

Getting the Most from Your Vacuum Pump

With proper care and maintenance, you can maximize the return on your investment in vacuum technology. Use this Catalog to find everything you need for your vacuum pump.

- Operation
- Maintenance
- Repair
- Repair Services



5 Key Elements to Top Pump Performance and Long Life

1

Change oil frequently. Certified Welch® Oil protects your pump for efficient operation and long life.



8995G-11



1407K-11

Page 2

2

Protect your pump from damaging fumes and particulates. Use cold traps and in-line filters to limit contaminants that reduce vacuum efficiency and pump life.



1420H-14



1475K-21

Page 10-11

3

Changing exhaust filters periodically maximizes air flow, minimizes noise, and reduces airborne oil and particulates.



1417P-10



1412C

Page 12-13

4

Buying Certified Welch-Ilmvac Rebuild Kits provides original parts for repair - enables a return to your pump's original performance specifications.



402044-US

Page 37

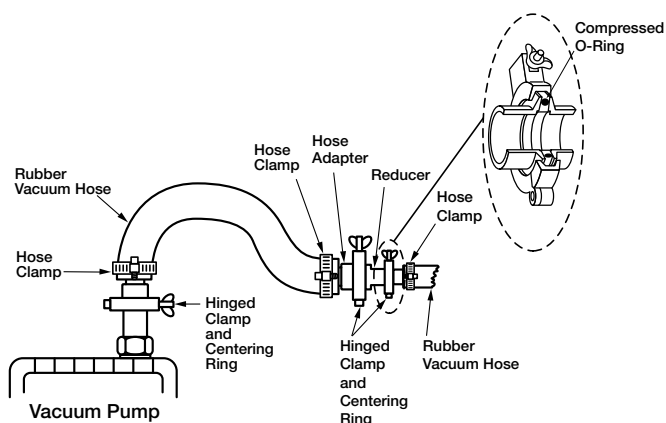
5

Economically restore your pump to top condition through Welch-Ilmvac warrantied repair service. See how our pump maintenance pays off - better performance and fewer repairs using original equipment replacement components.



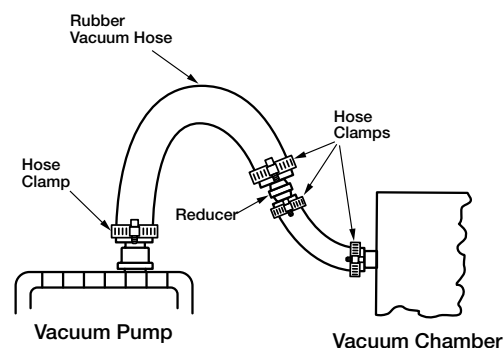
Page 14-17

Vacuum Hose & Connectors



Hose To ISO Connections

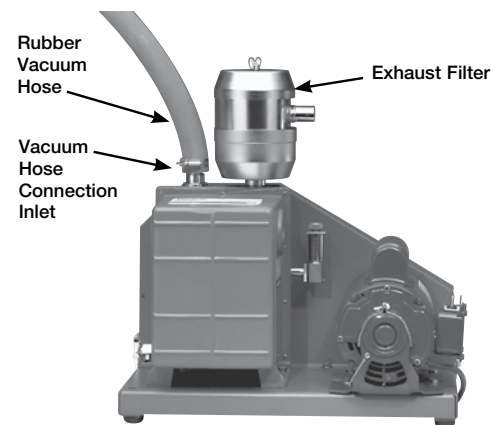
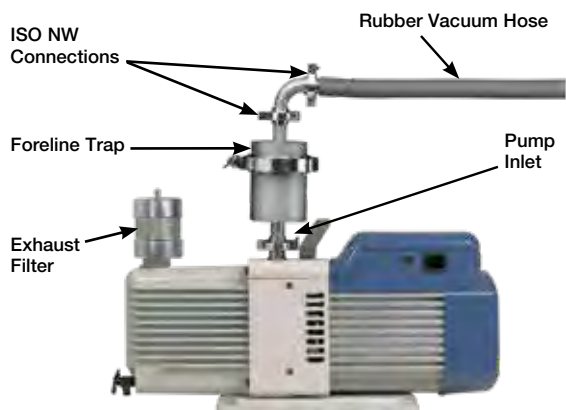
- Combines flexibility and frequent detachment ability
- Recommended for vacuum to 10^{-3} torr



Hose Nipple Connections

- Inexpensive
- Flexible
- For vacuum systems where the need for disassembly is infrequent
- Recommended for vacuum to 10^{-3} torr

Vacuum Accessories



- **Exhaust Filter** - Connects to pump's outlet. Filters oil mist from the pump's exhaust to keep your working area clean and air quality healthful. A second option is an exhaust line to a vapor hood or other outside exhaust vent. This requires an adapter and air tight connections (see p. 12).
- **Vacuum Oil** - Use of high quality vacuum oil is necessary for both vacuum performance and pump lifetime. With lesser quality oil the vacuum is degraded and pump lifetime is shortened. Welch offers three grades of vacuum oil designed especially for use in DuoSEAL and Direct-Drive vacuum pumps (see p. 3).
- **Foreline Trap** - Protects the vacuum pump from harmful substances present in the vacuum system and/or formed during the vacuum process. Can also block vacuum pump oil from back streaming into the system and contaminating samples (see p. 10 for Trap Selection chart)*. Failure to use a foreline trap, when recommended, can result in serious damage to the vacuum pump. **For trap selection advice, see your Welch-Illvac representative at www.welchvacuum.com.**

* Dry ice/Isopropanol - Liquid Nitrogen trap recommended to protect pump from condensable vapors.

Protect Your Vacuum System

Foreline traps are used to prevent harmful substances generated or resident in vacuum systems from damaging vacuum pumps and/or your work:

Pump Damage

Liquid, water, solvents, and acids can cause serious damage to a vacuum pump:

- Vapors can condense to liquids within vacuum pump as a natural result of gas compression
- Liquid can be accidentally aspirated into the pump
- Particulates can become lodged in a pump mechanism

TRAP SELECTION TABLE			
Potential Pump Contaminants	Acid Neutralization Trap ¹	Cold Traps	
		Dry Ice Slurry (-79°C)	Liquid Nitrogen (-198°C)
Water	Excellent	Excellent	Excellent
Organics	Not Recommended	Excellent	Excellent
Acidic	Not Recommended	Fair	Excellent
Oil Backstreaming ²	Not Recommended	Excellent	Excellent

Key

Excellent
Fair
Not Recommended

Notes:
 1. Limits Pressure to 10⁻²torr
 2. Prevents pump oil from contaminating Application during prolonged deep vacuum or pump shutoff.

Protect, Improve Your Vacuum Application

Oil Back Streaming

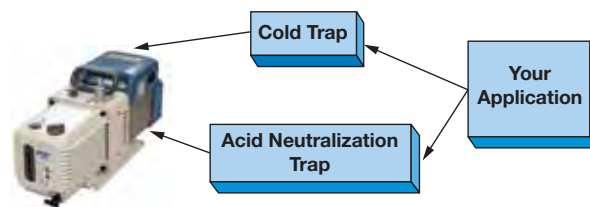
Oil molecules can migrate from an oil lubricated vacuum pump back into the vacuum system when operated at sustained vacuum levels of 1x10⁻²torr (1.33x10⁻²mbar) or deeper for long periods.

Pump Shutoff Back Migration

When a vacuum pump is shut off, contamination (oil, line substances) can back up into your work if unprotected by pump/system anti-suckback devices and traps.

Pump Efficiency

Cold traps lower vapor pressure, enabling higher vacuum with the same work from the pump.



Dry Ice / Isopropanol Trap (-79°)



- Recommended for freeze dryers, vacuum manifolds, concentrators, etc.
- Uses dry ice or liquid nitrogen as refrigerant
- Removable center make trapping surface easy to clean

DRY ICE/LIQUID NITROGEN COLD TRAP is an effective foreline cold trap for vacuum manifolds or Schlenk Lines. The trap has a large 3 quart (2.8 liters) center well for the dry ice/isopropyl alcohol slurry or liquid nitrogen; traps up to 1.5 liter condensate. With dry ice cold temperature may be maintained for up to 12 hours depending upon the vapor load. With liquid nitrogen cold temperature can be maintained for up to 2 hours depending upon the vapor load.

Tube Needed	Diam.	Height	Diameter	In/Out Offset	Trap CAT. No.
7/16"	10	8.25"	10.75"	3.5	1420H-14

Tube CAT. No. 331040-5

Acid Neutralization Trap



- ISO NW flange connection
- Calcium Hydroxide element
- Element changes from white to bluish-transparent when spent
- Configure with prior cold trap to reduce loading

ISO Size	Capacity	Trap	Replacement Element CAT. No.	Pump Connector Kit for Trap CAT. No. ¹
NW 16	To 2 cfm (57 l/min.)	1420H-21	1420E-02	302201
NW 25	To 12 cfm (340 l/min.)	1420H-20	1420E-01	302202

Note: 1. Includes hinge clamp, centering ring and elbow. Use with CHEMSTAR® vacuum pumps.

Application Note for Cold Traps

Cold traps employing a dry ice slurry or liquid nitrogen are effective as long as the refrigerant level is maintained. If the trap warms up while the pump is running, all of the trapped condensables will be ingested by the vacuum pump, contaminating the oil.

Cold traps must be cleaned out at the end of each day. If the pump is run overnight, the trapped condensables will ultimately be ingested by the pump as the trap warms up. Cleaning a Dry Ice Slurry/Liquid Nitrogen trap is easy. The steps are: 1. Turn off the pump. 2. Leak air into the trap from the application side. 3. Remove the center well and polypropylene ring to a hood. The center well can be washed off into a beaker or the condensables can be allowed to evaporate in the hood or added to the laboratory waste.

Peristaltic - Fluid Transfer Pumps

Models 3100/3200

Replacement Cartridges for Models 3100/3200

Material	Silicone	PVC
Applications	Biofluids / Food	General Lab, Viscous Fluids
Tubing I.D. (Flow Rate Range)	Tubing Cartridges (5 each) CAT. No.	Tubing Cartridges (5 each) CAT. No.
1.6mm (3-30 ml/min) - 5 pack	3432K-01	3434K-01
3.2mm (10-130 ml/min) - 5 pack	3432K-02	3434K-02
4.8mm (30-300 ml/min) - 5 pack	3432K-04	3434K-04



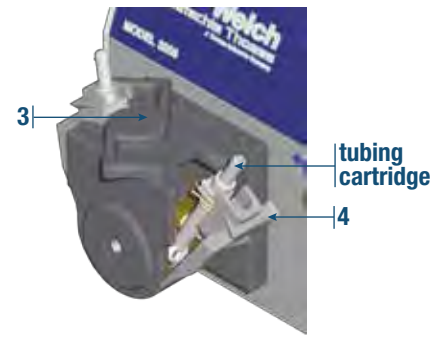
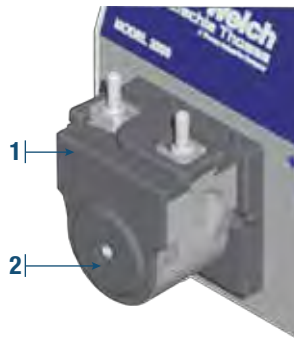
3100



3200

Service Kit CAT. No. 3200K-02 for Models 3100/3200

ID	Qty.	Description
1	1	Pump Head
2	1	Roller Carrier
3	1	Lock
4	1	Rolling Band



Index

Catalog No.	Page No.
1201E	46
1201T	46
1371A-01	19,20,24,25,26
1371A-01	26
1373K-05	36
1373K-06	36
1374	18
1374A	18
1374K-07	18
1374K-08	18
1376	19
1376B-46	36
1376K-05	19
1376K-06	19
1376K-09	26
1376K-10	26
1376K-46	36
1376K-47	36
1376N	26
1380	20
1380K-03	20
1380K-04	20
1393F	7,27
1393G	7,26,28
1393G	28
1393H	7
1393J	22,23
1393K	19,20,24,25
1393L	18,21
1393N	8
1393P	8
1393X	7,29
1397	21
1397A	21

Catalog No.	Page No.
1397B-46	36
1397K-07	21
1397K-08	21
1397K-46	36
1397K-47	36
1399	22
1399A	22
1399K-03	22
1399K-04	22
1400	23
1400A	23,27
1400K-03	23
1400K-04	23
1400K-09	27
1400K-10	27
1400N	27
1401D	19,20,24,25,26,28
1401D-01	19,20,24,25,26
1401E	22,23,27
1401E-01	22,23,27
1401F	18,21
1402	24
1402B-46	36
1402K-02	25
1402K-05	24,25
1402K-06	24
1402K-09	28
1402K-10	28
1402K-46	36
1402K-47	36
1402N	28
1405	25
1405A	19,20,24,25,26,28
1407K-11	3

Catalog No.	Page No.
1407K-15	3
1407K-20	3
1412C	13,51,52
1412D	13
1412E	13
1415B	13,42,51,52,53,54
1415C	13,51,52,53,54
1415D	13
1416B	12
1416C	12
1416C-01	12
1416D	12
1416E-01	10,12
1416E-02	10,12
1416H	12
1416H-01	12
1417	12,29
1417G	12
1417H-01	12
1417L	12,29
1417P-10	12
1417P-20	12
1417P-7	12
1417R	12
1417Y-05	12
1420H-01	11
1420H-02	11
1420H-14	10
1420H-17	11
1420H-18	11
1420H-19	11
1420H-20	10
1420H-21	10
1421	5

Catalog No.	Page No.
1421D	5
1423B	13,42
1426	45
1426K-01	45
1430A	11
1430B	11
1430C	11
1475K-01	55
1475K-02	55
1475K-03	55
1475K-04	55
1475K-05	55
1475K-06	55
1475K-07	55
1475K-08	55
1475K-09	55
1475K-10	55
1475K-20	55
1475K-21	11,55
1475K-22	11
1475K-23	11
1515	4
1515A	4
1515B	4
1520B-01	4
1520B-02	4
1520K-10	4
1520K-11	4
1525B-01	4
1525C-02	4
1525K-10	4
1525K-11	4
1801Z	46
2014	38