



A Gardner Denver Product

**OWNER'S MANUAL FOR
DUOSEAL® VACUUM PUMP MODELS:
1402C-46, 1402B-46 & 5Z025**



Manufactured in an
ISO 9000
Registered Environment



WARNING

Never block the Exhaust Port.

If the exhaust port is blocked, pressure will build-up in the pump with the potential of the pump body bursting and causing possible injury to personnel in the area.

Gardner Denver, Inc.
Welch Vacuum Technology
5621 W. Howard Street
Niles, IL 60714
Phone: (847) 676-8800
Fax: (847) 677-8606 Technical Support (847) 588-2366
E-Mail: gdwelchvacuum@gardnerdenver.com
Web-Page: www.welchvacuum.com

Part No. 67-2070 R1.1
Printed in USA

SAVE THESE INSTRUCTIONS

Section 5: QUICK REFERENCE CHART

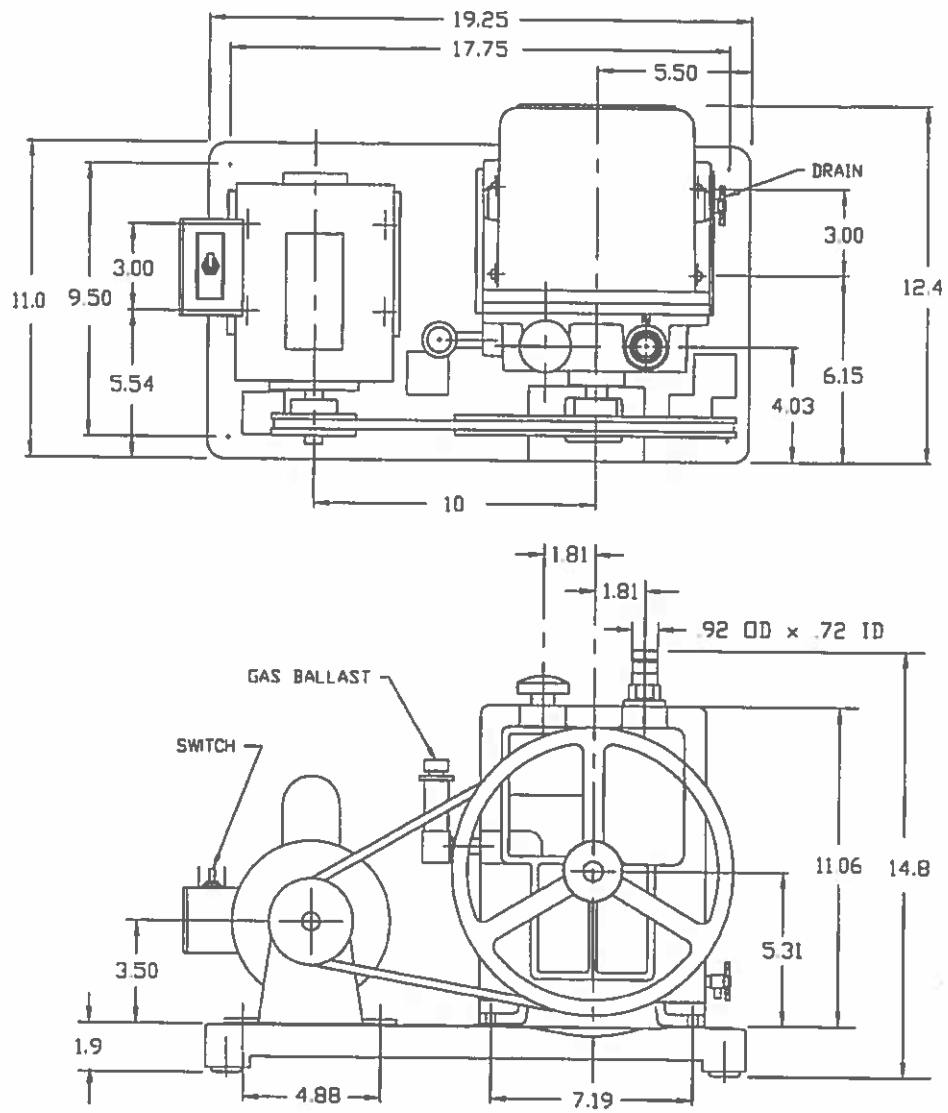
Motor Options	1402
Wired for 115V, 60Hz, 1Ph	1402B-46
Wired for 230V, 60Hz, 1Ph	N/A
Wired for 230V, 50Hz, 1Ph	1402C-46

Replacement Parts	
Shaft Seal: Lip Seal	1401D -01
Shaft Seal: Mechanical Seal	1401D
Air Filter Screen	41-0660
Intake Chamber Cover Gasket	41-0234
Oil Case Gasket	41-0403
Drain Plug	61-2278
Oil Window	61-2229A
Large Vane	41-0959
Small Vane	41-1487
Large Vane Spring	61-8930
Small Vane Spring	61-8930
Large Vane Spring Holder	41-1685
Small Vane Spring Holder	41-1685
Shaft	41-2093
Upper Exhaust Valve	41-2153
Lower Exhaust Valve	41-2154
Pressure Release Valve	41-0992
Optional Exhaust Filter	1417P-10
Optional Exhaust Filter Element	1417G
Pump Pulley	41-2074
Standard Belt	1405A
Standard Hose Barb Fitting	1393K
Standard Flange Adapter Fitting	1393G

Specifications	
Free Air Displacement, L/M (CFM)	160 (5.6)
Gas Ballast	Yes
Ultimate Pressure, Torr (mbar)	1 (1.3)x10 ⁻⁴
Rotational Pump (RPM)	525
Oil Capacity, quarts (Liters)	2.25 (2.1)
Net Wt. Unmounted Pump, lb (Kg)	82 (37)
Net Wt. Mounted Pump, lb (Kg)	112 (51)
Tubing Needed (I.D. Inches)	13/16
Standard Flange Size	NW25
Intake Thread Size	1-20
Exhaust Thread Size	1-20
Electrical Requirements 1	115V/230V
Electrical Requirements 2	60Hz
Electrical Requirements 3	1 Phase

Repair Kits	
Minor Repair Kit	1402K-46
Major Repair Kit	1402K-07
Base and Belt Guard Kit	1371A-01

Section 6: DIMENSIONAL DRAWING



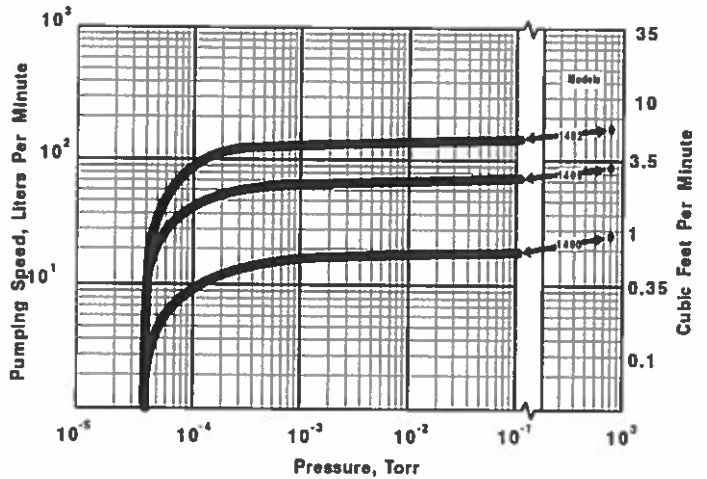
Section 7: PUMPING SPEED CURVES

HIGH EFFICIENCY PUMPING CHARACTERISTIC OF DUOSEAL® PUMPS

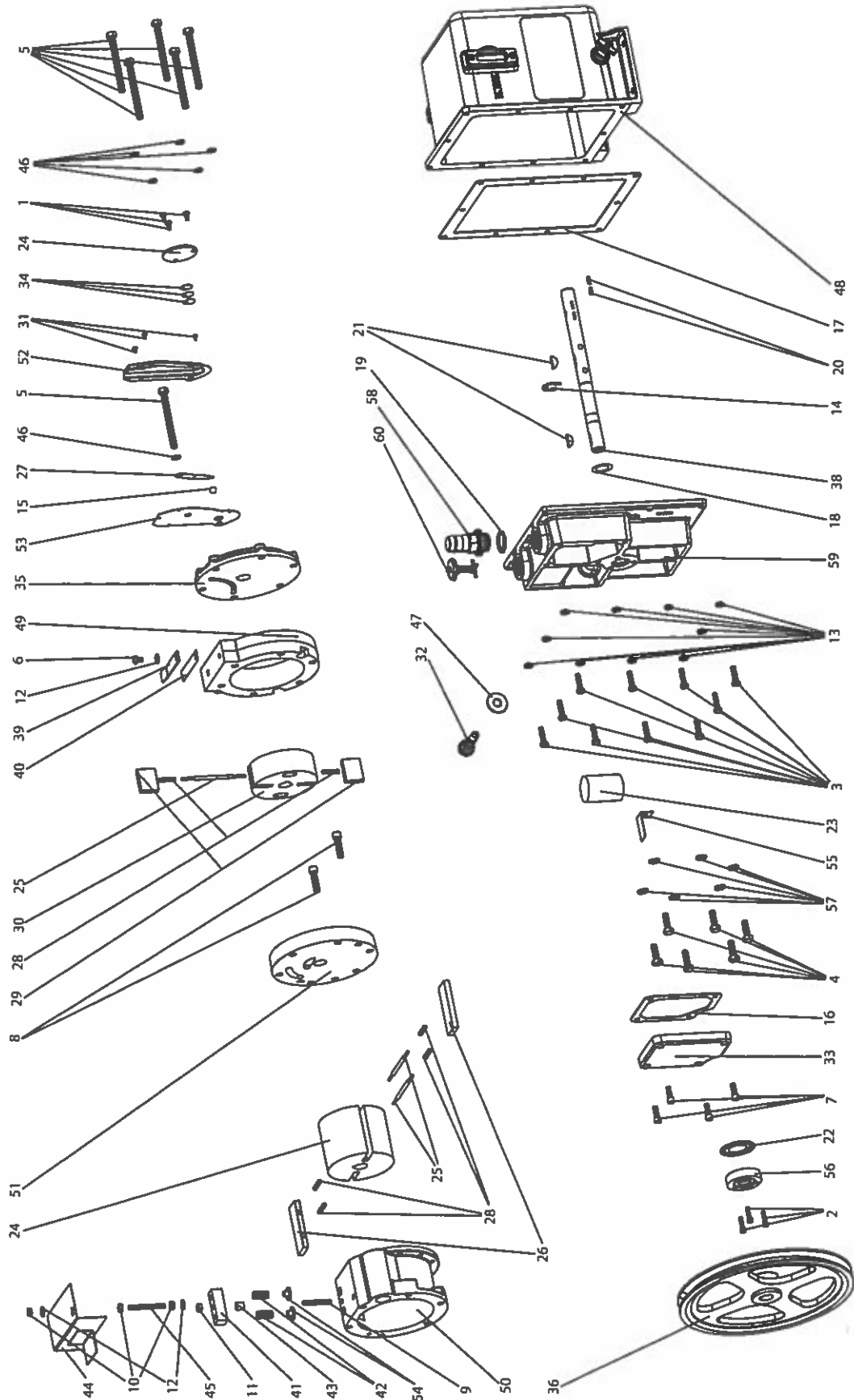
The low RPM design of DuoSeal vacuum pumps makes it possible to maintain high pumping efficiencies into the low micron range. High RPM direct drive vacuum pumps, on the other hand, experience a rapid fall off of pumping speed below 100 microns.

A comparison of the DuoSeal pumping speed curves shown below, versus high RPM pump speed curves conclusively illustrates the superior performance of the DuoSeal pump.

What does that mean for the vacuum pump user?
DuoSeal pumps provide considerable faster pumpdown time in the low micron range.



Section 8: EXPLODED VIEW



PARTS LIST

ITEM	QTY	P/N	A*	B*	DESCRIPTION	ITEM	QTY	P/N	A*	B*	DESCRIPTION
1	3	2-00-2706			SCREW PAN HD 10-32 x 3/8" LG.	31	3	62-0259			SCREW #6-1/4 SELF TAPPING
2	3	2-00-6712			SCREW SOCKET HD 10-32 x 3/4" LG.	32	1	41-1736	1	1	GAS BALLAST VALVE
3	10	2-01-0114			SCREW HEX HD 1/4"-20 X 7/8" LG.	33	1	61-8671			COVER, FINISHED
4	6	2-01-0316			SCREW HEX HD 5/16-18 x 1" LG.	34	3	41-1766	1	1	THRUST DISK
5	6	2-01-0356			SCREW HEX HD 5/16-18 x 3-1/4" LG..	35	1	41-2045			SMALL END PLATE, FINISHED
6	2	2-01-5106			SCREW SOCKET HD 1/4-20 x 3/8" LG.	36	1	41-2074			PULLEY w/ SET SCREW
7	4	2-01-6112			SCREW SOCKET HD 1/4-20 x 3/4" LG.	37	1	41-2082			ROTOR, INTAKE
8	2	2-01-6320			SCREW SOCKET HD 5/16-18 x 1-1/4"	38	1	41-2093			SHAFT
9	1	2-01-8123			SETSCREW 1/4-20 X 1-3/4" LG.	39	1	41-2153	1	1	EXHAUST VALVE, UPPER
10	3	2-31-0112			HEX NUT 1/4-20, STEEL	40	1	41-2154	1	1	EXHAUST VALVE, LOWER
11	1	2-36-8900			HEX LOCK NUT 1/4-20	41	1	61-8313A			VALVE BLOCK
12	3	2-61-0000			WASHER, STEEL 3/16	42	2	41-2156	2	2	VALVE SPRING
13	10	2-63-0163			WASHER, LOCK 1/4" MEDIUM	43	1	41-2159	1	1	VALVE BLOCK SPACER
14	1	4-06-0754	1	1	ROTOR CLIP	44	1	61-2160			BAFFLE ASSEMBLY
15	1	4-40-1200	1	1	STEEL BALL 3/8" DIA.	45	1	41-2175			SETSCREW 1/4-20 x 2.25" LG
16	1	41-0234	1	1	GASKET, INTAKE CHAMBER COVER	46	6	41-2363			WASHER 5/16 ID x 1/2 OD
17	1	41-0403	1	1	GASKET, OIL CASE	47	1	41-2757			LOCK NUT
18	1	41-0508	1	1	WASHER, THRUST	+ 48	1	61-8101			OIL CASE ASSEMBLY
19	3	61-8581	1	1	O-RING #214 NEOPRENE	49	1	61-8108D			EXHAUST RING
20	2	41-0813	2	2	WOODRUFF KEY #404	50	1	61-8113C			INTAKE RING
21	2	41-0824	2	2	WOODRUFF KEY	51	1	61-8250C			CENTER PLATE
22	1	41-0843			GASKET, SEAL	52	1	61-8309B			PRESSURE RELEASE TUBE #1
23	1	41-0660	1	1	INTAKE SCREEN	53	1	61-8310A			PRESSURE RELEASE TUBE #2
24	1	41-0672			SHAFT END PLATE	54	2	61-8314A			VALVE
25	3	61-8930	3	3	SPRING HOLDER	55	1	61-8329A			BRACKET, INTAKE SCREEN
26	2	41-0959	2		VANE, LARGE	56	1	41-2069			SHAFT SEAL ASSEMBLY
27	1	41-0992	1	1	PRESSURE RELEASE VALVE	57	6	61-8456A	6	6	WASHER 5/16, COPPER
28	6	41-1304	4	4	VANE SPRING	58	1	41-2984			HOSE ADAPTER FLARED
29	2	41-1487	2	2	VANE SMALL	59	1	61-8668			LARGE END PLATE
30	1	41-1518			EXHAUST ROTOR	60	1	61-8912			EXHAUST PLUG, LARGE
N/S		1-99-5282	1	1	SEALANT 6cc	N/S		1401D	1	1	MECHANICAL SEAL OPTION
N/S		1401D	1	1	MECHANICAL SEAL OPTION	N/S		1-99-5282	1	1	SEALANT, 6cc

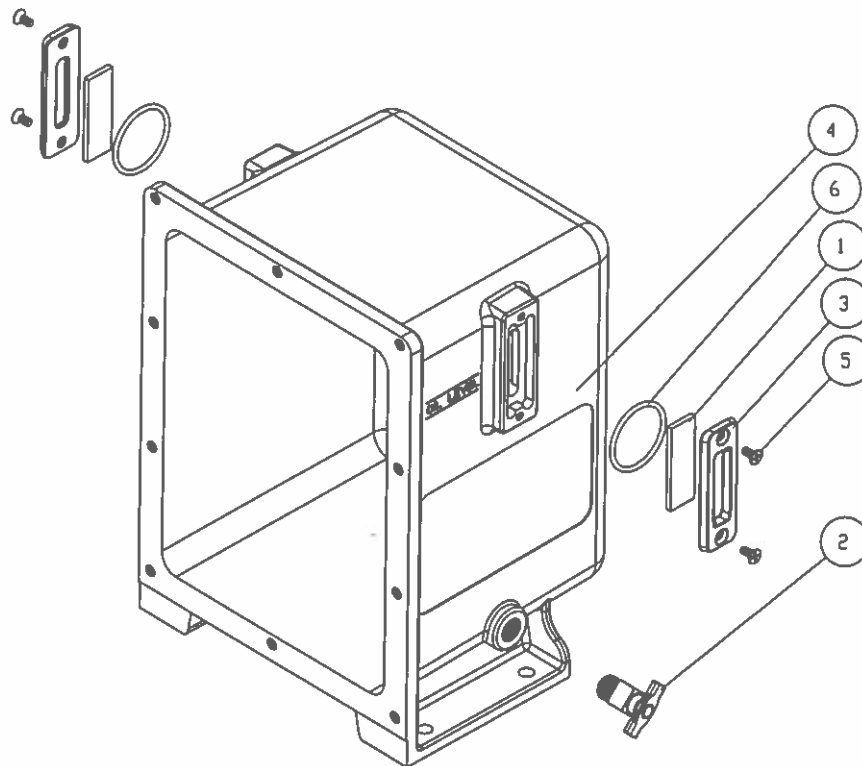
A*: Major Repair Kit Catalog # 1402K-47

B*: Minor Repair Kit Catalog # 1402K-46

**1401D is a Mechanical Seal Kit-includes Mechanical Seal, Gasket and 3 screws.

+ Item #48 exploded view shown on page 18

VIEW AND PARTS LIST FOR MODEL 61-8101



Parts List for Model 61-8101			
Item	Qty.	P/N	Description
1	2	61-2229A	Oil Window Glass
2	1	61-2278	Drain Valve
3	2	61-2370	Oil Window Cover
4	1	61-8833	Oil Case, Machined
5	4	62-1014	Screw 8-32x3/8" Flat Head
6	2	66-0304	O-ring #127 Aflas

PART #	DESCRIPTION	1402B-46	1402C-46	5Z025
41-0668	Pulley - Motor 3" OD X 5/8" Bore	X	X	X
41-2074	Pulley - Pump 10" OD X 3/4" Bore	X	X	X
1405A	V-Belt	X	X	X
41-1907A	Electric Motor	X	X	X
41-2984	Intake Connector Flare For 3/4" Flare	X	X	X
61-8803	Belt Guard Assembly	X	X	X
61-9607A	Feet - Rubber Bumper (4 Needed)	X	X	X
HANDLE GRIPS				
41-1072	Handles (2 Needed)	X	X	X
41-2725	Grip Handle (2 Needed)	X	X	X
2-31-9000	Hex Head Nut 1/2"-13 (4 Needed)	X	X	X
2-63-0700	Washer Splite 1/2" (2 Needed)	X	X	X

Section 9: ACCESSORY SECTION

Exhaust Filter

Filters oil mist from
pump exhaust

Easy Replacement

Reduces pump noise

Filters to 0.3 micron
particle size

Standard Exhaust Filter				
Use with pump model	Dimension		Catalog Number	
	Diameter	Height	Filter	Replacement Element
1392, 1399, 1400	2.5	2.5	1417	1417L
1376, 1380, 1402, 1400	5	6.25	1417P-10	1417G
1397, 1374	5	9	1417P-20	1417H-01

Directional Exhaust Filter

Large, high capacity

Screw-in type

360 Swivel outlet w/tubing connector

Directional Exhaust Filter				
Use with pump model	Dimension		Catalog Number	
	Diameter	Height	Filter	Replacement Element
1392, 1399, 1400	2.5	2.5	1417L	1417L
1376, 1380, 1402, 1400	5	6.25	1417G	1417G
1397, 1374	5	9	1417H-01	1417H-01

Exhaust Mist Eliminator

Exhaust oil recyclers capture oil mist expelled from the pump, separated air from oil, and return collected oil to the pump via a line connected to the gas ballast inlet. This process effectively reduces oil consumption and minimizes maintenance requirements by extending the time between oil changes.

Catalog Number	Use with pump model
1416H-01	1400
1416C-01	1405, 1376, 1380, 1400

Requires gas ballast connection kit: Cat. No. 141601 - for models 1400, 1405, 1376, 1380, 1402

Coaxial Traps

Reduces oil back streaming

Stainless steel construction

Easy Replacement of Element

ISO Size	Capacity	Diameter	Height	A2	Cat.No.1
NW16	to 4 CFM (140 L/min)	3.75	5.25	8.25	541001
Stainless Steel Element for ISO NW 16 Trap 1					541921
Stainless Steel Element for ISO NW 25 and NW 40 Traps1					541922

Cat. No.1. Element must be ordered with trap.

A2. Distance between ISO NW inlet and outlet connections

Dry Ice Cold Traps

Removable 3 quarter center well
for dry ice/alcohol slurry (do not
use acetone)

Visible trapping surface

Available with straight tube connections

Cold temperature up to 12 hours
depending on vapor load

ISO Size	Diameter	Height	A ¹	I/O Offset	Cat.No.	Repl.Seal Cat.No.
Straight Tube						
1/2 O.D.	10.00	8.25	10.75	3.5	1420H-14	545200

A1. Distance between ISO NW inlet and outlet connections