

DUOSEAL® Vacuum Pumps

Long Service Life Due
To Low Pump RPM

In Demanding Applications Such As:

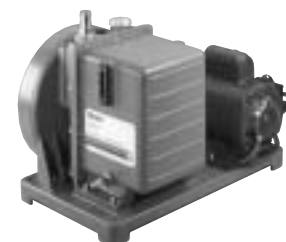
- Freeze Drying
- Refrigeration Service
- Heat Treating
- Degassing
- Vacuum Distillations
- Vacuum Drying



1399N-01



1400B-01



1405B-01/1402B-01

Specifications

TWO-STAGE VACUUM PUMPS¹

Welch Model	1400	1405	1402	1376	1397
Free Air Displacement					
CFM	0.9	3.2	5.6	10.6	17.7
L/min	25	90	160	300	500
Ult. Pressure, Torr(mbar) ¹	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)
Ult. Pressure, microns Hg	0.1	0.1	0.1	0.1	0.1
Gas Ballast	Yes	Yes	Yes	Yes	Yes
Pump RPM	580	525	525	525	400
Motor Horsepower (watts)	1/3(250)	1/2(370)	1/2(370)	1(750)	1(750)
Oil Capacity, qt. (liters)	0.62(0.59)	2.25(2.1)	2.25(2.1)	2.5(2.4)	1.25(1.2)
Tubing Needed, I.D. in.	7/16(11)	7/16(11)	13/16(21)	13/16(21)	1-5/8(41)
Intake, Nipple Thread	3/4-20	1-20	1-20	1-20	1.75-20
Exhaust, Thread Type	3/4-20	1-20	1-20	1-20	1.75-20
Weight, lbs (kg)	58(26)	112(51)	112(51)	156(71)	205(93)
Overall Dimensions					
L in. (cm)	17.8(45.1)	20(51)	20(51)	20(51)	26(66)
W in. (cm)	9(22.9)	12(30.5)	12(30.5)	14.1(35.9)	13.7(34.8)
H in. (cm)	12.6(32.1)	15(38.1)	15(38.1)	15.4(39)	18.8(47.6)
Ship Weight, lbs (kg)	70(31.8)	132(60)	132(60)	180(81.8)	213(96.8)
Shipping Carton Dimensions L x W x H in. (cm)	20.5 x 13.8 x 14.5 (52.1 x 35.1 x 36.8)	22.5 x 15.5 x 19.5 (57.2 x 39.4 x 49.5)	22.5 x 15.5 x 19.5 (57.2 x 39.4 x 49.5)	22 x 18 x 19 (55.9 x 45.7 x 48.3)	27.3 x 18 x 22 (69.3 x 45.7 x 55.9)

Ordering Information^{3,4}

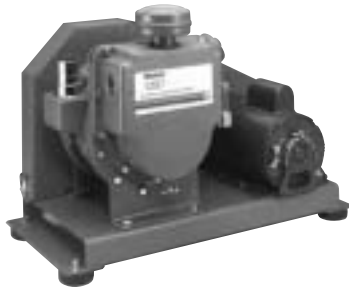
Catalog Number	1400B-01 ⁶	1405B-01 ⁶	1402B-01 ⁶	1376B-01	1397B-01
Wired for 115V, 60Hz, 1 Ph with N. American 115V Plug					
Wired for 230V, 60Hz, 1 Ph with N. American 230V Plug	1400C-01	1405C-01	1402C-01	-----	-----
Wired for 220V, 50Hz, 1 Ph w/Cont. Euro. (Schuko) Plug	1400C-02	1405C-02	1402C-02	1376C-02	1397C-02
Explosion Proof Motor, 115V, 60Hz	1400W-01 ⁵	1405W-01 ⁵	1402W-01 ⁵	-----	-----
3-Phase Motor 230V, 460V, 60Hz	-----	-----	1402M-01	1376M-01	1397M-01

Notes:

- Two-stage pumps should not be operated continuously at pressures above 10 Torr. Ultimate pressure measured with a trapped McCleod gauge.
- One-stage pumps should not be operated continuously at pressures above 50 Torr.
- All 115V and 230V single phase motors include thermal overload protection.
- Models 1400C-02, 1405C-02 and 1402C-02 provided with CE marking.



1376B-01



1397B-01/1374B-01

ONE-STAGE VACUUM PUMPS² w/o plate w/bell jar plate

1374	1399	1399N
23	1.2	1.2
650	35	35
1 x 10 ⁻⁴ (0.00013)	1.5 x 10 ⁻² (0.019)	1.5 x 10 ⁻² (0.019)
0.1	15	15
Yes	No	No
510	750	750
1-1/2(1120)	1/3(250)	1/3(250)
1.25(1.2)	0.5(0.47)	0.5(0.47)
1-5/8(41)	7/16(11)	7/16(11)
1.75-20	3/4-20	3/4-20
1.75-20	3/4-20	3/4-20
220(100)	51(23)	63(28.6)
26(66)	17(43.2)	17(43.2)
13.7(34.8)	9(22.9)	9(22.9)
18.8(47.6)	10(25.4)	10(25.4)
215(97.7)	62(28.2)	74(33.6)
27.3 x 18 x 22 (69.3 x 45.7 x 55.9)	20.5 x 13.8 x 14.5 (52.1 x 35.1 x 36.8)	20.5 x 13.8 x 14.5 (52.1 x 35.1 x 36.8)

1374B-01 ⁵	1399B-01	1399N-01
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1374C-02 ⁵	1399C-02	-----
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1374M-01	-----	-----

- Conduit wiring installation required. No cord, plug or switch provided. See page 9 for more details.
- CSA approved models are 1400B-80, 1405B-80 and 1402B-80.

Accessories and Oil

Exhaust Filter

A replaceable filter element captures oil mist from the exhaust port of the pump and reduces pump noise.

Pump Model	Cat. No.
1399, 1400	1417
1376, 1402, 1405	1417P-10
1397, 1374	1417P-20



Exhaust Oil Recycler

Use when pumping continuously above 1 Torr. Captures oil mist from the pump and returns it to the pump via a gas ballast connection.

Pump Model	Cat. No.
1400	1416H-01
1376, 1402, 1405	1416C-01



Dry Ice/Liquid Nitrogen Trap

Recommended to protect pump from condensable vapors. Use either dry ice slurry or LN2 in the 3 quart center well. Accepts 7/16" I.D. hose. See pg. 27.

Pump Model	Cat. No.
1400, 1405, 1402, 1376, 1399	1420H-14



DuoSEAL[®] Vacuum Pump Oil

Tested to high vacuum levels, this oil meets rigid requirements for vapor pressure, stability, and viscosity.

Size	Cat. No.
Quart	1407K-11
Gallon	1407K-15
5 Gallon	1407K-20
55 Gallon	1407K-25



Gold Vacuum Pump Oil

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

Size	Cat. No.
Liter	8995G-11
Gallon	8995G-15
5 Gallon	8995G-20
55 Gallon	8995G-25

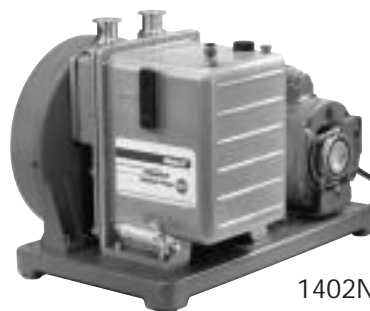


CHEMSTAR® Pumps For Corrosive Gases

CHEMSTAR Vacuum Pumps

For Pumping Corrosive Gases

- HCl • O₃ • H₂SO₄
- HBr • HOAC • SO_x
- Br₂ • F₃CCO₂H • H₂S
- Cl₂ • CH₂O • HNO₃
- SF₆, CF₄ Fragments and other gases



1402N-01

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. • Teflon® 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 package for corrosive gases

Specifications¹

Welch Model	1400N	1402N	1376N
Free Air Displacement			
CFM	0.9	5.6	10.6
L/min	25	160	300
Ultimate Pressure, Torr(mbar) ¹	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)
Gas Ballast	Yes	Yes	Yes
Pump RPM	580	525	525
Motor Horsepower (watts)	1/3(250)	1/2(370)	1(750)
Oil Capacity, qt. (liters)	0.62(0.59)	2.25(2.1)	2.5(2.37)
Tubing Needed, I.D. in.	7/16(11)	13/16(21)	13/16(21)
ISO Exhaust & Intake Flange	NW 16	NW 25	NW 25
Dimensions L x W x H in. (cm)	17.8 x 9 x 12.6 (45.2 x 22.9 x 32)	19.3 x 14.1 x 15.4 (49 x 35.3 x 39.1)	19.3 x 12.3 x 15.6 (49 x 31.2 x 39.6)
Weight, lbs (kg)	58(26)	112(51)	156(71)
Ship Weight, lbs (kg)	71(32.3)	133(60.5)	181(82.3)
Shipping Carton Dimensions L x W x H in. (cm)	20.5 x 13.8 x 14.5 (52.1 x 35.1 x 36.8)	22.5 x 15.5 x 19.5 (57.2 x 39.4 x 49.5)	22 x 18 x 19 (59.5 x 45 x 48)

Ordering Information^{2,3,5}

Catalog Number			
Wired for 115V, 60Hz, 1 Ph with N. American 115V Plug	1400N-01	1402N-01	1376N-01
Explosion Proof Motor 115V, 60Hz, 1 Ph	1400N-90 ⁴	1402N-90 ⁴	-----
Wired for 230V, 60Hz, 1 Ph with N. American Plug	-----	1402N-60	1376N-60
Wired for 220V, 50Hz, 1 Ph with Cont. Euro. (Schuko) Plug	1400N-50 ⁶	1402N-50 ⁶	1376N-49
Wired for 100V 50/60Hz, 1 Ph for Japan	1400N-53	1402N-53	1376N-53

Notes:

1. CHEMSTAR pump should not be operated continuously at pressures above 10 Torr. Ultimate pressure measured with a trapped McCleod gauge.
2. All single phase motors have overload protection.
3. Conduit wiring installation required. No cord, plug or switch provided.
4. Hinged clamp, centering ring assembly and hose adapter are included with all CHEMSTAR Pumps.
5. Standard filter option possible if the exhaust flange is removed, but not chemically resistant.
6. Units supplied with CE marking.