



Roots

412 Roots-Flo

Part Number – T3032502T



- Drop-in replacement for DuroFlow[®], Equalizer[®], and Big Jack equivalent blowers.
- Detachable steel mounting feet (feet are different for horizontal and vertical mounting)
- Ribbed cast iron casing and ridged headplates
- Piston ring seals reduce leakage through the shaft openings in the headplates.
- Lip type seals prevent lubrication from entering the air chamber.
- Machined and dynamically balanced ductile iron impellers with integral shafts
- Splash oil lubricated gears on drive and gear ends
- Carburized and ground alloy steel spur timing gears

Equivalent to:

Gardner Denver DuroFlow 4512

Tuthill M-D Equalizer DF 4512

Big Jack Model A412



816-741-0282



Quick Specs

Flow Range	to 1207 CFM
Max ΔPressure	15 PSI
Max ΔVacuum	16" Hg
Maximum RPM	4000
Minimum RPM	850
Max ΔT	275°F
Connection Size	6" Connectors
Shaft Dia.	1.4375"
Min Sheave Dia.	7.1"
Drive End Lubrication	Oil
Gear End Lubrication	Oil
Oil Sump Horiz Config	50 oz
Oil Sump Vert Config	30 oz
Bare Unit Weight	350 lbs
Container	Wood Skid
Skid Size (L x W x H)	42" x 29" x 26"
Shipping Weight on Skid	~400 lbs
Recommended to Ship Via	Truck



816-741-0282

Roots-Flo Parts Identification

Item Number	Quantity Used	Identification
1	2	Headplate
3	1	Gearbox
4	1	Gear Assembly
5	1	Drive End Cover
7	2	Gasket
8	8	O-Ring
9	1	Nameplate - Serial No.
10	As Required	Shim Set
11	1	Cylinder
12	1	Impeller & Shaft, Drive
13	1	Impeller & Shaft Driven
14	1	Roller Bearing
16	8	Pin, Dowel
17	2	Pin, End Cover
19	1	Key, Square
21	1	Plug, Vent
22	7	Plug, Pipe - Square Head
23	28	Screw - Hex Head
27	4	Seal, Headplate
28	4	Piston Ring Seal
29	4	Washer, Wavy Spring
31	2	Nut, Stop - Hex
32	10	Screw, Cap - Hex Head
33	1	Seal, Drive Shaft
34	1	Bearing Plate - Drive End
35	10	Lock Washers
37	1	Oil Level Gauge
38	4	Sleeve Piston Ring
40	1	Slinger, D.E.
46	1	Slinger, G.E.
54	2	Bearing Clamp Plate - G.E.
60	3	Screw Cap - Button Head
63	2	Lug, Lifting
66	4	Screw Cap - Hex Head
76	1	Foot, Vertical Unit
76	2	Feet, Horizontal Unit
89	3	Bearing, Deep Groove Ball
90	4	Screw - Hex Head
91	2	Washer, Flat
92	32	Washer, Flat
93	4	Washer, Lock
94	2	Gasket, Inlet/Outlet
95	Varies	Plug, Cap

Repair Kits

Repair kits are bundled with the parts you need to complete a standard repair. It is more cost effective to buy a repair kit than to purchase individual parts. However, if you need parts not listed in the kit, it is recommended that you call Pathfinder Systems for parts pricing.

P/N T30005RK Kit for ALL ROOTS-FLO®

Item	Qty	Kit Description	P/N
7	2	HEADPLATE GASKET	T20017001
8	8	O-RING	T20003002
10	1	SHIM SET	523780SS
14	1	ROLLER BEARING	T20054020
21	1	BREATHER, MINI ½"	T20013004
27	4	LIP SEAL (VITON) HEADPLATE	10460030
28	4	PISTON, RING SEAL	12283001
29	4	SPRING WAVY WASHER	10135023
31	2	HEX NUT	10319019
33	1	LIP SEAL (VITON) DRIVE SHAFT	10460034
37	1	OIL LEVEL SIGHT PLUG, ¾"	12066001
38	4	PISTON, RING SLEEVE	T30018021
89	3	BALL BEARING	T20004001

P/N 91124TSK Top Slinger Kit for ALL ROOTS-FLO

Item	Qty	Kit Description	P/N
310	2	HEX NUT	10319019
400	1	DRIVE END SLINGER	54710020
460	1	GEAR END OIL SLINGER	T20029001
600	3	CAP SCREW	12600001
910	2	BSH STL	T20031001
930	1	GEAR END WASHER	90185020

Dresser Roots highly recommends that you replace all slingers removed during disassembly.

ROOTS-FLO Blower Frame Connectors

Unit	Qty Required	Description	P/N
404	2	4" NPT LONG	T30029021
406	2	4" NPT SHORT	T30030021
409	2	4" NPT SHORT	T30031021
409	2	5" NPT SHORT	T30032021
412	2	6" NPT SHORT	T30033022

These connectors may also be used on DuroFlow® frames.

ROOTS-FLO Inlet/Outlet Gaskets

Unit	Qty Required	Description	P/N
404	2	GASKET	T20008001
406	2	GASKET	T20009001
409	2	GASKET	T20010001
412	2	GASKET	T20011001

The connector gasket is used to seal the connector to the blower flange. This gasket can be used on DuroFlow® and Big Jack units as well



816-741-0282

Table 2 - Recommended Oil Grades

Ambient* Temperature °F (°C)	ISO Viscosity No.
Above 90° (32°)	320
32° to 90° (0° to 32°)	220
0° to 32° (-18° to 0°)	150
Below 0° (-18°)	100

*Ambient temperature is defined as the temperature of the space in which the blower and drive are located.

Due to sludge build-up and seal leakage problems, Roots recommendation is DO NOT USE Mobil SHC synthetic oils in ROOTS blowers.

ROOTS® Synthetic Oil: ISO-VG-320 Grade

	Part Number
Quart	13106004
Gallon	13106005
Case (12 qts)	13106007

ROOTS® Synthetic Oil: ISO-VG-220 Grade

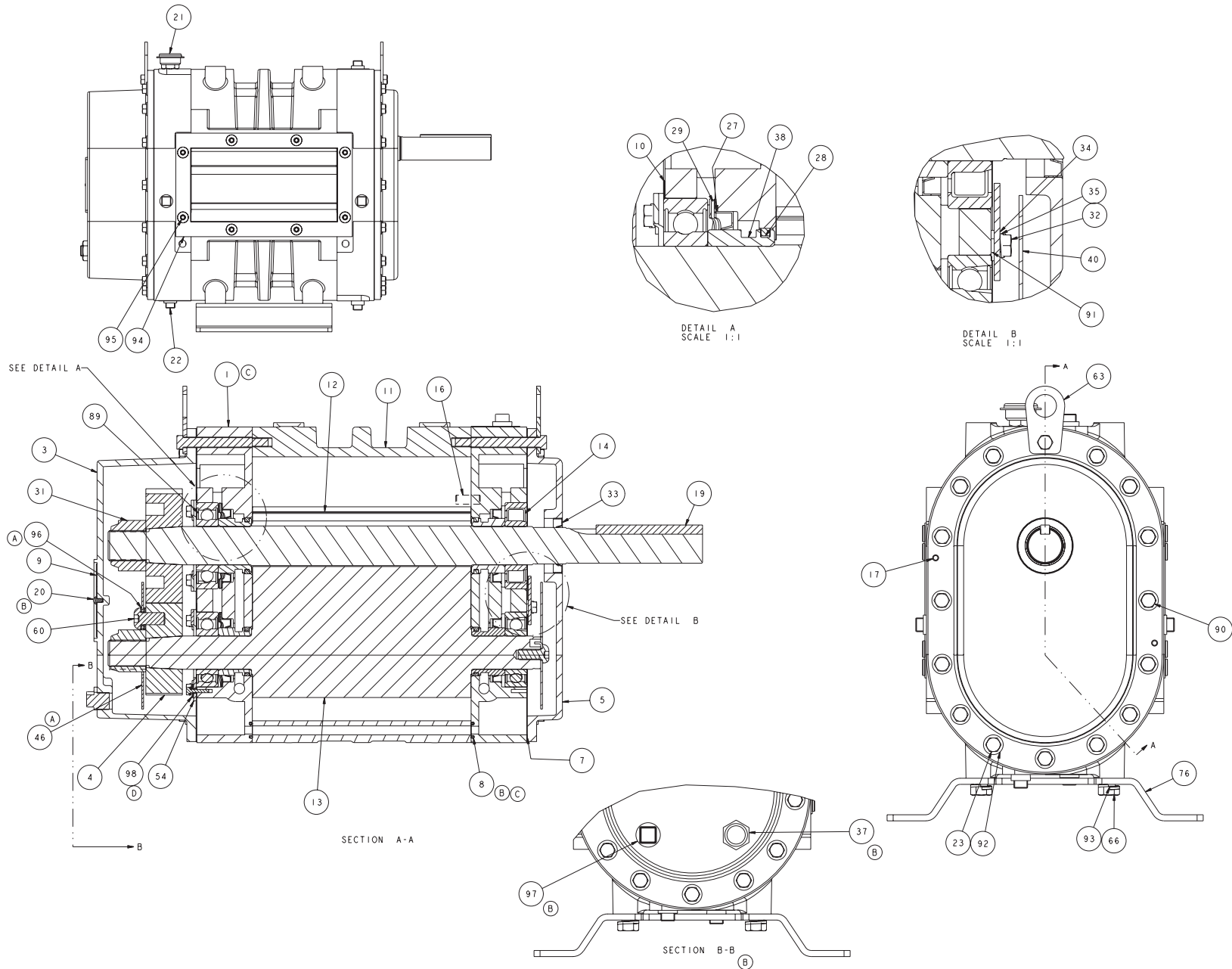
	Part Number
Quart	13106001
Gallon	13106002
Case (12 qts)	13106008

ROOTS® Synthetic Oil: ISO-VG-150 Grade

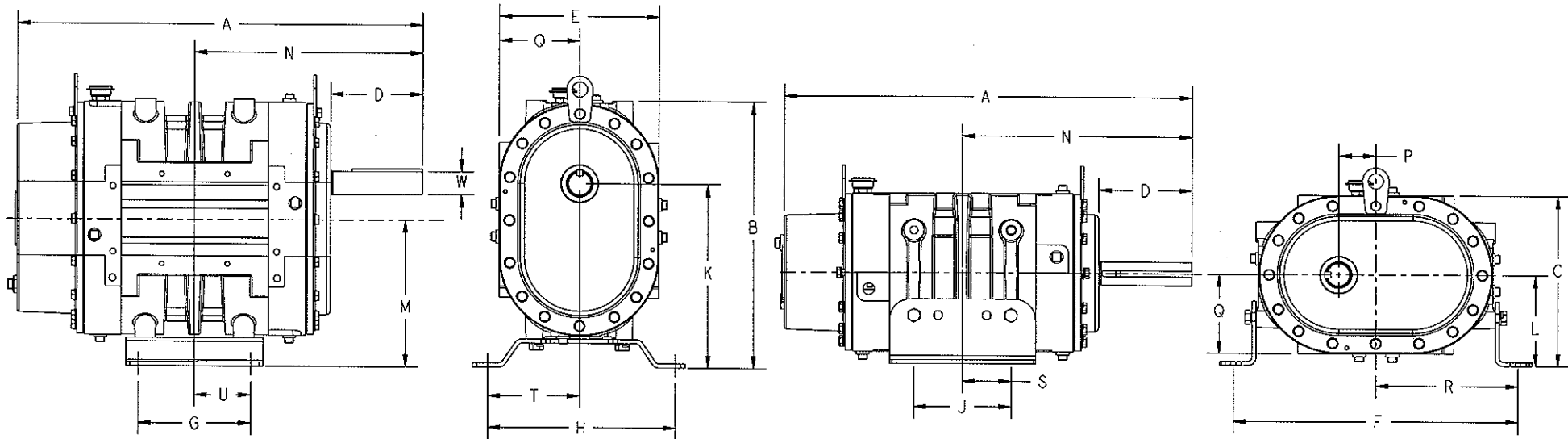
	Part Number
Quart	13106020
Gallon	13106021
Case (12 qts)	13106023
5 Gallon Pail	13106022
55 Gallon Drum	13106025

ROOTS® Synthetic Oil: ISO-VG-100 Grade

	Part Number
Quart	13106011
Gallon	13106012
Case (12 qts)	13106014
5 Gallon Pail	13106013
55 Gallon Drum	13106016



Parts Identification



FRAME	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	W	KEY WAY	WGT
404	18.43	16.37	10.5	4.19	9.75	17.5	4.88	11.5	5.0	11.35	5.62	9.10	10.02	2.25	4.88	8.75	2.5	5.75	2.44	1.44	.376 X.21	200
406	21.93	16.37	10.5	5.69	9.75	17.5	6.88	11.5	7.0	11.35	5.62	9.10	12.52	2.25	4.88	8.75	3.5	5.75	3.44	1.44	.376 X.21	240
409	24.93	16.37	10.5	5.69	9.75	17.5	6.88	11.5	7.0	11.35	5.62	9.10	14.02	2.25	4.88	8.75	3.5	5.75	3.44	1.44	.376 X.21	280
412	27.93	16.37	10.5	5.69	9.75	17.5	9.88	11.5	10.0	11.35	5.62	9.10	15.52	2.25	4.88	8.75	5.0	5.75	4.94	1.44	.376 X.21	330

FRAME	INLET AND DISCHARGE CONNECTIONS	MOUNTING BOLT HOLE DIAMETER
404	4" NPT	0.69
406	4" NPT	0.69
409	4" OR 5" NPT	0.69
412	6" NPT	0.69

REV. NO.	REVISIONS	BY	DATE	ECO. NO.	CHKD.	APPD.

CONFIDENTIAL
 THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION OF DMD-ROOTS DIVISION, DRESSER EQUIPMENT GROUP. IT SHALL BE HELD IN STRICTEST CONFIDENCE, AND BE USED ONLY IN CONJUNCTION WITH DMD-ROOTS DIVISION BUSINESS.

PERPENDICULARITY
 TRUE POSITION
 CONCENTRICITY
 STRAIGHTNESS
 PROFILE OF LINE
 MAX. MATERIAL CONDITION
 FINISH IN MICRO INCHES REGARDLESS OF FEATURE SIZE
 INDICATING MACHINE LOCATING SURFACE

DO NOT SCALE PRINTS. REMOVE BURRS. BREAK ALL SHARP EDGES. DIMENSIONS SHOWN IN 1/16 ARE MILLIMETERS. ALL FINISHED SURFACES TO BE UNLESS SPECIFIED.

ROUNDNESS
 FLATNESS
 PARALLELISM
 RUNOUT
 PROFILE OF SURFACE
 DIAMETER
 ANGULARITY

TOLERANCES UNLESS OTHERWISE SPECIFIED	
DIM	DIM
XX	±.01
XXX	±.005
XXX	±1/64
X*	±30°
MATERIAL	
PATTERN NO.	
REF. NO.	
WEST ASST.	

TITLE

ASSEMBLY, TOP LEVEL
 400 ROOTS-FLO



DMD-Roots Division
 DRESSER EQUIPMENT GROUP, INC.
 HOUSTON, TX, USA

DRAWN BY	CHECKED	APPROVED	SCALE	DRAWING NUMBER	REV.
TS			1:6		
DATE			1 OF 1		
11F801				T30003021	

ROOTS-FLO™

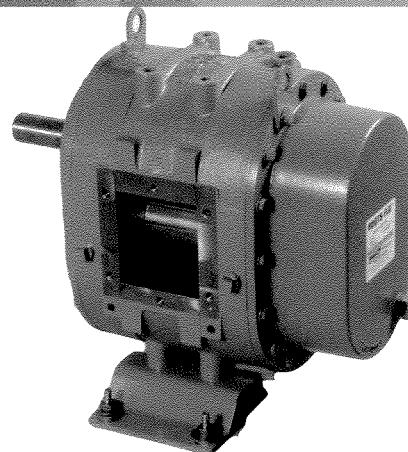
Frames 404, 406, 409, 412

BASIC BLOWER DESCRIPTION

Patented ROOTS-FLO blowers are heavy duty rotary units in a compact, sturdy design engineered for reliable pneumatic conveying of grain and similar product.

The basic model features a ribbed cast iron casing and ridged headplates, carburized and ground alloy steel spur timing gears secured to steel shafts with a taper mounting and locknut, and cast iron involute impellers. Oversized anti-friction bearings are used, with a cylindrical roller bearing at the drive shaft to withstand V-belt pull. Detachable rugged steel mounting feet permit easy in-field adaptability to either vertical or horizontal installation requirements.

The ROOTS-FLO is splash lubricated from oversized oil reservoirs. ROOTS exclusive gearbox design improves oil distribution and lengthens bearing and gear life.



PRODUCT FEATURES

Impellers

Machined and dynamically balanced ductile iron impellers with integral shafts per ASTM 536 Class 60-45-12 and 80-60-3 for additional strength on maximum load operations. Impellers are computer designed for maximum efficiency

Bearings

At maximum load and speed our extra capacity cylindrical roller drive shaft bearing has 2.5 to 3 times longer bearing life than the competitive units ball bearing.

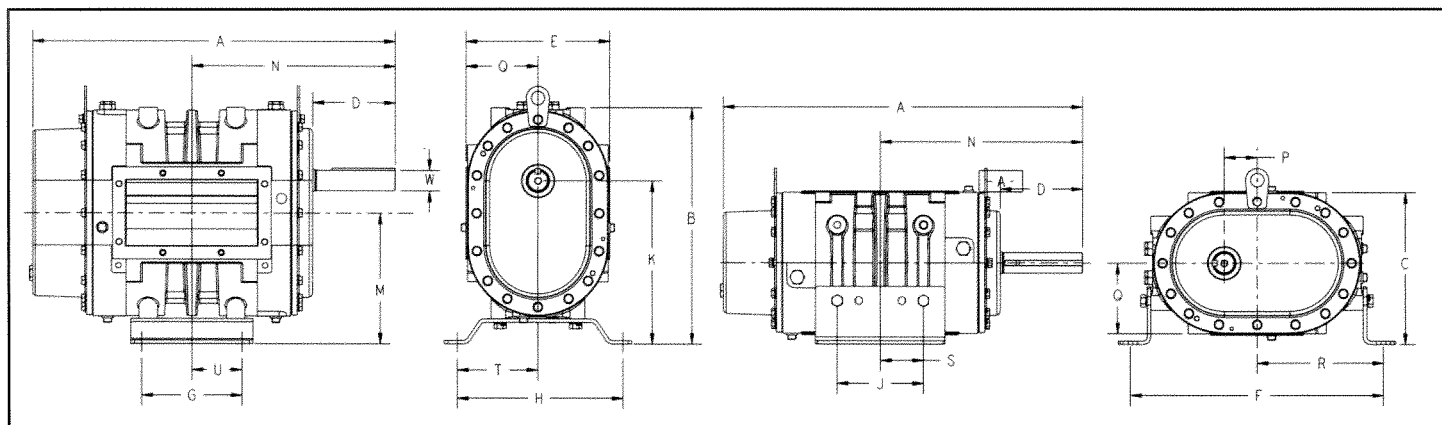
Gears

Gears are spur type SAE 8620 steel carburized and ground to 58-62RC for tough continuous operation, without inducing harmful thrust loads. Gears are reliably mounted with a taper fit to the shaft.

Seals

Main air seals are piston ring for minimal leakage. Bearing and drive shaft oil seals are Viton lip. All are proven Dresser ROOTS design and rated for severe duty.

OUTLINE DRAWING & DIMENSIONAL TABLE



Frame	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	W	WGT
404	18.43	16.37	10.5	4.19	9.75	17.5	4.88	11.5	5.0	11.35	5.62	9.10	10.02	2.25	4.88	8.75	2.5	5.75	2.44	1.44	200
406	21.93	16.37	10.5	5.69	9.75	17.5	6.88	11.5	7.0	11.35	5.62	9.10	12.52	2.25	4.88	8.75	3.5	5.75	3.44	1.44	240
409	24.93	16.37	10.5	5.69	9.75	17.5	6.88	11.5	7.0	11.35	5.62	9.10	14.02	2.25	4.88	8.75	3.5	5.75	3.44	1.44	280
412	27.93	16.37	10.5	5.69	9.75	17.5	9.88	11.5	10.0	11.35	5.62	9.10	15.52	2.25	4.88	8.75	5.0	5.75	4.94	1.44	330



Roots

PERFORMANCE TABLES

Pressure Performance Table For Air Inlet Temp = 68°F, Barometer = 14.7 PSIA													
		4PSIG		6PSIG		8 PSIG		10PSIG		112PSIG		15PSIG	
MODEL	RPM	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
404	1750	133	3.5	120	5.2	108	6.8	99	8.5	90	10.2		
	2950	265	6.3	252	9.1	240	11.9	231	14.7	222	17.6	209	21.8
	4000	381	9.2	367	13.0	356	16.8	346	20.7	337	24.5	333	30.3
406	1750	207	5.2	188	7.8	172	10.3	158	12.9	145	15.4		
	2950	407	9.2	388	13.6	372	17.9	358	22.1	345	26.5	328	32.8
	4000	583	13.1	564	19.2	548	25.0	533	30.6	520	36.6	503	45.2
409	1750	313	7.8	284	11.6	261	15.4	240	19.2	221	23.0		
	2950	613	13.6	584	20.0	561	26.4	540	32.9	521	39.3	495	49.0
	4000	875	19.2	847	28.0	823	36.7	802	45.4	783	54.1	758	67.2
412	1750	426	10.3	391	15.4	361	20.5	335	25.6	312	30.7		
	2950	826	17.9	791	26.5	761	35.1	735	43.6	711	52.2	679	65.0
	4000	1175	25.2	1140	36.8	1111	48.5	1085	60.1	1061	71.7	1029	89.1

Vacuum Performance Table For Air Inlet Temp = 68°F, Discharge Pressure = 30 HGA															
		4"HG		6"HG		8"HG		10"HG		12"HG		15"HG		16"HG	
MODEL	RPM	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
404	1750	148	1.8	136	2.6	124	3.4	112	4.2	100	5.1				
	2950	280	3.4	268	4.8	256	6.1	244	7.5	232	8.9	211	11.0		
	4000	395	5.3	383	7.1	371	9.0	359	10.9	347	12.8	326	15.6	318	16.5
406	1750	228	2.6	211	3.9	194	5.1	177	6.4	159	7.6				
	2950	429	4.8	411	7.0	394	9.1	377	11.1	359	13.3	329	16.4		
	4000	604	7.2	586	10.2	570	13.1	553	15.7	535	18.8	505	22.9	493	24.3
409	1750	344	3.9	318	5.7	293	7.6	268	9.5	242	11.3				
	2950	644	7.0	618	10.2	593	13.3	568	16.4	542	19.6	498	24.3		
	4000	906	10.3	880	14.6	855	18.9	831	23.1	804	27.4	760	33.8	744	35.9
412	1750	465	5.1	433	7.6	402	10.0	371	12.6	338	15.1				
	2950	865	9.2	832	13.4	801	17.1	770	21.7	737	25.9	682	32.2		
	4000	1214	13.4	1182	19.0	1151	23.7	1120	30.4	1087	36.1	1032	44.6	1011	47.4

CONSTRUCTION FEATURES

- Directly Interchangeable with competitive units.
- Heavy duty ribbed cast iron housing and ridged headplates are precision machined on CNC equipment. The material used is the finest in the industry.
- Shaft sleeves are cast iron and hardened for durability.
- Splash lubricated at both ends for extremely long bearing life.
- Top drive horizontal flow.
- Left hand or right hand drive with vertical flow.

Dresser, Inc.



Roots

S-61C02
April 2002

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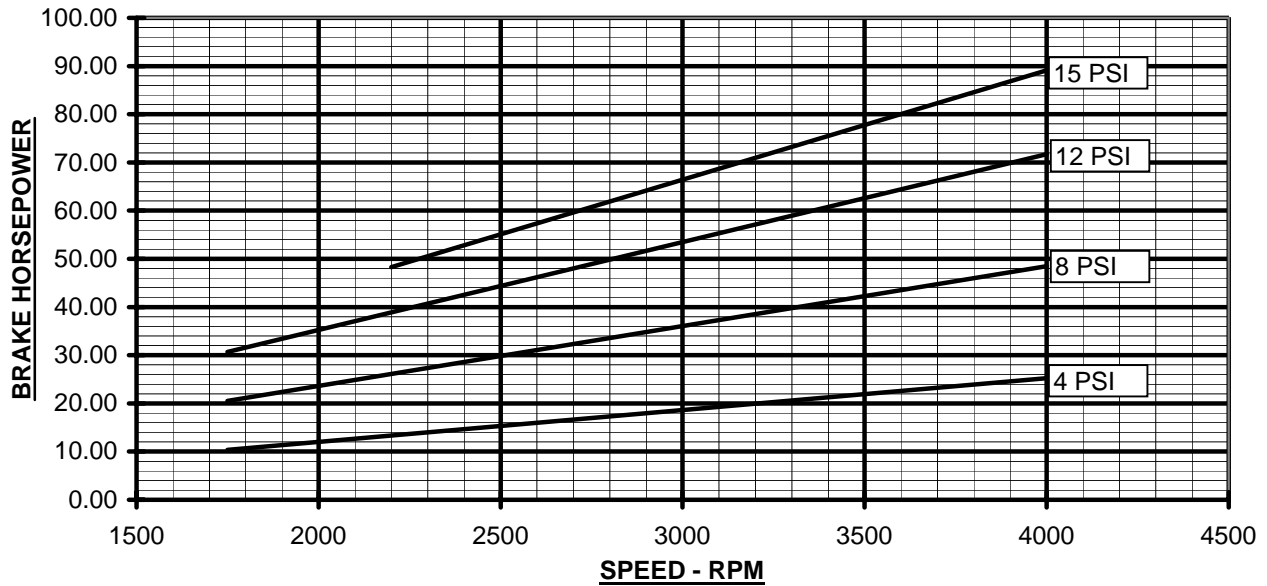
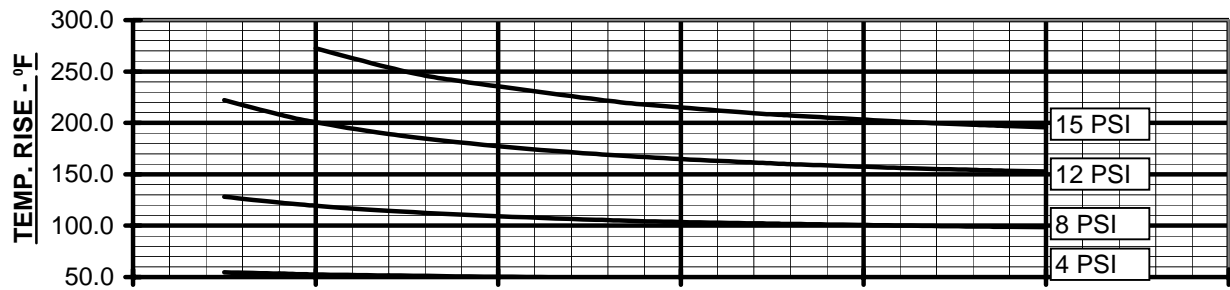
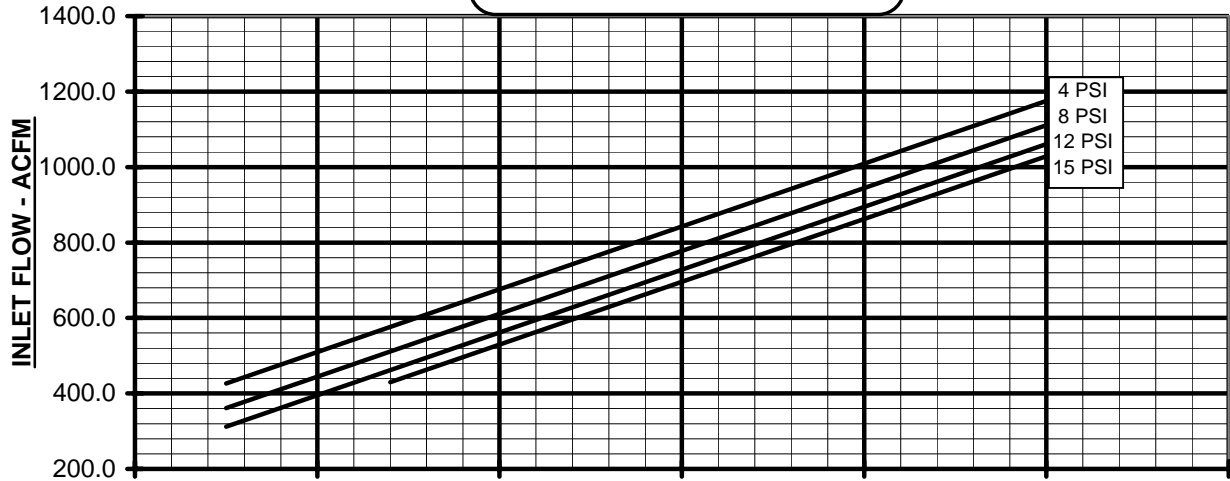
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PERFORMANCE BASED ON AIR,
 INLET AT 14.7 PSIA & 68°F
 JANUARY, 2001

PRESSURE PERFORMANCE
FRAME 412 ROOTS-FLO
 MAX. PRESSURE RISE = 15 PSI
 MAX. SPEED = 4000 RPM





PERFORMANCE BASED ON AIR,
 INLET TEMPERATURE = 68°F
 DISCH. PRESSURE = 30" HGA
 JANUARY, 2001

VACUUM PERFORMANCE
FRAME 412 ROOTS-FLO
 MAX. VACUUM = 16" HG
 MAX. SPEED = 4000 RPM

