




Pump Quick Selection Chart | For Common Lab Applications

APPLICATION	WELCH VACUUM PUMPS & SYSTEMS	FLOW RATE X VACUUM	UNIT PHOTO	MODEL	PAGE
Rotovap Volatiles, Low B.P. B.P. <100°C Samples 0-5 Liter 	Self Cleaning System with regulator, gauge, condensate jars	35 l/min. 9 torr (12mbar)		202501	6 - 8
	DRYFAST PTFE Pump	25 l/min. 9 torr (12mbar)		2034B-01	
Rotovap DMF, Toluene, other non-volatiles Samples 0-5 Liter 	Self Cleaning System programmable w/condensate catchpots	35 l/min. 2 torr (2.7mbar)		202701	6 - 8
	DRYFAST ULTRA PTFE Pump	35 l/min. 2 torr (2.7mbar)		2042B-01	
Concentrator DNA Pelletting SpeedVac® & CentriVap® Process Applications 	DRYFAST PTFE Pump	35 l/min. 9 torr (12mbar)		2044B-01	15
	DRYFAST ULTRA PTFE Pump	35 l/min. 2 torr (2.7mbar)		2042B-01	
	Welch High Capacity PTFE Pump	100 l/min. 6 torr (8.0mbar)		2054B-01	
Vacuum Manifold Schlenk Line 	DuoSEAL® & CHEMSTAR® Pumps	25 l/min. <1 millitorr (1.3x10 ⁻³ mbar)		1400B-01 or 1400N-01	10 - 11
	GEM® System	31 l/min. 100 millitorr (0.13mbar)		8890A-70	
Freeze Dryer 	CRVpro, Your Robust Vacuum Pump	158 l/min.		3081-01	16 - 17
	CHEMSTAR Low RPM Pump	160 l/min.		1402N-01	
	Direct drive pump with integral oil filtration system	173 l/min.		8917A-80	
Filtration 	Welch Light Chemical Duty Pump	37 l/min.		2019B-01	18 - 19
	DRYFAST - Chemical Duty Pump	35 l/min.		2014B-01	
	WOB-L - Standard Duty Pump	45 l/min.		2546B-01	
Aspiration/Automation Cell Harvester Plate Washer 	WOB-L - Standard Duty Pump	100 l/min. 27.6 in. Hg (80mbar)		2567B-50	12 - 13
	DRYFAST - Chemical Duty Pump	70 l/min. 28.5 in. Hg (47mbar)		2047B-01	
Cell Culture Aspiration 	Welch Aspiration Station With gauge, regulator, 1200 ml autoclavable trap with liquid blockade system	34 l/min. 27.2 in. Hg (93mbar)		2515B-75	12 - 13
Vacuum Oven Drying Degassing 	WOB-L - Standard Duty Pump	100 l/min.		2581B-50	22 - 23
	DRYFAST - Chemical Duty Pump	35 l/min.		2042B-01	
	Welch High Capacity PTFE Pump	100 l/min.		2054B-01	
	CRVpro Pump	160 l/min.		3061-01	
Gel Dryer 	DRYFAST - Chemical Duty Pump	35 l/min.		2014B-01	14

Model Selectors

Look for the Model Selector Charts in each Application Section for further pump selection guidance.



Model
2070/2071 Chemstar Dry



Model
CRVpro 4/6/8



Model
DuoSeal 1400/1402/1405

**Specifications &
Ordering - p. 48, 52, 54**

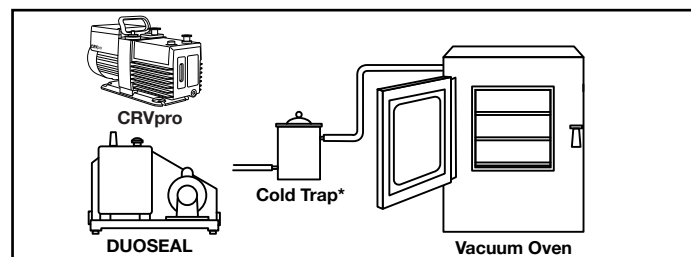
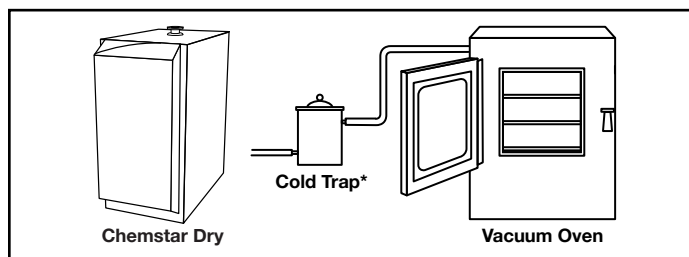
- High vacuum
- High flow
- Oil-free option available

Some applications for vacuum ovens require sample drying, bake-out, curing, etc. require ultimate vacuum pressure below 0.1 torr (0.13 mbar). In these situations, the key factor in vacuum pump selection is the ultimate vacuum level achievable by the pumps. Welch offers solutions for this high vacuum level in oil-free and oil-sealed pumping technologies. Budget requirements play a key role in deciding what type of pumping technology to select.

Models 2070, 2071 Oil-free ChemStar® Dry vacuum system integrates a proprietary vacuum blower backed with a patented PTFE diaphragm pump. Software optimizes proprietary vacuum blower/PTFE diaphragm operation to allow plug and play operation. Vacuum to 0.050 torr (0.07 mbar) depending on model. In-line cold trap is recommended when pumping chemical vapors (see pages 69).

Model CRVpro 4, 6, 8. CRVpro direct-drive rotary vane pumps are built for reliability to provide stable operation and long product lifespan with proper maintenance. The pumps are cool running due to enhanced air flow leading to pump running 10°C cooler than standard direct drive vane pumps. The lower temperature leads to reduced chemical activity within the pump and slows down rates of oil consumption. CRVpro vacuum pumps are available in several sizes to match with your vacuum oven volume. These rugged vacuum pumps can achieve an ultimate vacuum pressure 5×10^{-4} mbar (4×10^{-4} torr). In-line cold trap is recommended when pumping chemical vapors (see pages 69).

Models 1400, 1405, 1402 DuoSeal® belt-drive vacuum pumps are well-known for their durability and ruggedness. The large oil capacity of the DuoSeal pump effectively dilutes contaminants for longer maintenance intervals and pump life. Chemical reactions affecting the pump oil are lessened by low pump operating temperature, a result of slow pump rotation, reduced friction, and large oil capacity. In-line cold trap is recommended when pumping chemical vapors (see pages 69).



Model Selector | Vacuum Ovens

Oven Volume ft ³	Oil-Free Vacuum 1.5 to 3.5 torr		Oil-Seal Deep Vacuum 2×10^{-3} torr	
	Aqueous Vapours	Chemical Vapours	Single stage direct drive	Two stage direct drive
0.6 - 1.5	2561B-50	DryFast 2042	CRVpro 4	1400
2.5 - 4.5	2561B-50	DryFast 2047	CRVpro 6	1402
4.5 - 9.0	2581B-50	DryFast 2054	CRVpro 8	1402

WELCH CRVpro VACUUM PUMPS



Model
3081-01

Specifications &
Ordering - p. 53

- Lightweight, compact pump
- Ultimate 0.0004 torr (0.0005 mbar)
- Integral isolation valve

Welch direct drive vacuum pumps are high performance, but very portable with a small footprint in your lab. Ultimate vacuum to 1×10^{-4} torr, flow .3 cfm for rapid box chamber cycling.

This oil-seal pump design has an integrated isolation device to prevent oil and air contaminating your system in the event of a power failure. Pump can be ordered with an optional exhaust filter (see p. 70) to control exhaust oil mist.

OIL-FREE EVACUATION OF GLOVE BOX AND TRANSFER STATION

- High flow to shorten the purge/fill cycle
- Oil-free - no contamination, no oil changes
- Compact, lightweight, portable

WOB-L® dry piston pumps are effective for acrylic and polycarbonate glove boxes with vacuum requirements above 5 torr (6.7 mbar). The oil-free WOB-L piston vacuum pump provides continuous, reliable, high flow vacuum for your glove box. Model 2581 is suited for transfer chamber evacuation and purge/fill cycles for a glove box of up to 30 ft³ (0.84 m³). The pump is complete with vacuum adjustment, vacuum gauge to monitor vacuum level, and muffler. See application note below regarding glove box vacuum limitations.

HIGH VACUUM FOR STAINLESS STEEL / GLASS GLOVE BOXES



Model
1402

Specifications &
Ordering - p. 54

- High vacuum to 0.0001 torr
- High flow (5.6 cfm)
- Very rugged and reliable

DUOSEAL® vacuum pumps are effective for use with high purity atmosphere metal glove boxes. Use DuoSeal pumps to draw a deep vacuum when establishing glove box atmosphere and for rapid transfer chamber cycling.

The large oil capacity of the DuoSeal pump effectively dilutes contaminants for longer maintenance intervals levels and pump life. Chemical reactions affecting the pump oil are lessened by low pump operating temperature, a result of slow pump rotation and reduced friction. Use of a cold trap to minimize harmful vapor ingress is recommended.

NOTE: Optional exhaust filter catalog number 1417A is recommended for glove box applications to control exhaust oil mist (see p. 70).



Model
2581

Specifications &
Ordering - p. 46

Application Note | Glove Box

Standard glove boxes and transfer chambers are not normally evacuated much below 25 torr (29" Hg) due to plastic material limitations. Both acrylic and polycarbonate which are used in standard glove boxes are not suited for deep vacuum (1 torr operation).

High end glove boxes capable of deeper vacuum normally are constructed of stainless steel and heavy glass plates. Follow glove box manufacturer recommendations for vacuum pumping requirements.

Model Selector | Glove Box

Oil-Free Vacuum for Acrylic Glove Boxes	Oil-Seal Deep Vacuum for Metal Glove Boxes	
Aqueous Vapors	Portable Direct Drive	Durable Belt-Drive
2581B-50	CRVpro 8 CRVpro 16	1402B-01 1376B-01

Standard Duty Dry Vacuum Pumps | WOB-L Piston



**Model
2511**



**Models
2522 / 2534**



**Model
2546**



**Models
2567 / 2561**

Specifications

Vacuum/Pressure Pumps

Model	2511	2522	2534	2546	2561
Free Air Displacement cfm (l/min.)@60Hz	0.39 (11)	0.76 (22)	1.2 (34)	1.6 (45)	2.3 (65)
m ³ /hr (l/min.)@50Hz	0.55 (9.2)	1.1 (18)	1.7 (28)	2.3 (38)	3.4 (57)
Ult. Vac. Pressure, torr(mbar)	219 (292)	100 (133)	70 (93)	60 (80)	5 (6.7)
Max Pressure PSIG (pascal)	33 (3.3 x 105)	100 (106)	50 (5 x 105)	100 (106)	---
Maximum Vacuum, in. Hg	21.3	26	27.2	27.6	29.8
Motor Horsepower (watts)	1/30 (25)	1/8 (93)	1/8 (93)	1/4 (190)	1/3 (250)
Tubing Needed, I.D. in. (mm)	3/16 (5)	3/16 (5)	3/16 (5)	3/16 (5)	1/4 (7)
Intake/Exhaust Thread NPT	3/16 in. Hose	1/4	1/4	1/4	1/4
Weight lbs.(kg)	5 (2.3)	11.7 (5.3)	11.7 (5.3)	13.8 (6.3)	16.5 (7.5)
Overall Dimensions L x W x H in. (cm)	7.6x4.5x7.5 (19x11x19)	8.1x8.8x10 (21x22x25)	8.1x8.8x10 (21x22x25)	10x7.5x9 (25x19x8)	17.3x6.5x10.5 (44x17x27)
Ship Weight, lbs. (kg)	6 (2.7)	17 (7.7)	17 (7.7)	17 (7.7)	24 (10.9)
Shipping Carton Dimensions L x W x H in. (cm)	11x7x8.3 (28x18x21)	15.3x12.3x12.7 (39x31x32)	15.3x12.3x12.7 (39x31x32)	15.3x12.3x12.7 (39x31x32)	21x12x15 (53x30x38)

Ordering Information

Wired for 115V, 60Hz, 1 Ph with N. American 115V Plug	2511B-01 ³	2522B-01 ⁴	2534B-01 ⁴	2546B-01 ⁴	2561B-50
Wired for 230V, 60Hz, 1 Ph with N. American 230V Plug	---	---	2534C-01 ^{4, 7}	2546C-01 ^{4, 7}	---
Wired for 230V, 50Hz, 1 Ph2. with Cont. Euro.(Schuko) Plug	2511C-02 ³	2522C-02 ^{4, 6}	2534C-02 ^{4, 6, 7}	2546C-02 ^{4, 6, 7}	2561C-50 ^{6, 7, 8}
Wired for 100V, 50/60Hz, 1 Ph with a plug	2511C-05 ^{3, 5}	2522C-05 ^{4, 5}	---	---	---

Applications

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Vacuum/Pressure Standard Duty Dry Vacuum Pumps

- Ultimate to <5 torr (6.7 mbar)
- Lightweight, compact pump
- Inlet liquid trap with vacuum regulator

Oil-free operation for reduced maintenance. These WOB-L piston pumps have a high water vapor tolerance. Pumps come with inlet liquid trap, mounted vacuum gauge and vacuum regulator (except 2511 and 2562).

Note: Standard Duty Dry Pumps are not recommended for pumping organic, acidic or basic vapors.



**Model
2585B-50**

Standard Duty Dry Vacuum Pumps | WOB-L Piston



**Model
2562B-01**



**Models
2585 / 2581**



**Model
2511B-75**



**Model
2515B-75**

Standard Duty Vacuum Pumps				Aspiration/Filtration Systems	
2562	2567	2581	2585	2511	2515
2.3 (65)	3.5 (100)	3.5 (100)	7.1 (201)	0.39 (11)	1.2 (34)
3.4 (57)	4.9 (83)	4.9 (83)	10 (168)	0.55 (9.2)	1.7 (28)
7.5 (10)	60 (80)	5 (6.7)	60 (80)	219 (292)	70 (93)
---	---	---	---	33 (3.3 x 105)	---
29.6	27.6	29.8	27.6	21.3	27.2
1/3 (250)	1/3 (250)	1/3 (250)	1/3 (250)	1/30 (25)	1/8 (93)
3/8 (10)	1/4 (7)	1/4 (7)	1/4 (7)	3/16 (5)	3/16 (5)
1/4	1/4	3/8	3/8	3/16 in. Hose	1/4
16.5 (7.5)	16.5 (7.5)	24.5 (11.1)	24.5 (11.1)	5.7 (2.6)	13.2 (6.0)
17.0x7.5x12 (43x19x31)	15.0x10x10 (38x25x25)	17x7.5x12 (43x42x19)	17x7.5x12 (43x42x19)	11.0x8.3x10.0 (28x21x25)	14.8x8.3x10.0 (37.5x21x25.5)
24 (10.9)	24 (10.9)	32 (14.5)	32 (14.5)	11.0 (5)	14.8 (6.7)
21.5x12.5x16 (55x32x31)	21x12x15 (53x30x38)	21x12x15 (53x30x38)	21x12x15 (53x30x38)	15.3x12.3x12.7 (39x31x32)	21x12x15 (53x30x38)
2562B-01	2567B-50	2581B-50	2585B-50	2511B-75	2515B-75
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---	2567C-50 ^{6, 7, 8}	2581C-50 ^{6, 7, 8}	2585C-50 ^{6, 7, 8}	2511C-75 ^{6, 7, 8}	2515C-75 ^{6, 7}
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Notes:

1. All models are recommended for pumping vapors of aqueous solutions including buffers, but not for acidic, basic or organic vapors or gases.
2. Units supplied with CE marking.
3. Model 2511 can deliver 33 PSIG (3.3 x 10⁵ pascal).
4. Models 2522, 2534 and 2546 come with vacuum (and pressure) regulator, vacuum (and pressure) gauge, silencer and water trap. Models 2522 and 2546 can deliver 100 PSIG (10⁶ pascal). Model 2534 can deliver 50 PSIG (5 x 10⁵ pascal).
5. Comes with PSE mark.
6. Included is UK and Schuko cord sets.
7. Motor can operate at 230V, 50/60Hz, 1Ph.
8. For 230V in US, order cord 61-8707.

Aspiration / Filtration Systems

Systems collect waste into 1.2 Liter autoclaveable reservoir. Both models enable vacuum measurement and regulation. Reservoirs are protected from overflow by float valve; inlet line hydrophobic filter further protects pump. Includes 6 ft. tubing and 2 filters. See p. 10 for more information. For accessories, like pipettor system and foot switches, see page 78.



**Model
2511B-75**



**Model
2515B-75**

For a Complete System

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• Replacement Jars	79

Inlet/Exhaust Catchpot
Replacement Jars

1415B



1415C

- Glass and plastic replacement jars.

Pump Model	KIT No.	Description
2025, 2026, 2027, 2028	1415B	Replacement Jars; Glass,
2561B-50, 2567B-50, 2581B-50, 2585B-50 2561C-50, 2567C-50, 2581C-50, 2585C-50	1415D	Replacement jar polypropylene
2522, 2546, 2534	1415C	Replacement jar polypropylene

Replacement Receivers for
Aspiration Stations

1475K-20



828840

- Replacement receiver kits

Pump Model	KIT No.	Description
2511B-75, 2511C-75, 2515B-75, 2515C-75	1475K-20	Includes a 1.2 liter autoclavable receiver, 6ft. of tubing and two hydrophobic filters.
Biovac 106	828840	Replacement 5L glass receiver
Biovac 106	112523-7	Replacement 4L plastic receiver

Chemstar Dry



- One and two head diaphragm service kits
- Replacement diaphragm pump replacement kit
- Blower replacement kit

Pump Model	KIT No.	Description
2070, 2071, 2080	2047K-01	One Head Service Kit
	2047K-02	Two Head Service Kit
2070	2070K-50	Replacement diaphragm pump for CAT. No. 2070C-02
	2070K-60	Replacement diaphragm pump for CAT. No. 2070B-01, 2071B-01
2070, 2071, 2080	2700D-01	Replacement vacuum blower

Model 8917A-80 with Acid
Neutralization & Oil Filtration

- Repair kits for pump
- Replacement Element for Oil Sump

Pump Model	KIT No.	Description
8917	8917K-04	Minor repair kit for 8917
	1420E-03	Replacement element oil sump

Diaphragm Pump Model 2019



- Diaphragm service and pump head rebuild kits

Pump Model	KIT No.	Description
2019	2019K-01	One-Head diaphragm service kit
	2019K-03	Pump head and rebuild kit
	2500K-04	Service kit for feet