

**Welch®**

**OEM, Industrial & Refrigeration Catalog  
2005-2006**

**DUOSEAL® Rugged Belt-Drive Vacuum Pumps  
Catalog Pages 4, 5 & 9**

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## DUOSEAL® Vacuum Pumps

Long Service Life Due  
To Low Pump RPM

In Demanding Applications Such As:

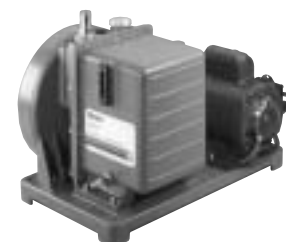
- Freeze Drying
- Refrigeration Service
- Heat Treating
- Degassing
- Vacuum Distillations
- Vacuum Drying



1399N-01



1400B-01



1405B-01/1402B-01

## Specifications

### TWO-STAGE VACUUM PUMPS<sup>1</sup>

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) <sup>1</sup>	$1 \times 10^{-4}(0.00013)$	$1 \times 10^{-4}(0.00013)$	$1 \times 10^{-4}(0.00013)$	$1 \times 10^{-4}(0.00013)$	$1 \times 10^{-4}(0.00013)$
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<sup>3,4</sup>

Catalog Number	1400B-01 <sup>6</sup>	1405B-01 <sup>6</sup>	1402B-01 <sup>6</sup>	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 <sup>5</sup>	1405W-01 <sup>5</sup>	1402W-01 <sup>5</sup>	-----	-----
3-Phase Motor 230V, 460V, 60Hz	-----	-----	1402M-01	1376M-01	1397M-01

**Notes:**

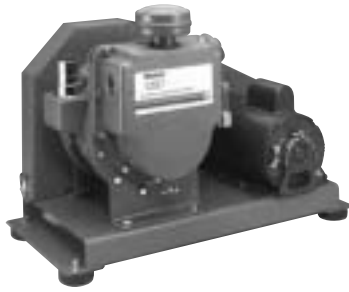
1. Two-stage pumps should not be operated continuously at pressures above 10 Torr. Ultimate pressure measured with a trapped McCleod gauge.
2. One-stage pumps should not be operated continuously at pressures above 50 Torr.

3. All 115V and 230V single phase motors include thermal overload protection.
4. Models 1400C-02, 1405C-02 and 1402C-02 provided with CE marking.

# Vacuum Pumps



1376B-01



1397B-01/1374B-01

## ONE-STAGE VACUUM PUMPS<sup>2</sup> w/o plate      w/bell jar plate

1374	1399	1399N
23	1.2	1.2
650	35	35
1 x 10 <sup>-4</sup> (0.00013)	1.5 x 10 <sup>-2</sup> (0.019)	1.5 x 10 <sup>-2</sup> (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 <sup>5</sup>	1399B-01	1399N-01
-----	-----	-----
1374C-02 <sup>5</sup>	1399C-02	-----
-----	-----	-----
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<sup>®</sup> 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



# Special Configuration Belt Drive Pumps

## Pump With Explosion Proof Motor



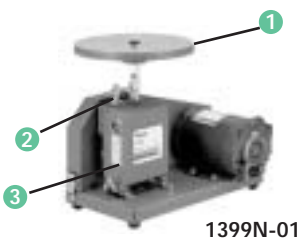
- 1 Explosion proof motor, Class I Group D, Class II Groups E,F,G\*
- 2 Conduit wiring installation required. No Cord, plug or switch provided
- 3 Large oil reservoir dilutes contaminants

\*Cat. no. 1402W-01 is Class I Group C,D, Class II Groups F,G

Cat. No.	Description <sup>1</sup>
1400W-01	25L/min, $1 \times 10^{-4}$ Torr ( $1.3 \times 10^{-4}$ mbar), 115/230V, 60Hz, 1 Ph
1405W-01	90L/min, $1 \times 10^{-4}$ Torr ( $1.3 \times 10^{-4}$ mbar), 115/230V, 60Hz, 1 Ph
1402W-01	160L/min, $1 \times 10^{-4}$ Torr ( $1.3 \times 10^{-4}$ mbar), 115/230V, 60Hz, 1 Ph

**Note:** See page 4 for more details.

## Pump With Bell Jar Plate

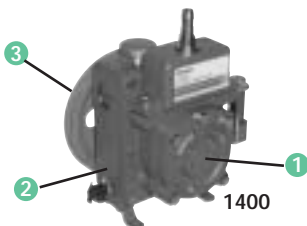


- 1 Includes bell jar plate
- 2 Delivers pressure of 15 PSIG
- 3 One stage vacuum pump

Cat. No.	Description <sup>1</sup>
1399N-01	35L/min, $1.5 \times 10^{-2}$ Torr ( $1.9 \times 10^{-2}$ mbar), 115/230V, 60Hz, 1 Ph

**Note:** See page 5 for more details.

## DUOSEAL® Pump Only

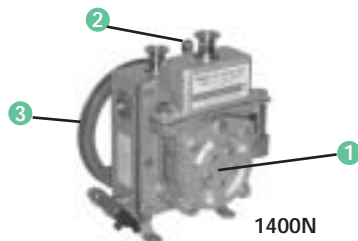


- 1 Low pump RPM for long service life
- 2 High contamination tolerance
- 3 Pump only, no motor, base or belt guard

Cat. No.	Description <sup>1</sup>
1400	25L/min, $1 \times 10^{-4}$ Torr ( $1.3 \times 10^{-4}$ mbar), pump only
1402	160L/min, $1 \times 10^{-4}$ Torr ( $1.3 \times 10^{-4}$ mbar), pump only

**Note:** See pages 4 & 5 for more details. Additional pump only, cat. nos. 1405(90L/min), 1376(300L/min), 1397(500L/min), 1374(650L/min) & 1399(35L/min).

## CHEMSTAR® Pump Only, For Corrosive Gases



- 1 Vital parts corrosion resistant
- 2 Nitrogen purge standard
- 3 Pump only, no motor, base or belt guard

Cat. No.	Description <sup>1</sup>
1400N	25L/min, $1 \times 10^{-4}$ Torr ( $1.3 \times 10^{-4}$ mbar), pump only
1402N	160L/min, $1 \times 10^{-4}$ Torr ( $1.3 \times 10^{-4}$ mbar), pump only

**Note:** See page 6 for more details. Additional pump only, cat. no. 1376N, 300L/min,  $1 \times 10^{-4}$  Torr ( $1.3 \times 10^{-4}$  mbar).