	Measuring range max. (mbar)	Recorder output (V)	Dimensions (W/D/H) (mm)	Order-No.
PIA 1.2	$1000 - 10^{-3}$	0 - 10	96/118/48	600008
PIA 100	$120 - 10^{-3}$	0 - 10	98/152/98	600011

### Fine Vacuum Gauge with Capacitive Sensor PIZA

Type	Measuring range max. (mbar)	Recorder output (V)	Dimensions (W/D/H) (mm)	Order-No.
PIZA 111	$1050 - 10^{-3}$		80/36/125	600072

### High Vacuum Gauges $10^{-3} - 10^{-7}$ mbar, Gas Type Dependent

Type	Measuring range max. (mbar)	Recorder output (V)	Dimensions (W/D/H) (mm)	Order-No.
PEN 100	$5 \times 10^{-2} - 5 \times 10^{-8}$	0 - 10	98/152/98	600015

### Multi-Range Vacuum Gauges 4000 - $10^{-5}$ mbar

NEW

Type	Measuring range max. (mbar)	Recorder output (V)	Dimensions (W/D/H) (mm)	Order-No.
MRV 3000	$2000 - 10^{-10}$	0 - 10	95/119/95	600080

## Vacuum Control Box VCB 424



The vacuum control box VCB 424 is available in four types to allow for control of different vacuum sources.

**VCB 424 cv:**  
with pressure control over control valve integrated at the box

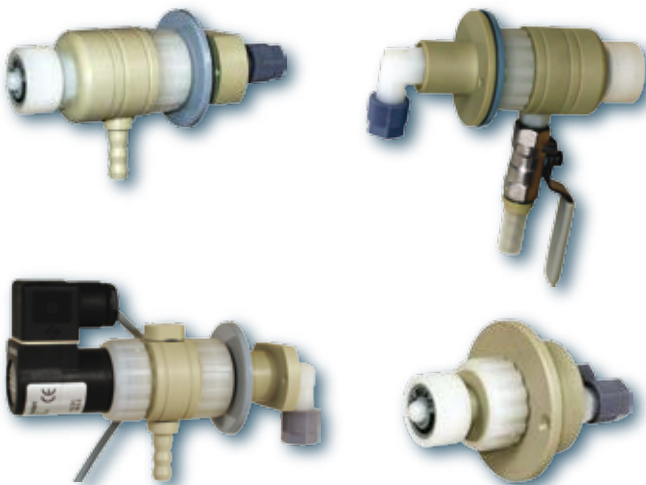
**VCB 424 ef:**  
with pressure control over a analog output for the control of an external speed adjusted vacuum pump (ecoflex)

**VCB 424 en:**  
with pressure control of an external vacuum pump by on/off circuit of the motor (economic)

**VCB 424 es:**  
with external sensor and ventilation valve for the regulation of the vacuum over a optional control valve or over a analog output for the control of an external speed adjusted vacuum pump (ecoflex) or an external vacuum pump by on/off circuit of the motor (economic).

Type	Measuring range max. (mbar)	Weight ( Kg)	Maße ( B/T/H ) ( mm)	Order-No.
VCB 424 cv	1100 - 1	1,6	195/178/105	600037

## Vacuum networks - netvac



ILMVAC vacuum networks can be constructed in an infinite number of ways to produce exactly the right solution for any requirement.

The wide range of interchangeable valve models and connecting devices make the job of extending or reconfiguring the network easy. Constructed from chemically resistant materials, the network components are ideally suited for laboratory as well as industrial use.

Any of our pumps can be used with Netvac networks, the most common being diaphragm and scroll pumps.

## Flange components



- Quality products
- Short lead times
- Latest manufacturing techniques
- Pollution free and safe packing
- 100% quality control at each manufacturing step
- Compatibility to existing flanges
- High tightness with leak rates  $1 \times 10^{-9}$  mbar of  $l \times s^{-1}$
- 100% helium leak testing of all components
- very low desorption rates



## Terms for Delivery and Payment of ILMVAC

### § 1 Scope

Conclusion of a contract, delivery and rendering of performance are effected exclusively on the basis of written declarations by telex or via electronic transfer and of these terms and conditions.

Any incorporation of the general terms and conditions of the purchaser is herewith excluded.

The general terms and conditions also apply to future transactions without renewed incorporation, provided no new drafting of these is incorporated.

### § 2 Conclusion of Contract, Intellectual Property

Catalogue or internet presentations are subject to change without notice and are not binding.

The contract (minimum value of 150 Euros - excepting repairs and deliveries of spare parts) shall be concluded with the sending of ILMVAC's order confirmation in writing or by telex. If we draw up and expressly indicate an offer to be binding, the contract shall be concluded upon the customer's written, telex or electronic confirmation.

Our employees are not authorised to make subsidiary agreements by word of mouth or to make verbal undertakings.

Our documents such as diagrams, drawings and specifications of weight and dimensions are only approximately decisive unless such documents are expressly indicated as binding in a written form. Variations customary in the trade are reserved for this case as well. Quotations and other documents, samples and similar material must not be disclosed to third parties, we reserve a property right and a copyright. Such quotations, documents, samples and materials are to be returned to us immediately if the order is not awarded. When goods are made to customer specifications, the purchaser is responsible for ensuring that no third-party industrial property rights are being infringed, there is no obligation to verify on our side.

### § 3 Prices and Terms of Payment, Right of Retention, Offsetting

Our prices are ex-factory prices, excluding the relevant legally binding VAT, packaging, costs of insurance, training, installation, transport amongst other things. Price increases for which we are not responsible (e.g., increases in purchase prices) entitle us to furnishing proof of any such increases and pass such increases on to the purchaser.

The packaging is charged on the basis of the cost price and will not be taken back.

The payment of the purchase price is due when invoiced, and, unless otherwise agreed by the parties, must be paid within 10 days without any deduction. Agreed cash discounts will only be granted when all financial obligations from earlier deliveries have been executed. We are not obliged to accept any cheques or bills of exchange or any other promise to pay.

Repair orders and the delivery of replacement parts are immediately due for net payment.

We are at liberty to set off payments of the purchaser against older debts, despite stipulations of the purchaser to the contrary.

Offsetting and retention are only permitted in commercial transactions against the claims of the seller with counter-claims which have been recognised or are legally binding.

### § 4 Delivery

Delivery deadlines are non-binding unless expressly agreed otherwise in writing by the parties.

Binding delivery deadlines are deemed observed upon the notification of readiness for shipment, at the latest upon the departure from the factory. The observance of the deadline supposes the performance of the purchaser's contributory actions.

The observance of delivery deadlines is subject to correct and timely reception of own deliveries.

Such events as strikes, lawful lock-outs, natural occurrences, and transport or plant interruptions for which we are not answerable result in a reasonable extension of the delivery deadline. This also applies when such reasons occur with a subcontractor. In case of considerable impediments of performance, we are entitled to rescind the contract, this does not give rise to any claims from the purchaser to the exception of repayment claims for advance payments made and of the return of samples.

If the purchaser does not take delivery of the goods, or if shipping is delayed on purchaser's request, we are

entitled to invoice the cost incurred due to storage, i.e., at least 0.5 per cent of the invoice amount for every week. After the ineffectual expiration of a reasonable deadline defined by us, we are entitled to sell the delivery item otherwise, and supply the purchaser at a reasonable new deadline.

If delivery is delayed by our fault, the purchaser is entitled to claim a compensation for delayed performance to an amount of 0.5 per cent per full week but limited to 5 per cent of the value of that part of the complete delivery which can not be put into useful operation. Proof of less damage furnished by us shall remain admissible.

Part deliveries are permitted and considered independent transactions. Additional deliveries are permitted up to 10 % liable to remuneration, short deliveries to such extent are not considered a material defect.

### § 5 Passage of Risk

Shipment is for the account and risk of the purchaser. Risk passes upon notification of readiness to ship ex works. If purchaser requests shipment, the risk passes with the handing over to the carrier ex works. This shall also apply when we perform other services, e.g., forwarding expenses or installation or transport by ourselves. This shall also apply to part deliveries.

If reception is required, reception in our factory shall prevail, and risk passes upon such reception irrespectively of other measurements/indications of the goods at the purchaser's premises. Reception shall be without delay at the set date, alternatively after notification of readiness to take delivery.

Reception may not be refused for a non-essential defect.

We are only obliged to insure the goods at the cost and at the content specification of the purchaser when so requested by the purchaser. However, we are entitled to conclude the insurance at purchaser's cost should the purchaser, at our request, not produce evidence of an insurance of his own.

Return shipments shall be agreed with us in advance. Any insolvency proceedings filed for the purchaser, substantial deterioration of assets, and considerable financial difficulties shall entitle us to cease deliveries. If such reasons cannot be cleared up within two weeks after becoming known and making a request, or if no security can be given to us by absolute bank guaranty before such deadline, we shall be entitled to terminate the contract or make further delivery contingent upon advance payments.

### § 6 Liability for Defects and Legal Liability

For defective goods, we shall, at our choice, either deliver again, or rectify the defects. If any, defect rectification shall be at our choice either in the works or at the premises of the purchaser. Immaterial defects do not entitle the purchaser to claim liability for defects. Replaced parts shall remain our property.

Any open defect shall be notified in writing immediately, at the latest within one week after receipt, and in any case prior to processing, installation or resale. Hidden defects shall be notified in writing, including a precise description, immediately, at the latest within 10 days after detection. If the notice of defects is lodged wrongfully, we may demand damages for the expenses incurred.

When goods are made to purchaser specifications, we are only liable for execution according to such specifications.

For essential products from other vendors, the purchaser shall have recourse against the vendor in court, having assigned to us any liability claims due to us for such purpose. Subsequently, we are secondarily liable.

No warranty is given for defects resulting from inappropriate or improper use, faulty installation or faulty start-up by purchaser or third parties, faulty or negligent handling, improper rectification by purchaser, unsuitable equipment, replacement materials, faulty construction work, unsuitable subsoil, chemical or other influences for which we are not responsible.

We are not liable for any damage not caused on the delivered item itself.

In the event of liability for default based either on contractual or legal claims, we are only liable for:

- Intent
- gross negligence committed by our owner/bodies or executive employees
- culpable injury to life, body, health
- for the fraudulent concealment of defects or for defects which have been guaranteed as non-existent
- for defects in the delivery items so far as there is liability for personal injuries and material damage to privately used items under the Product Liability Act.

In the event of culpable non-observance of essential duties under a contract, we are also liable for gross negligence by non-executive employees, and for ordinary negligence, while the latter case is restricted to foreseeable contract-typical damage.

Claims of the purchaser from warranty claims for material defects are subject to a limitation period of one year after the reception/handing over, or after a point in time treated as equal. We are liable for 6 months but at least up to the expiration of the time limit set forth in the foregoing sentence for replacement parts installed by way of warranty or rectification work.

### § 7 Security Payments

The goods remain our property until the complete payment of all accounts payable out of the current commercial relationship. Until this is revoked, the purchaser is entitled to process and to mix/assemble and resell the conditional commodity in proper business. The processing or transformation takes place always for us, as the manufacturer. If the our property expires in accordance with §§ 947, 948 BGB, the (joint) ownership of the purchaser of the item is transferred proportionately to its value (invoice value) to us. The purchaser will hold the (joint) property in safe custody without payment, and insure the joint property at purchaser's cost and produce evidence of this. If the goods are resold by the purchaser, then the purchaser's debt claim from the resale, as well as from other legal grounds (insurance, unlawful acts) in relation to the third-party purchaser shall be assigned to us for security to the value of the (joint) property already now. We accept the transfer herewith. The purchaser is entitled, within the framework of proper business, to call in the debt claims and to forward these for invoicing to us until this is revoked. The purchaser shall notify us in writing immediately upon request to whom a resale was made and what debt claims are outstanding on account of such resale. The purchaser will issue officially authenticated documents stating the assignment of the debt claims at purchaser's cost.

The purchaser may neither pledge, nor chattel mortgage the purchased item, nor otherwise permit the use thereof in a way that is detrimental to the security.

If the value of all security interests exceeds the amount of all secured claims by more than 20 percent, we will release a corresponding part upon purchaser's request.

If action is taken by third parties during the period of the retention of ownership in relation to the purchased item (e.g., attachment), the purchaser is obliged to immediately notify in writing and to immediately draw the attention of the third party to the rights of ownership of the seller. The purchaser bears the cost of attachment and of replacing the goods.

In case of delay in payment or breach of the aforementioned obligations, we are entitled to terminate after reminder, the purchaser being obliged to surrender the conditional commodity even without termination. The demand of surrender and the taking back does not constitute withdrawal from the contract unless another express declaration is made.

### § 8 Miscellaneous

The sole place of jurisdiction for all disputes deriving from this contractual relationship is Ilmenau. The place of performance for all obligations is our registered office. German law shall apply to the exclusion of the UN Sales Convention.

We store data on our business relations as defined in § 26 of the German Federal Data Protection Act.

Any transfer of rights and obligations from this contract is subject to our consent.

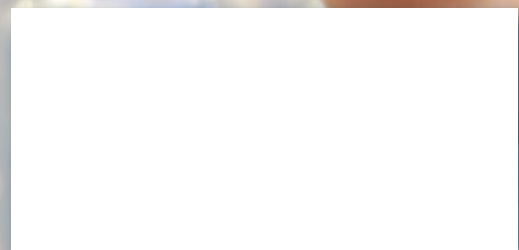
Should any individual provision of this contract be void, the validity of the remaining provisions shall in no way be affected thereby. In such cases, the void provision or provisions will be replaced by a provision or provisions coming as close as possible to the desired Economic intention.



Subject to technical changes  
Brochure 05/06

**ILMVAC GmbH**  
Am Vogelherd 20  
D-98693 Ilmenau

Tel. (+49)03677-604-0  
Fax (+49)03677-604-110  
info@ilmvac.de



**www.ilmvac.com**



**DIN EN ISO 9001**  
Zertifikat 15 100 6109