CHIMICA CENTRO
Soluzioni per laboratori scientifici
Aria, Acqua, Ambiente, Alimenti, Sicurezza, Ricerca e Sviluppo, Controllo Qualità

WELCH Formerly ILMVAC
by Gardner Denver

APPLIED VACUUM TECHNOLOGY

Vacuum Pumps and Systems

Via Vinciguerra, 45 | 62019 RECANATI MC | Tel 071 7572490 | Fax 071 7574340
www.chimicacentro.it info@chimicacentro.it

CHIMICA CENTRO

Soluzioni per laboratori scientifici

Aria, Acqua, Ambiente, Alimenti, Sicurezza, Ricerca e Sviluppo, Controllo Qualità

1 Application Overview

WELCH formerly ILMVAC by Gardner Denver

Selection chart for common lab applications

Application	Overview of system	Flow rate/X Vacuum	Model	
General vacuum work	Dry running pump, compact and portable	38 l/min 8 mbar	 MPC 301 Z	412722
Vacuum/pressure filtration Glass filtration assemblies SPE 	Filtration pump with dial gauge, regulator and separator	15 l/min 100 mbar	 MPC 090 E	412021
Degassing, Desiccation 	Dry piston pump with vacuum/pressure gauge, regulator, silencer and trap	18 l/min 133 mbar	 WOB-L 2522	2522C-02
Rotary Evaporation Non-Volatiles Boiling point 40 °C Samples 0-5 litres 	Economic PTFE dry pump with vacuum regulation	43 l/min < 5 mbar	 MPC 302 Z	414722
Rotary Evaporation Non-Volatiles Boiling point 40 °C Sample 0-1 litres 	Vacuum system with ecoflex speed control and built-in solvent library	20 l/min 2 mbar	 LVS 105 T - 10 ef	114184
Vacuum oven Drying Degassing 	For aqueous, acidic or basic samples	75 l/min 2 mbar	 MPC 601 T	412743
Vacuum Concentrator 	Minimum maintenance	36 l/min 2 mbar	 MPC 201 T P 6 Z	412543
	With cold trap	77 l/min 2x10⁻³ mbar		322003
Freeze dryer Lyophilizing 	Combination pump system Completely mounted with oil mist separator and solvent trap	97 l/min 2x10⁻³ mbar	 Chemvac P 6 Z - 101	109030
Vacuum manifold Schlenkline 	Compact, oil free vacuum pump No trapping required	150 l/min 7x10⁻² mbar	 ChemStar Dry	2070C-02
Aspiration 	Aspiration and filtration system with autoclavable container and handheld pipettor set	15 l/min 100 mbar	 Biovac 106 + Handvac, Biovac 106 4l PP-Bottle	112037, 112037-04
Molecular Distillation/ Sublimation 	For high vacuum and UHV applications	50 l/s 2x10⁻⁷ mbar	 CDK 180	101240
Vacuum controller		Measuring range 1050 - 1 mbar	 VCB 521	600053
Vacuum gauge	Multi range vacuum gauge with chemical resistant sensor	Measuring range 1050 - 10⁻³ mbar	 PIZA 111 cr-gold	600074

Via Vinciguerra, 45 | 62019 RECANATI MC | Tel 071 7572490 | Fax 071 7574340

www.chimicacentro.it info@chimicacentro.it

WELCH | ILMVAC
by Gardner Denver

Rotary Evaporation

ROdist professional package
with LVS 105 T - 10 ef | 112033

Description

Rotary evaporators are widely used in chemical laboratories as a way of evaporating solvents from a sample. A rotary evaporator needs to be partnered with a source of vacuum, with the vapour pressure of the solvent and the water bath temperature determining the vacuum level required.

A range of flask sizes can be used with a rotary evaporator and the size (flow rate) of the vacuum pump should be chosen based on the flask volume being used.

Application note

Ensure the correct vacuum level and flow rate for your pump based on the solvents being and flask size being used. Use our model selector for guidance.

Use a vacuum regulator to stop your sample from foaming and bumping.

Recommended Products

Welch produce a wide range of vacuum pumps and vacuum pump systems for use with rotary evaporators. With ultimate vacuum levels from 75 mbar to 1 mbar, flow rates up to 138 l/min and a variety of vacuum regulation options there's a pump for all applications.

Pumps can be regulated for better control. Regulation is available as manual and digital controller options. Some products come with vacuum regulators as standard.

- MPC chemical duty diaphragm pumps for an economical option. Available in a wide range of sizes and accessories available for vacuum regulation

- LVS systems, built on the MPC chemical duty diaphragm pump but with added glassware and options for built in regulation - manual or digital controller.

- 8890 Gem gear pump system. Designed for use with very high boiling point solvents. Includes vacuum regulator and oil mist eliminator as part part of the package.

Model Selector I Rotary Evaporators

Boiling Point, Atmospheric Pressure	**80°C**		**110°C**		**160°C**		**195°C**	
Example Solvents	Methylene chloride Acetone Chloroform Ethanol		Trichloroethylene n-Propyl alcohol Heptane Water Toluene Acetic Acid		1,1,2,2,-Tetrachloroethane DMF Pentachloroethane		DMSO Polymers	
RotoVap Flask Volume	Pump Models	System Models	Pump Models	System Models	Pump Models	System Models	Pump Models	System Models
1 L	↑	↑	↑	↑	↑	↑	↑	↑
2 L	↑	↑	MPC 101 Z	LVS 101 Z	MPC 105 T, MPC 105 T iQ-P	LVS 105 T-10 ef	↑	↑
10 L	↑	LVS 101 Z	↑	↑	MPC 201 T	LVS 210 T LVS 210 T ef	1400	8890C-70
20 L	MPC 110 E	LVS 301 Z	MPC 301 Z, MPC 302 Z	LVS 301 Z, LVS 310 Z	MPC 601 T	LVS 610 T LVS 610 T ef	1402	1402

1 Application Overview

Rotary Evaporation

MPC 095 Z | 412422-10,
MPC 105 T | 412443-10

MPC 095 Z

MPC 095 Z rotary evaporator package is an economical option to partner with your rotary evaporator. The package includes the MPC 095 Z vacuum pump, DBR-P vacuum regulator with dial gauge and vacuum hose to connect the pump to your rotary evaporator.

Built from chemical duty components and with an ultimate vacuum of 5 mbar the MPC 095 Z is suitable for evaporating most common solvents. The addition of a vacuum regulator allows the vacuum level to be manually adjusted to control the evaporation rate and reduce bumping and foaming. The built in vacuum gauge allows the user to monitor the vacuum level of the evaporation process.

MPC 105 T

MPC 105 T rotary evaporator package is designed to partner with your rotary evaporator when using non-volatile solvents. The package includes the MPC 105 T vacuum pump, DBR-P vacuum regulator with dial gauge and vacuum hose to connect the pump to your rotary evaporator. Built from chemical duty components and with an ultimate vacuum of 2 mbar the MPC 105 T is suitable for evaporating high boiling point solvents, such as DMF.

The addition of a vacuum regulator allows the vacuum level to be manually adjusted to control the evaporation rate and reduce bumping and foaming. The built in vacuum gauge allows the user to monitor the vacuum level of the evaporation process.

LVS 105 T - 10 ef | 114184

HBP 101 | 112036

LVS 105 T - 10 ef

The LVS 105 T - 10 ef is the perfect partner for your rotary evaporator. It has been optimised for rotary evaporator application with an ultimate vacuum of 2 mbar and peak flow of 20 l/min, allowing non-volatiles such as DMF to be evaporated at 30°C. It combines a powerful built in chemical duty diaphragm vacuum pump with Ecoflex control principals. Heating of the pump heads allows a consistent clean vacuum without gas ballasting. The Ecoflex control continuously adjusts the pumping speed to match the vapour load of the process and allows the pump to exhibit single point control which reduces bumping and foaming whilst achieving increased evaporation rates.

The built in digital vacuum controller allows easy adjustment of the desired vacuum level as well as the option to select common solvents from the built in solvent library.

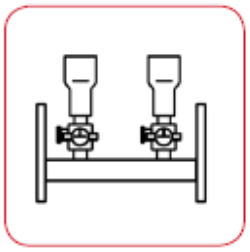
An inlet trap protects the pump from ingesting liquids and particles and an exhaust vapour condenser for optimal solvent recovery.

HBP 101

Hold Back Pumps create a fully-automatic distillation process without attention to fraction quantities, manual adjustment, or continuous regulation. The resultant distillation is considerably better and more economically sound than using a diaphragm pump system with a solenoid valve. Based on the rugged chemical resistant Welch MPC 301 Z, the Hold Back Pump utilises solvent flow to automatically regulate the diaphragm pump vacuum level. This means that the Hold Back Pump can be used to distil a mixture of solvents without knowledge of its composition.

WELCH formerly ILMVAC
by Gardner Denver

Filtration / SPE



MPC 090 E | 412021 + Filtration Flask

Description

Vacuum and pressure filtration is widely used for sample preparation in chemistry, life science, environmental analysis and pharmaceutical QC. Filtration rates are greatly enhanced by creating a differential pressure across the filter unit by applying either vacuum or pressure. The ultimate differential pressure requirements are generally low. When filtering at 100 mbar, 90% of atmospheric pressure is available to assist the filtration. Improving the vacuum level to 50 mbar (95% vacuum) has little appreciable effect on the differential pressure.

Solid phase extraction (SPE) is a sample preparation technique which is growing in popularity. SPE gives better yields than traditional liquid to liquid methods and the wide range of available stationary phase forms allow for rapid processing and automation.

Recommended Products

Diaphragm or WOB-L piston pumps are generally used for filtration applications as excessive vacuum (e. g. from a rotary vane pump) causes boiling of the liquid being filtered, which is undesirable. For most filtration applications a modest vacuum of 75 to 150 mbar absolute, or a positive pressure of 2 to 6 bar is required, with free air displacement of 10 to 60 l/min depending on the filter size, leak rate, condition of the filter cake and whether a filtration manifold is being used to operate multiple filters simultaneously. For filtration of aqueous solutions a WOB-L piston pump or standard duty diaphragm pump can be used. For filtration of acidic and basic solutions or organic solvents use a chemical duty MPC diaphragm pump. For SPE the requirement is similar to vacuum filtration, with a chemical duty diaphragm pump necessary. Pumps with regulator valves can be used when the filtration rate needs to be controlled or to stop evaoration of particularly volatile liquids.

Model Selector I Filtration

Filtration Solvent / Media	Chemical Examples	Vacuum Regulation	Number of Filters	Model
Aqueous Vapors	Suspended solids samples Food slurry analysis	Yes	1-2	WOB-L 2522
		Yes	1-4	WOB-L 2534
		Yes	1-6	WOB-L 2546
		Yes	6 funnel manifold	WOB-L 2567
Mild Chemical Vapors	Weak acid /base solutions	Yes	1	MPC 090 E
	Field environmental Samples	Yes	1	MPC 090 E with auto adapter
Low-volume Organic Vapors	Alcohol Solutions Solid Phase Extractions	No	1	2019 C-20 MPC 090 E
Strong Chemical Vapors	Chlorinated solvents Strong acid /base solutions Ketones	Yes	1-2	MPC 301 E
		Yes	1-6	MPC 601 E
		Yes	6 funnel manifold	MPC 602 E

1 Application Overview

Aspiration

handvac | 112580

Description

Aspirators are used for the aspiration and disposal of liquids in biochemistry, microbiology and cell culture applications. The pump creates a vacuum in the collection receiver which allows liquids to be sucked into it due to the pressure differential. The liquid is collected in the receiver and can be disposed of when full.

Application note

The most common reason for vacuum pump failure in aspiration applications is the ingestion of liquid into the pump mechanism. Welch Aspiration Stations integrate features that protect your pump and your application. Routinely empty the collection receiver to ensure continuous aspiration.

Recommended Products

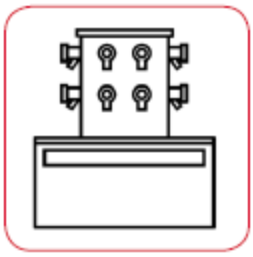
The Welch range includes aspiration stations with standard duty pumps for aqueous solutions including buffers and with chemical duty pumps for acidic, basic and organic solutions. All models come with autoclavable collection receiver, automatic flow stop and in-line hydrophobic filter.

- biovac 106 for precise aspiration of chemical, biological and medical liquids. Includes HandVac pipettor as standard. Available with 2 litre glass or 4 litre PP collection receiver.
- 2511 for economical aspiration of aqueous liquids. Compact and portable with a 1.2 litre PP collection receiver.
- 2515 for high flow aqueous applications such as cell culture aspiration or use of multiple pipettors. Compact and portable with a 1.2 litre PP collection receiver.
- fluivac 105 for aspirating large volumes of chemical, biological and medical liquids. Includes a 5 litre glass collection receiver. Mounted on a trolley for portability.

biovac 106 | 112037

WELCH formerly ILMVAC
by Gardner Denver

Freeze Drying



Description

Freeze drying, or lyophilisation, is the process of freezing a material and then sublimating any frozen liquid from a solid directly to a gas. Freeze drying is commonly used as a method of preservation in food and pharmaceutical industries. It allows products to be easily stored and transported without having to be constantly refrigerated.

Application Note

Ensure that your vacuum pump is sized correctly for your freeze dryer. If the flow rate of the pump is too high then the vapour is pulled through the condenser too quickly which reduces the condensing efficiency.

Clean the freeze dryer's condenser after each run to prevent sublimation of frozen chemicals into the vacuum pump.

Recommended Products

For freeze drying (lyophilisation) applications a high vacuum levels is required, typically between 10^{-1} and 10^{-3} mbar. There are different pump types can be employed; oil-sealed rotary vane pumps, Chemvac combination pumps, dry scroll pumps and specialist pump systems.

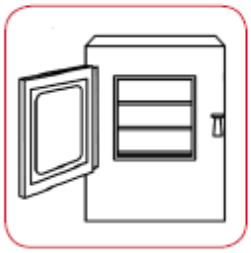
- Rotary vane pump for standard freeze drying applications.
- Chemvac combination pumps for freeze drying with high organic vapour or acidic vapour loads (e.g. TFA). A chemical duty diaphragm pump is used to degas the pump oil and keep the pump clean.
- Scrollvac scroll pumps for an oil-free solution when vacuum to 10^{-1} mbar is required.
- ChemStar Dry for oil free chemical resistant solution with self cleaning programme. Peak flow rate in the range of 0.1 - 10 mbar.

Model Selector I Pump Selection - Application Chart

Application		P 4 Z	P 6 Z / P 6 Z-101	P 8 Z	P 12 Z / P 12 Z-301	S 10	S 15	ChemStar Dry
Freeze dryer								
Ice holding capacity	up to 2 kg	X						
	up to 4.5 kg		X					
	up to 6 kg			X				X
	up to 8 kg				X	X		
	up to 12 kg				X		X	
	up to 24 kg							

WELCH Formerly ILMVAC
by Gardner Denver

Vacuum oven



Description

Vacuum ovens are used for drying sensitive substances, which may be damaged by excess heat, and where extremely low residual moisture levels are demanded. Depending on the solvents used and the temperature limitations of the samples and chamber, a medium to high ultimate vacuum is generally required from the pump. The potentially large quantities of vapour generated from the chamber also mean that the pump should handle vapours well; these may be aqueous, basic or acidic. Piston and diaphragm pumps are most suitable, with PTFE constructed diaphragm pumps being employed where chemical resistance is most important. High flow rates may also be needed where vapour volumes are large.

Recommended Products

For most vacuum oven applications a dry pump can be used and this could be either a WOB-L piston pump for a diaphragm pump. When low volatility solvents are being removed at low temperatures then an oil-sealed rotary vane pump is required.

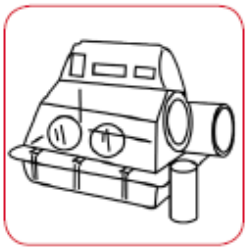
- WOB-L piston pumps for fast drying of aqueous samples. These oil free two stage pumps have a high flow rate, can create a deep vacuum below 10 mbar and come with an inlet trap, vacuum regulator and dial vacuum gauge as standard.
- MPC diaphragm pumps for chemical duty drying applications. With PTFE components these pumps are ideal when organic solvents are being removed from samples.
- LVS diaphragm pump systems for extra protection for your MPC pump and air quality with inlet separator and exhaust condenser. If vacuum level control is required then and LVS system is ideal.
- Rotary vane pumps for fast drying of low volatility solvents. One stage or two stage pumps depending on vacuum level requirement. Use AKS inlet separator to protect pump from ingestion of liquids or particles.

Model Selector I Vacuum Ovens

	Oil-Free Vacuum 2 to 10 mbar		Oil-Seal Deep Vacuum 0.1 mbar to 10^{-3} mbar	
Oven Volume	Aqueous Vapours	Chemical Vapours	Single stage direct drive	Two stage direct drive
Up to 20 litres	2561C-50	MPC 301 Z	P 4 E	P 4 Z
Up to 50 litres	2561C-50	MPC 302 Z	P 4 E	P 4 Z
Up to 120 litres	2581C-50	MPC 602 T	P 6 E	P 6 Z
Up to 250 litres	2581C-50	S 15	P 8 E	P 8 Z

1 Application Overview

Glove Box



Description

Glove boxes are used to house a controlled environment either for isolation of sensitive substances or to protect users from hazardous substances. They have built in gloves to allow users to manipulate the substances inside of the glove box. A vacuum pump is used to remove ambient air from the glove box and then it can be backfilled with an inert gas, such as Argon. This process can be repeated to achieve a lower oxygen concentration. Transfer chambers also need to be evacuated to ensure that the external atmosphere does not enter the glove box.

Recommended Products

Standard glove boxes and transfer chambers are not normally evacuated much below 20 mbar due to plastic material limitations. Both acrylic and polycarbonate which are used in standard glove boxes are not suited for deep vacuum. High end glove boxes capable of deeper vacuum normally are constructed of stainless steel & heavy glass plates. These can generally be evacuated below 1 mbar.

- 2 stage oil free WOB-L piston pumps for vacuum down to 7 mbar. Suitable for aqueous vapours only.
- Scroll pumps for when a deeper oil free vacuum is required.
- 2 stage rotary vane pumps for when a deep vacuum is required. With a high pumping speed these pumps are suitable for larger glove boxes also. An anti suck back valve ensures that there is no back flow of oil into the glove box.

Gel Dryer

Description

Vacuum drying of gels is a common preparation technique for gel electrophoresis applications. The gel is heated on a gel dryer and vacuum is applied to improve the drying. A medium vacuum level is required for gel drying.

Recommended Products

There are two options of vacuum pump technology when it comes to gel drying; LVS diaphragm pump system or Gelmaster™ system.

- LVS 300 Z with a powerful chemical duty MPC 301 Z base diaphragm pump and inlet and exhaust separators to trap liquids and particles.
- The revolutionary Gelmaster™ gel dryer vacuum systems unique design uses a patented room temperature vapour trap with a built-in dry vacuum pump. Condensate is collected in liquid form and doesn't have an effect on performance, so the tenth drying run is as fast as the first. When the collector reaches capacity, simply drain the contents and begin again.

WELCH formerly ILMVAC
by Gardner Denver

Desiccation

MP 065 E | 411011

Description

Vacuum desiccators are used frequently in laboratories for the removal of moisture in a sample, maintenance of a dust and moisture-free environment, vacuum testing, defoaming and storing samples under various atmospheres. Some substances oxidise when exposed to air. To reduce the reaction rate the substances can be kept under vacuum in a desiccator.

Recommended Products

A WOB-L piston pump or diaphragm pump is the best option for use with a vacuum desiccator. Both technologies are oil free so there is no chance of any oil contamination. Generally a single stage pump is required for process applications and a two stage pump is required for storage applications. The free air displacement of the pump should be matched to the size of the desiccator to ensure a satisfactory pump down time.

- Use WOB-L piston pumps for standard duty aqueous applications, with a high pumping speed for quick evacuation of your desiccator. These pumps come with a vacuum regulator and dial vacuum gauge as standard for controlled evacuation and vacuum level monitoring.
- Use chemical duty MPC diaphragm pumps when solvents are being used. These rugged diaphragm pumps use PTFE and other chemical duty materials for protection against damage from solvents. Use the optional DRB regulator with dial gauge if vacuum regulation is required.

Model selector | Dessication

	Desiccator Type	Application	Pumping speed & vacuum	Model	CAT. No.
Aqueous vapours	Small benchtop	Process	0,7 m³/h 100mbar	MP 065 E	411011
		Storage	0,5 m³/h <5 mbar	MP 055 Z	411422
	Small cabinet (<25 litres)	Process	1,7 m³/h 93 mbar	2534C-02	2534C-02
		Storage	3,0 m³/h 6,7 mbar	2561C-50	2561C-50
	Large cabinet (>25 litres)	Process	3,0 m³/h 6,7 mbar	2561C-50	2561C-50
		Storage	3,0 m³/h 6,7 mbar	2561C-50	2561C-50
Chemical vapours	Small benchtop	Process	1,0 m³/h 100 mbar	MPC 090 E	412021
		Storage	0,9 m³/h 5 mbar	MPC 095 Z	412422-02
	Small cabinet (<25 litres)	Process	2,3 m³/h <75 mbar	MPC 301 E	412711
		Storage	2,6 m³/h <5 mbar	MPC 302 Z	414722
	Large cabinet (>25 litres)	Process	3,8 m³/h <75 mbar	MPC 601 E	412721
		Storage	2,6 m³/h <5 mbar	MPC 302 Z	414722
			2,6 m³/h <5 mbar	MPC 302 Z	414722

WELCH formerly ILMVAC
by Gardner Denver

Vacuum Network

Description

Netvac area vacuum systems provide vacuum on demand for all the users and applications in your lab - all from a single system.

Univac MPKC Systems

The Univac systems are available with eith 4 or 6 MPC diaphragm pumps mounted on a trolley with a microprocessor control system. With ultimate vacuum options of 75 mbar, 8 mbar and 2 mbar and with peak flow rates of up to 50 m^3/h the Univac systems are designed to supply vacuum to your whole lab. The built in digital controller allows the vacuum level to be controlled and only runs the quantity of pumps necessary to achieve the requirement of the users, saving energy as well as wear on the pumps. When the demand is not 100& the controller cycles the pump(s) being used to ensure even wear.

LVS 210 T ef

The LVS 210 T ef is an excellent solution for continuous, chemical resistant and oil-free proceeding with corrosive and aggressive gases and vapours. Besides the intelligent ecoflex control system, the connected chemical duty diaphragm pump is very quiet in operation and can be reached easily for cleaning or maintenance purposes.

With an ultimate vacuum of 2 mbar and a peak flow of 36 l/min the LVS 210 T ef has been optimised for applications in chemical, biological and pharmaceutical laboratories and is suitable for use in multi user network (Netvac) systems. The Ecoflex control continuously adjusts the pumping speed to match the vapour load of the process. An inlet trap protects the pump from ingesting liquids and particles and an exhaust vapour condenser for optimal solvent recovery.

LVS 610 T ef

The LVS 610 T ef is an excellent oil-free, chemical resistant solution for multi user network (Netvac) systems. With an ultimate vacuum of 2 mbar and a peak flow of 81 l/min the LVS 610 T ef has been optimised for applications in chemical, biological and pharmaceutical laboratories and can pump corrosive and aggressive gases and vapours. The high flow rate and deep vacuum allow it to supply vacuum to approximately 10 individual ports.

It is designed for continuous duty and comes with the ecoflex control system which continuously adjusts the pumping speed to match the vapour load of the process and allows the pump to operated unattended. An inlet trap protects the pump from ingesting liquids and particles and an exhaust vapour condenser for optimal solvent recovery.

Recommended Products

Using Welch pumps, controllers, systems and components, we can custom design your laboratory vacuum utility to provide the right performance to each of your applications.

Univac - MPKC 2403 T | 112223

LVS 210 T ef | 115234

LVS 610 T ef | 115254

3 Diaphragm Pumps

WELCH formerly ILMVAC
by Gardner Denver

Dry, oilfree Diaphragm Pumps

MPC 601 T | 412743

Advantages

- analytically pure, oil free vacuum
- user friendly
- light weight, rugged design
- designed for permanent operation
- maintenance-free drive system and proven long diaphragm life
- minimal operation vibration
- wide vacuum and flow range to match application
- superior chemical resistance (MPC models)

Scope of Delivery

- ON/OFF switch and internal protective thermal switch for the motor, mains cable and plug
- carry handle
- vibration isolating feet
- MP models come with and exhaust silencer
- MPC models come with a gas ballast valve

Range of Applications

- rotary evaporators
- vacuum ovens
- degassing / desiccation
- vacuum distillation
- vacuum filtration
- solid phase extraction (SPE)
- gas sampling
- vacuum drying
- vacuum holding
- pick and place
- backing turbomolecular pumps

Description

Welch diaphragm pumps have been developed specifically to meet the requirement for oil-free vacuum generation. Their low weight and excellent ergonomics, make Welch diaphragm pumps the first choice for most laboratory applications. With ultimate vacuum from 75 to 1 mbar and peak flow rates up to 138 l/min there is a specific model configuration to suit almost all applications. Our proven diaphragm technology offers a double benefit to the user – outstanding diaphragm life and market leading cost of ownership. Use MP models for standard duty applications and MPC models for chemical duty applications. The MPC models use PTFE and other fluorinated plastics for the wetted parts to allow aggressive solvent and acid vapours to be pumped. For extra harsh chemical vapours use X2 versions. Ecoflex versions with variable speed motors are also available.

WELCH Formerly ILMVAC
by Gardner Denver

Highlight NEW MPC 302 Z

MPC 302 Z | 414722

Advantages

- analytically pure, oil free vacuum
- user friendly
- light weight, rugged design
- designed for permanent operation
- maintenance-free drive system and proven long diaphragm life
- minimal operation vibration
- significantly improve flow and vacuum performance in the application critical range
- superior chemical resistance
- stabilised process flow
- enhanced repeatability

Scope of Delivery

- ON/OFF switch and internal protective thermal switch for the motor, mains cable and plug
- carry handle
- vibration isolating feet
- gas ballast valve
- KF 16 inlet flange / 8mm hose nozzle

NEW MPC 302 Z

No matter if for research and development applications or in the analysis field, the latest generation of Welch's diaphragm pumps are suitable for a wide range of laboratory applications. The new MPC 302 Z uses a patented pump head design to provide significantly improved performance, particularly in the application critical range. Optimised construction of the pump heads allows the MPC 302 Z to reach a 17% higher pumping speed in the application critical vacuum range compared to similar products of the previous generation. Besides the pumping speed, the ultimate vacuum is improved as well to 5 mbar. These significant improvements directly influence the process flow and the repeatability. A more stable applied vacuum gives a more repeatable application and achieves more reliable results. The effectiveness and quality of chemical applications, especially distillation processes are improved.

Accessories for MPC 302 Z

Accessoires	CAT.No.
Digital Vacuum Control Box VCB 521 cv, 1100 - 1 mbar, 90-260V, 50/60Hz with Schuko, UK and US plug leads	600053
Vacuum Regulator with Dial Gauge for MP/MPC 301 Z, 601 E, 601 T, 901 Z, 1201 E	700458
Vacuum Hose, Rubber red, 18/8x5, meter	828310-4

3 Diaphragm Pumps

Technical Data - Chemical Duty Diaphragm Pumps

Premium selection Chemical Duty Diaphragm Pumps






Parameter	MPC 090 E	MPC 110 E	MPC 095 Z	MPC 155 Z	MPC 105 T	MPC 105 T IQ
Number of heads/stages	1/1	2/1	2/2	4/2	4/3	4/3
Free Air Displacement, m³/h	1,0	1,0	0,9	1,4	1,2	1,2
Free Air Displacement, l/min	16,7	16,7	15	23	20	20
Ultimate pressure, mbar	100	50	5	5	< 2	< 2
Intake connection	Hose nozzle DN 6	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8
Exhaust connection	Hose nozzle DN 6	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8
Sound level	<45	<45	<45	<45	<45	<45
Dimensions (B/T/H), mm	144/198(130) /244	235/140 /277	235/140 /277	235/145 /327	235/145 /327	235/145 /327
Weight, kg	2,7	6,15	6,15	6,5	6,5	6,5
Ordering information						
90...260VAC	412021	412421-02	412422-02	412642	412443-02	412443-17

One-Stage Direct-Driven Diaphragm Pumps, Ultimate pressure <75 mbar








Parameter	MPR 060 E-EC	MPC 201 E	MPC 301 E	MPC 302 E	MPC 601 E	MPC 602 E	MPC 1201 E	MPC 2401 E
Number of heads/stages	2/1	2/1	1/1	1/1	2/1	2/1	4/1	8/1
Free Air Displacement, m³/h	0,6	1,8/2	2,3/2,5	2,9/3,5	3,8/4,2	4,2/5,0	8,3/9,1	15,5/17,0
Free Air Displacement, l/min	10	30/33	38/41	48/58	63/70	70/83	138/151	258/283
Ultimate pressure, mbar	<60	< 75	< 75	< 40	< 75	< 30	< 75	< 75
Intake connection	Hose nozzle DN 6/8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF
Exhaust connection	Hose nozzle DN 6/8	Hose nozzle DN 8	Hose sleeve A 10 - 8 or optional (enclosed) Exhaust silencer A 10	Hose sleeve A 10 - 8 or optional (enclosed) Exhaust silencer A 10	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF
Sound level	42	<44	<45	<45	<44	<44	<44	<44
Dimensions (B/T/H), mm	115/165/145	195/225/147	156/260/253	156/260/253	230/265/170	233/260/171	230/380/170	540/300/240
Weight, kg	2,3	6,5	8,9	8,9	11,2	11,2	18,3	32,8
Ordering information								
90...260VAC	412121	-	-	-	-	-	-	-
230V 50/60Hz	-	412521	412711	414711	412721	414721	412741	412781
115V 50/60Hz	-	412521-01	412711-01	-	412721-01	414721-01	412741-01	412781-01
400V 50/60Hz	-	-	-	-	412721-02	414721-02	412741-02	412781-02

WELCH | ILMVAC
by Gardner Denver

Technical Data - Chemical Duty Diaphragm Pumps

Multi-Stage Direct-Driven Diaphragm Pumps

	Two-Stage Direct-Driven Diaphragm Pumps, Ultimate Pressure <8 mbar						Three-Stage Direct-Driven Diaphragm Pumps, Ultimate Pressure <2 mbar		
Parameter	MPC 030 Z-EC	MPC 101 Z	MPC 301 Z	MPC 303 Z	MPC 601 Z	MPC 1601 Z	MPC 201 T	MPC 601 T	MPC 1201 T
Number of heads/stages	2/2	2/2	2/2	2/2	4/2	8/2	4/3	4/3	8/3
Free Air Displacement, m³/h	0,35	1,1/1	2,3/2,5	2,6/3,1	6,8/7,5	12/13,3	2/2,2	4,5/4,9	8,3/9,1
Free Air Displacement, l/min	5,8	16,7/18	38/41	43/52	113/124	201/221	33/36	75/81	135/151
Ultimate pressure, mbar	<5	< 8	< 8	< 5	< 8	< 8	< 2	< 2	< 2
Intake connection	Hose nozzle DN 6/8	Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF	Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF
Exhaust connection	Hose nozzle DN 6/8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF
Sound level	38	<44	<44	<44	<44	<44	<45	<44	<44
Dimensions (B/T/H), mm	115/165 /145	195/225 /147	230/265 /170	233/260 /171	230/380 /170	540/300 /240	200/260 /150	230/380 /170	540/300/ 240
Weight, kg	2,3	6,5	11,2	11,2	18,3	32,8	10,3	18,3	32,8
Ordering information									
90...260VAC	412722	-	-	-	-	-	-	-	-
230V 50/60Hz	-	412522	412722	414722	412742	412782	412543	412743	412783
115V 50/60Hz	-	412522-01	412722-01	414722-01	412742-01	412782-01	412543-01	412743-01	412783
400V 50/60Hz	-	-	412722-02	414722-02	412742-02	412782-02	-	412743-02	412783-02

High Chemical/Corrosion Duty Diaphragm Pumps

Parameter	MPC 301 E-X2	MPC 601 E-X2	MPC 1201 E-X2	MPC 2401 E-X2	MPC 301 Z-X2	MPC 901 Z-X2	MPC 1801 Z-X2	MPC 601 T-X2	MPC 1201 T-X2
Number of heads/stages	1/1	2/1	4/1	8/1	2/2	4/2	8/2	4/3	8/3
Free Air Displacement, m³/h	2,3/2,5	3,8/4,2	8,3/9,1	15,5/17,0	2,3/2,5	6,8/7,5	12/13,3	4,5/4,9	8,3/9,1
Free Air Displacement, l/min	38/41	63/70	138/151	258/283	38/41	113/124	201/221	75/81	135/151
Ultimate pressure, mbar	< 75	< 75	< 75	< 75	< 8	< 8	< 8	< 2	< 2
Intake connection	Hose nozzle DN8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF
Exhaust connection	Hose sleeve A 10 - 8 or optional (enclosed) Exhaust silencer A 10	Hose nozzle DN8	Hose nozzle DN8	DN 16 KF	Hose nozzle DN8	Hose nozzle DN8	DN 16 KF	Hose nozzle DN8	DN 16 KF
Sound level	<45	<44	<44	<44	<44	<44	<44	<44	<44
Dimensions (B/T/H), mm	156/260 /253	230/265 /170	230/380 /170	540/300 /240	230/265 /170	230/380 /170	540/300 /240	230/380 /170	540/300 /240
Weight, kg	8,9	11,2	18,3	32,8	11,2	18,3	32,8	18,3	32,8
Ordering information									
230V 50/60Hz	412711-03	412721-03	412741-03	412781-03	412722-17	412742-07	412782-03	412743-03	412783-03

3 Diaphragm Pumps

Technical Data - Chemical Duty Diaphragm Pumps

More Diaphragm Pumps

	ATEX		Ecoflex		
Parameter	MPC 301 Zp, ATEX Kat.2	MPC 601 Tp, ATEX Kat.2	MPC 301 Z ef	MPC 601 T ef	MPC 1201 T ef
Number of heads/stages	2/2	4/3	2/2	4/3	8/3
Free Air Displacement, m³/h	2,3	4,5	2,6	4,9	8,3
Free Air Displacement, l/min	38	75	43	75	138
Ultimate pressure, mbar	< 8	< 2	< 8	< 2	< 2
Intake connection	Hose nozzle DN8	DN 16 KF	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF
Exhaust connection	Hose nozzle DN 8	DN 16 KF	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF
Sound level	<44	<44	<47	<47	<47
Dimensions (W/D/H), mm	240/300/260	240/425/272	260/310/190	260/390/170	540/262/390
Weight, kg	22,9	29,7	15,5	22,6	34,0
Ordering information					
90...260VAC	-	-	-	-	-
230V 50/60Hz	-	-	412922	412943	412983
115V 50/60Hz	-	-	412922-01	412943-01	412983-03
400V 50/60Hz	4000481-04	4000511-04	-	-	-

Technical Data - Standard Duty Diaphragm Pumps

One-Stage Direct-Driven Diaphragm Pumps, Ultimate pressure <75 mbar

Parameter	MP 065 E	MP 065 E + Inlinefilter-Kit	MP 105 E	MP 201 E	MP 301 E	MP 601 E	MP 1201 E	MP 2401 E
Number of heads/stages	2/1	2/1	2/1	2/1	1/1	2/1	4/1	8/1
Free Air Displacement, m³/h	0,7	0,7	0,9/1,0	1,8/2	2,3/2,5	3,8/4,2	8,3/9,1	15,5/17,0
Free Air Displacement, l/min	11,6	11,6	15/16,6	30/33	38/41	63/70	138/151	258/283
Ultimate pressure, mbar	100	100	< 60	< 75	<75	< 75	< 75	< 75
Intake connection	Hose nozzle DN 6	Hose nozzle DN 6	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF
Exhaust connection	Hose nozzle DN 6, w/exhaust silencer (removable)	Hose nozzle DN 6, w/exhaust silencer (removable)	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF
Sound level	<45	<45	<45	<44	<45	<44	<44	<44
Dimensions (B/T/H), mm	144/127/196	144/127/196	235/140/277	195/225/147	156/260/253	230/265/170	230/380/170	540/300/240
Weight, kg	2,3	2,3	6,25	6,5	8,9	11,2	18,3	32,8
Ordering information								
90...260VAC	411011	411011-01	-	-	-	-	-	-
230V 50/60Hz	-	-	411421	411521	411711	411721	411741	411781
115V 50/60Hz	-	-	411421	411521-01	411711-01	411721-01	411741-01	411781-01
400V 50/60Hz	-	-	-	-	-	411721-02	411741-02	411781-02

WELCH formerly ILMVAC
by Gardner Denver

Technical Data - Standard Duty Diaphragm Pumps

Two-Stage Direct-Driven Diaphragm Pumps, Ultimate Pressure <8 mbar

Parameter	MP 030 Z-EC	MP 055 Z	MP 101 Z	MP 301 Z	MP 901 Z	MP 1801 Z
Number of heads/stages	2/2	2/2	2/2	2/2	4/2	8/2
Free Air Displacement, m³/h	0,35	0,5/0,55	1/1,1	2,3/2,5	6,8/7,5	12/13,3
Free Air Displacement, l/min	5,8	8/9,1	16,7/18	38/41	113/124	201/221
Ultimate pressure, mbar	< 5	< 5	< 8	< 8	< 8	< 8
Intake connection	Hose nozzle DN6/8	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF
Exhaust connection	Hose nozzle DN6/8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF
Sound level	38	<45	<44	<44	<44	<44
Dimensions (B/T/H), mm	115/165 /145	235/140 /277	195/225 /147	230/265 /170	230/410 /170	540/300 /240
Weight, kg	2,3	6,25	6,5	11,2	18,3	32,8
Ordering Information						
90...260VAC	411122	-	-	-	-	-
230V 50/60Hz	-	411422	411522	411722	411742	411782
115V 50/60Hz	-	411422	411522-01	411722-01	411742-01	411782-01
400V 50/60Hz	-	-	-	411722-02	411742-02	411782-02

more Multi-Stage Direct-Driven Diaphragm Pumps

	Three-Stage Direct-Driven Diaphragm Pumps, Ultimate Pressure <2 mbar			Four-Stage Direct-Driven Diaphragm Pumps, Ultimate Pressure <1 mbar	
Parameter	MP 201 T	MP 601 T	MP 1201 T	MP 101 V	MP 301 V
Number of heads/stages	4/3	4/3	8/3	4/4	4/4
Free Air Displacement, m³/h	2/2,2	4,5/4,9	8,3/9,1	1,0 / 1,1	2,3/2,5
Free Air Displacement, l/min	33/36	75/81	135/151	16,7/18	38/41
Ultimate pressure, mbar	< 2	< 2	< 2	< 1	< 1
Intake connection	Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8	DN 16 KF	Hose nozzle DN 8	DN 16 KF with optional Hose nozzle DN 8
Exhaust connection	Hose nozzle DN 8	Hose nozzle DN 8	DN 16 KF	Hose nozzle DN 8	Hose nozzle DN 8
Sound level	<45	<44	<44	<45	<44
Dimensions (B/T/H), mm	200/260 /150	230/380 /170	540/300 /240	200/260 /150	230/380 /170
Weight, kg	10,3	18,3	32,8	10,3	18,3
Ordering Information					
90...260VAC	-	-	-	-	-
230V 50/60Hz	411543	411743	411783	411544	411744
115V 50/60Hz	411543-01	411743-01	411783-01	411544-01	411744-01
400V 50/60Hz	-	411743-02	411783-02	-	411744-02

WELCH | ILMVAC
by Gardner Denver

Accessories

Vacuum Regulators, Gauges and Glassware

Vacuum regulators for mounting to the inlet of the MP/MPC pump to regulate the vacuum level by way of a bleed valve. There are different options depending on pump model and also glassware to protect pump from ingestion of liquids / particles and to condense and collect exhaust vapours.

CAT. No	Accessories	for
700458	Vacuum regulator with dial gauge	MP/MPC 301 Z, 601 E, 601 T, 901 Z, 1201 E
700458-01	Vacuum regulator with dial gauge and liquid trap	MP/MPC 301 E
700458-02	Vacuum regulator with dial gauge	MP/MPC 095 Z, 110 E, MPC 105 T, MPC 155 Z
700459	Vacuum regulator with dial gauge	MP/MPC 095 Z, 110 E, MPC 105 T, MPC 155 Z
700459-01	Vacuum regulator with digital gauge and pressure release valve	MP/MPC 095 Z, 110 E, MPC 105 T, MPC 155 Z
700459-02	Digital vacuum gauge	MPC 105 T iQ
700460	Inlet separator	MP/MPC 095 Z, 110 E, MPC 105 T, MPC 155 Z
700461	Vacuum regulator with dial gauge and inlet separator	MP/MPC 095 Z, 110 E, MPC 105 T, MPC 155
700462	Exhaust condenser / solvent recovery unit	MPC 095 Z, 110 E, 105 T, 155 Z


700458


700458-01, 700458-02


700459


700459-01, 700459-02


700460


700461

Vacuum Hose

Vacuum hose for connection between your vacuum pump and laboratory equipment. Please indicated the required length in metres.

CAT. No.	Accessories	Size
828310-3	Red rubber vacuum hose,	10mm ID, 5mm wall thickness
828310-4	Red rubber vacuum hose	8mm ID, 5mm wall thickness
828374	Silicone vacuum hose	6mm ID, 3mm wall thickness


828310-3, 828310-4


828374

3 Diaphragm Pumps

Connection Kits

Connection Kits

Vacuum Oven Kit

- For easy connection of diaphragm pump to vacuum oven with either DN 16 KF or DN 25 KF flange
- Vacuum oven kit includes 2.5m vacuum hose, hose connectors, hinged clamping rings and centering rings
- CAT. No. 404005

Vacuum Oven Kit | 404005

Advanced Vacuum Oven Kit

- For extra protection when connecting diaphragm pump to vacuum oven with either DN 16 KF or DN 25 KF flange
- Advanced vacuum oven kit includes 2.5m vacuum hose, hose connectors, hinged clamping rings, centering rings and in-line particle filter with spare element.
- CAT. No. 404006

Advanced Vacuum Oven Kit | 404006

Vacuum Filtration and Desiccation Kit

- Quick connection to vacuum filtration funnel / manifold or desiccator
- Kit includes in-line hydrophobic filter, 1.5 m silicone vacuum hose (6mm ID) and 1.5m silicone vacuum hose (8mm ID)
- CAT. No. 404008

Vacuum Filtration and Desiccation Kit | 404008

Rotary Evaporator Kit

- Quick and easy connection to rotary evaporators
- Kit includes 2m vacuum hose, cooling water hose and clamps
- CAT. No. 112575

Rotary Evaporator Kit | 112575

Other Accessories

- CAT. No. 112555-04 - In-line hydrophobic filter
- CAT. No. 829923 - Y-piece hose connector
- CAT. No. 825261 - Auto adapter for MP 065 E / MPC 090 E, 12 - 24 VDC for field use

112555-04

829923

825261

Exhaust silencers

CAT. No.	for Type
829901	MP 101 Z, MP 101 V, MP 201 T, MP 601 E, MP 601 T, MP 901 Z, MP 1201 E
400942	MP 060 E, MP 055 Z, MP 105 E
400596	MP 301 Z, MP 301 V
400941	MP 301 E

829901

400592

4 LVS

WELCH | ILMVAC
by Gardner Denver

Laboratory Vacuum Systems (LVS)

LVS 210 T ef | 115234

Advantages

- analytically pure, oil free vacuum
- user friendly
- designed for permanent operation
- maintenance-free drive system and proven long diaphragm life
- wide vacuum and flow range to match application
- fully chemically resistant
- inlet separator to protect pump from liquid and particle ingestion
- exhaust condenser for optimal solvent recovery
- modular design to tailor the system to your application needs

Scope of Delivery

- Chemical duty diaphragm pump mounted on chassis
- ON/OFF switch and internal protective thermal switch for the motor, mains cable and plug
- vibration isolating feet
- inlet separator
- exhaust condenser (except for LVS 300 Z)
- gas ballast valve (except for LVS 105 T - 10 ef)
- 8mm inlet / exhaust hose nozzle

Range of Applications

- rotary evaporators
- vacuum ovens
- multi-user networks (Netvac)
- solvent concentration

Description

LVS systems are specially designed for solvent distillation / evaporation applications. They comprise an oil-free chemical duty diaphragm pump (MPC) with optional control packages, liquid containment and exhaust vapour condenser. All wetted parts are made from high quality chemically resistant materials with clear plastic coated glassware to allow solvent and acid vapours to be pumped.

4 LVS

Model options

The LVS systems are available with a range of vacuum control options; *unregulated*, *manually regulated* and *three different electronic control packages* are available.

Unregulated

- When ultimate vacuum is required at all times.

LVS 300 Z

Manually regulated

- A fine control valve is used to regulate the vacuum by acting as a bleed valve. Options available with one or two manual regulators.

LVS 301 Z

Standard digital control (cv)

- The standard electronic control package uses a chemically resistant solenoid valve to control the process vacuum while the pump runs continually.
- The user defined vacuum and hysteresis levels are used to open and close the control valve thus maintaining vacuum at the process between the high and low control points. This is known as two point control.

LVS 310 Z

Economic digital control (en)

- Economic control uses the same two point control system, but as cv replaces the control valve with a relay which turns the pump on and off to maintain the process vacuum between the user defined vacuum and hysteresis levels. This method greatly reduces power consumption and extends the lifetime of the pump.
- Economic control is particularly useful for multi-user vacuum networks where the pump is located away from the user.

LVS 310 Z en

Ecoflex digital control (ef)

- Ecoflex control varies the speed of the pump constantly to maintain the user defined vacuum level regardless of changes in the process requirements.
- The Ecoflex method exhibits genuine single point (hysteresis-free) control and therefore a stable vacuum level.
- Single point control results in up to 40% increase in evaporation rates with minimal bumping or foaming of precious samples. This is particularly important in ultimate rotary evaporation.

LVS 310 Z ef

Highlight LVS 105 T - 10 ef

WELCH formerly ILMVAC
by Gardner Denver

LVS 105 T - 10 ef | 114184

Advantages

- analytically pure, oil free vacuum
- deep 2 mbar ultimate vacuum
- Ecoflex vacuum control
- built in solvent library
- multi-lingual digital display
- user friendly
- heated pump heads to stop vapours condensing inside of the pump
- designed for permanent operation
- maintenance-free drive system and proven long diaphragm life
- fully chemically resistant
- compact design
- inlet separator to protect pump from liquid and particle ingestion
- exhaust condenser for optimal solvent recovery

Scope of delivery

- Chemical duty diaphragm pump built inside casing
- ON/OFF switch and internal protective thermal switch for the motor, mains cable and plug
- Built in digital vacuum controller with ecoflex control software and solvent library
- vibration isolating feet
- inlet separator
- exhaust condenser
- pump head heating
- 8mm inlet / exhaust hose nozzle

ROdist professional package
with LVS 105 T - 10 ef | 112033

Description

The LVS 105 T - 10 ef is the perfect partner for your rotary evaporator, but can also be used for a range of other applications such as vacuum ovens, solvent concentration and multi-user vacuum networks. Its deep 2 mbar ultimate vacuum and high free flow of 20 l/min make it ideal for use with both high and low boiling point solvents - even allowing non-volatiles such as DMF to be evaporated at 30°C. It combines a powerful built in chemical duty diaphragm vacuum pump with Ecoflex control principals. Heating of the pump heads allows a consistent clean vacuum without gas ballasting.

The Ecoflex control continuously adjusts the pumping speed to match the vapour load of the process and allows the pump to exhibit single point control which reduces bumping and foaming whilst achieving increased evaporation rates. The built in multi-lingual digital vacuum controller allows easy adjustment of the desired vacuum level as well as the option to select common solvents from the built in solvent library. An inlet trap protects the pump from ingesting liquids and particles and an exhaust vapour condenser is included for optimal solvent recovery.

4 LVS

Overview of Systems

Flow rate / Free Air Displacement	Ultimate Pressure	Manual Vacuum Control	Standard Two Point Vacuum Control	Ecoflex Vacuum Control	Economic Vacuum Control	Welch Model	Number of Unregulated Connections	Number of Manual Regulated Connections	Number of Controller Regulated Connections	With Dial Vacuum Gauge	With Digital VCZ 521 Controller	With LED VCZ 424 Controller	Ordering Information 230V, 50/60Hz, 1 Ph
m³/h @50Hz	mbar												
1.2	2			x		LVS 105 T-10 ef			1		x		114184
1.0	8	x				LVS 101 Z w/ gauge		1		x			115027
↓	↓		x			LVS 110 Z			1		x		115024
2.0	2	x				LVS 201 T		1					115037
↓	↓	x				LVS 201 T w/ gauge		1		x			115037-10
↓	↓		x			LVS 210 T			1		x		115034
2.2	2			x		LVS 210 T ef			1		x		115234
2.3	8					LVS 300 Z	1						115041
↓	↓	x				LVS 301 Z		1					115047
↓	↓	x				LVS 301 Z w/ gauge		1		x			115047-10
↓	↓	x				LVS 302 Z		2					115043
↓	↓		x			LVS 310 Z			1		x		115044
↓	↓	x	x			LVS 311 Z		1	1		x		115045
↓	↓		x			LVS 320 Z			2			x	115046
2.6	8			x		LVS 310 Z ef			1		x		115244
4.5	2					LVS 600 T	1						115051
↓	↓	x				LVS 601 T		1					115057
↓	↓	x				LVS 601 T w/ gauge		1		x			115057-10
↓	↓	x				LVS 602 T		2					115053
↓	↓		x			LVS 610 T			1		x		115054
↓	↓	x	x			LVS 611 T		1	1		x		115055
↓	↓		x			LVS 620 T			2			x	115056
4.9	2			x		LVS 610 T ef			1		x		115254
8.3	2		x			LVS 1210 T			1		x		115064
9.1	2			x		LVS 1210 T ef			1		x		115264
Notvac LVS Systems													
2.3	8				x	LVS 310 Z en			1		x		115248-02
4.5	2				x	LVS 610 T en			1		x		115258-02

Every LVS system is supplied with a Chemical Duty Diaphragm Pump and a DN 8 hose connector. Some configurations also come with a vacuum control package and capture solvent recovery system depending on your needs. Comes pre-assembled and ready to use.

Connection Types


Manual Regulated Connections


Controller Regulated Connections


With Dial Vacuum Gauge


With a Digital Vacuum Controller


Simultaneous operation of two independent vacuum processes

Comments Vacuum Control

Manual

- Vacuum is adjusted by user turning the regulator

Standard Two Point Control

- Vacuum is automatically controlled at set point using on/off solenoid valve

Ecoflex

- Pump speed is automatically varied to control vacuum

Economic

- Pump automatically turns on/off based on demand for vacuum

WELCH formerly ILMVAC
by Gardner Denver

Technical Data

Final pressure <8 mbar	LVS 101 Z w/ gauge	LVS 110 Z	LVS 300 Z	LVS 301 Z	LVS 301 Z w/ gauge	LVS 302 Z	LVS 310 Z	LVS 311 Z	LVS 320 Z (424)
Parameter									
Free Air Displacement, m³/h @ 50Hz	1,0	1,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
Free Air Displacement, l/min	16,7	16,7	38	38	38	38	38	38	38
Ultimate pressure, mbar	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8
Intake/Exhaust connection	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8
Sound level	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44
Dimensions (W/D/H), mm	360/310 /445	360/310 /445	360/310 /395	360/310 /445	360/310 /445	360/310/ 445	360/310 445	360/310 /445	360/310 /445
Weight, kg	11,60	11,70	16,1	16,30	16,30	16,3	17,8	18,1	18,4
Ordering Information									
230V 50/60Hz	115027	115024	115041	115047	115047-10	115043	115044	115045	115046
115V 50/60Hz	115027-01	115024-01	115041-01	115047-01	115047-11	115043-01	115044-01	115045-01	115046-01

Final pressure <2 mbar	LVS 201 T	LVS 201 T w/gauge	LVS 210 T	LVS 600 T	LVS 601 T	LVS 601 T w/gauge	LVS 602 T	LVS 610 T	LVS 611 T	LVS 620 T (424)	LVS 1210 T
Parameter											
Free Air Displacement, m³/h @ 50Hz	1,8	1,8	1,8	4,5	4,5	4,5	4,5	4,5	4,5	4,5	8,3
Free Air Displacement, l/min	33	33	33	75	75	75	75	75	75	75	138
Ultimate pressure, mbar	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Intake/Exhaust connection	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8
Sound level	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44
Dimensions (W/D/H), mm	360/310 /445	360/310 /445	360/310 /445	360/310 /395	360/310/ 445	360/310 /445	360/310 /445	360/310 /445	360/310 /445	360/310 /445	540/310 /445
Weight, kg	15,0	15,3	15,7	23,2	23,50	23,50	23,5	24,7	25,0	25,3	36,1
Ordering Information											
230V 50/60Hz	115037	115037-10	115034	115051	115057	115057-10	115053	115054	115055	115056	115064
115V 50/60Hz	115037-01	115037-11	115034-01	115051-01	115057-01	115057-11	115053-01	115054-01	115055-01	115056-01	115064-01

Ecofiex	LVS 310 Z ef	LVS 105 T - 10 ef	LVS 210 T ef	LVS 610 T ef	LVS 1210 T ef
Parameter					
Free Air Displacement, m³/h @ 50Hz	2,6	1,2	2,2	4,9	9,1
Free Air Displacement, l/min	43	20	36	81	151
Ultimate pressure, mbar	< 8	< 2	< 2	< 2	< 2
Intake/Exhaust connection	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8
Sound level	< 44	< 44	< 44	< 44	< 44
Dimensions (W/D/H), mm	360/310/445	250/260/435	360/310/445	360/310/445	540/310/445
Weight, kg	19,9	9,5	19,0	26,8	37,1
Ordering Information					
90...260VAC	-	114184	-	-	-
230V 50/60Hz	115244	-	115234	115254	115264
115V 50/60Hz	115244-01	-	115234-01	115254-01	-

4 LVS

Accessories & Configurations

700183-11

828857-18

828839

620637-01

Glassware

CAT. No.	Accessories	for
700183-08	Exhaust condenser complete	all LVS models
700183-11	Exhaust condenser complete	LVS 105 T - 10 ef
828857-18	Drain	all LVS condensor, with hose nozzle DN 10, with KS 35
828839	Receiving flask coated, 500ml	

Software Connection Kit

- For connection of PC to digital controller in LVS systems
- Kit includes CD with software and RS232 connection cable
- CAT. No. 620637-01

112575

828310-4

700300-02

Rotary Evaporator Kit

- Quick and easy connection to rotary evaporators
- Kit includes 2m vacuum hose, cooling water hose and clamps
- CAT. No. 112575

Vacuum Hose

- Red rubber vacuum hose, 8mm ID, 5mm wall thickness
- CAT.No. 828310-4

Water Valve

- 2 way water flow valve for the demand-responsive cooling water supply.
- Input: G 3/4 inch sleeve nut,
- output: hose nozzle for hose inside diameters 8 mm
- CAT. No. 700300-02