

## Water jet pumps/Water jet pumps



### 1 Water jet pump, PP

This pump will work on pressures up to 10 kg/cm<sup>2</sup>. With built-in, non-return valve to eliminate back flow. Useful for vacuum removal of spilt chemicals, as well as for filter work. Easily dismantled for cleaning.

*Kartell*

Description	PK	Cat. No.
Water jet vacuum pump	1	9.303 031
Tubing connectors	1	9.303 032



### 2 Water jet pumps, PP

With constant ultimate vacuum, high suction flow rate and very low water consumption.

*BRAND*

Can be connected to mains water system in a number of different ways using the adapter supplied and reducing adapters that are available as accessories. For continuous use at temperatures up to 80 °C max. High chemical resistance as the media being pumped only comes into contact with PP, FKM and PTFE. Integral non-return valve increases safety.

**Comprises:** Water jet pump, including:

Mains water connections: R 3/4" sleeve nut, R 1/2" reducing adapter and flexible tubing connection (nozzle) with external diameter from 10 mm to 12 mm.

Vacuum connection: Detachable nozzle with external diameter from 6mm to 9mm and GL 14 screw cap.

Type	PK	Cat. No.
Reducing adapter R 3/8" for water jet filter pump	1	7.020 037
Reducing adapter M 22x1 for water jet filter pump (thread for screen tap)	1	7.020 038
Water jet pump	1	9.303 125



### 3 Water jet pump, nickel-plated

Nickel-plated brass, non-return valve, with connection for quick coupling.

*Usbeck*

Description	Thread	Weight	PK	Cat. No.
		<b>g</b>		
Water jet pump	G 1/2	188	1	9.303 000
Quick coupling for water jet pump			1	9.303 001



### 4 Water Jet Pump, nickel-plated

Nickel-plated brass, non-return valve, with female connection to water tap.

*Usbeck*

Thread	Ext. diam.	Weight	PK	Cat. No.
	<b>mm</b>	<b>g</b>		
G 1/2	21.0	245	1	6.070 401
G 3/4	26.5	250	1	6.302 608

### 1 Piston pump LLG-uniVACUUPUMP 1

1

The **portable** piston pump LLG-uniVACUUPUMP 1 has been developed for **vacuum and pressure applications** in the laboratory, in particular in the field of Life Science. Typical applications for this low-cost vacuum pump are the single funnel filtration of aqueous and buffered solutions, SPE, as well as any applications where no harmful gases are conveyed. The LLG-uniVACUUPUMP 1 operates oil-free and can also be used as a compressor to a pressure up to 3.3 bar. This allows you, for example, pressure filtration, if vacuum filtration is not sufficient. Not recommended for pumping organic, acidic, or basic vapours.

**Advantages:**

- Dry-running technology for physical applications
- Can be used as a vacuum pump and compressor
- Cost-effective alternative for water pumps
- Sound suppressor for quiet operation
- Compact, light weight and portable
- Oil-free, suitable for continuous operation
- Suction/pressure connection: hose nozzle DN 6 for hose inner diameter 6 mm

**Scope of delivery:** Pump, incl. 2 hose clamps, EU + UK-plug power cord.

**Specifications**

Pump speed 50/60 Hz at atmospheric pressure:	9.2/11 l/min
Final pressure:	292 mbar
Max. overpressure:	3.3 bar
Max. operating gas temperature:	60 °C
Permissible ambient temperature:	10 ... 40 °C
Suction/pressure connection:	DN 6
Noise emission:	<45 dB(A)
Motor power:	25 W
Dimensions (W x D x H):	194 x 114 x 191 mm
Weight:	2.0 kg
Power supply:	230 V/50 Hz
IP code:	IP 20
Warranty:	3 years



Type	PK	Cat. No.
LLG-uniVACUUPUMP 1	1	6.263 580

### 2 Piston pump, complete

2

Piston pumps are a reliable partner for physical applications, notably with aqueous solutions. Being a vacuum pump and compressor, it can be used for a wide variety of applications such as filtration, gas sampling, vacuum drying, desiccation and automation technology. The integrated vacuum and pressure gauges and regulators allow the pressure to be continuously monitored and adjusted. For use with dry or aqueous vapor applications only.

*Welch Vacuum*

- Oil free
- Easy to clean
- Easy maintenance
- Easy handling and control features
- Robust construction
- Pressure connection with exhaust silencer
- Suction/pressure connection: hose nozzle DN 8 for hose inner diameter 8 mm

**Scope of delivery:** vacuum pump, vacuum and pressure regulators with gauges, inlet water trap and muffler

**Specifications**

Suction/pressure connection:	DN 8
Ambient temperature:	10 ... 40 °C
Max. Operating gas temperature:	60 °C
Noise DIN EN ISO 2151:	56 dB (A)
IP code:	IP 20



Ultimate pressure	Flow rate	Max. pressure	Dimensions (W x D x H)	Weight	Rating	PK	Cat. No.
mbar	L / min.	bar	mm	kg	W		
133	18	7.9	206 x 224 x 254	5.3	93	1	6.287 585
93	28	5.8	206 x 224 x 254	5.3	93	1	6.287 586
80	38	5.2	254 x 191 x 77	6.3	190	1	6.287 587

### 1 Mini Diaphragm Vacuum Pumps LABOPORT®

For Filtration, SPE, Degassing, Fluid aspiration.

KNF

- N 938.50 KT.18 ensures exceptionally fast evacuation by the parallel and in series connection of both pump heads
- N 86 KT.18 has a very small footprint
- PTFE-coated diaphragm is ideal for aggressive/corrosive gases and vapors
- Pump head made from PPS (Polyphenylsulfide), valves made from FFPM (Perfluoro rubber)

#### Specifications

Operating pressure:	0.5 bar
Connectors for tube	
N 86 KT.18/KN.18:	ID4 mm
N 816.3 KT.18/N 816.1.2 KT.18:	ID6 mm
N 938.50 KT.18:	ID10 mm
Permissible media and ambient temperature:	5 to 40 °C
Flow rate:	Up to 1.8 m³/h
Ultimate vacuum:	Up to 15 mbar abs.
IP code:	IP 20

Type	Flow rate l / min.	Ultimate vacuum mbar (abs).	Max. pressure bar	PK	Cat. No.
N 86 KN.18	6	100	2.4	1	9.880 510
N 86 KT.18	5.5	160	2.5	1	9.880 680
N 816.3 KT.18	16	20	0.5	1	7.620 376
N 816.1.2 KT.18	30	160	0.5	1	6.206 850
N 938.50 KT.18	30	15	0.5	1	7.940 228

### 2 Mini-Diaphragm vacuum pumps LABOPORT® N96, chemically-resistant

NEW

The Pump combines a high flow rate with a very compact design. Suitable for filtration, SPE, and liquid aspiration using a vacuum. Due to the manual rotational speed control, the pump is quiet, very energy efficient, and can be optimally adjusted in accordance with the application.

KNF

- Easy-to-clean surface
- Very small footprint
- Adjustable in flowrate due to manual rotational speed control
- PTFE-coated diaphragm for use with aggressive/corrosive gases and vapors

#### Specifications

Ultimate vacuum (abs.):	<130 mbar
Operating pressure:	2.5 bar
Connectors for tube:	ID 6 mm
Permissible ambient temperature:	5 ... 40 °C
Pump head:	PPS
Diaphragm:	PTFE coated
Valves:	FKM

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	Width mm	Depth mm	Height mm	Weight kg	PK	Cat. No.
N96	7	130	75	156	119	1.3	1	4.672 374



## 9. Vacuum technology, Drying, Dry storage Diaphragm pumps/Pumps

### Diaphragm pumps, Aluminium PTFE design, ME 1, MD 1

The diaphragm pumps ME 1 offer a compact and high performance solution. With their easy-to-use functionality, they are a perfect partner for both single and multiple filtrations.

One-stage diaphragm pumps are an excellent solution for continuous, oil-free pumping of gases and vapors for modest vacuum requirements. In contrast to water-jet pumps, they do not consume water and therefore do not produce any contaminated waste water in daily use.

Vacuum filtration is frequently used for sample preparation in chemistry, microbiology, waste water control and analysis. Typical applications for the ME 1 are aqueous filtrations. The PTFE diaphragm and valves are rugged and provide high chemical resistance. If aluminium has the required specific resistance, solvent-containing samples can also be filtrated.

VACUUBRAND



9.880 930



9.880 080

Type	Dimensions (W x D x H)	Flow rate (50/60 Hz)	Number of steps	Ultimate vacuum	Connector	Weight	PK	Cat. No.
	mm	L / min.		mbar		kg		
ME 1	247 x 121 x 145	11.66 / 14.16	1	100	CEE	5.0	1	9.880 930 1
ME 1	247 x 121 x 145	11.66 / 14.16	1	100	UK	5.0	1	9.880 932
MD 1	303 x 143 x 163	20 / 23.33	3	1.5	CEE	6.5	1	9.880 080 2
MD 1	303 x 143 x 163	20 / 23.33	3	1.5	UK	6.5	1	6.284 823

Country-specific power cord versions available on request.

### Diaphragm pumps chemistry design, ME 1C, MZ 1C, MD 1C

The diaphragm pumps ME 1C offer a compact and high performance solution. With their easy-to-use functionality, they are the perfect partner for both single and multiple filtrations.

One-stage diaphragm pumps are an excellent solution for continuous, oil-free pumping of gases and vapors for modest vacuum requirements. In contrast to water-jet pumps, they do not consume water and therefore do not produce any contaminated waste water in daily use.

Vacuum filtration is frequently used for sample preparation in chemistry, microbiology, waste water control and analysis. In the chemistry diaphragm pumps ("C") all major parts in contact with pumped media are made of chemically resistant fluoroplastics. The ME 1C is also often used for solid phase extraction (SPE).

An optional manual regulator valve with dial gauge enables variable fine adjustment of the pumping speed and the ultimate vacuum.

Gas ballast for reliable pump performance.

Two up to four stage chemistry diaphragm pumps (letters in the product name Z, D or V) are equipped with a manual gas ballast valve as standard. The supply of gas ballast minimizes the risk of condensation inside the pump.

VACUUBRAND



9.880 934



9.880 083

Type	Dimensions (W x D x H)	Flow rate (50/60 Hz)	Ultimate vacuum without / with gas ballast	Connector	Weight	PK	Cat. No.
	mm	L / min.	mbar		kg		
ME 1C	247 x 121 x 145	11.66 / 14.16	100	CEE	5.0	1	9.880 934 3
ME 1C	247 x 121 x 145	11.66 / 14.16	100	UK	5.0	1	9.880 936
MZ 1C	312 x 121 x 170	12.5 / 15	12 / 20	CEE	6.7	1	6.254 394
MZ 1C	312 x 121 x 170	12.5 / 15	12 / 20	UK	6.7	1	9.880 947
MD 1C	316 x 143 x 223	21.66 / 25	2 / 4	CEE	6.9	1	9.880 083 4
MD 1C	316 x 143 x 223	21.66 / 25	2 / 4	UK	6.9	1	6.284 822

Diaphragm pumps ATEX-models available on request. Country-specific power cord versions available on request.

### Diaphragm pumps, Aluminium

- Improved performance, increased pumping speed (up to 16 m<sup>3</sup>/h) and better ultimate vacuum (up to 0.5 mbar). VACUUBRAND
- Extend applications with non-aggressive gases whether used in the laboratory or for industrial processes.
- Very low leak rate due to enhanced leak-tight tubing connections, resulting in consistent performance characteristics
- even after many years of operation. Ideal for analytical applications.
- Long diaphragm and valve lifetimes: made of highly flexible FPM, with fabric-reinforced double diaphragms for improved long term stability.
- Very quiet and ultra low vibration due to compact drive with patented motor drive system. Ideal as a built-in component for sensitive analytical equipment.
- Easy to clean due to smooth surfaces. A robust solution for numerous applications in industrial environments

The VARIO® design provides vacuum control by precise and continuous adaption of the diaphragm pumps motor speed, and includes the vacuum pump, as well as the VACUU-SELECT controller.

#### Specifications

Vacuum inlet	
10 mm tubing nozzle:	ME4NT, ME4RNT, ME8NT, MZ2NT
KF DN16:	MZ2DNT, MD4NT, MV2NT
Pressure outlet	
Silencer:	ME4NT, MZ2NT, MZ2DNT, MD4NT, MV2NT
Twin silencers:	ME8NT
Tubing nozzle:	ME4RNT

Type	Dimensions (W x D x H) mm	Flow rate (50/60 Hz) L / min.	Ultimate vacuum mbar	Number of steps	Connector	PK	Cat. No.
ME 2 NT	243 x 211 x 198	33.33 / 36.67	70	1	CEE	1	9.880 940
ME 2 NT	243 x 211 x 198	33.33 / 36.67	70	1	UK	1	9.880 941
ME 4 NT	239 x 243 x 198	66.67 / 73.33	70	1	CEE	1	9.880 883
ME 4 NT	239 x 243 x 198	66.67 / 73.33	70	1	UK	1	4.670 420
ME 4R NT	239 x 243 x 290	63.33 / 70	100	1	CEE	1	9.880 884
ME 4R NT	239 x 243 x 290	63.33 / 70	100	1	UK	1	4.670 423
ME 8 NT	239 x 325 x 198	121.67 / 135	70	1	CEE	1	9.880 885
ME 8 NT	239 x 325 x 198	121.67 / 135	70	1	UK	1	4.670 483
ME 16 NT	554 x 260 x 359	273.30 / 306.67	70	1	CEE	1	9.880 952 <sup>1</sup>
ME 16 NT	554 x 260 x 359	273.30 / 306.67	70	1	UK	1	9.880 953
MZ 2 NT	239 x 243 x 198	36.67 / 40	7	2	CEE	1	9.880 887
MZ 2 NT	239 x 243 x 198	36.67 / 40	7	2	UK	1	4.670 427
MD 12 NT	554 x 260 x 359	201 / 221	2	3	UK	1	9.880 950
MD 12 VARIO select	554 x 260 x 420	223	1.5	3	CEE	1	4.670 566
MD 4 NT	239 x 325 x 198	63.30 / 71.67	1	3	CEE	1	9.880 890 <sup>2</sup>
MD 4 NT	239 x 325 x 198	63.30 / 71.67	1	3	UK	1	4.670 487
MD 4 VARIO select	239 x 325 x 245	95	1	3	CEE	1	4.670 492
MV 10 NT	554 x 260 x 359	173.30 / 193.30	0.5	4	CEE	1	9.880 954
MV 10 VARIO select	554 x 260 x 420	202	0.3	4	CEE	1	7.983 695
MV 10 VARIO select	554 x 260 x 420	202	0.3	4	UK	1	4.670 571
MV 2 VARIO select	239 x 325 x 245	55	0.3	4	CEE	1	4.670 552

Country-specific power cord versions available on request.

1



9.880 952

2



9.880 890

# 9. Vacuum technology, Drying, Dry storage Diaphragm pumps/Pumps

## 1 Diaphragm vacuum pumps -NT Series, Chemistry design

VACUUBRAND

- Improved performance, increased pumping speed and lower ultimate vacuum extends applications in both the laboratory and in industrial applications.
- Long-life diaphragm with PTFE sandwich construction and unstressed diaphragm support.
- Easy service/exchange of diaphragm or valves due to novel integrated valve head assembly. Easy dismantling, cleaning and reassembly without requiring readjustment.
- Very quiet and ultra low vibration due to compact drive with patented motor control system. Ideal as a built-in component for sensitive equipment in both the laboratory and in industry.
- Superior vapour tolerance due to integral tubing connections and gas ballast valve for continuous purge (at ME 16C NT, MZ 2C NT, MD 4C/12C NT and MV 10C NT).
- Easy to clean due to smooth exterior surfaces.



The VARIO® design provides vacuum control by precise and continuous adaption of the chemistry diaphragm pumps motor speed, and includes the vacuum pump, as well as the VACUU-SELECT controller.

### Specifications

Vacuum inlet: 10 mm tubing nozzle  
Pressure outlet: 10 mm tubing nozzle

Type	Dimensions (W x D x H) mm	max. discharge flow m <sup>3</sup> / hr.	Ultimate vacuum without / with gas ballast mbar (abs.)	Number of steps	Connector	PK	Cat. No.
ME 2C NT	243 x 211 x 198	2.1 / 2.4	70	1	CEE	1	9.880 943
ME 2C NT	243 x 211 x 198	2.1 / 2.4	70	1	UK	1	9.880 944
ME 4C NT	243 x 255 x 198	3.9 / 4.3	70	1	CEE	1	9.880 894
ME 4C NT	243 x 255 x 198	3.9 / 4.3	70	1	UK	1	4.670 425
MZ 2C NT	243 x 243 x 198	2.0 / 2.3	7 / 12	2	CEE	1	9.880 898
MZ 2C VARIO select	243 x 243 x 245	2.8	7 / 12	2	CEE	1	4.670 437
ME 8C NT	243 x 325 x 198	7.1 / 7.8	70	1	CEE	1	9.880 896
ME 8C NT + 2AK	243 x 319 x 374	7.1 / 7.8	70	1	-	1	6.267 643
MD 4C NT	243 x 325 x 198	3.4 / 3.8	1.5 / 3	3	CEE	1	9.880 900
MD 4C NT	243 x 325 x 198	3.4 / 3.8	1.5 / 3	3	UK	1	4.670 495
MD 4CRL NT	243 x 325 x 198	3.4 / 3.8	1.5 / 0.001*	3	-	1	9.880 926
MD 4C VARIO select	243 x 325 x 245	4.6	1.5 / 3	3	CEE	1	4.670 500
ME 16C NT	533 x 260 x 359	16.3 / 18.4	70 / 100	1	CEE	1	9.880 955
ME 16C NT	533 x 260 x 359	16.3 / 18.4	70 / 100	1	UK	1	9.880 956
ME 16C VARIO select	533 x 260 x 450	20	70 / 100	1	CEE	1	4.672 102
MD 12C NT	533 x 260 x 359	12.0 / 13.3	2 / 4	3	CEE	1	9.880 957
MD 12C NT	533 x 260 x 359	12.0 / 13.3	2 / 4	3	UK	1	9.880 958
MD 12C VARIO select	533 x 260 x 450	14.3	1.5 / 3	3	CEE	1	6.311 049
MD 12C VARIO select	533 x 260 x 450	14.3	1.5 / 3	3	UK	1	4.672 103
MV 10C NT	533 x 260 x 359	9.5 / 10.7	0.9 / 1.5	4	CEE	1	9.880 960
MV 10C VARIO select	533 x 260 x 359	9.5 / 10.7	0.9 / 1.5	4	CEE	1	4.672 104

\* diaphragm pump with reduced leakage rate (mbar x l/s). Country-specific power cord versions available on request.

## 2 Diaphragm pump MPC 101 Z

Welch Vacuum

The two-stage pump is designed for pumping and compressing gases and vapours and generate vacuum e.g. for rotary evaporators, vacuum ovens and vacuum filtration. Their electrical conductivity prevents electrostatic charging and minimizes the risk of the gas mixture igniting inside the pump.

- For tubes with ID = 8 mm
- Chemically resistant
- Resistant to aggressive solvents and acid vapours
- Elastomer diaphragms with PTFE layer
- Pump and connection heads are carbon fibre reinforced
- Integrated motor protection switch
- Vibration isolating feet



**Scope of delivery:** 2-head chemical diaphragm pump, external power supply and device connection cable with plug (EU, UK).

### Specification

Pump speed 50/60 Hz: 16.7/18.3 l/min  
Final vacuum (abs.): < 8 mbar  
Suction/pressure connection: Hose nozzle DN 8  
Noise: < 44 dB(A)  
Motor power: 60 W  
Voltage/frequency: 230 V/50/60 Hz  
Dimensions (W x D x H): 225 x 195 x 147 mm  
Weight: 6.5 kg  
IP code: IP 54

Type	Ultimate vacuum mbar (abs.)	Flow rate L / min.	Dimensions (W x D x H) mm	PK	Cat. No.
MPC 101 Z	8	18	225 x 195 x 147	1	6.241 127



1



### 1 Diaphragm pump MPC 301 Z

The two-stage pump is designed for pumping and compressing gases and vapours and generate vacuum e.g. for rotary evaporators, vacuum ovens and gel dryers. *Welch Vacuum*  
 Their electrical conductivity prevents electrostatic charging and minimizes the risk of the gas mixture igniting inside the pump.

- For tubes with ID = 8 mm
- Chemically resistant
- Resistant to aggressive solvents and acid vapours
- Elastomer diaphragms with PTFE layer
- Pump and connection heads are carbon fibre reinforced
- Integrated motor protection switch
- Vibration isolating feet

**Scope of delivery:** 2-head chemical diaphragm pump, external power supply and device connection cable with plug (EU, UK).

#### Specification

Pump speed 50/60 Hz:	38.3/41.7 l/min
Final vacuum (abs.):	< 8 mbar
Suction/pressure connection:	Hose nozzle DN 8
Noise:	< 44 dB(A)
Motor power:	180 W
Voltage/frequency:	230 V/50/60 Hz
Dimensions (W x D x H):	265 x 230 x 170 mm
Weight:	11.2 kg
IP code:	IP 54

Type	Ultimate vacuum mbar (abs).	Flow rate L / min.	Dimensions (W x D x H) mm	PK	Cat. No.
MPC 301 Z	8	41	265 x 230 x 170	1	6.224 872

2



### 2 Laboratory Vacuum Pump Microsart® e.jet

The laboratory vacuum pump for the filtration of samples in microbiology. *Sartorius Lab Instruments*  
 During the vacuum filtration, the filtrate is directly discharged to the drain.

- Transmembranous pressure of less than 700 mbar, acc. ISO 8199
- Constant flow rates
- Defined maximum vacuum
- Suitable for gases and liquids

#### Specifications

Flow rate:	> 4.0 l/min.
Max. vacuum:	0.4 bar
Power supply:	100 ... 240 V , 47 ... 63 Hz

Type	PK	Cat. No.
Microsart® e.jet	1	7.629 701

3



9.880 613

### Diaphragm vacuum pumps LABOPORT®

- Application: Fluid aspiration, Degassing, Gel drying, Rotary evaporation, Centrifugal concentration, Distillation *KNF*
- Flow rate up to 2.04 m³/h/Ultimate vacuum up to 8 mbar abs.
- High level of vapor and condensate compatibility
- PTFE pump head combined with PTFE-coated diaphragm are ideal for extremely aggressive/corrosive gases and vapors
- N 820.3 FT.18 and N 840.3 FT.18: ATEX-compliant in accordance with ATEX II 2/-G IIB+H2 T3 Gb internal atmosphere only

#### Specifications

Operating pressure:	1 bar
Connectors for tube:	ID10 mm
Permissible media and ambient temperature:	5 to 40 °C
Pump head:	PTFE
Diaphragm:	PTFE-coated
Valves:	FFPM

4



9.880 675

Type	Width mm	Length mm	Height mm	Flow rate L / min.	Ultimate vacuum mbar (abs).	PK	Cat. No.
N 820.3 FT.18	154	312	207	20	8	1	9.880 613 3
N 840.3 FT.18	166	341	226	34	8	1	9.880 614
N 842.3 FT.18	167	341	223	34	2	1	9.880 675 4



### Diaphragm vacuum pumps LABOPORT® N820G/N840G, chemically-resistant

The compact pumps feature a control knob for manual adjustments of the flow rate, making them well suited to a wide variety of applications, e.g. rotary evaporation, distillation, gel drying, degassing as well as the use with vacuum ovens and vacuum concentrators. Due to the manual rotational speed control, the pumps are quiet, very energy efficient, and can be optimally adjusted in accordance with the application.

KNF

- Easy-to-clean surface
- Adjustable in flowrate due to manual rotational speed control
- Combination of PTFE pump head and PTFE-coated diaphragm makes the pump ideal for extremely aggressive/corrosive gases and vapors
- High level of compatibility with vapor and condensation
- Integrated gas ballast valve
- 3-color status display: In operation/Stand-by/Error
- ATEX-compliant in accordance with II 2/-G IIB+H2 T3 internal atmosphere only
- 100 % oil-free transfer to ensure uncontaminated transfer, evacuation and compression
- Optional: Easily expandable with separators and/or condensers

#### Specifications

Ultimate vacuum (abs.):	6 mbar
Operating pressure:	0.1 bar
Connectors for tube:	ID9/10 mm
Permissible ambient temperature:	5 ... 40 °C
Pump head:	TFM™ PTFE
Diaphragm:	PTFE-beschichtet
Valves:	FFPM

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	Width mm	Depth mm	Height mm	Weight kg	PK	Cat. No.
N820G	20	6	163	259	220	8.8	1	4.672 375 1
N840G	34	6	177	289	240	11.3	1	4.672 376

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### Diaphragm vacuum pumps LABOPORT® SD, chemically-resistant

t-Application: Rotary evaporation, Distillation, Vacuum oven, Centrifugal concentration

KNF

- Flow rate up to 2.04 m³/h/Ultimate vacuum 10 mbar abs.
- Integrated KNF self-drying system ensures that condensate is quickly removed from the pump heads without the vacuum being altered. This significantly reduces process time and preserves the pump heads.
- Chemically resistant and thus ideal for use with extremely aggressive/corrosive gases and vapors

#### Specifications

#### N 820 // N 840

Operating pressure:	1 bar
Flow rate:	2.04 m³/h
Ultimate vacuum:	10 mbar
Connectors for tube:	ID10 mm
Permissible ambient temperature:	5 to 40 °C
Pump head:	PTFE
Diaphragm:	PTFE-coated
Valves:	FFPM
Weight:	9.6 kg // 12.9 kg

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	Width mm	Length mm	Height mm	PK	Cat. No.
N 820.3 FT.40.18	20	10	177	312	220	1	9.880 615
N 840.3 FT.40.18	34	10	189	341	239	1	9.880 616

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4.672 375

2





### 1 Diaphragm Vacuum Pump N 920 G

- Application: Degassing, Gel drying, Rotary evaporation, Distillation, Centrifugal concentration
- Flow rate 1.26 m<sup>3</sup>/h/Ultimate vacuum 2 mbar abs.
- High suction speed, particularly in the low vacuum range
- Integrated rotational speed control enables pumping capacity to be easily adapted manually to process requirements
- PPS pump head combined with PTFE-coated diaphragm are ideal for aggressive/corrosive gases and vapors
- Integrated gas ballast valve

KNF

Tip: When combined with the VC 900 vacuum control unit and the connection cable, the rotational speed is controlled in accordance with the requirements of the process.

#### Specifications

Operating pressure:	0.5 bar
Connectors for tube:	ID10 mm
Permissible media and ambient temperature:	5 to 40 °C
	10 to 40 °C
Pump head:	PPS
Diaphragm:	PTFE-coated
Valves:	FFPM
Weight:	8.5 kg

Type	Flow rate l / min.	Ultimate vacuum mbar (abs).	Width mm	Length mm	Height mm	PK	Cat. No.
N 920 G	21	2	158	324	226	1	6.287 429

### 2 Diaphragm Vacuum Pump N 860.3 FT.40.18

- Application: Rotary evaporation, Distillation, Vacuum oven, Centrifugal concentration
- Flow rate 3.6 m<sup>3</sup>/h/Ultimate vacuum 4 mbar abs.
- Integrated KNF self-drying system ensures that condensate is quickly removed from the pump heads without the vacuum being altered. This significantly reduces process time and preserves the pump heads.
- Chemically resistant and thus ideal for use with extremely aggressive/corrosive gases and vapors

KNF

#### Specifications

Operating pressure:	1 bar
Connectors for tube:	ID12 mm
Permissible media and ambient temperature:	5 to 40 °C
Pump head:	PTFE
Diaphragm:	PTFE-coated
Valves:	FFPM
Weight:	14.8 kg

Flow rate l / min.	Ultimate vacuum mbar (abs).	Width mm	Length mm	Height mm	PK	Cat. No.
60	4	291	331	278	1	7.608 467

1



2



### Vacuum Pumps Rotavac Vario

Suitable for Rotary evaporators Hei-VAP series. Controllable vacuum pumps for digital regulation of the vacuum via operation panel or directly at the unit.

Heidolph

- High distillation rates and reduced process time by 30 %.
- Solvent recovery up to 99 %.
- Pump stops automatically as soon as the set vacuum is reached and reliably holds the vacuum constant
- Increased diaphragm performance life due to periods of non-operation
- Low energy consumption
- Significant noise and vibration reduction
- The pumps can be combined with a condenser

#### 1 Vacuum Pumps Rotavac Vario Control

- 3-stage diaphragm pump
- High suction capacity for fastest evacuation
- Even if the gas ballast valve is open an excellent ultimate vacuum is reached when working with easily condensable vapors. This makes distilling high boiling point solvents such as DMF or DMSO possible at low bath temperatures

Heidolph

**Specifications**

Suction capacity:	1.7 m <sup>3</sup> /h
Ultimate vacuum:	2 mbar
Power input:	160 W
Dimensions (W x D x H):	167 x 236 x 196 mm
Weight:	5.4 kg

Type	PK	Cat. No.
Rotavac Vario Control for Hei-VAP	1	9.812 477



#### 2 Vacuum Pumps Rotavac Vario Tec

- 2-stage diaphragm pump
- Recommended for solvents with low or medium boiling points

Heidolph

**Specifications**

Suction capacity:	1 m <sup>3</sup> /h
Ultimate vacuum:	12 mbar
Power input:	160 W
Dimensions (W x D x H):	156 x 236 x 196 mm
Weight:	4.3 kg

Type	PK	Cat. No.
Rotavac Vario Tec for Hei-VAP	1	9.812 478



#### 3 Vacuum Pumps Rotavac Vario Pump Unit

Suitable for Hei-VAP Core. Fully controllable stand-alone pumping unit including vacuum controller

Heidolph

- 3-stage diaphragm pump is made from chemical-resistant material
- High suction capacity for fast evacuation
- Precise vacuum control avoids bumping and eliminates foaming of your evaporation solution
- Automatic vacuum supply to the process parameters
- The pump unit can be combined with a condenser

**Specifications**

Suction capacity:	1.7 m <sup>3</sup> /h
Ultimate vacuum:	5 mbar
Power input:	160 W
Dimensions (W x D x H):	193 x 263 x 299 mm
Weight:	6 kg

Type	PK	Cat. No.
Rotavac Vario stand-alone pumping	1	9.812 365



**1**


4.658 071

### Speed vacuum systems SC 920 G, SC 950, SCC 950

- Application: Vacuum oven
- Flow rate up to 3 m<sup>3</sup>/h/Ultimate vacuum 2 mbar abs.
- Integrated KNF self-drying system ensures that condensate is quickly removed from the pump heads without the vacuum being altered. This significantly reduces process time and preserves the pump heads.
- Chemically resistant and thus ideal for use with extremely aggressive/corrosive gases and vapors

KNF

SC 920G: Vacuum system for one rotary evaporator.

SC 950: Vacuum system for one rotary evaporator, with higher flow rate

SCC 950: Vacuum system for 2 rotary evaporators. Equipped with 2 controllers for different vacuum requirements.

**2**


6.266 708

### Specifications

Connectors for tube:

SC 920 G:

SC 950:

Permissible media and ambient temperature:

Pump head:

Diaphragm:

Valves:

pneumatic ID10 mm, coolants ID8 mm

inert gas ID6 mm

inert gas ID4 mm

5 to 40 °C

PPS

PTFE-coated

FFPM

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	Width mm	Length mm	Height mm	PK	Cat. No.
SC 920 G	20	2	366	294	423	1	<b>4.658 071 1</b>
SC 950	50	2	246	313	487	1	<b>6.266 708 2</b>
SCC 950	50	2	353	376	487	1	<b>6.287 426</b>

With overload protection and mains fuse

**3**


4.662 294

### Chemistry Pumping Units VARIO® select

**NEW**

VACUUBRAND

The combination of speed controlled VARIO® chemistry diaphragm pumps and the new VACUU-SELECT vacuum controller makes the VARIO® select chemistry pumps the ideal solution for chemical processes that require precise vacuum, such as rotary evaporation, vacuum drying or vacuum concentration.

- High chemical resistance and therefore ideally suited for pumping aggressive gases and vapours.
- Short process times and smooth running due to optimal setting of the pressure via the VACUU-SELECT controller.
- The VARIO® technology controls the vacuum precisely and efficiently via motor speed.
- Power consumption, maintenance and noise are exceptionally low.
- The outlet catchpot and solvent condenser combine to prevent solvent vapor emissions into the lab, allowing for nearly full recovery of solvents.

Type	Flow rate (50/60 Hz) L / min.	Ultimate vacuum without / with gas ballast mbar	Dimensions (W x D x H) mm	Plug type	Weight kg	PK	Cat. No.
PC 3001 VARIO® select	33.3	2 / 4	306 x 303 x 400	CEE	8.2	1	<b>4.662 294 3</b>
PC 3001 VARIO® select	33.3	2 / 4	306 x 303 x 400	UK	8.2	1	<b>6.274 832</b>
PC 3002 VARIO® select	46.67	7 / 12	419 x 243 x 457	CEE	17.9	1	<b>7.649 323</b>
PC 3002 VARIO® select	46.67	7 / 12	419 x 243 x 457	UK	17.9	1	<b>4.670 478</b>
PC 3003 VARIO® select	46.67	0.6 / 1.5	419 x 243 x 457	CEE	21.1	1	<b>6.311 665</b>
PC 3003 VARIO® select	46.67	0.6 / 1.5	419 x 243 x 457	UK	21.1	1	<b>4.670 558</b>
PC 3004 VARIO® select	76.67	1.5 / 3	419 x 243 x 457	CEE	21.1	1	<b>4.667 856</b>
PC 3004 VARIO® select	76.67	1.5 / 3	419 x 243 x 457	UK	21.1	1	<b>4.670 543</b>
PC 3010 VARIO® select	193.33	0.6 / 1.5	616 x 387 x 450	CEE	27.0	1	<b>4.672 099</b>
PC 3012 VARIO® select	215	1.5 / 3	616 x 387 x 450	CEE	27.0	1	<b>4.672 100</b>
PC 3016 VARIO® select	321.67	70 / 100	616 x 387 x 450	CEE	27.0	1	<b>4.672 098</b>

Country-specific power cord versions available on request.

## 9. Vacuum technology, Drying, Dry storage

### Diaphragm pumps/Pump units-speed controlled-Pump units-valve controlled

#### 1 Chemistry Pumping Unit PC 3001 VARIO® select with condenser Peltronic®

The PC 3001 VARIO® select pumping unit precisely controls the vacuum level in order to achieve unparalleled process control. VACUUBRAND  
 This pump is suitable for even high boiling point solvents. The integrated VACUU-SELECT controller provides an easy-to-use, application based interface that covers all common lab applications. The pump's variable motor speed responds to demand, reducing energy waste and mechanical wear, ensuring unrivalled service life for the diaphragms.

- For solvent evaporation, the controller detects solvent boiling and automatically adjusts the pump's motor speed to maintain process control
- User-defined applications with simple drag-and-drop editing.
- Small footprint and low weight for flexible use in the laboratory
- The inlet separator, made of glass with a robust protective coating, prevents particles and liquid droplets from entering the pump
- The included emission condenser Peltronic® works without any cooling media like water or dry ice.

**Scope of supply:** Chemistry pumping unit PC 3001 VARIO® select completely mounted with condenser Peltronic®, ready for use, with manual.

**Without mains cable, please order separately.**

**Specifications**

Cooling power at 21 °C:	50 W
Ambient temperature range:	10 ... 40 °C
Preset cooling temperature:	10 °C
Materials in contact with media:	PP, PFA, ETFE/ECTFE, borosilicate glass
Power supply:	100 ... 230 V, 50/60 Hz
Dimensions (W x D x H):	175 x 179 x 392 mm

Description	Flow rate (50/60 Hz) L / min.	Ultimate vacuum mbar	Weight kg	Dimensions (W x D x H) mm	PK	Cat. No.
PC 3001 VARIO® select EKP	33.33	2	11.8	300 x 370 x 400	1	4.669 248

#### 2 Vacuum system LABOPORT®

- Application: Rotary evaporation, Distillation KNF
- Flow rate up to 2.04 m³/h/Ultimate vacuum 8 mbar abs.
- Vacuum system comprising chemically resistant diaphragm vacuum pump, base plate, condenser, separator and vacuum control unit
- PTFE pump head combined with PTFE-coated diaphragm are ideal for extremely aggressive/corrosive gases and vapors

**Specifications**

Operating pressure:	1 bar
Connectors for tube:	pneumatic ID10 mm, coolants ID8 mm
Permissible ambient temperature:	5 to 40 °C
Pump head:	PTFE
Diaphragm:	PTFE-coated
Valves:	FFPM

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	Pump Model	PK	Cat. No.
LABOPORT® SC 820	20	8	N 820.3 FT.18	1	9.880 627
LABOPORT® SC 840	34	8	N 840.3 FT.18	1	9.880 632



### Vacuum Pumps Rotavac Valve

Suitable for all Hei-VAP Rotary evaporators.  
 Vacuum can be controlled manually or via valve operated vacuum controllers.

Heidolph

- With two-stage diaphragm pump
- All components which come in contact with media are built from chemically resistant fluoropolymer
- The durable PTFE design guarantees an superior diaphragm lifespan
- The head cover and clamping disc have a stable core made of metal which offers unsurpassed long-term performance of your operational parameters
- The direct pump drive (without belt) is exceptionally quiet, creates a very low vibrational environment and reduces the need of wear and tear parts to a minimum
- The gas ballast valve has been optimized to prevent media condensing in the pump
- The pumps can be combined with a condenser
- For combination with the Hei-VAP Precision Rotary evaporators a vacuum valve is necessary.

1



### 1 Vacuum Pumps Rotavac Valve Control

- High suction capacity for fast evacuation
- Suction capacity for up to 3 rotary evaporators at the same time
- Depending on your application you can switch on and off the vacuum pump via switchbox

Heidolph

#### Specifications

Suction capacity:	2 m <sup>3</sup> /h
Ultimate vacuum:	7 mbar
Power input:	180 W
Dimensions (W x D x H):	195 x 245 x 310 mm
Weight:	12.8 kg

Type	PK	Cat. No.
Rotavac Valve Control	1	9.812 385

2



### 2 Vacuum Pumps Rotavac Valve Tec

Recommended for solvents with low or medium boiling points.

Heidolph

#### Specifications

Suction capacity:	0.75 m <sup>3</sup> /h
Ultimate vacuum:	12 mbar
Power input:	80 W
Dimensions (W x D x H):	145 x 315 x 169 mm
Weight:	6 kg

Type	PK	Cat. No.
Rotavac Valve Tec for Hei-VAP	1	6.231 964

3



### 3 Valve-regulated vacuum pump Rotavac 20

Includes secondary condenser and air intake separation vessel. This vacuum system can be applied in many different fields in order to evacuate, evaporate and pump out gases and vapors. Thanks to the emission condenser it is possible to achieve a chemical recovery of almost 100 %.

Heidolph

- Excellent compatibility with chemicals and condensate
- Excellent ultimate vacuum
- Very quiet and very low Vibration
- Very high suction capacity of 50 l/min

#### Specifications

Suction capacity:	3 m <sup>3</sup> /h
Ultimate vacuum:	2 mbar
Power input:	250 W
Dimensions (W x D x H):	350 x 275 x 495 mm
Weight:	19.9 kg

Type	PK	Cat. No.
Rotavac 20	1	6.257 926

### Chemistry Pump Units and Vacuum Systems

Compact design, ready to use, no set-up required. Constructed in chemically resistant materials. Quiet operation.

VACUUBRAND

- 100 % oil-free pumping of gases
- gas ballast as standard for working with condensable vapours
- good vacuum even with gas ballast
- high vapour tolerance for water and solvents
- long service life, low maintenance

#### Features:

**2AK:** Inlet and outlet separator

**AK + EK:** Inlet separator, exhaust vapour condenser

**PC 510 select (two-stage)/610 select (three-stage) :** with AK + EK; 1 electronically controlled vacuum port

**PC 511 select (two-stage)/611 select (three-stage) :** with AK + EK; 1 electronically controlled and 1 manually controlled vacuum port

**PC 520 select (two-stage)/620 select (three-stage) :** with AK + EK; 2 electronically controlled vacuum ports

#### Characteristics and applications:

##### Without vacuum control:

**MZ 2C NT +2AK:** e.g. filtration, distillation without condensation at the outlet

**MZ 2C NT +AK+EK:** Well-proven unit for a wide range of applications for the single-user, e.g. gel drying, distillation, vacuum concentrator. For solvents with medium to low volatility.

**MD 1C +AK+EK:** Space-saving single-user configuration. For high-boiling-point solvents.

**MD 4C NT + AK+EK:** Larger or multi-user applications, the local vacuum network VACUU-LAN®.

For high-boiling solvents.

**MV 10C NT +EK:** Four-stage diaphragm pump with exhaust vapour condenser. For particularly high demands regarding low ultimate vacuum and pumping speed in chemistry laboratories, pilot plant or small production units.

##### With vacuum controller:

**PC 510 select/511 select:** Well-proven units for a wide range of processes in chemistry laboratories, e.g. all common solvents. PC 511 select with additional manually controlled vacuum port.

**PC 610 select/611 select:** Proven solution for supporting electronically controlled evaporation or drying processes even with many high boiling point solvents. PC 611 select with additional manually controlled vacuum port.

**PC 520 select/620 select:** Compact solution for simultaneous operation of two electronically controlled vacuum applications with one single pump.

1



9.880 921

2



4.665 353

Type	Dimensions	max. discharge flow	Ultimate vacuum without / with gas ballast	Connector	PK	Cat. No.
	(W x D x H)					
	mm					
MD 1C + AK + EK	239 x 316 x 405	1.3 / 1.5	2 / 4	CEE	1	9.880 828
MD 1C + AK + EK	239 x 316 x 405	1.3 / 1.5	2 / 4	UK	1	4.670 345
MZ 2C NT + 2AK	243 x 319 x 309	2.0 / 2.3	7 / 12	CEE	1	9.880 832
MZ 2C NT + 2AK	243 x 319 x 309	2.0 / 2.3	7 / 12	UK	1	4.670 442
MZ 2C NT + AK + EK	242 x 326 x 402	2.0 / 2.3	7 / 12	CEE	1	6.234 067
MZ 2C NT + AK + EK	242 x 319 x 309	2.0 / 2.3	7 / 12	UK	1	4.670 445
MZ 2C NT + AK + M + D	243 x 310 x 313	2.0 / 2.3	7 / 12	CEE	1	6.231 821
MZ 2C NT + AK SYNCHRO + EK	243 x 326 x 402	2.0 / 2.3	7 / 12	CEE	1	9.880 921 1
MZ 2C NT + AK SYNCHRO + EK	243 x 310 x 313	2.0 / 2.3	7 / 12	UK	1	4.670 449
PC 510 select	243 x 418 x 457	2.0 / 2.3	7 / 12	CEE	1	4.665 353 2
PC 510 select	243 x 418 x 457	2.0 / 2.3	7 / 12	UK	1	4.670 456
PC 511 select	243 x 435 x 457	2.0 / 2.3	7 / 12	CEE	1	7.983 629
PC 511 select	243 x 435 x 457	2.0 / 2.3	7 / 12	UK	1	4.670 463
PC 520 select	243 x 435 x 457	2.0 / 2.3	7 / 12	CEE	1	7.983 628
PC 520 select	243 x 435 x 457	2.0 / 2.3	7 / 12	UK	1	4.670 470
MD 4C NT + AK + EK	243 x 326 x 402	3.4 / 3.8	1.5 / 3	CEE	1	9.880 837
MD 4C NT + AK + EK	248 x 326 x 402	3.4 / 3.8	1.5 / 3	UK	1	4.670 506
PC 610 select	243 x 419 x 457	3.4 / 3.8	1.5 / 3	CEE	1	4.670 516
PC 610 select	243 x 419 x 457	3.4 / 3.8	1.5 / 3	UK	1	4.670 518
PC 611 select	243 x 435 x 457	3.4 / 3.8	1.5 / 3	CEE	1	4.670 525
PC 611 select	243 x 435 x 457	3.4 / 3.8	1.5 / 3	UK	1	4.670 527
PC 620 select	243 x 435 x 457	3.4 / 3.8	1.5 / 3	CEE	1	4.670 533
PC 620 select	243 x 435 x 457	3.4 / 3.8	1.5 / 3	UK	1	4.670 535
MD 12C NT + EK	387 x 528 x 395	12.0 / 13.3	2 / 4	CEE	1	9.880 965
MD 12C NT + AK + EK	387 x 616 x 395	12.0 / 13.3	2 / 4	CEE	1	9.880 968
MD 12C NT + AK + EK	387 x 616 x 395	12.0 / 13.3	2 / 4	UK	1	9.880 970
MV 10C NT + EK	528 x 387 x 395	9.5 / 10.7	0.9 / 1.5	CEE	1	9.880 976

Country-specific power cord versions available on request.



## Rotary vane pumps/Pumps

**1**


### 1 Rotary vane pumps

Vacuubrand rotary vane pumps encompass one and two stage pumps with throughputs from 2 to 9 m<sup>3</sup>/h.

VACUUBRAND

Typical rotary vane pump applications include, use as a backing pump for turbomolecular pumps but also serve in diverse chemical laboratory applications.

**Features and important characteristics:** high water vapour tolerance, vacuum tight pumping mechanism when switched off, high performance gas ballast mechanisms. These increase the overall performance potential of these pumps, the service life of mechanical parts, increase oil-change intervals and reduce maintenance overheads.

Type	Dimensions (W x D x H) mm	Flow rate (50/60 Hz) L / min.	Ultimate vacuum (abs.) mbar	Weight kg	Connector	PK	Cat. No.
RE 2.5	316 x 125 x 190	38.33 / 46.67	0.3	10.2	CEE	1	<b>9.880 120</b>
RE 6	370 x 142 x 207	95 / 133.33	0.1	15.4	CEE	1	<b>9.880 121</b>
RE 6	370 x 142 x 207	95 / 133.33	0.1	15.4	UK	1	<b>4.670 373</b>
RE 9	460 x 152 x 232	148.33 / 170	0.1	21.4	CEE	1	<b>9.880 101</b>
RZ 2.5	316 x 125 x 190	38.33 / 46.67	0.002	11.4	CEE	1	<b>9.880 123</b>
RZ 2.5	316 x 125 x 190	38.33 / 46.67	0.002	11.4	UK	1	<b>4.670 378</b>
RZ 6	370 x 142 x 207	95 / 133.33	0.002	16.4	CEE	1	<b>9.880 124</b>
RZ 9	460 x 152 x 232	148.33 / 170	0.002	24.2	CEE	1	<b>9.880 125</b>
RZ 9	460 x 152 x 232	148.33 / 170	0.002	24.2	UK	1	<b>4.670 384</b>

Country-specific power cord versions available on request.

### Rotary vane pump CRVpro 2/4/6/8

The Welch CRVpro pumps are high-performance two-stage vacuum pumps.

Welch Vacuum

They impress with their long service life, high reliability and low maintenance requirements.

The CRVpro series are the perfect partners for freeze dryers, vacuum concentrators, Schlenklines, glove boxes and vacuum ovens, as well as industrial applications.

- Cool running operation for less oil consumption
- Coated oil case to slow metal corrosion
- Extended oil change intervals for less maintenance costs
- Dual voltage

**Scope of supply:** Every pump is supplied complete with Directorr™ Premium vacuum pump oil, centering rings, clamping rings and motor overload protection.

**2**


### 2 Rotary vane pump CRVpro 2

**NEW**

Welch Vacuum

#### Specifications

Ultimate pressure without gas ballast partial:	3 x 10 <sup>-4</sup> mbar
Ultimate pressure without gas ballast total:	3 x 10 <sup>-3</sup> mbar
Ultimate pressure with gas ballast total:	9 x 10 <sup>-2</sup> mbar
Connection:	DN 16 KF
Motor rating 50/60 Hz:	0.29/0.3 kW
Nominal speed 50/60 Hz:	1440/1720 rpm
Dimensions (L x W x H):	384 x 138 x 211 mm
Weight:	15 kg

Type	Suction rate (50/60 Hz) L / min.	Oil capacity ml	Plug type	PK	Cat. No.
CRVpro 2	38/47	450	EU, UK	1	<b>6.313 234</b>

**3**


### 3 Rotary vane pump CRVpro 4/6/8

Welch Vacuum

#### Specifications

Ultimate pressure without gas ballast partial:	5 x 10 <sup>-4</sup> mbar
Ultimate pressure without gas ballast total:	2 x 10 <sup>-3</sup> mbar
Ultimate pressure with gas ballast total:	7 x 10 <sup>-2</sup> mbar
Connection:	DN 16 KF
Motor rating 50/60 Hz:	0.37/0.4 kW
Nominal speed 50/60 Hz:	1450/1740 rpm
Dimensions (L x W x H):	463 x 157 x 230 mm

Type	Suction rate (50/60 Hz) L / min.	Oil capacity ml	Weight kg	Plug type	PK	Cat. No.
CRVpro 4	63/77	1150	21.0	EU, UK	1	<b>6.290 993</b>
CRVpro 6	85/122	1150	22.0	EU, UK	1	<b>6.290 994</b>
CRVpro 8	122/143	1000	22.5	EU, UK	1	<b>6.290 995</b>

# 9. Vacuum technology, Drying, Dry storage

## Rotary vane pumps/Pumps-Accessories/for vacuum pumps

### 1 Rotary Vane Vacuum Pump RC 6

VACUUBRAND

The Rotary Vane Vacuum Pump RC 6 has been designed to minimise the adverse effects of condensable and corrosive vapours. Its main components are a two-stage rotary-vane pump and a two-stage chemistry diaphragm for optimised corrosion resistance. The diaphragm pump continuously evacuates the oil reservoir of the rotary-vane pump in order to keep the partial pressures of solvent vapours, oxygen and corrosive gases at a low level and/or below their condensation point. The RC 6 is a low-maintenance pump for freeze-drying and other applications requiring an ultimate vacuum in the 10<sup>-3</sup> mbar range.

**Scope of supply:** Pump, overload circuit breaker and mains cable (2 m), centering and clamping ring for inlet, particulate filter, operating instructions, oil (bottle of 500 ml).

**Specifications**

Pumping speed 50/60 Hz:	98.33/115 l/min
Ultimate vacuum (partial) without gas ballast:	0.0004 mbar
Ultimate vacuum (total) without gas ballast:	0.002 mbar
Ultimate vacuum (total) with gas ballast:	0.01 mbar
Oil capacity (B-Oil):	min. 0.34 l; max. 0.53 l
Inlet connection:	Small flange NW 16
Outlet connection:	Hose nozzle NW 8-10 mm
Motor rating:	0.37 kW
Nominal speed 50/60 Hz:	1500/1800 rpm
Dimensions (L x W x H):	510 x 305 x 230 mm
Weight:	24.2 kg
IP code:	IP 40



Type	Plug type	PK	Cat. No.
RC 6	CEE	1	9.882 235
RC 6	UK	1	4.670 386

Country-specific power cord versions available on request.

### Chemistry pumping units

VACUUBRAND

Vacuubrand chemistry vacuum systems and chemistry pumping units for fine to high vacuum ranges. Complete chemical vacuum systems and chemical pump stands offer the advantages of practical, connection-ready units.

- compact structure, little space requirement and a high degree of mobility
- the great convenience of proven pump stand configuration
- good ultimate vacuum even with gas ballast and smooth running
- high tolerance to water and solvent vapours due to efficient gas ballast

Type	Dimensions (W x D x H) mm	Flow rate (50/60 Hz) L / min.	Ultimate vacuum (abs.) mbar	Pump Model	PK	Cat. No.
PC 3 with RZ 2.5	342 x 448 x 608	38.33 / 46.67	0.002	RZ 2.5	1	9.881 368
PC 3 with RZ 6	370 x 448 x 608	95 / 113.33	0.002	RZ 6	1	9.881 369 2
PC 3 with RZ 9	460 x 486 x 608	148.33 / 170	0.002	RZ 9	1	9.881 370



9.881 369

### 3 Chemistry pump device GP3

**NEW**  
KGW

The mobile chemistry pump stand has a cold trap and a pump fork with a separate aeration cell. The pump fork has four independently switched vacuum valves and additionally four independently switched aeration valves. So can every sample holder get individually evacuated or aerated without affecting the vacuum of the other sample holders. You can also connect an electronic vacuum gauge. The vacuum pump is not included in the delivery.

- Small flange KF-NW 16 with vacuum manometer
- GL18 glass screw thread
- 10 mm PTFE-olive
- PE-table plate
- Aluminum-rack
- Four lockable guide rolls

**Specifications**

Capacity with cold trap:	2000 ml
Condensate capacity of cold trap:	max. 250 ml

Type	PK	Cat. No.
Chemistry pump device GP3	1	6.311 927



Vacuum tubing - please see page 146.

**1**


### 1 Condensation traps, borosilicate 3.3, two-piece

Borosilicate 3.3 glass, comprising bottle with ground glass cone neck fitting a separate inlet/outlet head with choice of tubing or ground joint connections.

Capacity	Cone	Socket	Connection	PK	Cat. No.
ml	NS	NS			
100	29	29	Tubing connections	1	9.305 350
250	45	45	Tubing connections	1	9.305 351
100	29	29	Cone / socket NS 29	1	9.305 352
250	45	45	Cone / socket NS 29	1	9.305 353

**2**


### 2 Cold traps, borosilicate 3.3, one-piece

Borosilicate 3.3 glass, one-piece, with GL 45 neck and cap closure, GL 14 threaded side connections with caps and plastic tubing adapters.

Capacity	PK	Cat. No.
ml		
250	1	9.305 349

### Cold traps with Dewar flask, borosilicate glass 3.3

Cold traps with Dewar flasks are made from 3.3 DIN/ISO 3585 borosilicate glass to hold LN<sub>2</sub> for vacuum applications. The flasks are vacuum insulated and silver-plated. They are encased in metal sheet, blue coated for protection and have a plastic ring collar, into which the cold trap is inserted. Thus no additional support is needed for the cold trap.

KGW

The Dewar flask has got a theoretical coolant capacity of 1.0 L or 2.0 L respectively.

The cold trap has got a theoretical condensate capacity of 150 ml or 250 ml respectively.

**Items supplied:** Cold trap, Dewar-flask, plastic ring.

Dewar type 12C/18C: see no. 9.032.024/9.032.030

Versions Cold trap joints:

S29 = spherical joints

GL18 = glass screwthead with PTFE olive 10 mm

O 29 = spherical joints S29 with O-ring seal

The standard assembly is designed for use with LN<sub>2</sub> as coolant. When using CO<sub>2</sub> and acetone please order CO<sub>2</sub> grid separately (Dewar Type 12 C Cat. No. 9.032 081 and Dewar Type 18 C Cat. No. 9.032 082).

Type	Condensate capacity	Coolant capacity	Dewar	Cold trap	PK	Cat. No.
	ml	ml	type	joints		
KF 29-K	150	1000	12 C	S 29	1	9.032 065 <b>3</b>
KF 29-OK	150	1000	12 C	O 29	1	9.032 066 <b>5</b>
KF 29-GL	150	1000	12 C	GL 18	1	9.032 067 <b>4</b>
KFL 29-K	250	2000	18 C	S 29	1	9.032 068
KFL 29-OK	250	2000	18 C	O 29	1	9.032 069
KFL 29-GL	250	2000	18 C	GL 18	1	9.032 070
KF 29-K-A	150	1000	12 C	S 29	1	9.032 071
KF 29-OK-A	150	1000	12 C	O 29	1	9.032 072
KF 29-GL-A	150	1000	12 C	GL 18	1	9.032 073 <b>6</b>
KFL 29-K-A	250	2000	18 C	S 29	1	9.032 074
KFL 29-OK-A	250	2000	18 C	O 29	1	9.032 075
KFL 29-GL-A	250	2000	18 C	GL 18	1	9.032 076



9.032 065



9.032 067



9.032 066



9.032 073

➔ Dewar vessels please see page 770.

### 1 Woulff bottles, DURAN®



DIN 12480. With 3 NS standard ground joints. Without base tubulature.  
Vacuum resistant. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.

Capacity	Diam.	Neck	PK	Cat. No.
L	mm	NS		
0.5	87	19/26	1	9.305 319
1.0	113	24/29	1	9.305 324
2.0	135	29/32	1	9.305 329
5.0	185	34/35	1	9.305 336

DWK Life Sciences



### 2 Woulff bottles, DURAN®

Erlenmeyer pattern (5000 ml is bottle-shaped), with reinforced walls, for work under vacuum and plastic coating to act as a splinter and implosion protection. A glass insert is fitted with removable PP tubing connections, vent valve head and analogue pressure gauge with 2 scale ranges (1000 to 0 mbar, 760 mm to 0 mm Hg).

Form	Capacity ml	Diam. mm	PK	Cat. No.
Erlenmeyer pattern	500	110	1	9.305 340
Erlenmeyer pattern	1000	140	1	9.305 341
Erlenmeyer pattern	2000	170	1	9.305 342
bottle-shaped	5000	185	1	9.305 343
bottle-shaped	10000	240	1	9.305 344
bottle-shaped	15000	255	1	9.305 345
bottle-shaped	20000	290	1	9.305 346



**1**


### 1 LLG-Vacuum measuring instrument DVR 2 pro

Versatile vacuum gauge for vacuum measurement between atmospheric pressure and 1 mbar. With integral, alumina ceramic, pressure transducer providing excellent corrosion resistance and long-term stability.

- Mains independent due to battery operation
- Large display
- High measuring accuracy
- Optimal menu navigation
- With support rod
- All parts in contact with media are made of chemically resistant materials

DKD initial delivery calibration (Cat. No. 7.059 540) please order separately.

**Scope of supply:** Vacuum measuring instrument with connections for small flange D16, compression fitting and tubing nozzle for tubing with 6 to 10 mm ID.

#### Specifications

Measuring range:	1080 to 1 mbar (hPa), 810 to 1 Torr
Measurement principle:	Capacitive; gas type-independent absolute pressure measurement
Measuring accuracy:	< 1 mbar (0.75 Torr) ±1 digit
Power supply/battery:	9 V battery
Dimensions (W x D x H):	115 x 115 x 66 mm
Weight:	0.40 kg

Type	PK	Cat. No.
DVR 2 pro	1	6.263 582

**2**


6.268 865

### Vacuum measuring instrument VACUU-VIEW

The rough vacuum gauge VACUU-VIEW covers the measuring range from atmospheric pressure down to 0.1 mbar very precisely. The combined rough and fine vacuum gauge VACUU-VIEW extended works in the enhanced range from atmosphere down to 10<sup>-3</sup> mbar. The illuminated displays of both vacuum gauges enable comfortable reading.

*VACUUBRAND*

- Compact design with integrated sensors one piece equipment for direct connect at point of interest
- Chemically resistant, heavy duty vacuum sensors highly reliable at harsh laboratory conditions even in case of very aggressive chemicals
- High repeatability and long-term accuracy under all typical conditions reliable and repeatable results
- Display with menu driven handling, easy to use e.g. for unit settings
- Compatible to gauge DCP 3000 and controller CVC 3000 or VACUU-SELECT
- The product is delivered ready for use

#### VACUU-VIEW

Chemically resistant ceramic diaphragm sensor for measurement in the rough vacuum range. VACUU-VIEW provides gas-independent pressure indication with precise capacitive readout. Highest precision and chemical resistance in the range from atmosphere down to 0.1 mbar, a perfect gauge for all rough vacuum applications.

#### VACUU-VIEW extended

The heavy duty combination of ceramic diaphragm sensor and ceramic jacketed Pirani sensor ensures reliable readings in the wide range from atmosphere down to 10<sup>-3</sup> mbar. Precision and chemical resistance in an exceptionally wide range, one gauge covers all applications in the fine and rough vacuum range

**3**


6.268 864

#### Specifications

Measuring range VACUU-VIEW	1100 to 0.1 mbar(hPa)/825 to 0.075 torr
Measuring range VACUU-VIEW extended:	1100 to 0.001 mbar(hPa)/825 to 0.001 torr
Accuracy VACUU-VIEW:	±1 mbar(hPa)
Accuracy VACUU-VIEW extended:	±15 % of indicated value in the range from 0.01-5 mbar(hPa) ±3 mbar for > 5 mbar(hPa)
Vacuum connection:	KF DN 16/hose nozzle DN 6/10 mm
Dimensions (L x W x H):	103 x 62 x 50 mm
Weight:	190 g
Power supply:	100-230 V, 50/60 Hz (CEE/CH/UK/US/AUS/CN)

Type	Plug type	PK	Cat. No.
VACUU-VIEW	EU, UK, CH	1	6.268 865 <b>2</b>
VACUU-VIEW extended	EU, UK, CH	1	6.268 864 <b>3</b>



### Vacuum Controller VACUU-SELECT®

VACUUBRAND

Fully equipped vacuum controller with capacitive, gas type-independent absolute pressure measurement using an alumina-ceramic diaphragm. While the base unit Vacuum Controller VACUU-SELECT® still requires a separate vacuum control valve as an accessory, there is the fully equipped Compact controller VACUU-SELECT® as two-point vacuum regulator with chemical suction line valve. With connected vacuum valve the VACUU-SELECT® automatically detects the boiling point during solvent evaporation and switches to two-point control mode. The graphical user interface offers predefined vacuum processes for all common laboratory applications. Applications, such as desired vacuum and other parameters can also be put together and controlled individually.

- Interactive, graphic touch display for easy operation
- Touchscreen display can be operated with safety gloves
- Predefined vacuum processes for reproducible results and time savings in the laboratory
- Fully automatic evaporations at the touch of a button
- Easy-to-use application editor for creating your own processes
- Integrated help function
- Integrated ventilation valve also for inert gas
- Ethernet/USB (Type A) interface
- EX approval: II 3/- G IIC T4 X Internal Atm. Only

#### Specifications

Measuring range:	0.1 ... 1080 mbar
Accuracy:	<±1 mbar/±1 digit (after adjustment, constant temp.)
Housing:	Plastic, good chemical resistance
Connection venting valve:	Hose nozzle DN 4-5 mm
Vacuum connection (Compact controllers only):	Hose nozzle DN 6/10 mm
Ambient temperature range:	10 ... 40 °C
Dimensions (W x D x H):	152 x 127 x 41 mm
Weight:	0.745 kg
Power supply:	100 ... 230 V, 50/60 Hz
IP code/IP code front side:	IP 40/IP 42

### Compact Vacuum Controller VACUU-SELECT®

VACUUBRAND

Fully equipped two-point vacuum controller with capacitive, gas type-independent absolute pressure measurement using an alumina-ceramic diaphragm. Available as benchtop or stand version and ready to use due to standard laboratory connections.

**Scope of delivery:** Vacuum controller VACUU-SELECT® with chemistry suction line valve, check valve, integrated ceramic vacuum sensor, venting valve and power supply.



4.662 221



6.274 041

Type	Description	Dimensions (W x D x H) mm	PK	Cat. No.
Compact controller VACUU-SELECT®	Benchtop version	191 x 127 x 187	1	4.662 221 1
Compact controller VACUU-SELECT®	Stand version	152 x 127 x 189	1	6.274 041 2

### Accessories for Vacuum Controller VACUU-SELECT

VACUUBRAND

Description	PK	Cat. No.
Solenoid inline valve VV-B 6C	1	9.882 851
Cooling water valve VKW-B	1	9.882 852
Air admittance valve VBM-B	1	9.882 849
Extension cable for VACUU-BUS®, 2m	1	9.882 853
Y-adapter for VACUU-BUS®	1	6.284 162
Exhaust filter FO for R8 / 9 / 16, outlet DN 25 KF	1	6.206 298



1



### 1 Vacuum measuring instrument DCP 3000 with Pirani sensor VSP 3000

VACUUBRAND

The Pirani-type vacuum sensor VSP 3000 offers an outstanding corrosion resistance and mechanical robustness for fine vacuum measurements. It is primarily designed for applications in chemistry and process engineering.

The vacuum gauge DCP 3000 is now also available with this new Pirani sensor VSP 3000 for an increased measuring range down to the  $10^{-3}$  mbar range. Up to eight external gauge heads (four of ceramic diaphragm-type VSK 3000 and four VSP 3000) can be connected simultaneously to the DCP 3000 vacuum gauge for easy measurements at multiple points. Communication between the DCP 3000 and the external components is provided by the especially developed bus control system VACUU-BUS®. It is self-configuring, easy to use due to standardized plug connectors and allows cable extensions up to 30 m. The large illuminated display, controlled by a simple jog wheel, displays the readings from each gauge head.

#### Performance features

- brand new rugged vacuum sensor VSP 3000 made of plastics and ceramics with high chemical resistance
- wide measurement range from atmospheric pressure to fine vacuum ( $10^{-3}$  mbar) due to Pirani measurement system (thermal conductivity)
- upto 8 gauge heads VSP 3000 (Atm. to  $10^{-3}$  mbar), VSK 3000 (Atm. to 0.1 mbar) can be connected (4 of each)
- rugged, splash-water proof vacuum sensor, also for rough operating conditions
- with vacuum controller VCV 3000, VSP 3000 and vacuum solenoid valves of type VV-B vacuum control from atm. to  $10^{-3}$  mbar is achieved

#### Specifications:

Upper measuring limit mbar/hPa/torr:	$1 \times 10^3/7.5 \times 10^2$
Lower measuring limit mbar/hPa/torr:	$1 \times 10^{-3}/1 \times 10^{-3}$
Measurement principle	Thermal conductivity acc. to Pirani
Measurement uncertainty	$\pm 15\%$ of indicated value in the range 0.01-10 mbar/hPa/torr
Vacuum connection	Small flange KF DN 16 and hose nozzle DN 6/10 mm
Control connections:	1 socket for supply/Vario pump 2 expandable sockets for external sensors/valves
Rated mains voltage	100-230 V 50/60 Hz /CEE/CH/UK/US/AUS
Dimensions (desktop unit, L x W x H):	144 x 124 x 114 mm
Weight (without mains adapter):	0.44 kg

Description	PK	Cat. No.
Vacuum gauge Set DCP 3000 + VSP 3000	1	9.882 207

2



### 2 Vacuum Control Unit VC 900

KNF

- Application: Rotary evaporation, Distillation, Multi-user vacuum system
- Easy to use to control the vacuum application
- Separate control unit with pressure sensors and two-step controlled valve to be placed independently from the operating unit
- Vacuum controller can be operated with components from KNF and other producers

#### Specifications

Housing material:	Plastic
Power supply:	Power cord, cable length 150 cm
Protection class:	IP30
Mains voltage:	100-240 V
Frequency:	50/60 Hz
Operating current:	max. 1.0 A
Accuracy of measurement:	$\pm 1$ mbar
Measuring limit:	upper: 1100 mbar abs. lower: 0 mbar abs.

#### Specifications of the Control Unit

Hose connections:	for gas in ID 10 mm, PVDF/for gas out ID 10 mm, PVDF or venting ID 4 mm, nickel-plated brass
Dimensions (W x H x D):	155 x 109 x 60 mm
Permissible media and ambient temperature:	10 to 40 °C
Weight:	1.2 kg

Type	Width mm	Length mm	Height mm	PK	Cat. No.
VC 900	101	67	181	1	6.281 572

Please order the appropriate control cable for operating the N 920 G pump separately.

