

HIGH PRESSURE EXTERNAL GEAR PUMPS: DUCTILE IRON CONSTRUCTION

SERIES GP-410, GP-414

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SERIES DESCRIPTION

Viking's GP-410 and GP-414 Series positive displacement pumps are designed for the demanding applications that require high discharge pressures on thin liquids. These pumps were created with fixed end clearance, ease of preventative maintenance, and motor speed operation.

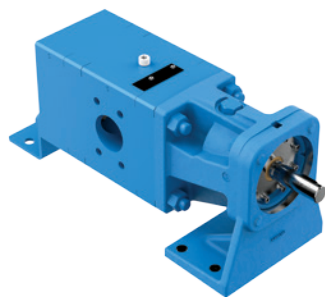
There are 9 models available for this series and standard in ductile iron externals, spur gear style gears, and hardened internal components.

TYPICAL APPLICATIONS

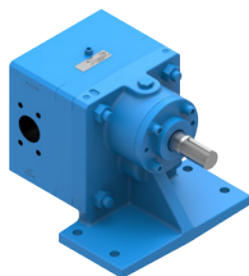
This pump is designed to handle applications that are thin, clean, and lubricating liquids with high differential pressure requirements across multiple applications.

Below is a subset of proven applications where these products have been applied in the field:

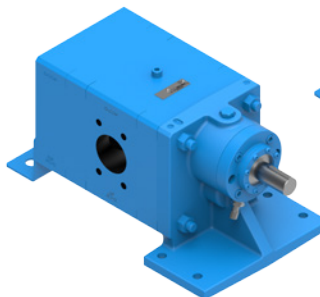
Pipelines, process, sumps, dehydration, booster, injection, and LACT Units, and many other liquids requiring high differential pressures supporting multiple application needs.



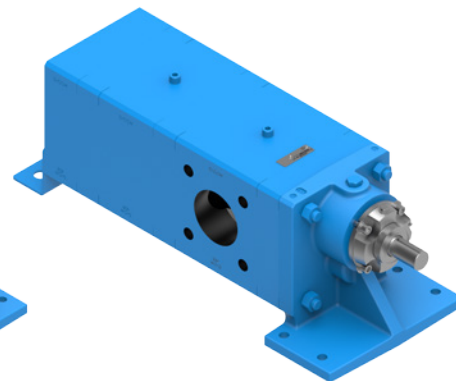
GP-41026



GP-41415
Shown with
Component Seal



GP-41440
Shown with Type 8
Balanced Seal



GP-41460
Shown with Cartridge Seal

OPERATING RANGE

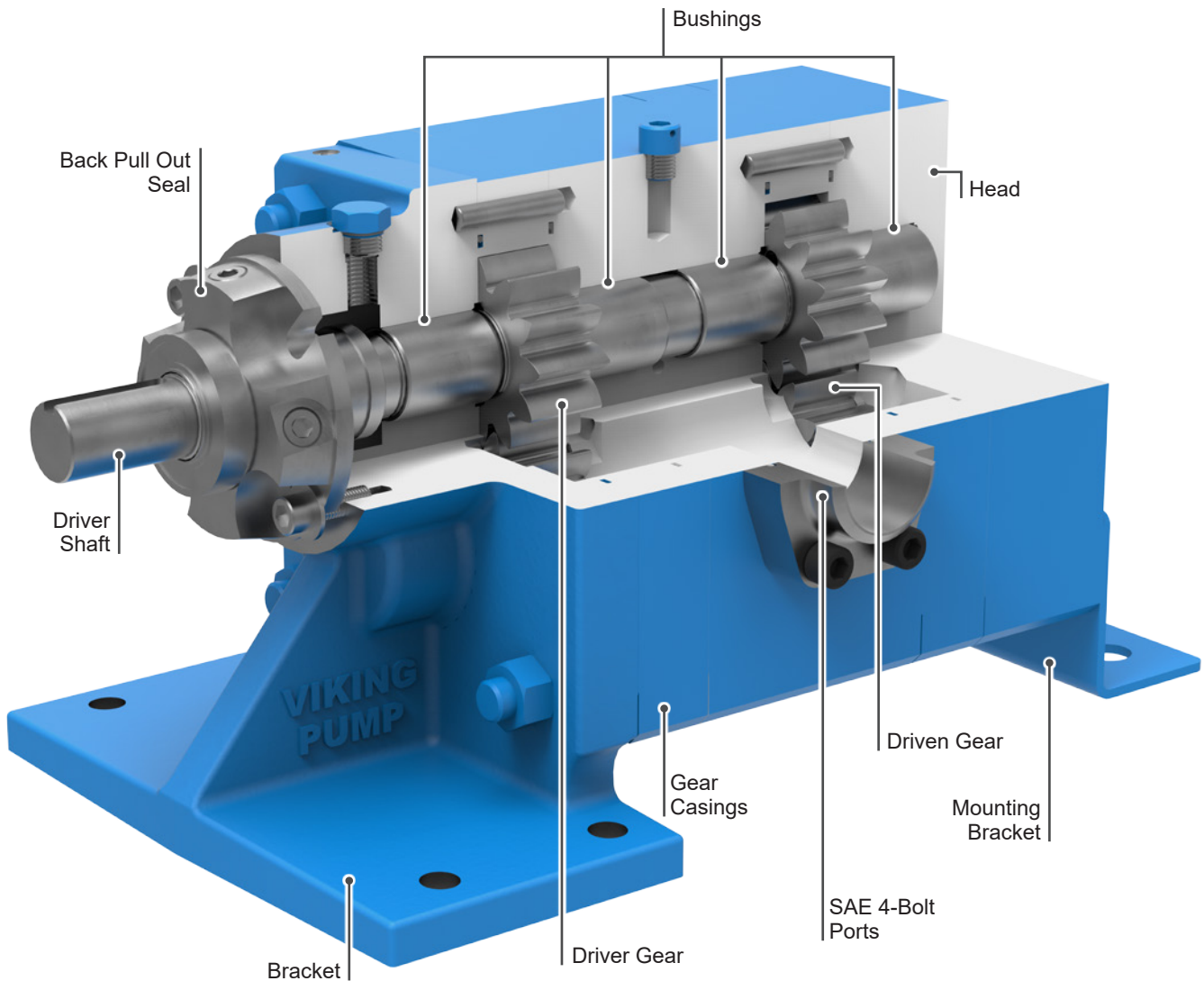
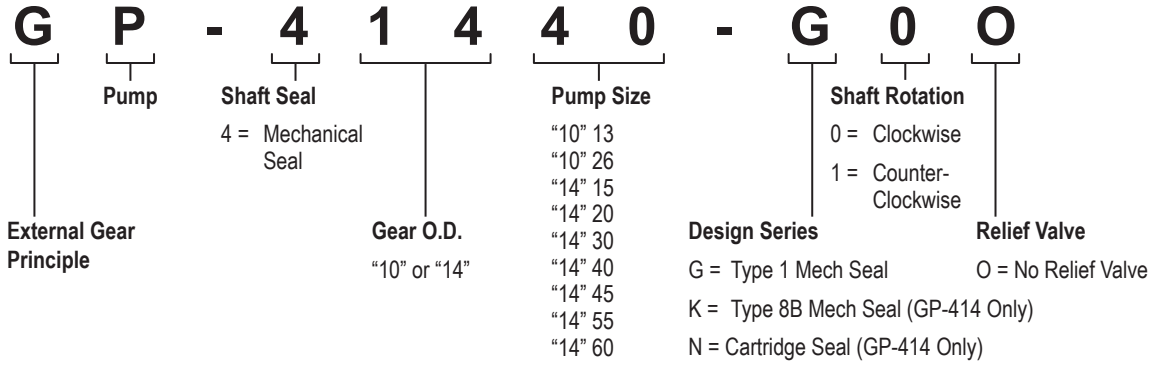
SERIES	NOMINAL FLOW		MAXIMUM PRESSURE PSI	TEMPERATURE RANGE °F	VISCOSITY RANGE	
	GPM	BPD			SSU	cP
GP-410	10 - 50	350 - 1,750	1,500	0 to +350	28 to 2,500	1 to 550
GP-414	25 - 210	850 - 7,250	1,500	0 to +350	28 to 2,500	1 to 550

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SERIES GP-410, GP-414

MODEL NUMBER KEY



HIGH PRESSURE EXTERNAL GEAR PUMPS: DUCTILE IRON CONSTRUCTION

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MATERIALS OF CONSTRUCTION

Component	Standard Offering	Options
Bracket	Ductile Iron (ASTM A536) with Surface Hardening (Vitek)	----
Casing	Ductile Iron (ASTM A536)	----
Head / Separation Plate	Ductile Iron (ASTM A536) with Surface Hardening (Vitek)	----
Gears	Heat Treated Steel (ASTM A322)	----
Shafts	Heat Treated Steel (ASTM A322)	----
Bushings	DU (PTFE-Impregnated Bronze with Steel Reinforcement)	----
O-Rings	Viton™	----
Mechanical Seal	Carbon / Silicon Carbide ①	Carbon / Silicon Carbide Balanced ②③

① Standard Mechanical Seal - John Crane Type 1 Bellows Seal

Viton™ is a trademark of the Chemours Company FC, LLC.

② Balanced Mechanical Seal - John Crane Type 8B5 (GP-414 Only)

③ Cartridge Mechanical Seal - John Crane 5611Q (Tungsten Carbide / Silicon Carbide) (GP-414 Only)

PERFORMANCE

Pump Model	① Ports	Nominal Flow @ 750PSI (1,775 rpm) on 4 cP			Nominal Flow @ 1,500PSI (1,775 rpm) on 4 cP			Maximum Continuous Pressure PSI	Maximum Recommended Temperature °F	Approximate Shipping Weight (Pump Only) Lb.
		GPM	BPH	BPD	GPM	BPH	BPD			
Ductile Iron	Inch									
GP-41013	2" SAE	22	32	760	20	29	683	1500	350	61
GP-41026	2" SAE	44	63	1,520	40	57	1,366	1500	350	85
GP-41415	2" SAE	46	66	1,587	40	57	1,366	1500	350	170
GP-41420	2" SAE	60	85	2,045	-	-	-	750	350	170
GP-41430	2" SAE	94	134	3,208	81	116	2,779	1500	350	270
GP-41440	3" SAE	120	172	4,138	-	-	-	750	350	284
GP-41445	3" SAE	141	201	4,833	122	175	4,202	1500	350	395
GP-41455	3" SAE	168	240	5,760	-	-	-	750	350	403
GP-41460	4"	182	260	6,230	-	-	-	750	350	447

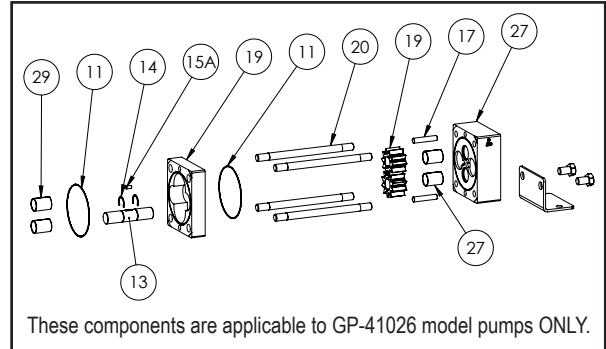
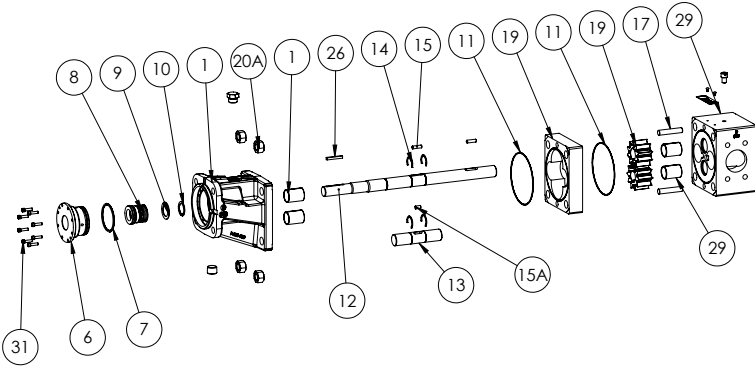
① 2" and 3" SAE Ports use J518 Code 61 SAE Flange Ports. 4" port uses 3000 Series Square Flange.

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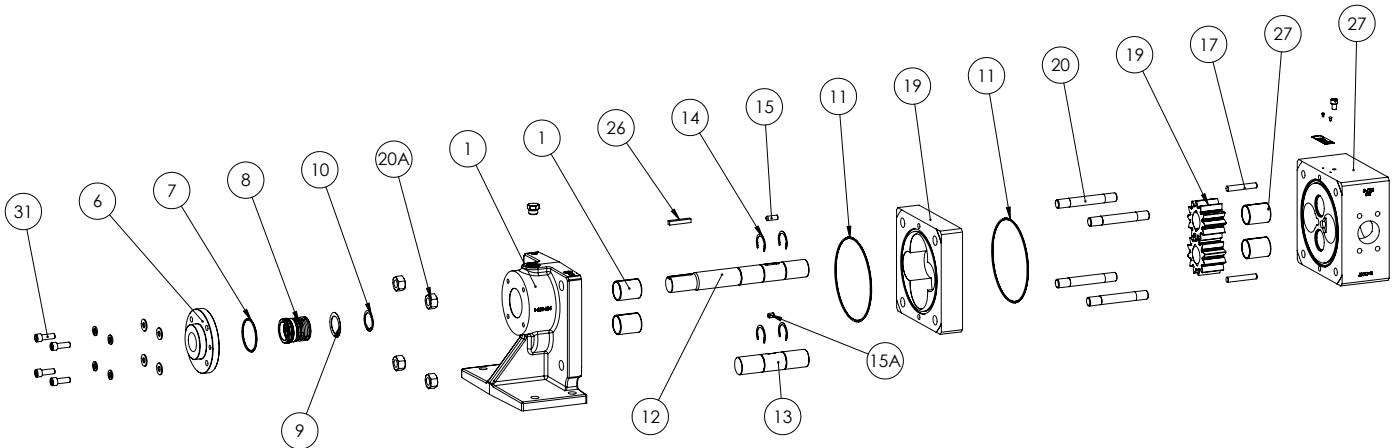
SERIES GP-410, GP-414

COMPONENT IDENTIFICATION – GP-41013, GP-41026



Item	Name of Part	Item	Name of Part	Item	Name of Part
1	Bracket & Bushing Assembly	12	Driver Shaft	20	Studs
6	Seal Holder	13	Driven Shaft	20A	Nuts
7	O-Ring For Seal Holder	14	External Retaining Ring	26	Key
8	Mechanical Seal	15	Gear Pin (Driver Gear)	27	Head & Bushing Assembly
9	Spacer for Mechanical Seal	15A	Gear Pin (Driven Gear)	29	Separation Plate & Bushing Assembly
10	External Retaining Ring	17	Alignment Pins	31	Capscrews
11	O-Ring Between Sections	19	Match Ground Casing & Gears Assembly		

COMPONENT IDENTIFICATION – GP-41415, GP-41420



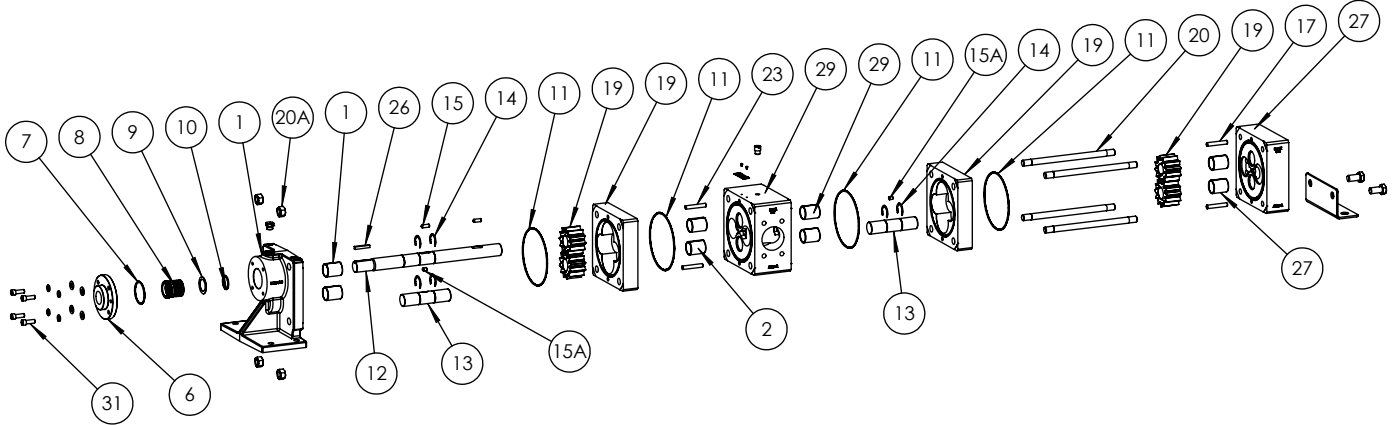
Item	Name of Part	Item	Name of Part	Item	Name of Part
1	Bracket	12	Driver Shaft	20	Studs
6	Seal Holder	13	Driven Shaft	20A	Nuts
7	O-Ring for Seal Holder	14	External Retaining Ring	26	Key
8	Mechanical Seal	15	Gear Pin (Driver Gear)	27	Head & Bushing Assembly
9	Spacer for Mechanical Seal	15A	Gear Pin (Driven Gear)	31	Capscrews
10	External Retaining Ring	17	Alignment Pins		
11	O-Ring Between Sections	19	Match Ground Casing & Gear Assembly		

HIGH PRESSURE EXTERNAL GEAR PUMPS: DUCTILE IRON CONSTRUCTION

SERIES GP-410, GP-414

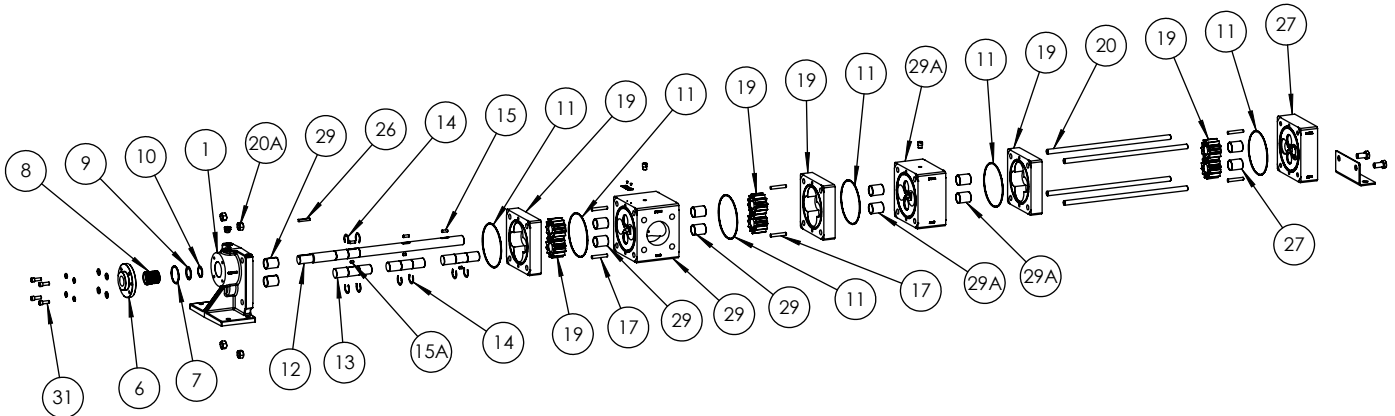
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COMPONENT IDENTIFICATION – GP-41430, GP-41440



Item	Name of Part	Item	Name of Part	Item	Name of Part
1	Bracket	12	Driver Shaft	20	Studs
6	Seal Holder	13	Driven Shaft	20A	Nuts
7	O-Ring for Seal Holder	14	External Retaining Ring	26	Key
8	Mechanical Seal	15	Gear Pin (Driver Gear)	27	Head & Bushing Assembly
9	Spacer for Mechanical Seal	15A	Gear Pin (Driven Gear)	29	Separation Plate & Bushing Assembly
10	External Retaining Ring	17	Alignment Pins	29A	Separation Plate & Bushing Assembly
11	O-Ring Between Sections	19	Match Ground Casing & Gears Assembly	31	Capscrews

COMPONENT IDENTIFICATION – GP-41445, GP-41455, GP-41460



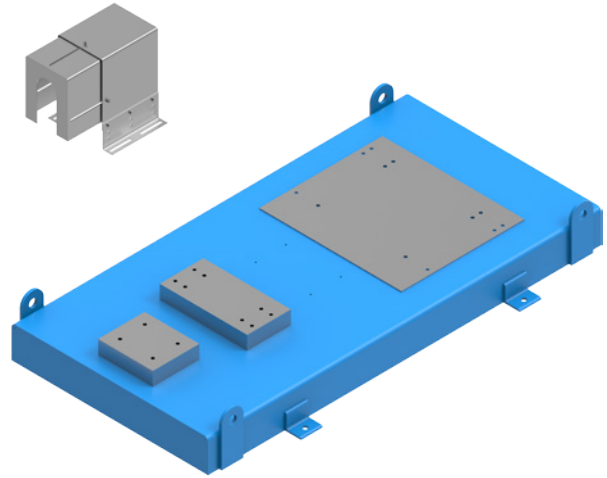
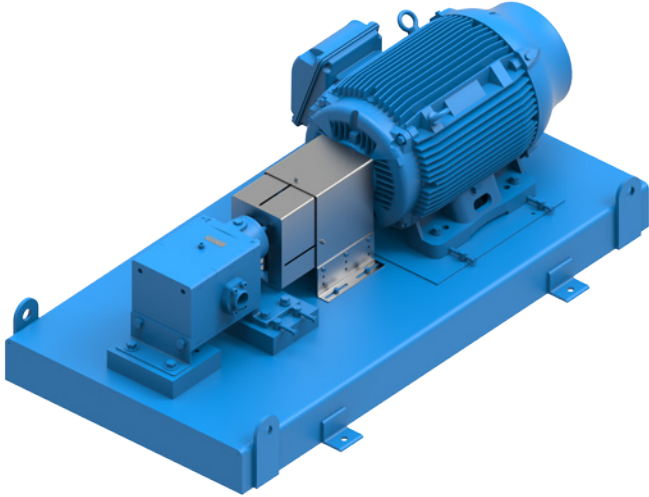
Item	Name of Part	Item	Name of Part	Item	Name of Part
1	Bracket	12	Driver Shaft	20	Studs
6	Seal Holder	13	Driven Shaft	20A	Nuts
7	O-Ring for Seal Holder	14	External Retaining Ring	26	Key
8	Mechanical Seal	15	Gear Pin (Driver Gear)	27	Head & Bushing Assembly
9	Spacer for Mechanical Seal	15A	Gear Pin (Driven Gear)	29	Separation Plate and Bushing Assembly
10	External Retaining Ring	17	Alignment Pins	29A	Separation Plate and Bushing Assembly
11	O-Ring Between Sections	19	Match Ground Casing & Gears Assembly	31	Capscrews

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HIGH PRESSURE EXTERNAL GEAR PUMPS: DUCTILE IRON CONSTRUCTION

SERIES GP-410, GP-414

DRIVE OPTIONS



Base Mounted Units (“D” Drive)

GP-410/414 Series external gear pumps are available mounted to a Viking formed steel base providing solid mounting for the pump, motor, and coupling guard. Available as complete unit with spec motor, spacer coupling, coupling guards, and alignment jacking bolts.

NOTE: This mounting arrangement requires on-site coupling alignment.

Dimensions for Base Mounted Pumps (“D” Drive) — See Pages 1657.9 - 1657.11.

Base Package Standard Features

GP-410/14 Series Base Packages are available from Viking as a turn key pump and motor package to allow maximum flexibility for future pump needs (CPL), ease of alignment with jacking bolts and milled mounting pads, and integrated lifting lugs for proper rigging and unit mobility. The Viking base package also includes a standard adjustable aluminum coupling guard covering our 5” / 8” spacer coupling for easy seal access.*

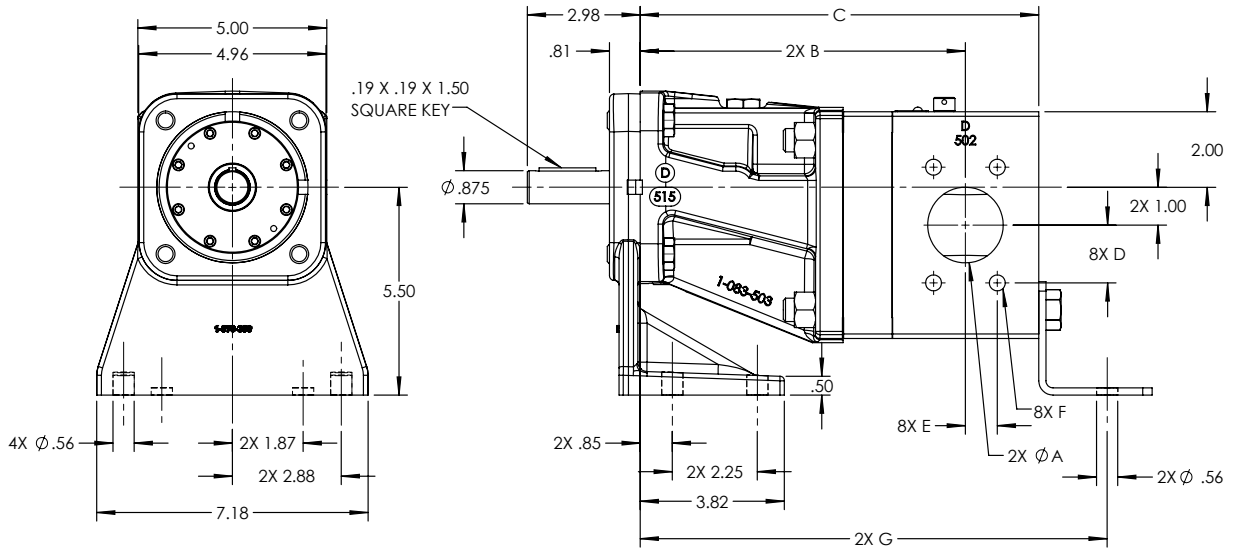
*8” spacer coupling standard on motor frames 445T and larger

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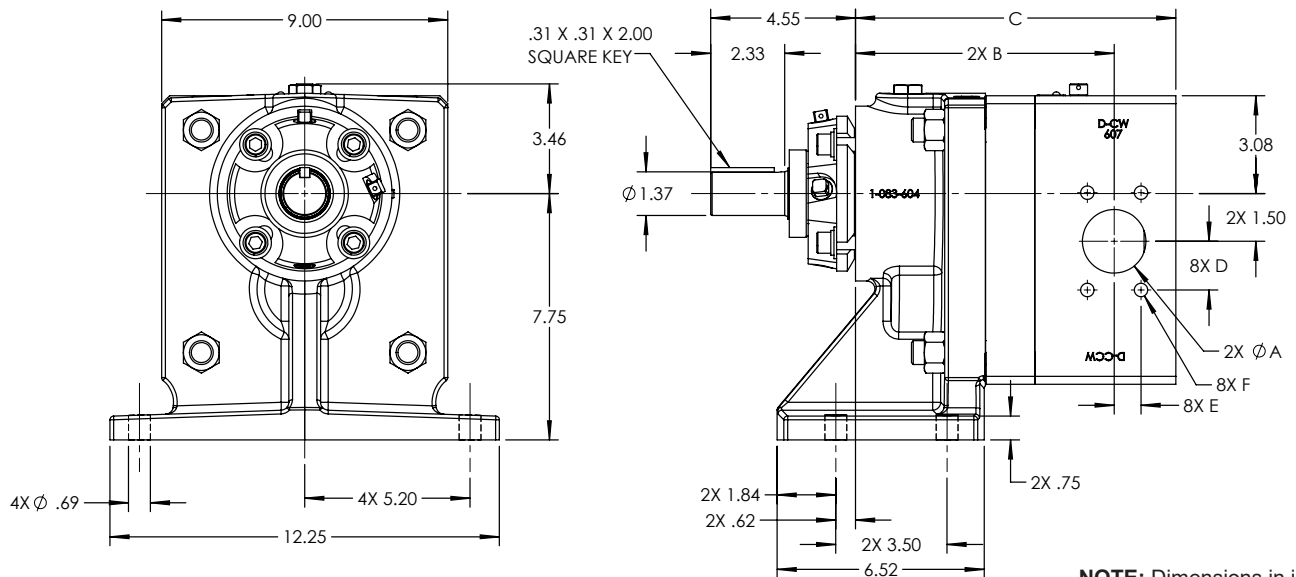
DIMENSIONS – GP-41013, GP-41026 (PUMP & FOOTED BRACKET)



NOTE: Dimensions in inches

Model No.	A	B	C	D	E	F	G
GP-41013	2.00	8.61	10.55	1.53	.84	1/2-13 UNC-2B	12.36
GP-41026	2.00	8.61	14.10	1.53	.84	1/2-13 UNC-2B	15.91

DIMENSIONS – GP-41415, GP-41420 (BARE SHAFT PUMP)



NOTE: Dimensions in inches

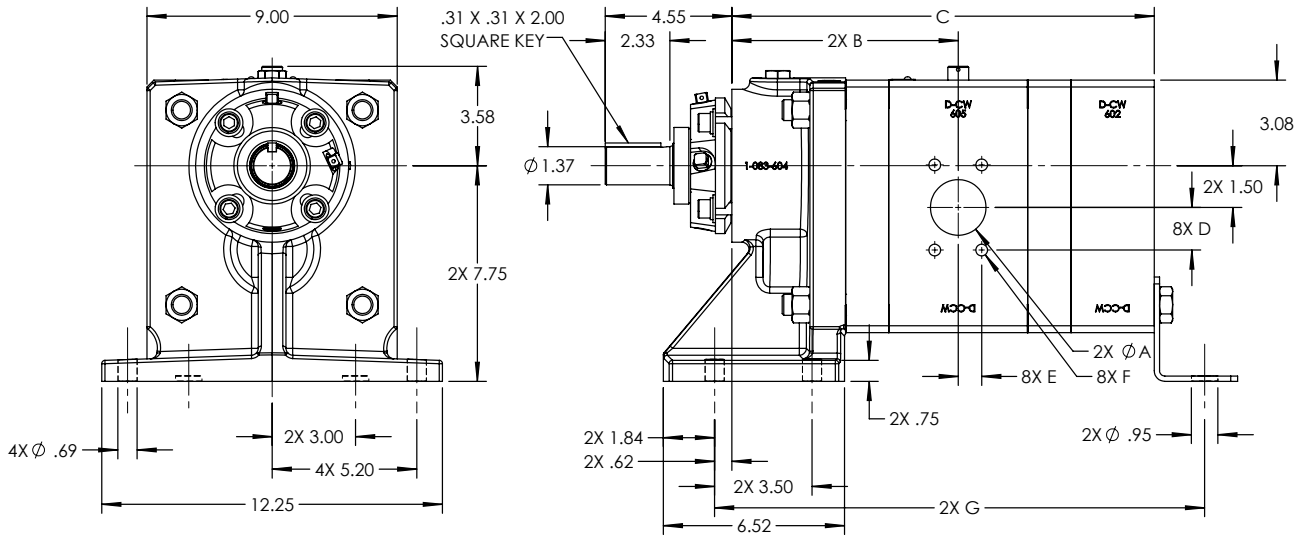
Model No.	A	B	C	D	E	F	Approximate Shipping Weight in Pounds
GP-41415	2.00	8.14	10.08	1.53	.84	1/2-13 UNC-2B	185
GP-41420	2.00	8.58	10.52	1.53	.84	1/2-13 UNC-2B	192

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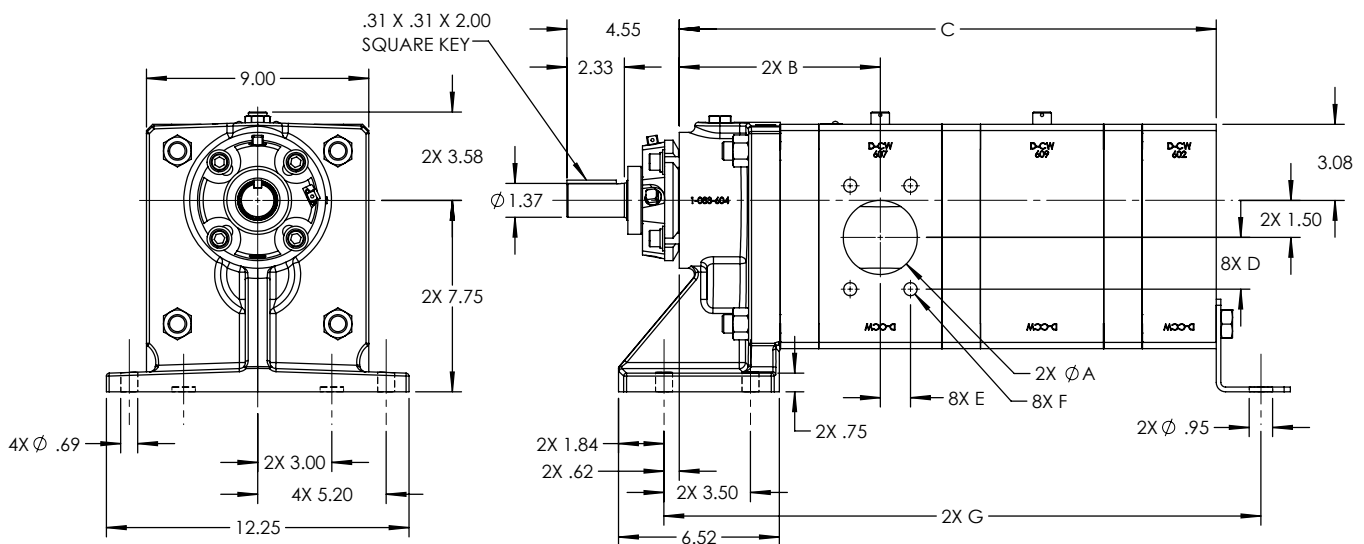
DIMENSIONS – GP-41430, GP-41440 (BARE SHAFT PUMP)



NOTE: Dimensions in inches

Model No.	A	B	C	D	E	F	G	Approximate Shipping Weight in Pounds
GP-41430	2.00	8.14	15.19	1.53	.84	1/2-13 UNC-2B	17.62	284
GP-41440	3.00	8.58	16.08	2.09	1.22	5/8-11 UNC-2B	18.51	296

DIMENSIONS – GP-41445, GP-41455, GP-41460 (BARE SHAFT PUMP)



NOTE: Dimensions in inches

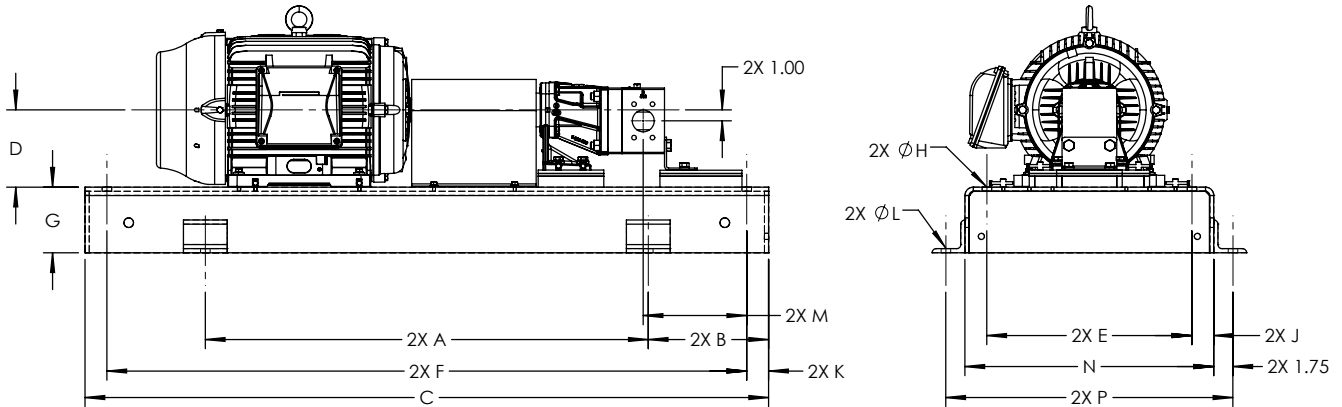
Model No.	A	B	C	D	E	F	G	Approximate Shipping Weight in Pounds
GP-41445	3.00	8.14	21.74	2.09	1.22	5/8-11 UNC-2B	24.17	399
GP-41455	3.00	8.09	22.63	2.09	1.22	5/8-11 UNC-2B	25.06	415
GP-41460	4.00	9.84	25.58	2.50	2.50	1-8 UNC-2B	28.01	460

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SERIES GP-410, GP-414

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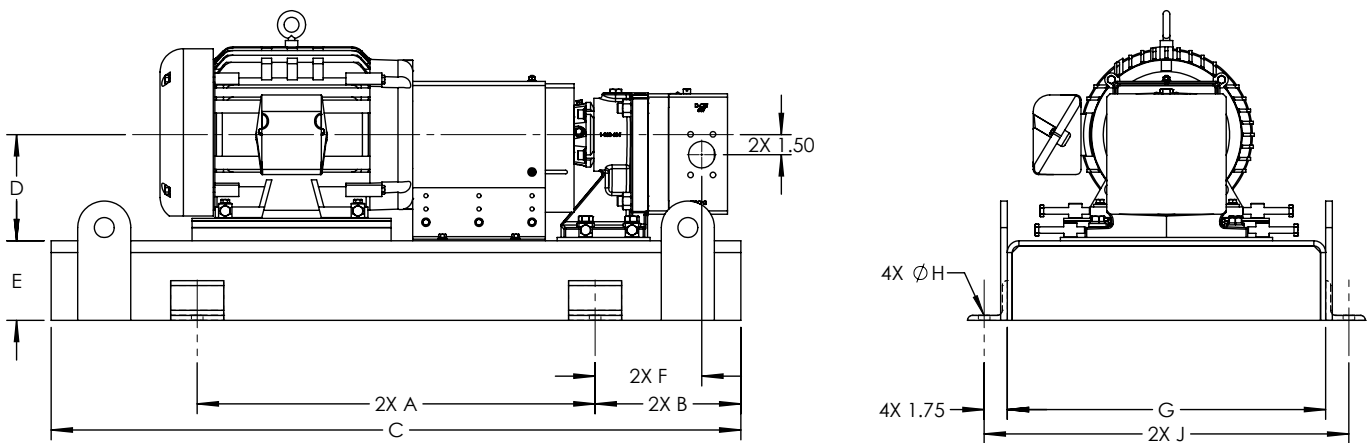
DIMENSIONS – GP-41013, GP-41026 (PUMP & MOTOR)



NOTE: Dimensions in inches

Motor Frame Size	Pump Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Approx. Shipping Weight (Pump, Drive & Motor) In Pounds
254T-256T	GP-41013	30.00	11	52.00	6.31	20.00	48.00	6.00	.63	2.00	2.00	.88	9.45	24.00	27.50	630
	GP-41026															655
284T-286T	GP-41013	40.50	11	62.50	7.06	18.75	58.50	6.00	.88	2.00	2.00	.88	9.45	22.75	26.50	800
	GP-41026															825

DIMENSIONS – GP-41415, GP-41420 (PUMP & MOTOR)



NOTE: Dimensions in inches

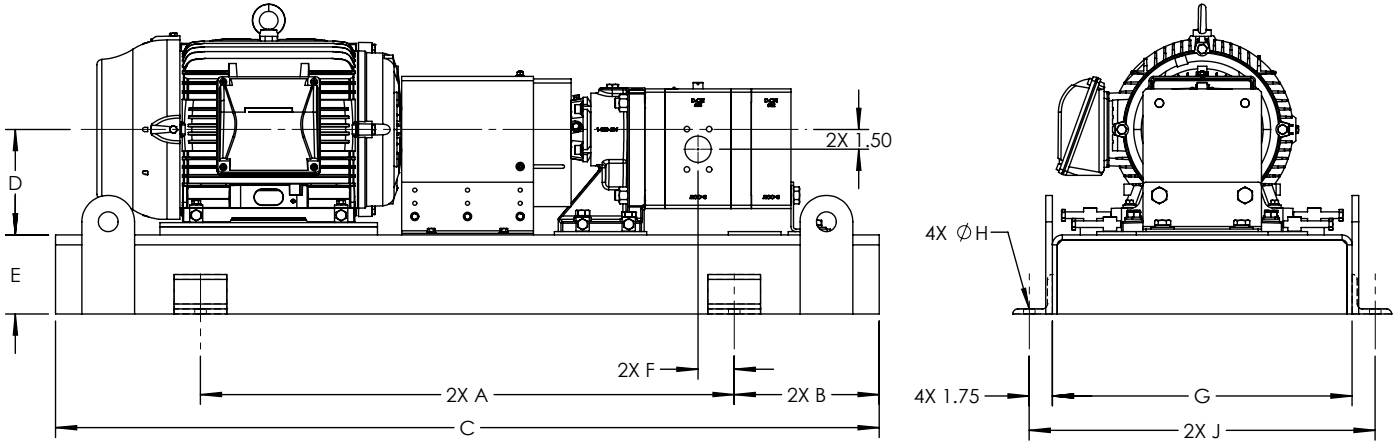
Motor Frame Size	Pump Model No.	A	B	C	D	E	F	G	H	J	Approx. Shipping Weight (Pump, Drive & Motor) In Pounds
182T-184T	GP-41415 GP-41420	19.75	11.00	41.75	8.00	4.00	8.05	18.75	.88	22.25	490
213T-215T											580
254T-256T		30.00	11.00	52.00	8.00	6.00	8.49	24.00	.88	27.50	800
284T-286T											970
324T-326T											1,045

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DIMENSIONS – GP-41430, GP-41440 (PUMP & MOTOR)



NOTE: Dimensions in inches

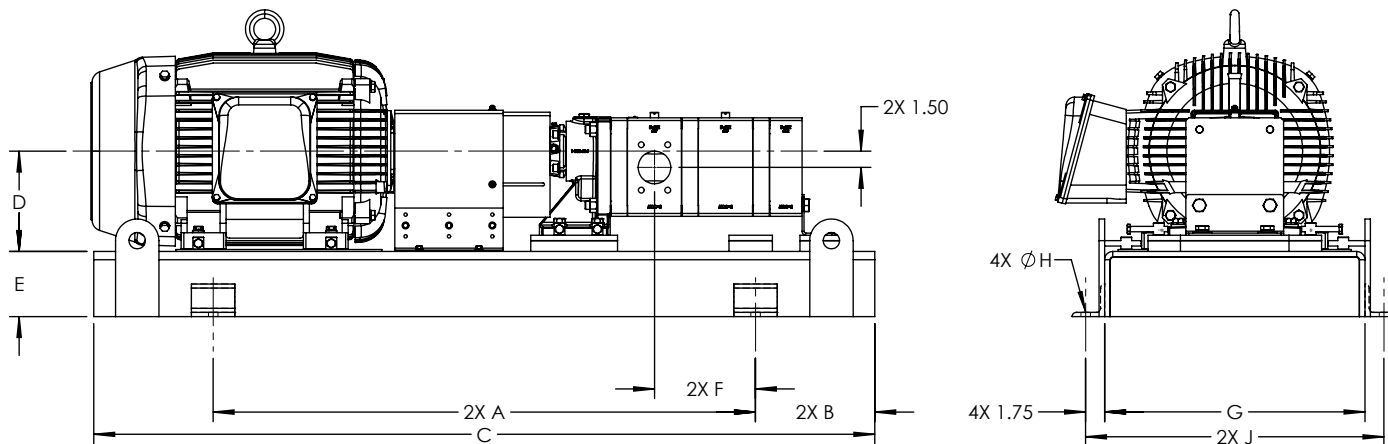
Motor Frame Size	Pump Model No.	A	B	C	D	E	F	G	H	J	Approx. Shipping Weight (Pump, Drive & Motor) In Pounds
213T-215T	GP-41430	30.00	11.00	52.00	8.00	6.00	2.74	24.00	0.88	27.50	775
254T-256T	GP-41430 GP-41440	40.50	11.00	62.50	8.00	6.00	2.74 2.30	22.75	0.88	26.25	930 942
284T-286T	GP-41430 GP-41440	40.50	11.00	62.50	8.00	6.00	2.74 2.30	22.75	0.88	26.25	1,095 1,108
324T-326T	GP-41430 GP-41440	40.50	11.00	62.50	8.25	6.00	2.74 2.30	22.75	0.88	26.25	1,177 1,190
364T-365T	GP-41430 GP-41440	50.00 43.00	11.00	"72.00 65.00"	9.25	6.00	2.74 1.50	24.00	0.88	27.50	1,762 1,740
404T-405T	GP-41430	40.00	16.00	72.00	10.25	6.00	2.24	36.00	0.88	39.50	2,185

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DIMENSIONS – GP-41445, GP-41455, GP-41460 (PUMP & MOTOR)



NOTE: Dimensions in inches

Motor Frame Size	Pump Model No.	A	B	C	D	E	F	G	H	J	Approx. Shipping Weight (Pump, Drive & Motor) In Pounds
284T-286T	GP-41455	50.00	11.00	72.00	8.00	6.00	9.75	24.00	0.88	27.50	1,395
	10.54						1,470				
324T-326T	GP-41455	50.00	11.00	72.00	8.25	6.00	9.75	24.00	0.88	27.50	1,465
	10.54						1,536				
364T-365T	GP-41445	50.00	11.00	72.00	9.25	6.00	9.31	24.00	0.88	27.50	1,890
	GP-41455						9.75				1,907
	GP-41460						10.54				1,980
404T-405T	GP-41445	52.00	16.00	84.00	10.25	6.00	4.31	36.00	0.88	39.50	1,890
	GP-41455						4.75				2,421
	GP-41460						4.75				2,494
444T-445T	GP-41445	64.00	16.00	96.00	11.37	6.00	2.60	36.00	0.88	39.50	3,165

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PERFORMANCE CURVES

Contact Viking Pump for performance curves for specific application conditions.

NPSH (NET POSITIVE SUCTION HEAD)

The NPSH_R (Net Positive Suction Head Required by the pump) is given in the table below and applies to viscosities through 750 SSU. NPSH_A (Net Positive Suction Head Available in the system) must be greater than NPSH_R.

For a complete explanation of NPSH, see Viking Application Data Sheet, AD-19.

GP Series
Net Positive Suction Head Required (NPSHR) ①
Feet of Liquid (S.G. 1.0)
Viscosities - 38 SSU to 750 SSU

Pump Size	Pump Speed (RPM)					
	640	780	950	1150	1450	1750
GP-41013	5.6	6.0	6.6	7.5	9.2	11.5
GP-41026	5.8	6.2	6.9	8.0	10.1	12.8
GP-41415	6.9	7.3	8.0	9.2	11.3	14.2
GP-41420	6.9	7.4	8.2	9.4	11.8	15.0
GP-41430	7.0	7.6	8.5	9.9	12.7	16.6
GP-41440	7.0	7.8	8.8	10.4	13.7	18.2
GP-41445	7.1	7.8	9.0	10.7	14.2	19.0
GP-41455	7.2	8.0	9.3	11.2	15.3	20.9
GP-41460	7.2	8.1	9.4	11.4	15.7	21.6

1 m = 3.28 feet

1 foot = 0.305 m

① - At pump suction port

For Viscosities Above 750 SSU (NPSH_R Data Not Available):

The performance curves are based on 15 In.-Hg. While vacuums up to 20 In.-Hg. will not generally result in any loss of capacity, it is recommended that the suction line size and possibly the pump port size be increased to hold the expected vacuum to 15 In.-Hg. or less, when measured at the pump suction port. Vacuum above 20 In.-Hg. should be avoided. (Refer to "Engineering Data" Catalog Section 510 for information helpful in determining suction line size.)

Mechanical Efficiency:

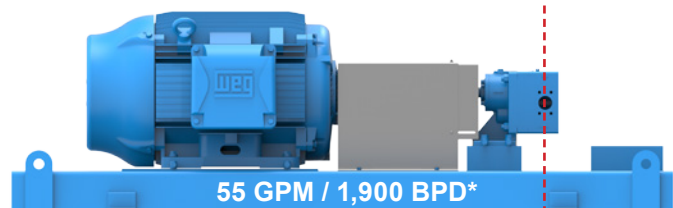
The Mechanical Efficiency (expressed in percent) can be calculated by using the following formula:

$$\text{Mechanical Efficiency} = \frac{(\text{Differential Pressure, PSI}) (\text{Capacity, GPM}) (100)}{(\text{Horsepower, BHP}) (1715)}$$

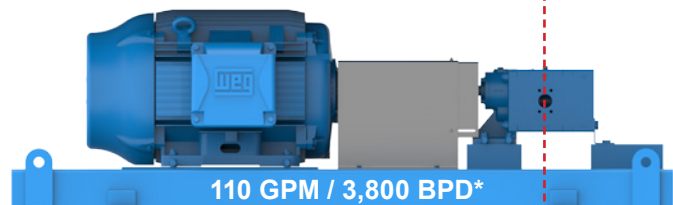
CPL (COMMON PORT LOCATION) OPTION

Viking's Common Port Location (CPL) base units allow for ease of downsizing pumps once wells come off of IP (Initial Production). This feature is special order (on some models), and allows customers to drop in smaller flow rated pumps into the exact base and drive as the original with no / minimal piping changes required. Contact Viking Pump for more information on this drive package option.

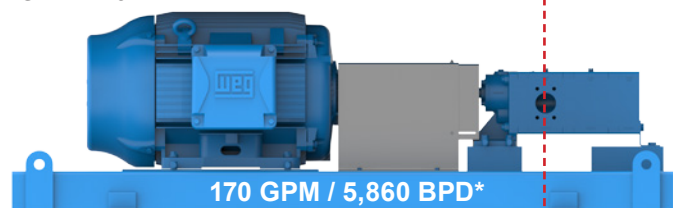
GP-41415:



GP-41430:



GP-41445:



* Nominal Flow