

*Vacuum Pump and  
Systems Catalog  
2011/2012*



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**WELCH-ILMVAC**  
APPLIED VACUUM TECHNOLOGY

**Welch-Ilmvac** is a global business unit of Gardner Denver Inc., dedicated to providing value-added Laboratory and Life Science products. We proudly offer environmentally responsible Welch and Ilmvac vacuum products for use by the scientific community and for innovative vacuum system integration in light industrial applications.

Ilmvac products are manufactured in Ilmenau, Germany – the heart of a region renowned for technical innovation. We bring a passion for precision to the manufacture of every Ilmvac pump, system, and component. With the latest in CAD design, CNC tooling stations, and advanced **LEAN** manufacturing practices, Ilmvac stands at the forefront of progressive vacuum design and quality vacuum product manufacturing.

We look forward to working with you to make vacuum a utility perfectly matched to your need. For technical assistance, please contact us at the appropriate global location on the back cover.

How to use this catalog and Pump Selection Reference Chart	1
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## Dry Vacuum Pumps (Oil-Free)

Chemical Duty Diaphragm Pumps (MPC)	2-5
Standard Duty Diaphragm Pumps (MP)	6-8
Advanced Diaphragm Technology	9
Laboratory Vacuum Systems (LVS)	10-13
Standard Duty WOB-L and GEMINI Pumps	14-15
Scrollvac Scroll Pumps	16
Turbomolecular Pumping Systems CDK / STP	17

## Rotary Vane Pumps (Oil-Sealed)

Two-stage Direct-Driven Rotary Vane Pumps (P*Z)	18-19
One-stage Direct-Driven Rotary Vane Pumps (P*E)	20
Chemvac Pump Systems	21
CHEMSTAR Belt-Driven Rotary Vane Pumps	22

## Specialized Vacuum Products

ROdist Rotary Evaporator Systems	23
Hold Back Pumps	24
Aspiration/Filtration Stations	25
Netvac Multi-User Vacuum Networks	26-27

## Accessories / Facilitating Products

Vacuum Gauges / Controllers	28-29
Vacuum Pump Oils	30
Service / Service Kits	31-32
Parts and Accessories	32

### Key Advantages of Application Specific Pumps and Systems

- Right pump ensures cost effectiveness and minimal maintenance
- Specific progressive design and consulting - Green and Safe

See our online catalog for service, repair and complete product offering.



# How to Use This Catalog

## Laboratory

The requirements for vacuum in your laboratory are created by the applications you use. For vacuum to work in harmony with your work, you need the right air flow profile, vacuum level, control, materials of construction, durability – factors designed and constructed into your vacuum pump system.

Use the Pump Selection Reference Chart (below) to match your application to the recommended class of vacuum pump. Where appropriate, integrated vacuum systems are also referenced, providing additional features – control, vapor trapping, etc. – to better enable your vacuum utility to function with your usage and environment.



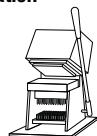







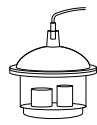



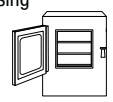

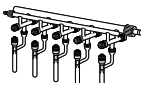



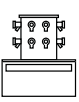

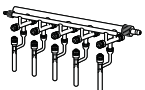



The Pump Selection Reference Chart also cites typical application configurations and operating parameters. The “Top Model” shown for each Application is the most frequently selected for this usage, but other referenced pumps and systems can be selected based on your specific requirements. For additional selection and configuration guidance, please contact your Welch-Ilmvac representative (see back cover).

## OEM / Industrial

The extensive Ilmvac product line contains vacuum solutions for nearly all common vacuum needs. This catalog is organized by pump design, with complete specification tables provided in order of ascending free-air displacement flow rate.

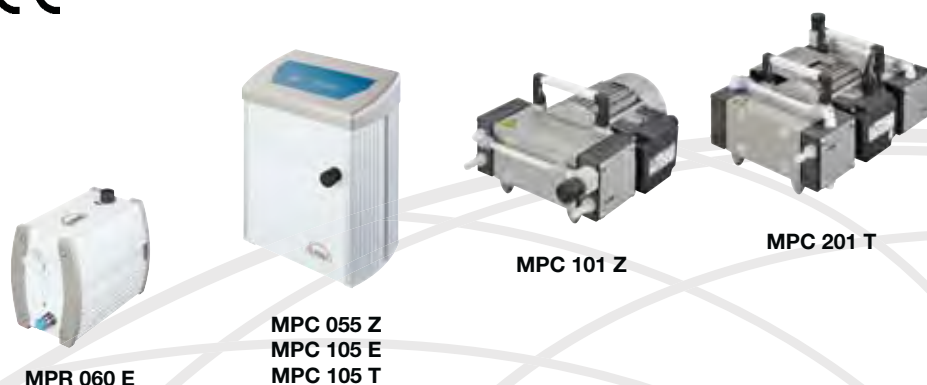
We also list basic vacuum system instrumentation, accessories, and components. Beyond the top offerings in this catalog, we have a broad range of products and engineering solutions. Please contact your Welch-Ilmvac representative (see back cover) or visit [www.welch-ilmvac.com](http://www.welch-ilmvac.com) for comprehensive product information.

### Pump Selection Reference Chart

APPLICATION	FLOW RATE/ X VACUUM	TOP MODEL	SEE PAGES	APPLICATION	FLOW RATE/ X VACUUM	TOP MODEL	SEE PAGES
<b>Rotary Evaporator</b> Volatiles, B.P. @60°C 0-4 Liter 	38L/min 8mbar (6torr)	 MPC 301 Z	2-5, 10-13	<b>Automation</b> 	100L/min 80mbar (60torr)	 2567	14-15
<b>Rotary Evaporator</b> Non-Volatiles, DMF, Toluene B.P. @40°C 0-1 Liter 	20L/min 2mbar (1.5torr)	 MPC 105 T	2-5	<b>Aspiration</b> 	15L/min 100mbar (75torr)	 biovac 106	25
<b>Rotary Evaporator</b> Non-Volatiles, DMF, Toluene B.P. @40°C 0-1 Liter 	20L/min 2mbar (1.5torr)	 LVS 105 T-10 ef	10-13	<b>Desiccation</b> 	18L/min 133mbar (100torr)	 2522	2-5, 14-15
<b>Vacuum Concentrator</b> 	36L/min 2mbar (1.5torr)	 MPC 201 T	2-5, 10-13	<b>Vacuum Oven</b> Drying, Degassing 	38L/min 8mbar (6torr)	 MPC 301 Z	2-5, 12-13, 14-15
<b>Vacuum Manifold</b> Schlenk Line 	77L/min 2x10 <sup>-3</sup> mbar (0.0015torr)	 P 4 Z	18-19, 21, 22	<b>Glove Boxes</b> 	183L/min 2x10 <sup>-3</sup> mbar (0.0015torr)	 P 12 Z	14-15, 16, 18-19
<b>Freeze Dryer</b> 	183L/min 2x10 <sup>-3</sup> mbar (0.0015torr)	 Chemvac 12 Z - 301	22	<b>Molecular Distillation / Sublimation</b> High Vacuum Line 	50L/min 5x10 <sup>-7</sup> mbar	 CDK 180	24
<b>Vacuum Filtration</b> 	10L/min 60mbar (45torr)	 MPR 060 E	2-5, 14-15				

Please see the pump selection reference chart on p. 1 for your specific needs.

- Rotary Evaporator
- Vacuum Oven
- Vacuum Filtration
- General Vacuum Work
- Gel Dryer
- Vacuum Concentrator
- Distillation / Evaporation
- Desiccation / Degassing
- Solid Phase Extraction
- Replace Water Jet Pumps



## Specifications

Ilmvac Model	MPR 060 E	MPC 055 Z	MPC 105 E	MPC 101 Z	MPC 105 T	MPC 201 T
adjustable vacuum						
Number of heads / stages	2 / 1	2 / 2	2 / 1	2 / 2	4 / 3	4 / 3
Free Air Displacement						
m <sup>3</sup> /h(L/min)@50Hz	0.6(10)	0.5(8)	0.9(15)	1.0(16.7)	1.2(20)	2.0(33)
cfm(L/min)@60Hz	0.4(10)	0.3(9.1)	0.6(16.6)	0.6(18)	0.7(20)	1.3(36)
Ultimate pressure, mbar(torr)	60(45)	5(3.8)	60(45)	8(6)	2(1.5)	2(1.5)
Maximum Vacuum, in. Hg	28.2	29.8	28.2	29.7	29.9	29.9
Max. overpressure, bar	----	----	----	----	----	----
IN / EX hose connector	DN 6/8 / silencer	DN 8	DN 8	DN 8	DN 8	DN 8
Tubing Needed, I.D. mm(in.)	6(0.24) / 8(0.32)	8(0.32)	8(0.32)	8(0.32)	8(0.32)	8(0.32)
Intake(Exhaust) Thread NPT	-(-)	-(1/8)	1/8(1/8)	1/4(1/4)	-(-)	1/4(1/4)
Sound level, dB(A)	42	44	44	45	44	45
Motor Power, watts(HP)	20(0.03)	68(0.09)	68(0.09)	60(0.08)	68(0.09)	90(0.12)
Type of motor protection, IP	20	42	42	54	42	54
Weight, kg(lbs.)	2.3(5.1)	6.3(13.8)	6.3(13.8)	6.5(14.3)	7.5(16.5)	10.3(22.7)
Overall Dimensions						
L cm(in.)	11.5(4.5)	23.5(9.3)	23.5(9.3)	19.5(7.7)	23.5(9.3)	20(7.9)
W cm(in.)	16.5(6.5)	14(5.5)	14(5.5)	23.5(9.3)	14(5.5)	26(10.2)
H cm(in.)	14.5(5.7)	27.7(10.9)	27.7(10.9)	14.5(5.7)	32.7(12.9)	15(5.9)
Ship Weight, kg(lbs.)	3(6.6)	8(17.6)	8(17.6)	9(19.8)	10(22.1)	13(28.7)
Shipping Carton Dimensions						
LxWxH cm(in.)	40x30x17 (15.7x11.8x6.7)	30x30x40 (11.8x11.8x15.7)	30x30x40 (11.8x11.8x15.7)	41x26x25 (16.1x10.2x9.8)	30x30x40 (11.8x11.8x15.7)	41x26x25 (16.1x10.2x9.8)

## Ordering Information

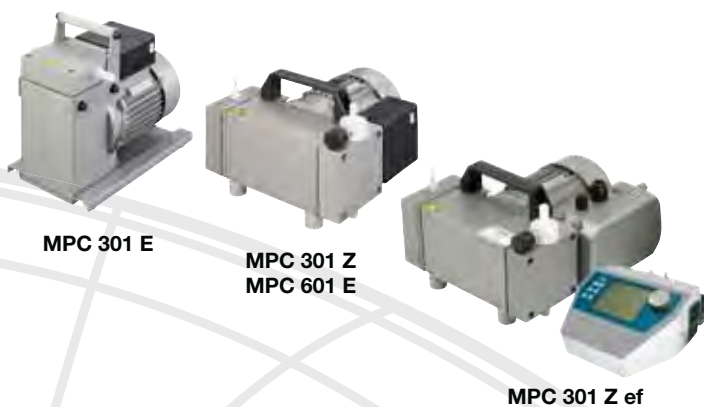
230V, 50/60Hz, 1 Ph <sup>1</sup>	----	----	----	412522	----	412543
115V, 50/60Hz, 1 Ph <sup>2</sup>	----	----	----	412522-01	----	412543-01
115/230V, 50/60Hz, 1 Ph <sup>3</sup>	----	412422	412421	----	----	----
90-260V, 50/60Hz <sup>4</sup>	412121	o.r. <sup>8</sup>	o.r. <sup>8</sup>	----	412443-02	----
100V, 50/60Hz, 1 Ph <sup>5</sup>	----	412422-01	412421-01	412522-04	----	412543-04
230/400V, 50/60Hz, 3 Ph <sup>6</sup>	----	----	----	----	----	----

Note:  
Every pump is supplied with ON/OFF switch and internal protective thermal switch for the motor, carry handle and vibration isolating feet. Comes pre-assembled.

For more information about materials of construction, Advanced Diaphragm Technology, the Ecoflex concept and ATEX, please see p. 9.

If there is a need for service information and service kits please see p. 31.

1. With Schuko and UK plug leads
2. With US plug lead
3. With Schuko, UK and US plug leads
4. With AC/DC adapter, Schuko, UK and US plug leads
5. With JP plug lead
6. Requires hard wiring to switched supply
7. With 3 phase 16A CEE plug lead
8. These pumps can be delivered on request (other country specific plug leads available upon request, please see p. 32)



MPC 301 E

MPC 301 Z  
MPC 601 E

MPC 301 Z ef

MPC 301 E	MPC 301 Z	MPC 301 Z ef	MPC 601 E
		Ecoflex	
1 / 1	2 / 2	2 / 2	2 / 1
2.3(38)	2.3(38)	2.6(43)	3.8(63)
1.5(41)	1.5(41)	1.6(43)	2.5(70)
75(56.3)	8(6)	8(6)	75(56.3)
27.7	29.7	29.7	27.7
----	----	----	----
DN 8	DN 8	DN 8	DN 8
8(0.32)	8(0.32)	8(0.32)	8(0.32)
-(-)	-(-)	-(-)	-(1/4)
45	45	44	45
180(0.25)	180(0.25)	200(0.27)	180(0.25)
54	54	54	54
8.9(19.6)	11.2(24.7)	15.5(34.2)	11.2(24.7)
26(10.2)	23(9.1)	26(10.2)	23(9.1)
16.2(6.4)	26.5(10.4)	31(12.2)	26.5(10.4)
25.2(9.9)	16.9(6.7)	19(7.5)	16.9(6.7)
12(26.5)	14(30.9)	18(39.7)	14(30.9)
35x25x30 (13.8x9.8x11.8)	48x32x30 (18.9x12.6x11.8)	48x32x30 (18.9x12.6x11.8)	48x32x30 (18.9x12.6x11.8)

412711	412722	412922	412721
412711-01	412722-01	412922-01	412721-01
----	----	----	----
----	----	----	----
412711-05	412722-04	----	412721-12
o.r. <sup>8</sup>	412722-02 <sup>7</sup>	----	412721-02 <sup>7</sup>

### OEM Modification / Customization

Welch-Ilmvac vacuum pumps can adapt for OEM equipment integration or for all-in-one packages.

- Color, motor voltage, Intake and Exhaust connector
- Package solution with integrated components
- Build-in pumps with 24V DC motor (see inside back cover)

Please see our OEM catalog or contact your local Welch-Ilmvac representative for further details and a customized offer.

### Vacuum Hose

Vacuum hose connection certain for common laboratory application. Please indicate the length in meter.



Material	O.D. mm	I.D. mm	Wall Thickness	CAT. No.
Rubber red	18	8	5	828310-4
Rubber red	20	10	5	828310-3
Silicone	12	6	3	828374

### Hose Adapter Kits

All in one kits, e.g. for connection to a vacuum oven with DN 16 KF or DN 25 KF flange. Each kit comes ready to use.

Type	Size	CAT. No.
Kit 1	DN 16 KF - DN 8	404002
Kit 2	DN 25 KF - DN 8	404004



Hose adapter kit includes hose connector, centering ring, hinge clamp ring and 2.5m vacuum hose, rubber red.

### Vacuum Regulator with Dial Gauge

The regulator valve for intake allows the adjustment of the ultimate pressure. The dial vacuum gauge indicates the vacuum level. The air regulator valve will be mounted directly on the pump.

For Pump Model	CAT. No.
MPC 055 Z, MPC 105 E, MPC 105 T	700459
MPC 101 Z, MPC 201 T, MPC 301 E, MPC 301 Z, MPC 601 E	700458



(Pump MPC 105 T shown with dial gauge 700459)



(Pump MPC 301 Z shown with dial gauge 700458)

### Digital Vacuum Control Box VCB 521

Programmable vacuum controller for use with various vacuum pump types in the rough vacuum range. Easy to maintain vacuum level. 90-260V, 50/60Hz <sup>3</sup>.

Type	Range	CAT. No.
VCB 521 cv	1100 - 1mbar	600053



For more detailed information and other models, please see p. 29.

### Complete Pump Systems

Complete vacuum systems (LVS) are integrated vacuum systems which are designed for solvent distillation/evaporation applications. LVS systems are available in different configurations with optional control packages, liquid containment and solvent recovery.

Type	CAT. No.
LVS 110 Z (230V, 50/60Hz)	115024 <sup>1</sup>
LVS 310 Z (230V, 50/60Hz)	115044 <sup>1</sup>
LVS 310 Z ef (230V, 50/60Hz)	115244 <sup>1</sup>



For more detailed information and other models, please see p. 12 - 13.

### Hose Connectors

Type	CAT. No.
DN 8 male 1/4 inch	710953
DN 10 male 1/4 inch	710955
Y - piece	829923

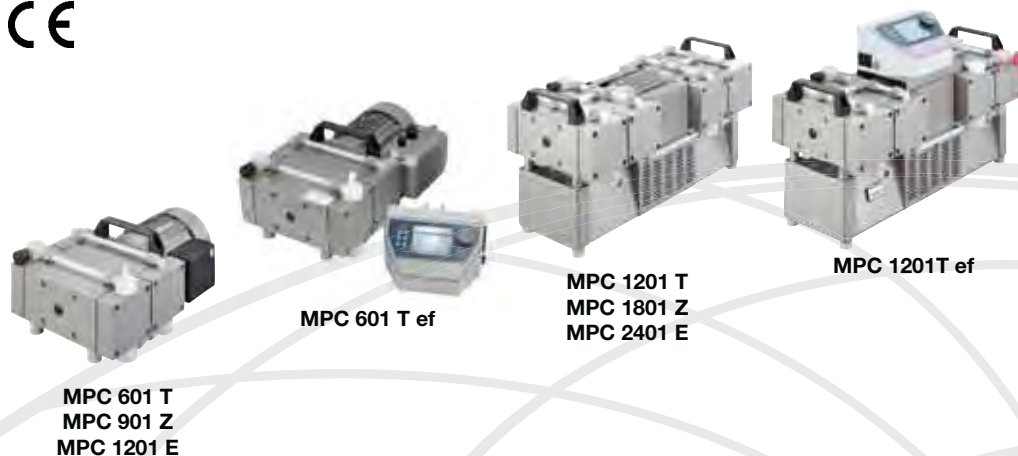


Please see the pump selection reference chart on p. 1 for your specific needs.

- Rotary Evaporator
- Vacuum Oven
- Vacuum Concentrator
- Vacuum Filtration
- Distillation / Evaporation
- Drying
- Degassing

### ATEX

- Areas with potentially explosive atmosphere



## Specifications

### Ilmvac Model

	MPC 601 T	MPC 601 T ef	MPC 901 Z	MPC 1201 E	MPC 1201 T	MPC 1201 T ef
Number of heads / stages	4 / 3	4 / 3	4 / 2	4 / 1	8 / 3	8 / 3
Free Air Displacement						
m <sup>3</sup> /h(L/min)@50Hz	4.5(75)	4.9(81)	6.8(113)	8.3(138)	8.3(135)	8.3(138)
cfm(L/min)@60Hz	2.9(81)	2.9(81)	4.4(125)	5.3(151)	5.3(151)	4.8(138)
Ultimate pressure, mbar(torr)	2(1.5)	2(1.5)	8(6)	75(56.3)	2(1.5)	2(1.5)
Maximum Vacuum, in. Hg	29.9	29.9	29.7	27.7	29.9	29.9
Max. overpressure, bar	---	---	---	---	---	---
IN / EX hose connector	DN 8	DN 8	DN 8	DN 8	DN 16 KF	DN 16 KF
Tubing Needed, I.D. mm(in.)	8(0.32)	8(0.32)	8(0.32)	8(0.32)	hose connector available	hose connector available
Intake(Exhaust) Thread NPT	- (1/4)	- (1/4)	- (-)	- (1/4)	1/4(1/4)	1/4(1/4)
Sound level, dB(A)	45	44	45	45	48	47
Motor Power, watts(HP)	370(0.5)	390(0.53)	370(0.5)	370(0.5)	370/440(0.5/0.6)	370(0.5)
Type of motor protection, IP	54	54	54	54	54	54
Weight, kg(lbs.)	18.3(40.3)	22.6(49.8)	18.3(40.3)	18.3(40.3)	32.8( 72.3)	34(75)
Overall Dimensions						
L cm(in.)	23(9.1)	26(10.2)	23(9.1)	23(9.1)	54(21.3)	54(21.3)
W cm(in.)	38(15)	42(16.5)	38(15)	38(15)	30(11.8)	30(11.8)
H cm(in.)	16.9(6.7)	19(7.5)	16.9(6.7)	16.9(6.7)	24(9.4)	32(12.6)
Ship Weight, kg(lbs.)	22(48.5)	29(63.9)	22(48.5)	22(48.5)	40.1(88.2)	41.5(91.3)
Shipping Carton Dimensions						
LxWxH cm(in.)	48x32x30 (18.9x12.6x11.8)	60x40x56 (23.6x15.8x22.1)	48x32x30 (18.9x12.6x11.8)	48x32x30 (18.9x12.6x11.8)	60x40x41 (23.6x15.8x16.1)	60x40x41 (23.6x15.8x16.1)

## Ordering Information

230V, 50/60Hz, 1 Ph <sup>1</sup>	412743	412943	412742	412741	412783	412983
115V, 50/60Hz, 1 Ph <sup>2</sup>	412743-01	412943-01	412742-01	412741-01	412783-01	412983-01
115/230V, 50/60Hz, 1 Ph <sup>3</sup>	---	---	---	---	---	---
90-260V, 50/60Hz <sup>4</sup>	---	---	---	---	---	---
100V, 50/60Hz, 1 Ph <sup>5</sup>	412743-04	---	412742-04	412741-04	o.r. <sup>8</sup>	---
230/400V, 50/60Hz, 3 Ph <sup>6</sup>	412743-02	---	o.r. <sup>8</sup>	412741-02	412783-02	---

### Note:

Every pump is supplied with ON/OFF switch and internal protective thermal switch for the motor, carry handle and vibration isolating feet. Comes pre-assembled.

For more information about materials of construction, Advanced Diaphragm Technology, the Ecoflex concept and ATEX, please see p. 9.

If there is a need for service information and service kits please see p. 31.

1. With Schuko and UK plug leads
2. With US plug lead
3. With Schuko, UK and US plug leads
4. With AC/DC adapter, Schuko, UK and US plug leads
5. With JP plug lead
6. Requires hard wiring to switched supply
7. With 3 phase 16A CEE plug lead
8. These pumps can be delivered on request (other country specific plug leads available upon request, please see p. 32)



MPC 301 Zp Ex



MPC 601 Tp Ex

MPC 1801 Z	MPC 2401 E	MPC 301 Zp Ex	MPC 601 Tp Ex
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8 / 2	8 / 1	ATEX 2 / 2	ATEX 4 / 3
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12(201)	15.5(258)	2.3(38)	4.5(75)
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7.8(222)	10(283)	1.3(38)	2.7(75)
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8(6)	75(56.3)	8(6)	2(1.5)
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29.7	27.7	29.7	29.9
------	------	------	------

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DN 16 KF hose connector available	DN 16 KF hose connector available	DN 8 8(0.32)	DN 16 KF hose connector available

1/4(1/4)	1/4(1/4)	---	---
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48	48	45	45
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370/440(0.5/0.6)	370/440(0.5/0.6)	180(0.25)	370(0.5)
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54	54	55	55
----	----	----	----

32.8(72.3)	32.8(72.3)	22.9(50.5)	29.7(65.5)
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54(21.3)	54(21.3)	24(9.4)	24(9.4)
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30(11.8)	30(11.8)	30(11.8)	42.5(16.7)
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24(9.4)	24(9.4)	26(10.2)	27.2(10.7)
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40.1(88.2)	40.1(88.2)	26(57.3)	33(72.8)
------------	------------	----------	----------

60x40x41 (23.6x15.8x16.1)	60x40x41 (23.6x15.8x16.1)	48x32x30 (18.9x12.6x11.8)	61x41x58 (24x16.2x22.8)
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412782	412781	---	---
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412782-01	412781-01	---	---
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o.r. <sup>8</sup>	o.r. <sup>8</sup>	---	---
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412782-02	412781-02	4000481-04	4000511-04
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### OEM Modification / Customization

Welch-Ilmvac vacuum pumps can adapt for OEM equipment integration or for all-in-one packages.

- Color, motor voltage, Intake and Exhaust connector
- Package solution with integrated components

Please see our OEM catalog or contact your local Welch-Ilmvac representative for further details and a customized offer.

## Vacuum Hose

Vacuum hose connection certain for common laboratory application. Please indicate the length in meter.

Material	O.D. mm	I.D. mm	Wall Thickness	CAT. No.
Rubber red	18	8	5	828310-4
Rubber red	20	10	5	828310-3
Silicone	12	6	3	828374

## Hose Adapter Kits

All in one kits, e.g. for connection to a vacuum oven with DN 16 KF or DN 25 KF flange. Each kit comes ready to use.

Type	Size	CAT. No.
Kits 1	DN 16 KF - DN 8	404002
Kits 2	DN 25 KF - DN 8	404004

Hose adaptor kit includes hose connector, centering ring, hinge clamp ring and 2.5m vacuum hose, rubber red.

## Complete Pump Systems

Complete vacuum systems (LVS) are integrated vacuum systems which are designed for solvent distillation/evaporation applications.

Type	CAT. No.
LVS 610 T (230V, 50/60Hz)	115054 <sup>1</sup>

For more detailed information and other models, please see p. 12 - 13.

## Handheld General Range

### Vacuum Gauge - PIZA 101

Piezo resistive robust rough vacuum gauge with digital display. Alternative for mechanical vacuum gauges.

#### Features

- With Piezo resistive ceramic sensor
- Economical rough vacuum gauge for multiple uses in laboratories
- Portable unit connects quickly to any vacuum source
- 90-260V, 50/60Hz<sup>4</sup>

Type	Range mbar(torr)	CAT. No.
PIZA 101	1050 to 1(785 to 1)	600071

For more detailed information and other models, please see p. 28.

## Explosion Proof Digital

### Vacuum Gauge - PIZA 102 ATEX

The compact gauge PIZA 102 ATEX approval for use in areas with potentially explosive atmospheres (ATEX category 2 - II 2G Ex ib IIB T4).

#### Features

- External sensor
- Operates on certified Ilmvac 9V battery
- ATEX Compact Vacuum gauge for fast, accurate and easy vacuum measurement

Type	Range mbar(torr)	CAT. No.
PIZA 102 ATEX	1050 to 1(785 to 1)	600077

## Hose Connectors

Type	CAT. No.
DN 8 male 1/4 inch	710953
DN 10 male 1/4 inch	710955
Y - piece	829923

## KF Connectors

Connectors for vacuum hose and DN KF.

Type	CAT. No.
DN 16 KF - 1/4 PP	710116
DN 25 KF - 1/4 PP	710117

Please see the pump selection reference chart on p. 1 for your specific needs.

- Aqueous Vacuum Filtration
- Air / Gas Sampling
- Vacuum Chambers
- Backing Pumps for Various Turbo Molecular Pumps
- Analytical Technology
- Mass Spectrometer
- Vacuum Chucking
- Parts Handling, Pick and Place Conveyor Lines



MP 101 Z

MP 101 V  
MP 201 T

MP 055 Z  
MP 105 E

MP 060 E

## Specifications

Ilmvac Model	MP 060 E	MP 055 Z	MP 105 E	MP 101 Z	MP 101 V	MP 201 T
Number of heads / stages	2 / 1	2 / 2	2 / 1	2 / 2	4 / 4	4 / 3
Free Air Displacement						
m <sup>3</sup> /h(L/min)@50Hz	0.6(10)	0.5(8)	0.9(15)	1.0(16.7)	1.0(16.7)	2.0(33)
cfm(L/min)@60Hz	0.4(10)	0.3(9.1)	0.6(16.6)	0.7(18)	0.7(18)	1.3(36)
Ultimate pressure, mbar(torr)	60(45)	5(3.8)	60(45)	8(6)	1(0.75)	2(1.5)
Maximum Vacuum, in. Hg	28.2	29.8	28.2	29.7	29.9	29.9
Max. overpressure, bar	----	----	----	----	----	----
IN / EX hose connector	DN 6/8 / silencer	DN 8	DN 8	DN 8	DN 8	DN 8
Tubing Needed, I.D. mm(in.)	6(0.24) / 8(0.32)	8(0.32)	8(0.32)	8(0.32)	8(0.32)	8(0.32)
Intake(EXhaust) Thread NPT	- (-)	- (1/8)	1/8(1/8)	1/4(1/4)	1/4(1/4)	1/4(1/4)
Sound level, dB(A)	42	44	44	45	45	45
Motor Power, watts(HP)	20(0.03)	68(0.09)	68(0.09)	60(0.08)	90(0.12)	90(0.12)
Type of motor protection, IP	20	42	42	54	54	54
Weight, kg(lbs.)	2.3(5.1)	6.25(13.8)	6.25(13.8)	6.5(14.3)	10.3(22.7)	10.3(22.7)
Overall Dimensions						
L cm(in.)	11.5(4.5)	23.5(9.3)	23.5(9.3)	19.5(7.7)	20(7.9)	20(7.9)
W cm(in.)	16.5(6.5)	14(5.5)	14(5.5)	23.5(9.3)	26(10.2)	26(10.2)
H cm(in.)	14.5(5.7)	27.7(10.9)	27.7(10.9)	14.5(5.7)	15(5.9)	15(5.9)
Ship Weight, kg(lbs.)	3(6.6)	8(17.6)	8(17.6)	9(19.8)	13(28.7)	13(28.7)
Shipping Carton Dimensions						
LxWxH cm(in.)	40x30x17 (15.7x11.8x6.7)	30x30x40 (11.8x11.8x15.7)	30x30x40 (11.8x11.8x15.7)	41x26x25 (16.1x10.2x9.8)	41x26x25 (16.1x10.2x9.8)	41x26x25 (16.1x10.2x9.8)

## Ordering Information

230V, 50/60Hz, 1 Ph <sup>1</sup>	----	----	----	411522	411544	411543
115V, 50/60Hz, 1 Ph <sup>2</sup>	----	----	----	411522-01	411544-01	411543-01
115/230V, 50/60Hz, 1 Ph <sup>3</sup>	----	411422	411421	----	----	----
90-260V, 50/60Hz <sup>4</sup>	411121	----	----	----	----	----
100V, 50/60Hz, 1 Ph <sup>5</sup>	----	o.r. <sup>8</sup>	o.r. <sup>8</sup>	o.r. <sup>8</sup>	o.r. <sup>8</sup>	o.r. <sup>8</sup>
230/400V, 50/60Hz, 3 Ph <sup>6</sup>	----	----	----	----	----	----

### Note:

Every pump is supplied with ON/OFF switch and internal protective thermal switch for the motor, carry handle and vibration isolating feet and EXhaust silencer. Comes pre-assembled.

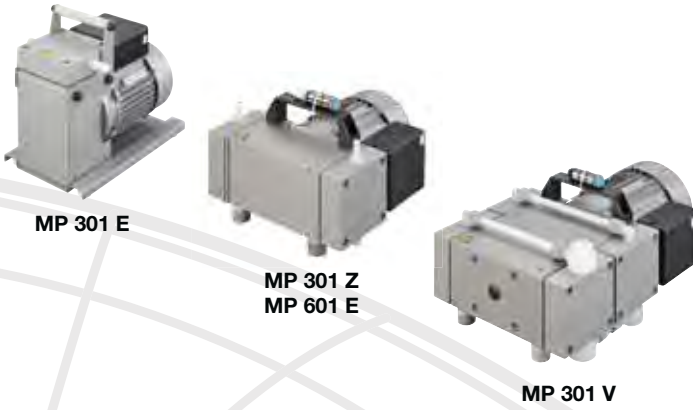
For more information about materials of construction, Advanced Diaphragm Technology, the Ecoflex concept and ATEX, please see p. 9.

If there is a need for service information and service kits please see p. 31.

1. With Schuko and UK plug leads
2. With US plug lead
3. With Schuko, UK and US plug leads
4. With AC/DC adapter, Schuko, UK and US plug leads
5. With JP plug lead
6. Requires hard wiring to switched supply
7. With 3 phase 16A CEE plug lead
8. These pumps can be delivered on request (other country specific plug leads available upon request, please see p. 32)



# Standard Duty Diaphragm Pumps



MP 301 E

MP 301 Z  
MP 601 E

MP 301 V

MP 301 E      MP 301 Z      MP 301 V      MP 601 E

1 / 1      2 / 2      4 / 4      2 / 1

2.3(38)      2.3(38)      2.3(38)      3.8(63)

1.5(41)      1.5(41)      1.5(41)      2.5(70)

75(56.3)      8(6)      1(0.75)      75(56.3)

27.7      29.7      29.9      27.7

----      ----      ----      ----

DN 8      DN 8      DN 16 KF / DN 8      DN 8

8(0.32)      8(0.32)      hose connector available      8(0.32)

- (-)      - (-)      - (-)      - (1/4)

45      45      45      45

180(0.25)      180(0.25)      370(0.5)      180(0.25)

54      54      54      54

8.9(19.6)      11.2(24.7)      18.3(40.3)      11.2(24.7)

26(10.2)      23(9.1)      23(9.1)      23(9.1)

16.2(6.4)      26.5(10.4)      38(15)      26.5(10.4)

25.2(9.9)      16.9(6.7)      16.9(6.7)      16.9(6.7)

12(26.5)      14(30.9)      22(48.5)      14(30.9)

35x25x30 (13.8x9.8x11.8)      48x32x30 (18.9x12.6x11.8)      48x32x30 (18.9x12.6x11.8)      48x32x30 (18.9x12.6x11.8)

411711      411722      411744      411721

411711-01      411722-01      411744-01      411721-01

----      ----      ----      ----

----      ----      ----      ----

o.r.<sup>8</sup>      o.r.<sup>8</sup>      o.r.<sup>8</sup>      o.r.<sup>8</sup>

o.r.<sup>8</sup>      411722-02      411744-02      411721-02

### OEM Modification/Customization

Welch-Ilmvac vacuum pumps can adapt for OEM equipment integration or for all-in-one packages.

- Color, motor voltage, Intake and Exhaust connector
- Package solution with integrated components

Please see our OEM catalog or contact your local Welch-Ilmvac representative for further details and a customized offer.

# Accessories

## Vacuum Hose

Vacuum hose connection certain for common laboratory application. Please indicate the length in meter.

Material	O.D. mm	I.D. mm	Wall Thickness	CAT. No.
Rubber red	18	8	5	828310-4
Rubber red	20	10	5	828310-3
Silicone	12	6	3	828374



## Particulate, In-line filter

The filter is an economical solution to protect the vacuum pump from fine particulates and aerosols to 0.2 microns .

Type	CAT. No.
DN 8	112555-04



## EXhaust Silencer

Exhaust silencers are installed in the exhaust port of the vacuum pump to reduce pump noise.

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



## Hose Connectors

Type	CAT. No.
DN 8 male 1/8 inch	710953
DN 10 male 1/4 inch	710955
Y - piece	829923



## KF Connectors

Connectors for vacuum hose and DN KF.

Type	CAT. No.
DN 16 KF - 1/4 AL	710108
DN 25 KF - 1/4 AL	710700



## Metal Vacuum Hose

Stainless Steel metal vacuum hose in various sizes and length for DN KF IN and EX connectors.

Type	Length mm	CAT. No.
DN 16 KF	500	710761
DN 16 KF	1000	710764
DN 25 KF	500	710762
DN 25 KF	1000	710765



## Accessories for KF Connectors

Centering ring made of aluminum with Viton O-Ring.

Type	CAT. No.
DN 16 KF	701091
DN 25 KF	701093



Hinge clamp ring for DN KF flange. Made of aluminium. Closure by wing and nut bolt.

Type	CAT. No.
DN 16 KF	701011
DN 25 KF	701013



Please see the pump selection reference chart on p. 1 for your specific needs.

- General Vacuum Work
- Air / Gas Sampling
- Fast Evacuation of Large Chamber Volumes
- Backing Pump for Various Turbo Pumps
- Drying Chambers
- Vacuum Chambers
- Degassing
- Isolation Vacuum



MP 601 T  
MP 901 Z  
MP 1201 E



MP 1201 T  
MP 1801 Z  
MP 2401 E

Specifications

Ilmvac Model	MP 601 T	MP 901 Z	MP 1201 E	MP 1201 T	MP 1801 Z	MP 2401 E
Number of heads / stages	4 / 3	4 / 2	4 / 1	8 / 3	8 / 2	8 / 1
Free Air Displacement						
m <sup>3</sup> /h(L/min)@50Hz	4.5(75)	6.8(113)	8.3(138)	8.3(135)	12(201)	15.5(258)
cfm(L/min)@60Hz	2.86(81)	4.42(125)	5.33(151)	5.33(151)	7.84(222)	10(283)
Ultimate pressure, mbar(torr)	2(1.5)	8(6)	75(56.3)	2(1.5)	8(6)	75(56.3)
Maximum Vacuum, in. Hg	29.9	29.7	27.7	29.9	29.7	27.7
Max. overpressure, bar	----	----	----	----	----	----
IN / EX hose connector	DN 16 KF / DN8	DN 16 KF / DN 8	DN 16 KF / DN 8	DN 16 KF	DN 16 KF	DN 16 KF
Tubing Needed, I.D. mm(in.)	hose connector available	hose connector available	hose connector available	hose connector available	hose connector available	hose connector available
Intake(EXhaust) Thread NPT	----	----	----	----	----	----
Sound level, dB(A)	45	45	45	47	47	47
Motor Power, watts(HP)	370(0.5)	370(0.5)	370(0.5)	370/440(0.5/0.6)	370/440(0.5/0.6)	370/440(0.5/0.6)
Type of motor protection, IP	54	54	54	54	54	54
Weight, kg(lbs.)	18.3(40.3)	18.3(40.3)	18.3(40.3)	32.8(72.3)	32.8(72.3)	32.8(72.3)
Overall Dimensions						
L cm(in.)	23(9.1)	23(9.1)	23(9.1)	54(21.3)	54(21.3)	54(21.3)
W cm(in.)	38(15)	38(15)	38(15)	30(11.8)	30(11.8)	30(11.8)
H cm(in.)	16.9(6.7)	16.9(6.7)	16.9(6.7)	24(9.4)	24(9.4)	24(9.4)
Ship Weight, kg(lbs.)	22(48.5)	22(48.5)	22(48.5)	40.1(88.2)	40.1(88.2)	40.1(88.2)
Shipping Carton Dimensions						
LxWxH cm(in.)	48x32x30 (18.9x12.6x11.8)	48x32x30 (18.9x12.6x11.8)	48x32x30 (18.9x12.6x11.8)	60x40x41 (23.6x15.8x16.1)	60x40x41 (23.6x15.8x16.1)	60x40x41 (23.6x15.8x16.1)

Ordering Information

230V, 50/60Hz, 1 Ph <sup>1</sup>	411743	411742	411741	411783	411782	411781
115V, 50/60Hz, 1 Ph <sup>2</sup>	411743-01	411742-01	411741-01	411783-01	411782-01	411781-01
115/230V, 50/60Hz, 1 Ph <sup>3</sup>	----	----	----	----	----	----
90-260V, 50/60Hz <sup>4</sup>	----	----	----	----	----	----
100V, 50/60Hz, 1 Ph <sup>5</sup>	o.r. <sup>8</sup>	o.r. <sup>8</sup>	o.r. <sup>8</sup>	o.r. <sup>8</sup>	o.r. <sup>8</sup>	o.r. <sup>8</sup>
230/400V, 50/60Hz, 3 Ph <sup>6</sup>	411743-02	411742-02	411741-02	411783-02	411782-02	411781-02

Note:  
Every pump is supplied with ON/OFF switch and internal protective thermal switch for the motor, carry handle and vibration isolating feet and EXhaust silencer. Comes pre-assembled.

For more information about materials of construction, Advanced Diaphragm Technology, the Ecoflex concept and ATEX, please see p. 9.

If there is a need for service information and service kits please see p. 31.

1. With Schuko and UK plug leads
2. With US plug lead
3. With Schuko, UK and US plug leads
4. With AC/DC adapter, Schuko, UK and US plug leads
5. With JP plug lead
6. Requires hard wiring to switched supply
7. With 3 phase 16A CEE plug lead
8. These pumps can be delivered on request (other country specific plug leads available upon request, please see p. 32)

## Materials of Construction

MP Series	MPC Series	All Models
Aluminium pump heads suitable for pumping permanent gases.  Connectors are made from PA with PTFE tubing.	PTFE doped with carbon to reduce electrostatic build up. these pumps are suitable for pumping acid and solvent vapours.  Connectors are made from PVDF and PP for chemical resistance.	PTFE diaphragms sandwiched to a strong non-wetted backing. We fit these diaphragms to all models because they offer longer lifetime than conventional elastomer diaphragms.  PEEK valves have excellent resistance to chemical attack and are extremely hard wearing when compared to elastomer valves.

Special requirements: Other materials can be specified for special compatibility needs for example: diaphragms in PTFE, valves in PFA or PTFE, O-rings in PTFE, special connectors  
Please contact your local Welch-Ilmvac representative for comprehensive product configuration.

## Ecoflex™

Ecoflex technology enables an electronic controller (VCB 521 ef) to continuously vary the throughput of the pump to maintain a user defined vacuum level. This constant adjustment results in more effective and reproducible process results for the three Ilmvac models listed below.

- MPC 301 Z ef
- MPC 601 T ef
- MPC 1201 T ef

### Features

- Faster process results though constant evaporation / degassing
- Automatic adjustment to changing process requirements
- Whisper quiet operation through reduced rpm
- Extended service intervals as wear is reduced
- Options for remote control and PC integration (see p. 13 for more information)



## ATEX

Use ATEX vacuum pumps for regulatory compliance when evacuating combustibles and when generating rough vacuum in areas with potentially explosive atmosphere.

Evacuation of combustible atmospheres inside or outside of a highly combustible environment require a special evaluation according to guideline 1999/92/EG (ATEX 137).

According to the results of this evaluation a suitable device of category 1, 2 or 3 has to be selected to fulfill the demands for zone 0, 1 or 2 in the regulations 94/9/EG (ATEX 95).

For compliance with the regulation, choose from two Ilmvac pump models designed to the specification II 2G c II T4x.

- MPC 301 Zp Ex
- MPC 601 Tp Ex

They provide for application in device categories 2 or 3 / zone 1 or 2.

*Please note that the evaluation must legally be made by the user or supervisor and not by the equipment manufacturer.*



## LVS Integrated Systems

LVS systems are designed for solvent distillation / evaporation applications and comprise an oil-free, chemical duty diaphragm pump with optional control packages, liquid containment and exhaust vapor condenser for optimal solvent recovery.

- Wide choice of performance**  
 Available with 2 or 3 pumping stages to generate vacuum as low as 2mbar(1.5torr).  
 Flow rate choices from 20 to 238L/min
- Modular design with options to complement your process**  
 Digital control options and on board accessories tailor the LVS to your needs.
- Resistant to acid and solvent vapors**  
 Wetted parts in PTFE, PVDF, PEEK, PP and glass.
- Ergonomic design places controls and features where they are needed.**  
 Frees up hood or bench space.

## Vacuum Control Packages

In addition to the manual controlled LVS models, three electronic control packages are available.

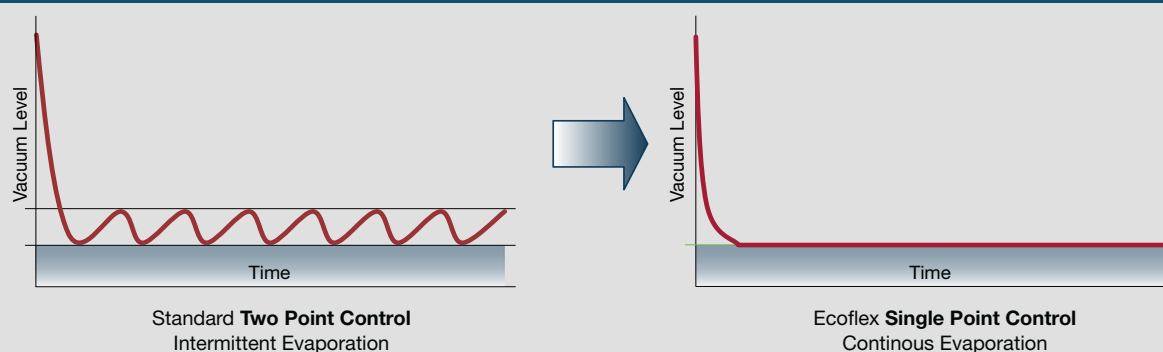
- Standard – cv**  
 The standard electronic control package uses a chemically resistant **solenoid valve** to control the process vacuum while the pump runs continually. The user defined vacuum and hysteresis levels are used to open and close the control valve thus maintaining vacuum at the process between the high and low control points. This is known as **two point control**.  
*Suitable for: rotary evaporators and general laboratory*
- Economic – en**  
 Economic uses the same two point control system, but 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.  
*Suitable for: multi-user vacuum network*

- Ecoflex – ef**  
 Ecoflex control **varies the speed** of the pump constantly to maintain the user defined vacuum level regardless of changes in the process requirements. Variability is exactly reduced with the Ecoflex method and therefore the process will see genuine **single point** (hysteresis-free) control with stable vacuum level. Single point control results in up to 40% increase in evaporation rates with minimal bumping or foaming of precious samples.

*Suitable for: ultimate rotary evaporation*



## Ecoflex preserves your sample while evaporating up to 40% faster



## LVS 105 T -10 ef

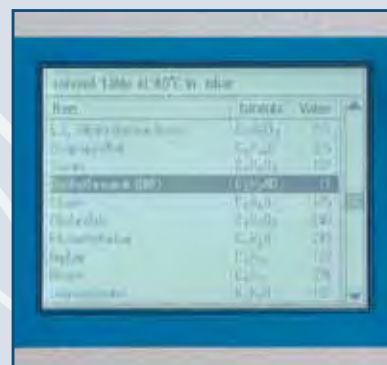
### The Perfect Partner for your Rotary Evaporator

Ecoflex Speed Control System Provides

- Faster Processes – up to 40% increase in evaporation rates
- Ultra quiet operation – silent at equilibrium
- 2mbar(1.5torr) evaporates non-volatiles, e.g. DMF @30° C(86° F)
- Solvent library built in – dial a solvent!
- Multi-lingual digital display; English, German, French, Spanish and others



*Green*  
**By Design**



## Ecoflex

### The Future for Evaporation Technology

The key features of the new **LVS 105 T -10 ef** all come from the Ecoflex control philosophy which continuously adjusts the pumping speed to match the vapor load produced by the evaporation process, regardless of changes in other parameters.

Boiling points can be selected via jog-dial from the internal solvent library, or can be automatically derived by the controller with sensitivity adjustable by the user. Designed for chemical applications, all wetted parts are made from high quality chemically resistant materials including PTFE, PEEK, PVDF, PP and clear plastic coated glassware.

With an ultimate vacuum of 2mbar(1.5torr) and peak flow of 20L/min the LVS 105 T -10 ef has been optimized for rotary evaporation of both high and low boiling point solvents.

Technical specifications and ordering information can be found on p. 12 and 13.

Please see the pump selection reference chart on p. 1 for your specific needs.

- Rotary Evaporator
- Vacuum Oven
- Multi-User Vacuum Network



## LVS Models



LVS 110 Z



LVS 210 T



LVS 300 Z



LVS 301 Z



LVS 311 Z

Free Air Displacement		Ultimate Pressure	Vacuum Control			ilmvac Model	Weight, kg(lbs)
m <sup>3</sup> /h(L/min) @50Hz	cfm(L/min) @60Hz		Manual Vacuum Control	Standard Two Point Vacuum Control	Ecoflex Vacuum Control		
1.2(20)	0.7(20)	2(1.5)			✓	LVS 105 T -10 ef	9.5(20.9)
1.0(16.7)	0.6(18)	8(6)	✓			LVS 101 Z w/gauge	11.6(25.6)
↓	↓	↓		✓		LVS 110 Z	12.7(27.9)
2.0(33)	1.3(36)	2(1.5)	✓			LVS 201 T	15.0(33.1)
↓	↓	↓	✓			LVS 201 T w/gauge	15.3(33.7)
↓	↓	↓		✓		LVS 210 T	15.7(34.2)
2.2(36)	1.3(36)	2(1.5)			✓	LVS 210 T ef	19.0(41.9)
2.3 (38)	1.5(41)	8(6)				LVS 300 Z	16.1(35.5)
↓	↓	↓	✓			LVS 301 Z	16.0(35.3)
↓	↓	↓	✓			LVS 301 Z w/gauge	16.3(35.9)
↓	↓	↓	✓			LVS 302 Z	16.7(36.8)
↓	↓	↓		✓		LVS 310 Z	17.8(39.2)
↓	↓	↓	✓	✓		LVS 311 Z	18.1(39.9)
↓	↓	↓		✓		LVS 320 Z	18.4(40.6)
2.6(43)	1.6(43)	8(6)			✓	LVS 310 Z ef	19.9(43.9)
4.5(75)	2.9(81)	2(1.5)				LVS 600 T	23.2(51.1)
↓	↓	↓	✓			LVS 601 T	23.1(50.9)
↓	↓	↓	✓			LVS 601 T w/gauge	23.5(51.8)
↓	↓	↓	✓			LVS 602 T	23.9(52.7)
↓	↓	↓		✓		LVS 610 T	24.4(53.8)
↓	↓	↓	✓	✓		LVS 611 T	25.0(55.1)
↓	↓	↓		✓		LVS 620 T	25.3(55.8)
4.9(81)	2.9(81)	2(1.5)			✓	LVS 610 T ef	26.8(59.1)
8.3(138)	5.3(151)	2(1.5)			✓	LVS 1210 T	36.3(80.0)
9.1(151)	5.3(151)	2(1.5)			✓	LVS 1210 T ef	37.1(81.8)
<b>Netvac LVS Systems</b>							
2.3 (38)	1.5(41)	8(6)			✓	LVS 310 Z en	17.5(38.6)
4.5(75)	2.9(81)	2(1.5)			✓	LVS 610 T en	24.7(54.5)

Manual - Vacuum is adjusted by user using valve

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



1. With Schuko and UK plug leads
2. With US plug lead
3. With JP plug lead

4. These pumps can be delivered on request
5. With Schuko, UK and US plug leads (other country specific plug leads available upon request, please see p. 32)

# Ordering Matrix

## Accessories

Additional accessories are available. Please see p. 27.

Software Kit for LVS & VCB 521  
CAT. No. 620637-01

Overall Dimensions LxWxH cm	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 <sup>1</sup>	115V, 50/60Hz, 1 Ph <sup>2</sup>	100V, 50/60Hz, 1 Ph <sup>3</sup>
25x26x43.5			1	✓			114184 <sup>5</sup>	114184 <sup>5</sup>	114184 <sup>5</sup>
35x32x44		1		✓			115027	115027-01	115027-05
↓			1	✓			115024	115024-01	115024-05
35x32x44		1					115037	115037-01	115037-05
↓		1		✓			115037-10	115037-11	115037-12
↓			1	✓			115034	115034-01	115034-05
35x32x44			1	✓			115234	115234-01	----
35x32x44	1						115041	115041-01	115041-05
↓		1					115047	115047-01	115047-05
↓		1		✓			115047-10	115047-11	115047-12
↓		2					115043	115043-01	115043-05
↓			1	✓			115044	115044-01	115044-05
↓		1	1	✓			115045	115045-01	115045-05
↓			2		✓		115046	115046-01	115046-05
35x32x44			1	✓			115244	115244-01	----
35x32x44	1						115051	115051-01	115051-05
↓		1					115057	115057-01	115057-05
↓		1		✓			115057-10	115057-11	115057-12
↓		2					115053	115053-01	115053-05
↓			1	✓			115054	115054-01	115054-05
↓		1	1	✓			115055	115055-01	115055-05
↓			2		✓		115056	115056-01	115056-05
35x32x44			1	✓			115254	115254-01	----
54x33x46			1	✓			115064	115064-01	115064-05
54x33x46			1	✓			115264	115264-01	----
35x32x44			1	✓			115248-02	115248-03	o.r. <sup>4</sup>
35x32x44			1	✓			115258-02	115258-03	o.r. <sup>4</sup>

## LVS Models



LVS 320 Z



LVS 310 Z ef



LVS 601 T



LVS 610 T



LVS 1210 T



Manual Regulated Connections



Controller Regulated Connections



With Dial Vacuum Gauge



With a Digital Vacuum Controller



Simultaneous operation of two independent vacuum processes

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.

Please see the pump selection reference chart on p. 1 for your specific needs.

**WOB-L and GEMINI**

- Aqueous Vacuum / Pressure Filtration
- Vacuum Oven
- Air / Gas Sampling
- Automation
- Desiccation
- Vacuum Chamber

**GEMINI**

- Lab or Field Filtration / Sampling
- Desiccation / Degassing

CE Standard Duty WOB-L Piston Pumps



Specifications

Welch Model

	2511	2522	2534	2546	2561	2567
		Vacuum/Pressure Pumps			Standard Duty Vacuum Pumps	
Number of heads / stages	1 / 1	1 / 1	1 / 1	1 / 1	2 / 2	2 / 1
Free Air Displacement						
m <sup>3</sup> /h(L/min)@50Hz	0.55(9.2)	1.1(18)	1.7(28)	2.3(38)	3.0(50)	4.9(83)
cfm(L/min)@60Hz	0.39(11)	0.76(22)	1.2(34)	1.6(45)	2.1(60)	3.5(100)
Ultimate pressure, mbar(torr)	292(219)	133(100)	93(70)	80(60)	6.7(5)	80(60)
Maximum Vacuum, in. Hg	21.3	26	27.2	27.6	29.8	27.6
Max. overpressure, bar	3.3	7.9	5.8	5.2	----	----
IN / EX hose connector	DN 6	DN 8	DN 8	DN 8	DN 10	DN 10
Tubing Needed, I.D. mm(in.)	6(0.24)	8(0.31)	8(0.31)	8(0.31)	10(0.38)	10(0.38)
Intake/Exhaust Thread NPT	----	1/4(1/4)	1/4(1/4)	1/4(1/4)	1/4(1/4)	1/4(1/4)
Motor Power, watts(HP)	25(0.03)	93(0.13)	93(0.13)	190(0.24)	250(0.34)	250(0.34)
Weight, kg(lbs.)	2.0(5)	5.3(7.7)	5.3(7.7)	5.3(7.7)	7.4(16.5)	7.4(16.5)
Overall Dimensions						
L cm(in.)	19.4(7.6)	20.6(8.1)	20.6(8.1)	25.4(10)	43.9(17.3)	38.1(15.0)
W cm(in.)	11.4(4.5)	22.4(8.8)	22.4(8.8)	19.1(7.5)	16.5(6.5)	25.4(10)
H cm(in.)	19.1(7.5)	25.4(10)	25.4(10)	22.9(9)	26.7(10.5)	25.4(10)
Ship Weight, kg(lbs.)	2.7(6)	7.7(17)	7.7(17)	7.7(17)	10.9(24)	10.9(24)
Shipping Carton Dimensions						
LxWxH cm(in.)	33x23x24 (13x9x9.5)	38x27x31 (15x10.5x12)	38x27x31 (15x10.5x12)	38x27x31 (15x10.5x12)	55x32x41 (21.5x12.5x16)	55x32x41 (21.5x12.5x16)

Ordering Information

230V, 50/60Hz, 1 Ph <sup>1</sup>	2511C-02	2522C-02	2534C-02	2546C-02	2561C-50	2567C-50
115V, 50/60Hz, 1 Ph <sup>2</sup>	2511B-01	2522B-01	2534B-01	2546B-01	2561B-50	2567B-50
115/230V, 50/60Hz, 1 Ph <sup>3</sup>	----	----	----	----	----	----
90-260V, 50/60Hz <sup>4</sup>	----	----	----	----	----	----
100V, 50/60Hz, 1 Ph <sup>5</sup>	2511C-05	2522C-05	----	----	2561C-56	----
230/400V, 50/60Hz, 3 Ph <sup>6</sup>	----	----	----	----	----	----

Note:

Every Vacuum / Pressure pump is supplied with vacuum and pressure regulator, vacuum and pressure gauge, silencer and water trap.

All standard WOB-L piston pumps are recommended for pumping vapors of aqueous solutions including buffers but not for acidic, basic or organic vapors or gases.

If there is a need for service information and service kits please see p. 31.

1. With Schuko and UK plug leads
2. With US plug lead
3. With Schuko, UK and US plug leads
4. With AC/DC adapter, Schuko, UK and US plug leads + 12V DC car adapter
5. With JP plug lead
6. Requires hard wiring to switched supply
7. With 3 phase 16A CEE plug lead
8. These pumps can be delivered on request (other country specific plug leads available upon request, please see p. 32)





2581  
2585



2050



2060

2581	2585	2050	2060
Standard Duty Vacuum Pumps		GEMINI Pumps	
2 / 2	2 / 1	2 / 1	2 / 1
4.9(83)	10(168)	0.5(8.5)	0.8(13)
3.5(100)	7.1(201)	0.3(8.5)	0.5(13)
6.7(5)	80(60)	253(190)	266(200)
29.8	27.6	21.3	27.2
----	----	----	----
DN 10	DN 10	DN 10	DN 10
10(0.38)	10(0.38)	10(0.38)	10(0.38)
1/4(1/4)	1/4(1/4)	----	----
250(0.34)	250(0.34)	29(0.03)	29(0.03)
11.2(24.5)	11.2(24.5)	2.4(5.3)	5(11)

43.2(17)	43.2(17)	19.4(7.6)	23.5(9.3)
19.1(7.5)	19.1(7.5)	11.4(4.5)	18.4(7.3)
30.5(12)	30.5(12)	19.1(7.5)	21.6(8.5)
14.5(32)	14.5(32)	3.2(7)	5.9(13)

55x32x4 (21.5x12.5x16)	55x32x41 (21.5x12.5x16)	38x27x31 (15x10.5x12)	38x27x3 (15x10.5x12)
---------------------------	----------------------------	--------------------------	-------------------------

2581C-50	2585C-50	----	----
2581B-50	2585B-50	----	----
----	----	----	----
----	----	2050C-02	2060C-02
2581C-56	----	----	----
----	----	----	----

### Standard WOB-L Piston Pumps

Simplicity is the key to the design of the WOB-L piston. As the piston wobbles, air resistance on upward stroke expands the PTFE seal on the piston to increase efficiency while compensating for the wobble action. Reliable dry vacuum pumps and vacuum/pressure stations for physical and aqueous vapor applications.

### GEMINI Vacuum Pumps

Simplify your sampling and preparative procedure with Welch's GEMINI pump. Use the same powerful, light-weight vacuum pump in the lab, or in the field! GEMINI gives you enhanced chemical resistance - tolerant beyond aqueous fumes for use with solvents and weak acids/bases. For convenient vacuum readout and regulation order Model 2060.

### Vacuum Hose

Thick walled hose for common lab applications. Please indicate the length in meter.



Material	O.D. mm	I.D. mm	Wall Thickness	CAT. No.
Rubber red	18	8	5	828310-4
Rubber red	20	10	5	828310-3
Silicone	12	6	3	828374

### Hose Adapter Kits

All in one kits, e.g. for connection to a vacuum oven with DN 16 KF or DN 25 KF flange. Each kit comes ready to use.

Type	Size	CAT. No.
Kit 1	DN 16 KF - DN 8	404002
Kit 2	DN 25 KF - DN 8	404004



Hose adapter kit includes hose connector, centering ring, hinge clamp ring and 2.5m vacuum hose, rubber red.

### Particulate, In-line Filter

The filter is an economical solution to protect the vacuum pump from fine particulates and aerosols to 0.2 microns.

Type	CAT. No.
DN 8	112555-04



### EXhaust Silencer

Exhaust silencer installed in the exhaust port of the pump to reduce pump noise.

For Pump Model	CAT. No.
2561, 2567, 2585	1412C
2581	1412E



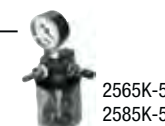
### Vacuum and Pressure Regulator

For Pump Model	CAT. No.
Intake - 2522, 2534, 2546	2522K-05
EXhaust - 2522, 2534, 2546	2522K-06



### Vacuum Regulator

For Pump Model	CAT. No.
2561, 2567	2565K-50
2581, 2585	2585K-50



### Replacement Jars

For Pump Model	CAT. No.
2522, 2546, 2534	1415C (plastic)
2561, 2567, 2581, 2585	1415B (glass)



### KF Connectors

Connectors for vacuum hose and DN KF.

Type	CAT. No.
DN 16 KF - 1/4 AL	710108
DN 25 KF - 1/4 AL	710700



### Accessories for KF Connectors

Centering ring made of aluminum with Viton O-Ring.

Type	CAT. No.
DN 16 KF	701091
DN 25 KF	701093



Hinge clamp ring for DN KF flange. Made of aluminium. Closure by wing and nut bolt.

DN 16 KF	701011
DN 25 KF	701013



## Applications

Please see the pump selection reference chart on p. 1 for your specific needs.

- Freeze Dryer
- Drying Oven
- Glove Boxes
- General Clean Pumping Application
- Load Locks and Transfer Chambers
- Analytical Equipment
- High Energy Physics
- Industrial Processing



S 10  
S 15

## Specifications

### Ilmvac Model

S 10      S 15

#### Free Air Displacement

m <sup>3</sup> /h(L/min)@50Hz	9.5(158)	14.5(242)
cfm(L/min)@60Hz	6.5(187)	10(287)

#### Ultimate pressure, mbar(torr)

total without gas ballast	7x10 <sup>-2</sup> (0.05)	7x10 <sup>-2</sup> (0.05)
total with gas ballast	1x10 <sup>-1</sup> (0.08)	1x10 <sup>-1</sup> (0.08)

#### Max. allowed intake/exhaust pressure, bar

1      1

#### Water vapor tolerance, mbar(torr)

50      50

#### Water vapor capacity, g/h

450      500

#### Cooling system

air-cooled      air-cooled

#### IN / EX hose connector

DN 25 KF      DN 25 KF

#### Tubing Needed, I.D. mm(in.)

hose connector available      hose connector available

#### Intake(Exhaust) Thread NPT

-(-)      -(-)

#### Sound level, dB(A)

56      56

#### Motor/Pump Speed, rpm@50Hz(60Hz)

1420(1720)      1420(1720)

#### Motor Power, watts(HP)

550(3/4)      550(3/4)

#### Type of motor protection, IP

54      54

#### Weight, kg(lbs.)

30(66.1)      30(66.1)

#### Overall Dimensions

L cm(in.)	47(19.6)	47(19.6)
W cm(in.)	32(13.3)	32(13.3)
H cm(in.)	44(18.3)	44(18.3)

#### Ship Weight, kg(lbs.)

45(99)      45(99)

#### Shipping Carton Dimensions

LxWxH cm(in.)	60x40x65 (25x16.7x27)	60x40x6 (25x16.7x27)
---------------	--------------------------	-------------------------

## Ordering Information

115/230V, 50/60Hz, 1 Ph <sup>1</sup>	460004	460005
--------------------------------------	--------	--------

Scroll pumps are an excellent oil-free alternative to the rotary vane pumps traditionally used in the high vacuum applications. Achieve vacuum to 0.05mbar without the mess and maintenance of oil. For harsh chemical fume applications, use of a cold trap is required.

## In-line filter

The filter is an economical solution to protect the vacuum pump from fine particulates and aerosols.

Type	CAT. No.
OMEH 30/25	700012-01



## Condensate Separator

Recommended to protect Scroll pumps from condensable vapors. The separator connects by flange directly to the scroll pump.

Type	CAT. No.
PT 25	700145



## In-line Safety Valve

The automatic in-line safety valve is connected with the Intake of the scroll pump. It closes the Intake flange when the pump is voluntarily or accidentally shut down, thus maintaining the vacuum in the connected system. The in-line safety valve is opened electromagnetically.

Type	Material	CAT. No.
VA 25 ME	Stainless Steel	700371



## Metal Vacuum Hose

Stainless Steel metal vacuum hose in various sizes and length for DN 25 KF IN and EX connectors.

Type	CAT. No.
500 mm	710762
750 mm	710782
1000 mm	710765
1500 mm	710756



## Accessories for KF Connectors

Centering ring made of stainless steel with Viton O-Ring.

Type	CAT. No.
DN 25 KF	701093



Hinge clamp ring for KF flange. Made of aluminium. Closure by wing and nut bolt

Type	CAT. No.
DN 25 KF	701013



1. With Schuko, UK and US plug leads (other country specific plug leads available upon request, please see p. 32)

#### Note:

Every pump is supplied with automatic gas ballast valve, internal protective thermal switch of the motor and integrated silencer in the EXhaust KF connector.

If there is a need for service information and service kits please see p. 31.

# Turbomolecular Pumping Systems CDK / STP



STP/1  
STP/5



STP/D1  
STP/D5



CDK 180 / UHV  
CDK 280 / UHV

## Applications

Please see the pump selection reference chart on p. 1 for your specific needs.

- Molecular Distillation/Sublimation
- Tube Furnace
- CCD Cameras and Cryostat
- Mass Spectrometer
- Electron microscope
- Sputtering Systems
- Isolation Vacuum

## Specifications

Ilmvac Model	STP/1			STP/5			STP/D1			STP/D5		
	With Rotary Vane Pump						With Diaphragm Pump					
Free Air Displacement l/s@50/60Hz	N <sub>2</sub>	He	H <sub>2</sub>	N <sub>2</sub>	He	H <sub>2</sub>	N <sub>2</sub>	He	H <sub>2</sub>	N <sub>2</sub>	He	H <sub>2</sub>
Ultimate pressure, mbar(torr)	1x10 <sup>-7</sup> (8x10 <sup>-8</sup> )			1x10 <sup>-7</sup> (8x10 <sup>-8</sup> )			5x10 <sup>-6</sup> (3.75x10 <sup>-6</sup> )			5x10 <sup>-6</sup> (3.75x10 <sup>-6</sup> )		
IN hose connector	DN 63 ISO-K			DN 100 ISO-K			DN 63 ISO-K			DN 100 ISO-K		
Weight kg(lbs.)	20(44)			25(55.1)			20(44)			25(55.1)		
Overall Dimensions	48(18.9)			48(18.9)			48(18.9)			48(18.9)		
L cm(in.)	50(19.7)			50(19.7)			50(19.7)			50(19.7)		
W cm(in.)	70(27.6)			70(27.6)			70(27.6)			70(27.6)		
H cm(in.)	25(55.1)			30(66.1)			25(55.1)			30(66.1)		
Ship Weight, kg(lbs.)	60x80x75 (23.6x31.5x29.5)			60x80x75 (23.6x31.5x29.5)			60x80x75 (23.6x31.5x29.5)			60x80x75 (23.6x31.5x29.5)		
Shipping Carton Dimensions LxWxH cm(in.)												

## Ordering Information

230V, 50/60Hz <sup>1</sup>	101341	101342	101343	101344
115V, 50/60Hz <sup>2</sup>	101341-01	101342-01	101343-01	101344-01

## Specifications

Ilmvac Model	CDK 180			CDK 180 UHV			CDK 280			CDK 280 UHV		
	N <sub>2</sub>	He	H <sub>2</sub>	N <sub>2</sub>	He	H <sub>2</sub>	N <sub>2</sub>	He	H <sub>2</sub>	N <sub>2</sub>	He	H <sub>2</sub>
Free Air Displacement l/s@50/60Hz	50	56	46	50	56	46	77	65	50	77	65	50
Ultimate pressure, mbar(torr)	5x10 <sup>-7</sup> (3.8x10 <sup>-7</sup> )			5x10 <sup>-8</sup> (4x10 <sup>-8</sup> )			5x10 <sup>-7</sup> (3.8x10 <sup>-7</sup> )			5x10 <sup>-8</sup> (4x10 <sup>-8</sup> )		
IN hose connector	DN 40 KF			DN 40 CF			DN 63 ISO-K			DN 63 CF		
Weight, kg(lbs.)	13.7(30.2)			14.7(32.4)			13.7(30.2)			14.7(32.4)		
Overall Dimensions	19.3(7.6)			19.3(7.6)			19.3(7.6)			19.3(7.6)		
L cm(in.)	34.4(13.5)			34.4(13.5)			34.4(13.5)			34.4(13.5)		
W cm(in.)	40(15.7)			40(15.7)			38.1(15)			38.1(15)		
H cm(in.)	15.7(34.6)			16.7(36.8)			15.7(34.6)			16.7(36.8)		
Ship Weight, kg(lbs.)	41x34x65 (16.1x13.4x25.6)			41x34x65 (16.1x13.4x25.6)			41x34x65 (16.1x13.4x25.6)			41x34x65 (16.1x13.4x25.6)		
Shipping Carton Dimensions LxWxH cm(in.)												

## Ordering Information

230V, 50/60Hz <sup>1</sup>	101240	101241	101242	101243
115V, 50/60Hz <sup>2</sup>	101240-01	101241-01	101242-01	101243-01

1. With Schuko and UK plug leads
2. With US plug lead  
(other country specific plug leads available upon request, please see p. 32)

## Accessories

### Vacuum Gauges for CDK

#### High Vacuum Gauge MRV100 + PEN 101

- 10<sup>-2</sup>mbar – 5x10<sup>-6</sup>mbar
- Flange size DN 25 KF



MRV 100 +  
PEN 101

#### Handheld Vacuum Gauge PIZA 111

- 1050mbar – 10<sup>-3</sup>mbar
- Flange size DN 16 KF

Type	CAT. No.
MRV 100	600081
PEN 101	620090
PIZA 111	600072

### Vacuum Gauge Module for CDK

Complete units to adapt to CDK systems

- M2
- M3T



Type	Range mbar	CAT. No.
M2 <sup>1</sup>	1x10 <sup>-2</sup> to 5x10 <sup>-6</sup>	101281-1
M3T <sup>1</sup>	1000 to 5x10 <sup>-6</sup>	101286-1

For more detailed information and other models, please see p. 29.

### Vacuum Components for Turbo-Molecular Pumping Systems

#### High Vacuum Flange

- KF and ISO-K components
- CF Flange
- Glass KF Flanges

#### Metal Vacuum Hose & Vacuum Valves



### Turbomolecular Pumps

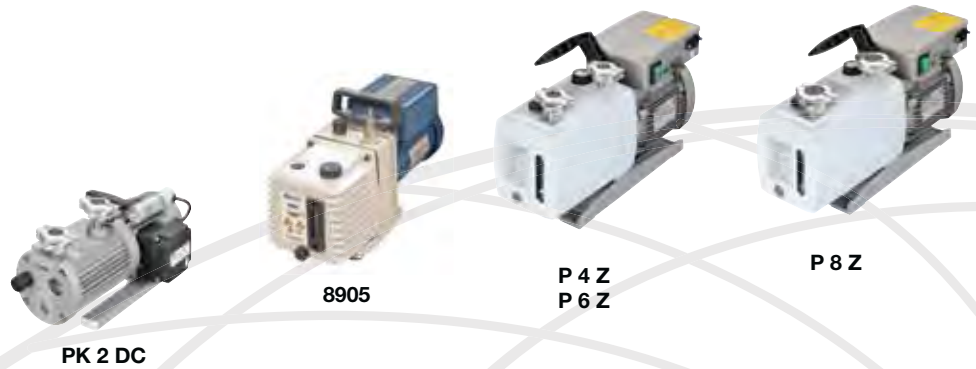
For other areas of laboratory application further TMP models and systems, as well as replacement TMP are available.



Please contact your Welch-ilmvac sales representative for more information.

Please see the pump selection reference chart on p. 1 for your specific needs.

- Freeze Dryer
- Glove Boxes
- Vacuum Concentrator
- Vacuum Manifold / Schlenk Line
- Chemistry and Research Laboratories
- Analytical / OEM Equipment
- Backing Pump for High Vacuum Pumping Systems
- Industrial Vacuum Process
- Chemistry / Pharmaceuticals



## Specifications

### Welch / Ilmvac Model

Welch / Ilmvac Model	PK 2 DC	8905	P 4 Z	P 6 Z	P 8 Z
Number of stages	2	2	2	2	2
Free Air Displacement					
m <sup>3</sup> /h(L/min)@50Hz	1.8(30)	2.6(43)	4.6(77)	5.8(97)	7.2(120)
cfm(L/min)@60Hz	1.3(36)	1.8(51)	3.3(92)	3.9(110)	5.0(143)
Ultimate Pressure, mbar(torr)					
partial abs	1x10 <sup>-3</sup> (0.00075)	2.7x10 <sup>-3</sup> (0.002)	2x10 <sup>-4</sup> (0.00015)	2x10 <sup>-4</sup> (0.00015)	2x10 <sup>-4</sup> (0.00015)
total without gas ballast	1x10 <sup>-2</sup> (0.0075)	6x10 <sup>-3</sup> (0.0055)	2x10 <sup>-3</sup> (0.0015)	2x10 <sup>-3</sup> (0.0015)	2x10 <sup>-3</sup> (0.0015)
total with gas ballast	0.5(0.375)	1x10 <sup>-2</sup> (0.01)	1x10 <sup>-2</sup> (0.0075)	1x10 <sup>-2</sup> (0.0075)	1x10 <sup>-2</sup> (0.0075)
Max. allowed intake/exhaust pressure, bar	1	1	1	1	1
Water vapor tolerance, mbar(torr)	33(24.8)	8(6)	60(45)	60(45)	60(45)
Water vapor capacity, g/h	65	30	160	170	230
Oil Capacity, l(qt)	0.25(0.27)	0.4(0.42)	0.53(0.56)	0.55(0.58)	0.6(0.64)
IN / EX hose connector	DN 16 KF	UNIBARB	DN 16 KF	DN 16 KF	DN 25 KF
Tubing Needed, I.D. mm(in.)	hose connector available	5, 10 (0.18, 0.43)	hose connector available	hose connector available	hose connector available
Intake(Exhaust) Thread NPT	-(-)	3/4-20	-(-)	-(-)	-(-)
Sound level, dB(A)	48	50	49	49	49
Motor/Pump Speed, rpm@50Hz(60Hz)	1300(1560)	2875(3450)	1440(1740)	1440(1740)	1440(1740)
Motor Power, watts(HP)	120(0.16)	190(0.25)	200(0.27)	200(0.27)	200(0.27)
Type of motor protection, IP	54	54	54	54	54
Weight, kg(lbs.)	8.0(17.6)	11.1(24.5)	17.5(38.6)	19.5(43)	21.5(47.4)
Overall Dimensions					
L cm(in.)	33.0(13)	35.9(14.1)	41.5(16.3)	43(16.9)	44.5(17.5)
W cm(in.)	16.5(6.5)	13(5.1)	15.0(5.9)	15(5.9)	15.0(5.9)
H cm(in.)	17.0(6.7)	21.3(8.4)	23.5(9.3)	23.5(9.3)	23.5(9.3)
Ship Weight, kg(lbs.)	10(21)	15(33)	20(43)	21.5(47.4)	23.5(51.8)
Shipping Carton Dimensions					
LxWxH cm(in.)	42x27x25 (16.3x10.4x9.6)	55x32x41 (21.5x12.5x16)	62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)

## Ordering Information

100-120V / 220-240V, 50/60Hz, 1 Ph <sup>1</sup>	----	----	322002	322003	322004
230V, 50/60Hz, 1 Ph <sup>2</sup>	322001	8905C-02	----	----	----
115V, 50/60Hz, 1 Ph <sup>3</sup>	322001-03	8905A	----	----	----
115/230V, 50/60Hz, 1 Ph <sup>1</sup>	----	----	----	----	----
100V, 50/60Hz, 1Ph <sup>4</sup>	322001-04	----	----	----	----
230/400V, 50/60Hz, 3 Ph <sup>5</sup>	----	----	322002-01	322003-01	322004-01

### Note:

Every pump is supplied complete with anti-suction back valve, gas ballast valve, vacuum pump oil (Labovac 10), centering ring, clamping ring and motor overload protection. Ready for use after oil filling.

1. With Schuko, UK and US plug leads
2. With Schuko and UK plug leads
3. With US plug lead
4. With JP plug lead

# Two-Stage Direct Driven Pumps



P 12 Z  
P 17 Z  
P 23 Z

P 4 Z - trolley

P 12 Z	P 17 Z	P 23 Z	P 4 Z - trolley
			mobile
2	2	2	2
11.0(183)	16.0(267)	21.0(350)	4.6(77)
7.8(220)	11.3(320)	14.8(420)	3.3(92)
1x10 <sup>-4</sup> (0.00013)	1x10 <sup>-4</sup> (0.00013)	1x10 <sup>-4</sup> (0.00013)	2x10 <sup>-4</sup> (0.00015)
2x10 <sup>-3</sup> (0.0015)	2x10 <sup>-3</sup> (0.0015)	2x10 <sup>-3</sup> (0.0015)	2x10 <sup>-3</sup> (0.0015)
3x10 <sup>-3</sup> (0.00225)	3x10 <sup>-3</sup> (0.00225)	3x10 <sup>-3</sup> (0.00225)	1x10 <sup>-2</sup> (0.0075)
1	1	1	1
35(26.2)	35(26.2)	35(26.2)	60(45)
450	650	850	160
1(1.06)	0.8(0.85)	0.82(0.87)	0.53(0.56)
DN 25 KF	DN 25 KF	DN 25 KF	DN 25 KF
hose connector available	hose connector available	hose connector available	hose connector available
-(-)	-(-)	-(-)	-(-)
49	49	49	49
1400(1680)	1400(1680)	1400(1680)	1440(1740)
550(0.75)	550(0.75)	550(0.75)	200(0.27)
54	54	54	54
35(77.2)	37(81.6)	38(83.8)	35(77.2)
54(21.3)	54(21.3)	54(21.3)	68(26.7)
17(6.7)	17(6.7)	17(6.7)	48(18.9)
26(10.2)	26(10.2)	26(10.2)	106(41.9)
37(81.6)	39(86)	40(88.2)	45(99.2)
62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)	80x60x130 (31.5x23.6x51.2)
322005	322006	322007	110008
----	----	----	----
----	----	----	----
----	----	----	----
322005-01	322006-01	322007-01	o.r. 7

- Requires hard wiring to switched supply
- With 3 phase 16A CEE plug lead
- These pumps can be delivered on request (other country specific plug leads available upon request, please see p. 32)

# Accessories and Oil

## Freeze Dryer Adapter Kits

All in one kit for connection to freeze dryer.

Type	size	CAT. No.
Kit 3	DN 16 KF	330031
Kit 4	DN 25 KF	330032



Adapter kits include 2-way ball valve, hose connector, hinge clamp ring, centering ring, oil mist separator (AKD) and 1.5m vacuum hose.

## Vacuum Measurement Packages

Reliable and accurate measuring for a wide range of application.

Type	Size	CAT. No.
Kit 7	DN 16 KF	330051
Kit 8	DN 25 KF	330052



Vacuum measurement package includes PIZA 111, T-connection, hinge clamp ring and centering ring.

## Vacuum Control Packages

A cost-effective package for controlling vacuum pressure up to 10<sup>-3</sup>mbar (0.001torr). Easy to adapt to two-stage rotary vane pumps.

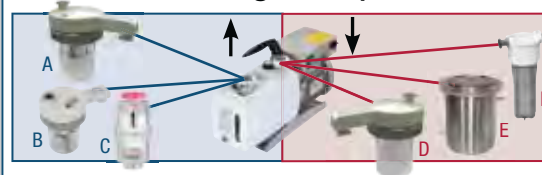
Type	Size	CAT. No.
Kit 9	DN 16 KF	330053
Kit 10	DN 25 KF	330054



Vacuum control package includes MRV 100, vacuum sensor, T-connection, solenoid valve, hinge clamp ring and centering ring.

Full specification of PIZA 111 and MRV 100, see p. 28 and 29.

## One and Two-Stage Pump Accessories



### For pump EXhaust:

Type	Size	CAT. No.
(A) Oil Mist Separator AKD 16	DN 16 KF	320015
(A) Oil Mist Separator AKD 25	DN 25 KF	320017
(B) Exhaust Separator with Oil Return	DN 16 KF	700323-01
(B) Exhaust Separator with Oil Return	DN 25 KF	700323
(C) Oil Mist Filter OME 10/16	DN 16 KF	700010
(C) Oil Mist Filter OME 20/25	DN 25 KF	700011

### For pump INTake:

Type	Size	CAT. No.
(D) Condenser AKS 16	DN 16 KF	320016
(D) Condenser AKS 25	DN 25 KF	320018
(E) Dry Ice / Nitrogen Cold Trap	DN 10	1420H-14
(F) Acid Neutralization Trap	DN 16 KF	1420H-21
(F) Acid Neutralization Trap	DN 25 KF	1420H-20
(G) Fine Vacuum Adsorption Trap	DN 16 KF	705179



### Hose Connector

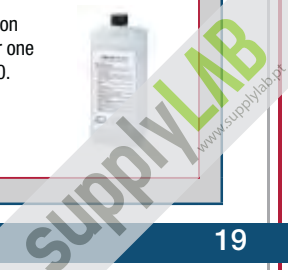
Type	CAT. No.	Type	CAT. No.
DN 16 KF – DN 12	701702	DN 25 KF – DN 12	710209
DN 16 KF – DN 20	701712-02	DN 25 KF – DN 20	701704

For more information, please see our vacuum components catalog.

## Vacuum Pump Oils

Vacuum Pump oils for various areas of application please see p. 30. Standard vacuum pump oil for one and two-stage rotary vane pumps is Labovac 10.

Type	CAT. No.
Labovac 10 - 1 liter	800122



Please see the pump selection reference chart on p. 1 for your specific needs.

- Vacuum Oven
- Research and Development
- Laboratory Application
- Drying
- Degassing
- OEM Equipment
- Laser Technology
- Cooling and Air Conditioning
- Electrical and Mechanical Engineering



One-Stage Direct Driven Pumps



Specifications

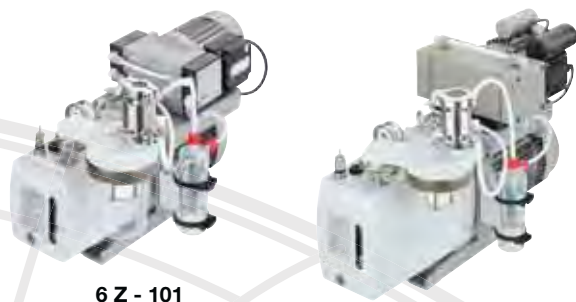
Ilmvac Model	P 4 E	P 6 E	P 8 E	P 12 E	P 17 E	P 23 E
Number of stages	1	1	1	1	1	1
Free Air Displacement						
m <sup>3</sup> /h(L/min)@50Hz	4.6(77)	5.8(97)	7.2(120)	11.0(183)	16.0(267)	21.0(350)
cfm(L/min)@60Hz	5.5(92)	6.6(110)	8.6(143)	13.2(220)	19.2(320)	25.2(420)
Ultimate Pressure, mbar(torr)						
total without gas ballast	1x10 <sup>-1</sup> (0.075)	1x10 <sup>-1</sup> (0.075)	1x10 <sup>-1</sup> (0.075)	9x10 <sup>-2</sup> (0.0675)	9x10 <sup>-2</sup> (0.0675)	9x10 <sup>-2</sup> (0.0675)
total with gas ballast	5x10 <sup>-1</sup> (0.375)	5x10 <sup>-1</sup> (0.375)	5x10 <sup>-1</sup> (0.375)	5x10 <sup>-1</sup> (0.375)	5x10 <sup>-1</sup> (0.375)	5x10 <sup>-1</sup> (0.375)
Max. allowed intake/exhaust pressure, bar	1	1	1	1	1	1
Water vapor tolerance, mbar(torr)	40(30)	40(30)	40(30)	35(26.3)	35(26.3)	35(26.3)
Water vapor capacity, g/h	150	200	300	450	650	850
Oil Capacity, l(qt)	0.53(0.56)	0.55(0.58)	0.6(0.64)	1(1.06)	0.8(0.85)	0.82(0.87)
IN / EX hose connector	DN 16 KF	DN 16 KF	DN 25 KF	DN 25 KF	DN 25 KF	DN 25 KF
Tubing Needed, I.D. mm(in.)	hose connector available	hose connector available	hose connector available	hose connector available	hose connector available	hose connector available
Intake(Exhaust) Thread NPT	-(-)	-(-)	-(-)	-(-)	-(-)	-(-)
Sound level, dB(A)	49	49	49	50	50	50
Motor/Pump Speed, rpm@50Hz(60Hz)	1440(1740)	1440(1740)	1440(1740)	1400(1680)	1400(1680)	1400(1680)
Motor Power, watts(HP)	200(0.27)	200(0.27)	200(0.27)	550(0.75)	550(0.75)	550(0.75)
Type of motor protection, IP	54	54	54	54	54	54
Weight, kg(lbs.)	17.0(37.5)	19.0(42)	21.0(46.3)	29.0(64)	32.0(70.5)	33.0(73)
Overall Dimensions						
L cm(in.)	40.5(16)	40.5(16)	40.5(16)	54(21.3)	54(21.3)	54(21.3)
W cm(in.)	15.0(5.9)	15.0(5.9)	15.0(5.9)	17(6.7)	17(6.7)	17(6.7)
H cm(in.)	21.5(8.5)	21.5(8.5)	21.5(8.5)	26(10.2)	26(10.2)	26(10.2)
Ship Weight, kg(lbs.)	19.0(42)	21.0(46.3)	23.0(51.0)	31.0(68.0)	34.0(75)	35.0(77)
Shipping Carton Dimensions						
LxWxH cm(in.)	62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)	62x22x32 (24.2x8.5x12.4)

Ordering Information

100-120V / 220-240V, 50/60Hz, 1 Ph <sup>1</sup>	321002	321003	321004	321005	321006	321007
230V, 50/60Hz, 1 Ph <sup>2</sup>	----	----	----	----	----	----
115V, 50/60Hz, 1 Ph <sup>3</sup>	----	----	----	----	----	----
115/230V, 50,60Hz, 1 Ph <sup>1</sup>	----	----	----	----	----	----
100V, 50/60Hz, 1 Ph <sup>4</sup>	----	----	----	----	----	----
230/400V, 50/60Hz, 3 Ph <sup>5</sup>	321002-01	321003-01	321004-01	321005-01	321006-01	321007-01

Note:  
Every pump is supplied complete with anti-suction back valve, gas ballast valve, vacuum pump oil (Labovac 10), centering ring, clamping ring and motor overload protection. Ready for use after oil filling.

1. With Schuko, UK and US plug leads
2. With Schuko and UK plug leads
3. With US plug lead
4. With JP plug lead
5. Requires hard wiring to switched supply (other country specific plug leads available upon request, please see p. 32)



6 Z - 101

12 Z - 301  
23 Z - 301

## Specifications

Ilmvac Model	6 Z - 101	12 Z - 301	23 Z - 301
Number of stages	2 + 2	2 + 2	2 + 2
Free Air Displacement			
m <sup>3</sup> /h(L/min)@50Hz	5.8(97)	11.0(183)	21.0(350)
cfm(L/min)@60Hz	3.9(110)	7.8(220)	14.8(420)
Ultimate Pressure, mbar(torr)			
partial	2x10 <sup>-4</sup> (0.00015)	1x10 <sup>-4</sup> (0.00013)	1x10 <sup>-4</sup> (0.00013)
total	2x10 <sup>-3</sup> (0.0015)	2x10 <sup>-3</sup> (0.0015)	2x10 <sup>-3</sup> (0.0015)
Max. IN/EX pressure, bar	1	1	1
Water v. tolerance, mbar(torr)	70(52.5)	80(60)	45(33.7)
Water vapor capacity, g/h	150	550	950
Oil Capacity, l(qt)	0.55(0.58)	1(1.06)	0.82(0.87)
IN / EX hose connector	DN 16 KF	DN 25 KF	DN 25 KF
Tubing Needed, I.D. mm(in.)	hose connector available	hose connector available	hose connector available
Intake(Exhaust) Thread NPT	-(-)	-(-)	-(-)
Sound level, dB(A)	50	50	50
Motor/P. Speed, rpm@50Hz(60Hz)	1440(1740)	1400(1680)	1400(1680)
Motor Power, watts(HP)	400(0.55)	900(1.23)	900(1.23)
Type of motor protection, IP	54	54	54
Weight, kg(lbs.)	25.5(56.2)	42.5(93.7)	46(101.4)
Overall Dimensions			
L cm(in.)	50(19.7)	59(23.3)	59(23.3)
W cm(in.)	33(13)	34.5(13.6)	34.5(13.6)
H cm(in.)	34(13.4)	42(16.4)	42(16.4)
Ship Weight, kg(lbs.)	30(66.2)	47(103.6)	50(110.3)
Shipping Carton Dimensions			
LxWxH cm(in.)	65x41x48 (25.6x16.2x18.9)	65x41x48 (25.6x16.2x18.9)	65x41x48 (25.6x16.2x18.9)

## Ordering Information

100-120V/220-240V, 50/60Hz, 1 Ph <sup>1</sup>	----	----	----
230V, 50/60Hz, 1 Ph <sup>2</sup>	109030	----	----
115V, 50/60Hz, 1 Ph <sup>3</sup>	109030-01	----	----
115/230V, 50,60Hz, 1 Ph <sup>1</sup>	----	109031	109032
100V, 50/60Hz, 1 Ph <sup>4</sup>	109030-03	109031-03	109032-03
230/400V, 50/60Hz, 3 Ph <sup>5</sup>	----	----	----

Note:  
Every pump is supplied with oil mist separator, solvent trap, dial vacuum gauge, vacuum pump oil (Labovac 10), centering ring and hinge clamp ring. Pump system is completely mounted, ready for use after oil filling.

Please see the pump selection reference chart on p. 1 for your specific needs.

- Freeze Dryer
- Vacuum Manifold/Schlenk Line
- Laboratory Applications with chemical and corrosive gases/vapors

Eliminate the harmful vapors that destroy your pump in the most demanding vacuum applications. The Chemvac Combination Pump draws a deep, high-flow vacuum – suitable for freeze dry applications – with a powerful Rotary Vane Pump. Harmful ingested fumes that would compromise the primary pump's oil are promptly degassed by Chemvac's secondary vacuum – a corrosion resistant PTFE diaphragm pump.

## Accessories

### Freeze Dryer Adapter Kits

All in one kit for connection to a freeze dryer.

Type	Size	CAT. No.
Kit 5	DN 16 KF	330033
Kit 6	DN 25 KF	330034



Adapter kits include hose connector, hinge clamp ring, centering ring and 1.5m vacuum hose.

### Oil Filter

The Oil Filters are designed for quick and easy installation to all Ilmvac rotary vane / chemvac pump models. The mechanical oil-filter (OPF 40M) filters out dust and particulate from the oil. The chemical oil-filter (OPF 40C) adsorbs corrosive substances, reducing pump wear. An indicator shows when the oil filter element has to be replaced.

Type	Oil capacity	CAT. No.
OPF 40C	1.0 liter	700153-01
OPF 40M	0.5 liter	700153-02



Ordering information for Vacuum pump oil, please see p. 30.

### Solvent Recovery Unit

For maximum environmentally friendly protection, a condenser is included to recover solvent vapors emitted by your Chemvac.

**Chemvac 6Z - 101 sr** (230V, 50/60Hz<sup>2</sup>)  
CAT. No. 109030-04



Please contact your Welch-Ilmvac representative for further models.

### Hose Connector

Type	CAT. No.	Type	CAT. No.
DN 16 KF – DN 12	701702	DN 25 KF – DN 12	710209
DN 16 KF – DN 20	701712-02	DN 25 KF – DN 20	701704

For more information, please see our vacuum components catalog.

### Vacuum Pump Oils

Standard vacuum pump oil for chemvac pump systems is Labovac 10.

Type	CAT. No.
Labovac 10 – 1 Liter	800122



For advanced corrosion resistance the chemvac models can be supplied with PAO vacuum pump oil.

# CHEMSTAR Belt-Driven Rotary Vane Pumps



1400N



1402N  
1376N

## For Pumping Corrosive Gases

- HCl
- HBr
- Br<sub>2</sub>
- Cl<sub>2</sub>
- SF<sub>6</sub>, CF<sub>4</sub> Fragments and other gases
- O<sub>3</sub>
- HOAc
- F<sub>3</sub>CCO<sub>2</sub>H
- CH<sub>2</sub>O
- H<sub>2</sub>SO<sub>4</sub>
- SO<sub>x</sub>
- H<sub>2</sub>S
- HNO<sub>3</sub>

## Specifications

Welch Model	1400N	1402N	1376N
Number of stages	2	2	2
Free Air Displacement			
m <sup>3</sup> /h(L/min)@50Hz	1.3(21)	7.9(133)	15.0(250)
cfm(L/min)@60Hz	0.9(25)	5.6(160)	10.6(300)
Ultimate pressure, mbar(torr)	1 x 10 <sup>-4</sup> (0.00013)	1 x 10 <sup>-4</sup> (0.00013)	1 x 10 <sup>-4</sup> (0.00013)
Max. allowed intake/exhaust pressure, bar	1	1	1
Oil Capacity, l(qt)	0.59(0.62)	2.1(2.25)	2.37(2.5)
IN / EX hose connector	DN 16 KF	DN 25 KF	DN 25 KF
Tubing Needed, I.D. mm(in.)	hose connector available	hose connector available	hose connector available
Motor / Pump Speed, rpm@50Hz(60Hz)	580	525	525
Motor Power, watts(HP)	250(0.33)	370(0.5)	750(1)
Gas Ballast	yes	yes	yes
Weight kg(lbs.)	26(58)	51(112)	71(156)
Overall Dimensions			
L cm(in.)	45.2(20.5)	57.2(22.5)	59.5(22)
W cm(in.)	22.9(13.8)	39.4(15.5)	45(18)
H cm(in.)	32(14.5)	49.5(19.5)	48(19)
Ship Weight, kg(lbs.)	32.3(71)	60.5(133)	82.3(181)
Shipping Carton Dimensions			
LxWxH cm(in.)	52.1x35.1x36.8 (20.5x13.8x14.5)	57.2x39.4x49.5 (22.5x15.5x19.5)	59.5x45x 48 (22x18x19)

## Ordering Information

115V, 50/60Hz, 1 Ph <sup>1</sup>	1400N-01	1402N-01	1376N-01
230V, 50Hz, 1 Ph <sup>2</sup>	1400N-50	----	----
230V, 50/60Hz, 1 Ph <sup>2</sup>	----	1402N-50	1376N-49
100V 50/60Hz, 1 Ph <sup>3</sup>	----	1402N-53	1376N-53

Note:  
Every pump is supplied complete with vacuum pump oil (Gold Vacuum Oil), motor overload protection, hinge clamp ring, centering ring, hose connector. Ready for use after oil filling.

1. With US plug lead
2. With Schuko plug lead
3. With JP plug lead

## The Five Defining Features Needed For Pumping Corrosive Gases

1. **High Contamination Tolerance**
  - Contaminants diluted
  - Fewer moving parts
  - Top oil feed for cleaner oil
2. **Vital Parts Corrosion Resistant**
  - Fluoroelastomer seals and gaskets
  - Metal vanes
  - Stainless steel valves, etc.
  - PTFE coated oil case
3. **Reduced Frictional Wear**
  - Less than 580 RPM vs. typical 1750 RPM direct drive
4. **Nitrogen Purge Standard**
  - Degases and cools oil
5. **Easy Attachment of Accessories**
  - Complete accessory packages for corrosive gases are available

## Accessories

### Hermetically Sealed Oil Mist eliminator

The oil mist eliminator prevents corrosive gases from escaping into the room. It also coalesces oil mist from the exhaust and allows it to drain back into the pump.

For Pump Model	CAT. No.
1376N 1400N, 1402N	1416D



8995G-11

### Gold Vacuum Pump Oil

Specially formulated oil for challenging applications. This highly saturated synthetic oil is resistant to breakdown at higher temperature and is highly stable in chemical environments.

- Exceptionally low vapor pressure
- High stability in chemical environments
- No additives or inhibitors

Size	CAT. No.
1 Liter	8995G-11
1 Gallon	8995G-15
5 Gallon	8995G-20





# ROdist - The COMPLETE Rotary Evaporation Family



**MPC 105 T**  
(Basic Package)



(Optional Vacuum Regulator)

or



**LVS 105 T -10 ef**  
(Professional Package)

+



## ROdist – Flexible Package for Efficient Distillation

Space saving **vertical glassware, coated**  
(Flexible design facilitates multiple glassware options)

Motorized height-adjustable lift with “Safety Stop” function, if the power cuts off the evaporation flask automatically raises

Free choice angle

Optional heating bath protection cover

**Digital water-oil heating bath** with integrated carrying handles

**Digital display** with intuitive user interface

Compact design for minimal bench space

## Specifications

### Ilmvac Model

Cooler type	vertical
Cooling surface, cm <sup>2</sup>	1,200
Flask size, ml	50-3000
Maximum flask capacity, kg(lbs.)	2(4.4)
Speed range, rpm	20-280
Speed display	digital
Right and left movement / interval operation	yes
Smooth start	yes
Head angle adjustable	0 - 45°
Stroke displacement	140mm, motorised
Vacuum controller integrated	No
Heating Bath	
Heating bath type	Water / Oil
Temperature range, °C(°F)	RT-180°(356°)
Heating power, W	1,300
Temperature display	digital
Setting accuracy, K	1
Control deviation, K	± 1
RS 232 interface	yes
Weight (depending on Glassware), kg(lbs.)	18-20(40-44)
Overall Dimensions	
L cm(in.)	50(19.7)
W cm(in.)	41(16.2)
H cm(in.)	30(11.8)

### ROdist digital

Cooler type	vertical
Cooling surface, cm <sup>2</sup>	1,200
Flask size, ml	50-3000
Maximum flask capacity, kg(lbs.)	2(4.4)
Speed range, rpm	20-280
Speed display	digital
Right and left movement / interval operation	yes
Smooth start	yes
Head angle adjustable	0 - 45°
Stroke displacement	140mm, motorised
Vacuum controller integrated	No
Heating Bath	
Heating bath type	Water / Oil
Temperature range, °C(°F)	RT-180°(356°)
Heating power, W	1,300
Temperature display	digital
Setting accuracy, K	1
Control deviation, K	± 1
RS 232 interface	yes
Weight (depending on Glassware), kg(lbs.)	18-20(40-44)
Overall Dimensions	
L cm(in.)	50(19.7)
W cm(in.)	41(16.2)
H cm(in.)	30(11.8)

Ship Weight, kg(lbs.)

Shipping Carton Dimensions

LxWxH cm(in.)

	ROdist digital	Basic Package	Professional Package
Ship Weight, kg(lbs.)	30(66.1)	60(132.3)	62(136.7)
Shipping Carton Dimensions			
LxWxH cm(in.)	60x80x100 23.6x31.5x39.4	120x80x100 47.3x31.5x39.4	120x80x100 47.3x31.5x39.4

## Ordering Information

230V, 50/60Hz <sup>1</sup>

115V, 50/60Hz <sup>2</sup>

	112020	112031	112033
230V, 50/60Hz <sup>1</sup>	112020	112031	112033
115V, 50/60Hz <sup>2</sup>	112020-01	112031-01	112033-01

### Note:

Every ROdist digital is supplied complete with control drive, heating bath, vapor tube NS 29/32, seal, glassware vertical coated with 1000ml evaporation flask and 1000ml receiving flask, clamps for glassware and woulf bottle.

1. With Schuko and UK plug leads
2. With US plug lead

## Accessories

### Coated Glassware for ROdist

Type	Cooling Surface	CAT. No.
Vertical-condenser with manifold & cut-off valve for Reflux distillation	1.200cm <sup>2</sup>	112570-11
Dry Ice condenser	620cm <sup>2</sup>	112570-10



### Protection Cover for Heating Bath

Essential accessory if it is not possible to work in a fume hood.

Type	CAT. No.
Protection cover	112570-01



### Optional Accessories for MPC 105 T

Type	CAT. No.
Vacuum Regulator	700459
Seperator / Liquid Trap (IN)	700460
Solvent recovery unit (EX)	700462



## ROdist Packages

**All in one ROdist packages – ROdist digital, vacuum pump or system and vacuum hose.**

For simultaneous operation of **2 Rotary Evaporators** we offer the **LVS 320 Z** vacuum system with 2 digital vacuum controllers for improved distillation process monitoring. Technical specifications and ordering information can be found on p. 12-13.





## Self Regulating Vacuum Distillation System

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.

The outstanding design of the Hold Back Pump utilizes solvent flow to automatically regulate the diaphragm pump vacuum level.

### Features

- 100% automatic distillation
- Collection flask at atmosphere pressure
- Easy connection to all common rotary evaporators.



### Applications

- Distillation of large volume of solvents
- Recycling Solvent
- Crystallization or re-crystallization
- Powder and granule drying

### Specifications

Ilmvac Model	HBP 101	Advanced Package
No of stages/heads	2/2	
Free Air Displacement		
m <sup>3</sup> /h(L/min)@50Hz	2.3(38)	
cfm(L/min)@60Hz	1.45(41)	
Ultimate pressure, mbar(torr)	15(11.2)	
IN / EX hose connector	DN 8	
Tubing Needed, I.D. mm(in.)	8(0.32)	
Intake(Exhaust) Thread NPT	-(-)	
Sound level, dB(A)	42	
Motor Power, watts(HP)	200(0.27)	
Type of motor protection, IP	54	
Weight, kg(lbs.)	18.8(41.4)	
Overall Dimensions		
L cm(in.)	31(12.9)	
W cm(in.)	27(11.3)	
H cm(in.)	49(20.4)	
Ship Weight, kg(lbs.)	25(55.1)	70(154.3)
Shipping Carton Dimensions		
LxWxH cm(in.)	60x80x60 (23.6x31.5x23.6)	120x80x110 (47.3x31.5x43.3)

### Ordering Information

230V, 50/60Hz <sup>1</sup>	112036	112032
115V, 50/60Hz <sup>2</sup>	112036-01	112032-01

Note:  
Every HBP is supplied with Condenser, solvent recovery, digital control panel, DN 8 hose connector and vacuum sensor.

1. With Schuko and UK plug leads
2. With US plug lead

### Accessories

#### Adapter for Rotary Evaporator 50/70

Material: borosilicate glass

- two hose connectors for vacuum sensor and vacuum hose connection
- DN 8 hose connector for refilling

Type	CAT. No.
Adapter 50/70	700181



#### Advanced Packages

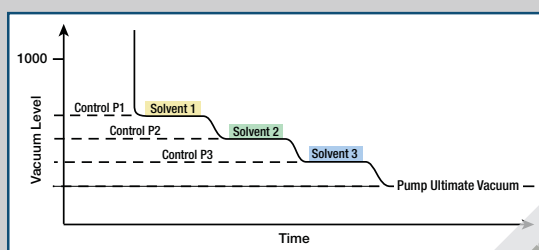
All in one R0dist packages - R0dist digital, HBP 101, glass adapter, vacuum sensor and vacuum hose.



Advanced package for fast and automatic stripping of most common rotary evaporator solvents without programming.

### Features

- Smooth distillations of multiple solvent systems
- Automatically moderates vacuum for each solvent fraction
- Distills any solvent / volume mixture without composition knowledge



# Aspiration / Filtration Stations



biovac 060



biovac 106



2511C-75



2515C-75

## Specifications

Welch / Ilmvac Model	biovac 060	biovac 106	2511	2515
	precise	compact	economical	high flow
Free Air Displacement				
m <sup>3</sup> /h(L/min)@50Hz	0.6(10)	0.7(15)	0.5(9.2)	1.7(28.0)
cfm(L/min)@60Hz	0.4(10)	0.6(17)	0.4(11)	1.2(34.0)
Ultimate pressure, mbar(torr)	150(113)	100(75)	292(219)	93(70)
Maximum vacuum, in Hg	25.5	26.8	21.3	27.2
Max. overpressure, bar	----	----	3.3	----
Aspiration rate of liquids ml/s	21	25	15	45
Sound level db(A)	44	45	45	46
Weight, kg(lbs.)	2.8(6.2)	8.0(17.6)	2.6(5.7)	6.0(13.2)
Overall Dimensions				
L cm(in.)	17.5(7.0)	35.5(14.2)	28.0(11.0)	37.5(14.8)
W cm(in.)	27.5(2.0)	14.5(5.8)	21.0(8.0)	21.0(8.3)
H cm(in.)	45.0(18.0)	27.7(11.1)	25.5(10.0)	25.5(10.0)
Ship Weight, kg(lbs.)	7.0(17.5)	14.2(35.5)	11.0(28.0)	14.8(37.5)
Shipping Carton Dimensions				
LxWxH cm(in.)	35x25x30 (13.8x9.8x11.8)	50x20x40 (20.0x8.0x16.0)	55x32x41 (21.5x12.5x16)	45x30x40 (18.0x12.0x16.1)

## Ordering Information

230V, 50/60Hz, 1 Ph <sup>1</sup>	----	----	2511C-75	2515C-75
115V, 50/60Hz, 1 Ph <sup>2</sup>	----	----	2511B-75	2515B-75
115/230V, 50/60Hz, 1 Ph <sup>3</sup>	----	112037	----	----
90-260V, 50/60Hz <sup>4</sup>	112014	----	----	----
100V, 50/60Hz, 1 Ph <sup>5</sup>	----	112037-01	2511C-76	2515C-76

## Features

Autoclavable container, adapters and tubing	✓	✓	✓	✓
Hydrophobic In-line filter	✓	✓	✓	✓
Vacuum control and dial vacuum gauge	----	----	✓	✓
Quick coupling	✓	✓	----	----
Automatic flow stop	✓	✓	✓	✓
On/Off foot switch	----	Option	Option	Option
Hand held pipettor set	✓	✓	Option	Option
Glass jar, Liters	1.0	2.0	----	----
Plastic jar, Liters	----	----	1.2	1.2

1. With Schuko and UK plug leads
2. With US plug lead
3. With Schuko, UK and US plug leads
4. With AC/DC adapter and Schuko, UK and US plug leads

5. With JP plug lead (other country specific plug leads available upon request, please see p. 32)

## Accessories

### Handheld Pipettor Set

All in one set for **biovac 060**, **biovac 106**, **2511** and **2515**.

CAT. No. 112524-3



### Power-Package

For simultaneous operation of two handheld pipettors. **For biovac 106 and 2515.**

CAT. No. 112524-4



### Optional On/Off Foot Switch

- Hands Free On/Off pump operation
- No adapters or special connection needed
- Plugs directly into the Aspiration Station



112529

Pump Model	CAT. No.	
biovac 106	112529	1430C
2511C-75, 2515C-75	1430C	
2511B-75, 2515B-75	1430B	
2511C-76, 2515C-76		1430B

### Spare Micro-filter (hydrophobic)

For **biovac 060** and **biovac 106** cap.

CAT. No. 828840-2



### Replacement Jar

Spare receiver kit includes the glass receiver.

**For biovac 060 and biovac 106.**

Pump Model	CAT. No.
biovac 060	828840-3
biovac 106	828840



Spare receiver kit includes a 1.2 l jar, 2m tubing and 2 hydrophobic filters. **For 2511 and 2515.**

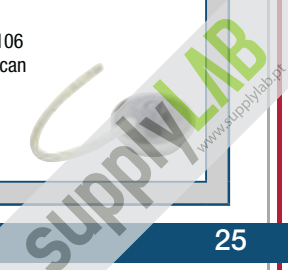
Pump Model	CAT. No.
2511, 2515	1475K-20



### Upgrade Kit

Upgrade biovac 060 or biovac 106 to a filtration station. Filter cap can be used for all standard filter funnels.

CAT. No. 112566-10





## Netvac – Flexible vacuum for your multi-user laboratory

Make precision vacuum readily available for all the users and applications in your lab – all from a single Netvac installation. Using IImvac pumps, controllers, systems and components, we can custom design your robust laboratory vacuum utility to provide the right performance to each of your applications.

We provide multi-port vacuum that is:

- Precisely controlled at your point of application
- Cabinet concealed with accessible controls
- Energy efficient and environmentally responsible
- Oil-free chemical resistance, low maintenance

We recommend the following laboratory need assessment to fully define your specific requirements. Your Welch-IImvac representative will be pleased to work with you to transform your needs into a Netvac system that will perfectly integrate vacuum into your laboratory, function affordably, and achieve all this while maintaining the highest level of environmental responsibility.

### 5 Steps to your Personal Netvac

1. How many Netvac ports are required?
2. What ultimate pressure is required? (2mbar or 8mbar)
3. Will the Netvac ports be mounted on the bench or fume hood?
4. Will your Netvac ports be surface-mounted (R04) or integrated (R01) into lab furniture?



- Surface mounted - common solution for installation for existing laboratory furniture or on walls.



- For integration into laboratory furniture. Vacuum hose is hidden and out of the way.

5. Do you need manual regulated or controller regulated ports?



- **Manual Regulated**  
Manual on/off, vacuum regulator and dial gauge.



- **Controller Regulated**  
With digital vacuum controller VCZ 521.

After you complete the “5 Steps” assessment, you can use the Netvac Pump Selection Chart and Netvac Port and Controller Chart Selection Chart to select the correct vacuum source and control option for your needs. Please consult your Welch-IImvac representative for Netvac configuration and installation expertise.

### Netvac Features

- Ideal economical solution for new lab construction or lab renovations
- Single pump system serves multiple vacuum applications
- Modular construction enables incremental port and component addition
- Operate up to 30 vacuum ports with a single system

Versatile Netvac installations can be configured as a separate pump and controller – or as a fully integrated (LVS). Either way, energy saving control options make your Netvac good both for the environment and your budget:

- *Economic* (en) control only runs the pump when there is a user demand
- *Ecoflex* (ef) control varies the speed of the pump to maintain the desired vacuum

Selecting **separate pump and controller** options creates flexibility in your Netvac installation. Choose from a wide variety of PTFE vacuum pumps and add a precision controller – either table top for ultimate flexibility or flush mounted within your furniture for a finished appearance and handy functionality.

Selecting an integrated **Laboratory Vacuum System (LVS)** provides additional standard features, such as integrated catchpot before the pump and a liquid-cooled condenser after the pump to capture any residual vapors prior to discharge into the air. The entire LVS package fits readily under a countertop. The beveled top display and control pad create easy access for system changes, and the front mounted catchpots detach simply for periodic vacuum line waste product removal.

## Closed Loop Cooling System

Developed for our LVS systems with emission condenser. It is intended for generating a cooling water inlet temperature for an solenoid recovery condenser between 7 and 10 °C.

Features:

- Water-saving
- Constant cooling temperature allows reproducible processes
- 90-260 V, 50/60Hz



Type	Dim.(LxWxH) mm	Weight, kg	CAT. No.
KWR 1	350x145x230	5.3	112041

## Cooling Water Solenoid Valve for LVS and VCB 521

Type	CAT. No.
WV 2(24V), G3/4 in. - DN8	700300-02



## Further Accessories

Special accessories are available to tailor Netvac to your requirements. For example, we can integrate control equipment which will sense when traps are full in vacuum systems which are hidden from view and automatically take corrective action.

Contact your local representative for detailed Netvac Information.

## Netvac Pump Selection Chart

This simple guide indicates the number of vacuum ports generally served by each available vacuum source. Contact your local representative to assess your own requirements.

Vacuum Pump Model	ultimate pressure	5 ports	10 ports	20 ports	30 ports
LVS 301 Z / 310 Z / en	8mbar				
LVS 601 T / 610 T / en	2mbar				
Univac - MPKC 2403 T	2mbar				
Univac - MPKC 3603 Z	8mbar				
Customized Solution	2 or 8mbar				

## Univac - MPKC Central Laboratory Vacuum Supply

The oil-free Univac system is a microprocessor controlled array of high capacity PTFE diaphragm pumps, working individually or in tandem as your laboratory's vacuum demand requires.

For more information on Univac, please contact your Welch-Ilmvac representative or [www.ilmvac.com](http://www.ilmvac.com).



## Netvac Port and Controller Selection Chart

Netvac Ports with Integral Check Valves

	Bench-Top					Fume Hood	
	Manual Regulated On/Off			Controller Regulated		Manual Regulated	
Flush Mount (R01)							
CAT. No.	700532	700535	700538	700532	700532	700531	
	No Vac. Reg.	Man. Vac. Regulated	Man. Vac. Reg. w/Dial	Use With 600053	Use With 600052-05	Use with 700519 or 700546	
Surface Mount (R04)							
CAT. No.	700532-03	700535-03	700538-03	600053	600052-05	700519	700546
	No Vac. Reg.	Man. Vac. Regulated	Man. Vac. Reg. W/Dial	Table Top Controller	Flush Mnt Controller	Man. Vac. Regulated	Man. Vac. Reg. On/Off

This selection chart indicates the most common Netvac ports. If you do not see what you need, please contact your Welch-Ilmvac representative.

## Accessories for Netvac

### Hoses

Type	CAT. No.
PTFE Vacuum hose, 10/8x1	828332
Hose for potable water to condenser 14/8x3	828346



### Fittings (Material PVDF)

Type	Size	CAT. No.	Type	Size	CAT. No.
Tee	10-10-10	829930	Straight	10-10	829945-2
Elbow	10-10	829983	Male adapter elbow	10-1/4 in.	829984



## Handheld General Range Vacuum Gauge - PIZA 101



- Portable unit connects easily to any vacuum source

PIZA 101, an economical raw gauge for uses in laboratory. The external PIZA sensor reads results to large LCD. Use either the DN 16 KF connection or an optional hose connector. Operates on standard 9V battery or with AC/DC adapter. Comes with sensor, cable and AC/DC adapter + 9V.

Ilmvac Model	Range mbar(torr)	Overall Dimensions LxWxH cm(in.)	Voltage	CAT. No.	Spare Sensor
PIZA 101	1050 - 1(785 - 1)	80x36x125(3.1x1.4x4.9)	90-260V, 50/60Hz <sup>1</sup>	600071	620001-01

1. With AC/DC adapter, Schuko, UK and US plug adapter

## Handheld Multi Range Vacuum Gauge - PIZA 111



- Economical, portable vacuum gauge for common applications in laboratories with vacuum measurement from **1050 - 10<sup>-3</sup> mbar**

Take accurate vacuum reading at multiple vacuum levels with combination sensor Piezo/Pirani. The external sensor comes with 2 meters of data cable and can be extended. Vacuum connection is DN 16 or optional hose nozzle. Operates on 9V battery or AC/DC adapter (both included).

Ilmvac Model	Range mbar(torr)	Overall Dimensions LxWxH cm(in.)	Voltage	CAT. No.	Spare Sensor
PIZA 111	1050 - 10 <sup>-3</sup> (785 - 10 <sup>-3</sup> )	80x36x125(3.1x1.4x4.9)	90-260V, 50/60Hz <sup>1</sup>	600072	620002-01

1. With AC/DC adapter, Schuko, UK and US plug adapter

## Pirani Fine Vacuum Gauge/Controller - PIA 1.2



- Rugged, reliable Pirani thermal conductivity sensor

PIA 1.2 provides an accurate, reliable vacuum measurement. Comes with a 0.5-4.5V recorder output. The sensor has a DN 16 KF connection. Comes with Pirani sensor and mounting bracket.

Ilmvac Model	Range mbar(torr)	Overall Dimensions LxWxH cm(in.)	Voltage	CAT. No.	Spare Sensor
PIA 1.2	1000 - 10 <sup>-3</sup> (750 - 10 <sup>-3</sup> )	96x118x48(3.8x4.7x1.9)	230V, 50/60Hz <sup>1</sup>	600008	620053
PIA 1.2	1000 - 10 <sup>-3</sup> (750 - 10 <sup>-3</sup> )	96x118x48(3.8x4.7x1.9)	115V, 50/60Hz <sup>2</sup>	600008-03	620053

1. With Schuko and UK plug leads

2. With US plug lead

## Explosion Proof Digital Vacuum Gauge - PIZA 102 ATEX (ATEX category 2 - II 2G Ex ib IIB T4)



- Compact vacuum gauge for use in areas with potentially explosive atmosphere.

Operates on certified Ilmvac battery. PIZA 102 ATEX comes with sensor, battery and certificate.

Ilmvac Model	Range mbar(torr)	Overall Dimensions LxWxH cm(in.)	Voltage	CAT. No.	Spare Sensor
PIZA 102 ATEX	1050 - 1(785 - 1)	80x36x125(3.1x1.4x4.9)	9V	600077	620001-01

## Calibration Service - CAT. No. L955110

We offer a recalibration service for all your Ilmvac vacuum gauges, including test / calibration certificate.

## Accessories

### Accessories for PIZA Gauges

#### Carrying Case

Robust plastic case to protect your PIZA gauge from damage during transportation.

Type	CAT. No.
carrying case	620095



#### Table Top Stand

Type	CAT. No.
Table Stand	620007



### Hose Connectors

Type	CAT. No.
DN 8 male 1/4 inch	710953
DN 10 male 1/4 inch	710955



### KF Reducing Adapter

Type	CAT. No.
DN 25 / 16 KF	701420



### Dial Vacuum Gauge VMF

VMF gauge and inexpensive gauge for measuring vacuum level in the rough vacuum range. VMF is independent of the type of gas.

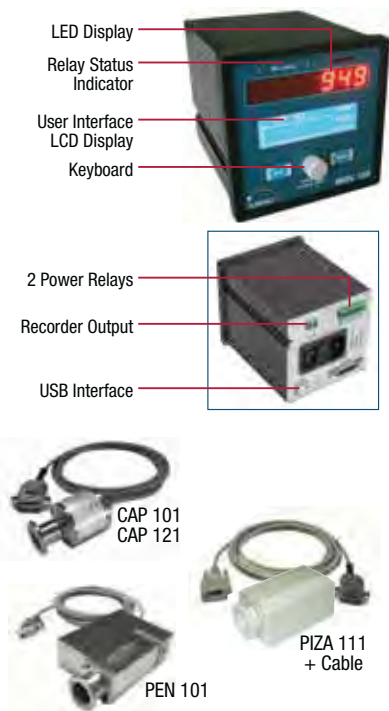
#### Features

- Usable for rough vacuum measurement
- Measurement range from 1000 - 1mbar



Type	Size	CAT. No.
VMF 16 Stainless Steel	DN 16 KF	600201-1

## Digital Multi-Range Gauge / Controller - MRV 100, for Multiple Transducers



- Dual display for pressure and operating status; user interface gives quick and easy settings.
  - Adjustable switching threshold with visual indication of the switching status in the display
- MRV 100 is cost effective, compact and accurate pressure measurement and control in the range between atmosphere and  $10^{-8}$  mbar. Readout selectable between mbar, torr and pascal. The MRV 100 automatically searches for the connected transducer and initializes the respective interface for the connected transducer. MRV 100 has 2 mechanical power relays for controlling external process equipment, e.g. solenoid valves. Relay contacts - 230V, 4 A, independently adjustable. Comes with 0-10V recorder output, data logger, USB interface and PC Software kit.

Ilmvac Model	Range mbar(torr)	Overall Dimensions LxWxH cm(in.)	Voltage	CAT. No.
MRV 100	depends on transducer	90x120x90(3.6x4.7x3.6)	110-240V, 50/60Hz <sup>1</sup>	600081

1. With Schuko, UK and US plug leads

### Vacuum transducers for MRV 100

For MRV 100 various transducer types for a variety of applications are available. The operating pressure range, mounting position, type of gases and connector type will determine the selection of the appropriate transducer. For further information please contact your Welch-Ilmvac representative.

Ilmvac Model	Range mbar(torr)	Connector Type	Material	CAT. No.	Connection Cable
CAP 101	1000 - 1 (785-1)	DN 16 KF	Stainless Steel	620088	included
CAP 121	200 - $10^{-1}$ (150 - $10^{-1}$ )	DN 16 KF	Stainless Steel	620089	included
PIZA 111	1050 - $10^{-3}$ (785 - $10^{-3}$ )	DN 16 KF	PP	620002-02	620091
PEN 101	$1 \times 10^{-2}$ - $5 \times 10^{-8}$	DN 25 KF	Nickel Plated AL	620090	included

For a complete MRV 100 control package with PIZA 111 transducer see p. 19. For further vacuum valves, components see our vacuum components catalog.

Switch-Box for MRV 100, connection for up to 4 sensor max 2 PEN 101 at the time; easy plug and play. CAT. No. 600081-01



## Digital Vacuum Control Box VCB 521



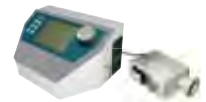
- For quick and easy vacuum setting and control for various laboratory application
- **VCB controls: vacuum - cooling water - venting valve**
- Table Top Vacuum Controller for most common vacuum pumps through DN 8 hose connector

**Programmable vacuum controller VCB 521 cv** with a built-in highly resistant ceramic diaphragm sensor for absolute pressure determination. On the VCB 521 cv the standard control concept (see p. 10) applies - 2 variable independent switch points can be set between 1100 - 1mbar. Digital display for easy vacuum control; digitally displayed user-friendly operating instructions. Due to the automatic venting valve foaming and bumping can be minimized.

VCB 521 ef is included in our ecoflex diaphragm package, see p. 9.

### Other models: VCB 521 es

Vacuum control box with external sensor for flexible work, with easy DN 16 KF or DN 8 hose connection to the application.



Ilmvac Model	Range mbar(torr)	Overall Dimensions LxWxH cm(in.)	Voltage	CAT. No.	Spare Sensor
VCB 521 cv	1100-1(825-0.75)	195x178x105(7.6x7x4.1)	90-260V, 50/60Hz <sup>1</sup>	600053	----
VCB 521 es	1100-1(825-0.75)	195x140x105(7.6x5.5x4.1)	90-260V, 50/60Hz <sup>1</sup>	600066	620052-04

1. With Schuko, UK and US plug leads

## Vacuum Gauge / Controller Selection Chart

Vacuum Gauge								Vacuum Gauge / Controller											
<b>Bourdon (Dial)</b>								<b>Capacitive</b>											
VMF								VCB 521											
1000 - 1								MRV 100 with CAP 101											
<b>Piezo</b>								MRV 100 with CAP 121											
PIZA 101								1000 - 1											
PIZA 102 ATEX								200 - 0,1											
<b>Piezo &amp; Pirani</b>								<b>Piezo &amp; Pirani</b>											
PIZA 111								MRV 100 with PIZA 111											
1050 - $10^{-3}$								1050 - $10^{-3}$											
<b>Pirani</b>								PIA 1.2											
PIA 1.2								1000 - $10^{-3}$											
<b>Cold Cathode</b>								<b>Cold Cathode</b>											
MRV 100 with PEN 101								MRV 100 with PEN 101											
10 <sup>-8</sup> - 10 <sup>-2</sup>								10 <sup>-8</sup> - 10 <sup>-2</sup>											
<b>Ult. Pr., mbar</b>								<b>Ult. Pressure, mbar</b>											
10 <sup>-3</sup> 10 <sup>-2</sup> 10 <sup>-1</sup> 1 10 100 1000								10 <sup>-8</sup> 10 <sup>-7</sup> 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup> 10 <sup>-2</sup> 10 <sup>-1</sup> 1 10 100 1000											

Use Welch-Ilmvac pump oils to reduce oil change cycles and maximize performance. The warranty is only effective when using Welch-Ilmvac qualified vacuum pump oils.

Please note that for demanding applications not all types of Welch-Ilmvac vacuum pump oil can be used. Please contact your local Welch-Ilmvac representative for further details.



### Labovac 10 – Mineral oil

Standard oil for One and Two-stage Welch-Ilmvac Rotary Vane pumps and chemvac's. To pump air, inert gases and noble gases.

#### Remarks:

Oil Service cycles can be extended by using a oil-filter.

### Labovac 11 – Synthetic oil

Used for high operating temperatures > 100°C, specially in One-stage rough vacuum rotary vane pumps.

#### Remarks:

Do not pump any inorganic acids. Ultimate pressure up to 0.5mbar(torr).

### Labovac 12S – Paraffin based mineral oil

For pumping air, chemically inert permanent gases – water vapour, solvent vapors.

#### Remarks:

Oil Service cycles can be extended by using a chemical oil-filter. Pump should operated with a cold trap.

### Labovac 13 – PFPE oil

For pumping strong oxidants like oxygen, ozone and reactive substances (halogens).

#### Remarks:

Mixing with other types of oil must be absolutely avoided. We recommend to order the rotary vane pump directly with these vacuum oil to ensure best performance.

### Labovac 14 – Polyalphaolefin (PAO) oil

For pumping of chemically inert permanent gases – water vapor and solvent vapors. Improved cold starting at low temperatures.

#### Remarks:

A oil-filter is strongly recommend. Ultimate pressure up to 10<sup>-2</sup>mbar(torr).

## Specifications

Ilmvac Model	Labovac 10 Mineral oil	Labovac 11 Synthetic oil	Labovac 12S Paraffin oil	Labovac 13 PFPE oil	Labovac 14 PAO oil
Vapour pressure mbar(torr)	10 <sup>-5</sup>	10 <sup>-5</sup>	10 <sup>-8</sup>	10 <sup>-6</sup>	10 <sup>-6</sup>
Viscosity at 40°C(104°F) cSt	118	110	94	120	47.9
Flash point °C(°F)	270(518)	260(500)	260(500)	not applicable	257(495)
Density @15°C(59°F) g/ml	0.888	0.960	0.886	1.890	0.918

## Ordering Information

1 Liters(1.1qt)	800122	800125	800128	800131	800135
2 Liters(2.1qt)	----	----	----	800132	800136
5 Liters(5.3qt)	800120	----	----	800133	800137
10 Liters(10.6qt)	800123	800126	800129	800134	800138
20 Liters(21.2qt)	800124	800127	800130	----	----
200 Liters(1.26ba)	800119	----	----	----	----

Note:  
Every Vacuum pump oil is supplied with MSDS (material safety data sheet).

## Vacuum Pump Oil Condition Color



Good



Bad (Possible Pump Damage)



Vacuum Pump oil can become contaminated with ingested fluids and vapors. Use recommended pump oil and change your pump oil regularly. Cloudy and discolored oil will lead to premature pump failure. **Make the clear choice and change your oil regularly.**

## Accessories

Oil Change Starter Kit for one and two-stage rotary vane pumps.  
CAT. No. 340003



Oil drain valve for one and two stage rotary vane pumps.  
CAT. No. 300839-2





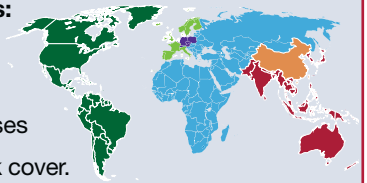
## Welch-Ilmvac Service: comprehensive and customer-oriented

We have service and support centers, as well as qualified sales, service and support agents worldwide to ensure the best Customer Service Program (CSP) possible. When you need after-sales support, service or repair, please visit [www.welch-ilmvac.com](http://www.welch-ilmvac.com) for an appropriate contact in your area:

### The Welch-Ilmvac Customer Service Program (CSP) offers you the following benefits:

- Exploded parts list and Service instructions are available in the user manual
- Dedicated Service Kits – in order to simplify service performed in the field
- Spare parts are available from stock in all regional Service center and support bases

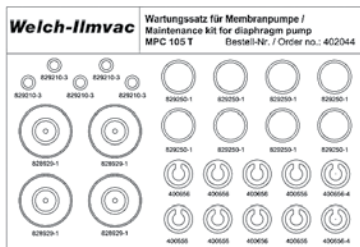
For more detailed information about our Customer Service Program please see inside back cover.



## Dry Pump Service Kit Ordering Information

### Chemical and Standard Duty Diaphragm Pumps & Laboratory Vacuum Systems (LVS)

- Service kit includes diaphragm, valves and O-Rings.



For Pump Model	KIT No.
MP / MPR 060 E, 030 Z, biovac 060	402031
MP / MPC 055Z, 105 E, biovac 106	402045
MPC 105 T	402044
MP / MPC 101 Z, 201 E	402008
MP / MPC 201 T, MP 101 V	402015
MP / MPC 301 E	402046
MP / MPC 301 Z, 601 E, 301 Z ef	402041
MP / MPC 601 T, 901 Z, 1201 E, MP 301 V	402042
MPC 301 Zp Ex	402038
MPC 601 Tp Ex	402039
HBP 101	402035

### Scrollvac - Scroll Pumps

- Service kit includes sliding seal and O-Rings.

For Pump Model	KIT No.
S 10, S 15	402201

### Standard WOB-L Piston Pumps

- Rebuild kit includes connection rod ass'y, O-ring, valve plate ass'y and gasket.
- Service kit includes valve, O-ring and gasket.
- Seal Kit includes valve and O-ring.

For Pump Model	Rebuild KIT No.
2522	2522K-03
2534	2534K-03
2546	2546K-03

For Pump Model	Service KIT. No.	Seal KIT No.
2561	2561K-03	2561K-04
2567	2567K-03	2567K-04
2581	2581K-03	2581K-04
2585	2585K-03	2585K-04
Service Kit for Feet (includes suction feet)		
All WOB-L Piston Pump Models		2500K-04

## Rotary Vane Pump Service Kit Ordering Information

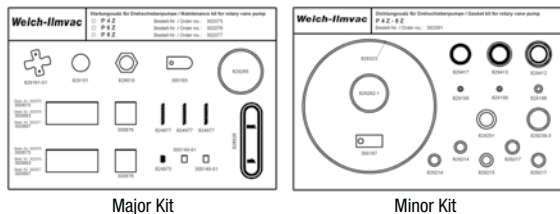
### Chemvac Combination Pump Systems

- Service kit for MPC includes diaphragm, valves and O-Rings.
- Service kit for P\*Z includes shaft seal, O-rings, valves, springs, vanes and oil glass.

For Pump Model	Service KIT No.
Chemvac 6 Z-101	
MPC 101 Z chemvac	402008-01
P 6 Z chemvac	302076-01
Chemvac 12 Z-301	
MPC 301 Z, chemvac	402041-02
P 12 Z, chemvac	302079-01
Chemvac 23 Z-301	
MPC 301 Z, chemvac	402041-02
P 23 Z, chemvac	302080-01

## Two-stage and One-stage Direct-Driven Rotary Vane Pumps

- Minor kit includes all necessary seals (shaft seal, O-Rings, valves, ...)
- Major kit includes minor kit plus vanes, springs, oil glass



For Pump Model	Minor KIT No.	Major KIT No.
PK 2 DC	302011	302012-1
8905	8905K-02	----
P 4 Z	302081	302075
P 6 Z,	302081	302076
P 8 Z	302081	302077
P 12 Z,	302082	302079
P 17 Z, P 23 Z,	302082	302080
P 4 E	321008	321012
P 6 E	321008	321013
P 8 E	321009	321014
P 12 E	321010	321015
P 17E, P 23E	321011	321016

## Chemstar Belt-Driven Rotary Vane Pumps

- Minor kit includes all necessary seals (shaft seal, O-Rings, valves, ...)
- Major kit includes minor kit plus vanes

For Pump Model	Minor KIT No.	Major KIT No.
1400N	1400K-09	1400K-10
1402N	1402K-09	1402K-10
1376N	1376K-09	1376K-10

# Tool Kits for HBP, MP & MPC Pumps

## Tool Kits

- Tool kits includes wrench, allen key and adjustable spanner wrench

For Pump Model	KIT No.
MP/MPC 101, 201, 301, 601, 901, 1201, 1801, 2401	402106
Adjustable spanner wrench for diaphragm washer	826801

# Parts and Accessories

## Plug Leads



Type	CAT. No.
Swiss Plug lead	825877
JP Plug Lead	825911

## Replacement Element for Filter/Trap



For Filter/Trap Model	CAT. No.
OME 10/16, OME 20/25, AKD 16 and AKD 25	800160
OMEH 30/25	800162
1420H-21	1420E-02
1420H-20	1420E-01
OPF 40C	828599
OPF 40M	800170

## Accessories for RODist



Type	CAT. No.
Vertical Condenser, coated for RODist	112570-02
Seal	112570-08
Vapour tube	112570-09
Evaporation flask, 1000ml	112570-12
Receiving flask, 1000ml	112570-13

## Accessories for LVS

- Condenser includes solvent recovery flask and clamp.



Type	CAT. No.
Condenser complete for all LVS models	700183-08
Condenser complete for LVS 105 T -10 ef, coated	700183-11