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Issued: 11.07.2018  
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These are the unapproved minutes of the 11.06.2018 Sequence VI Conference Call.

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The meeting was called to order at 1:02 PM Central Time by Chair Andrew Stevens.

#### Agenda

- 1.0 There was no Agenda. The meeting was called to discuss the motion by Dan Worcester to modify the circulation pump and motor wording.
  
- 2.0 Roll Call: The Attendance list is **Attachment 1**.

### 3.0 Old Business

3.1 The focus was on Section 6.6.5.2.

3.2 Dan Worcester provided information for a change to the circulation pump based on a new stand installation. See [Attachment 2](#) for the early version of the motion and stand RPM data in different stages, and [Attachment 3](#) for Viking data.

3.2.1 There was discussion that the Viking pump was discontinued.

3.2.2 There are newer versions but the 4124 and maybe the 4124A are no longer available.

3.2.3 The Dayton motor [2N912] has been replaced with a newer version [36VE89]. This replacement motor does meet Section 6.6.5.2 requirements.

3.2.4 However that section does call for a nameplate RPM range and this will continue with a wider bander for the new motor.

**MOTION:** Recommend to the Surveillance panel the following wording changes to include the latest version of the Viking pump and widen the range for the motor RPM:

Section 6.6.5.2 Use a positive displacement oil circulation pump. A Viking Series 4125, Model G4125, G4124A, or G4124B [with the Viton high temperature seal] no relief valve, base mounted, (see X1.15). The pump shall have a V-belt or direct drive electric drive motor with a minimum power of 0.56 kW. Voltage and phase are optional. The motor will run in an RPM range of 1140 r/min to 1170 r/min.

Dan Worcester, Ben Maddock, 2<sup>nd</sup>

The motion passed unanimously.

There was discussion on the new method developed by Lubrizol to read oil level. This will be reviewed at a later meeting. See [Attachment 4](#).

### 4.0 Meeting Adjourned

The meeting adjourned at 1:50 PM Central Time

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## ATTACHMENT 2: Dayton motor and Viking Pump

Here is the revised wording and data from old [2N912] and new motor[36VE89].

Motion # X:

Recommend to the Surveillance Panel:

6.6.5.2 Use a positive displacement oil circulation pump. A Viking Series 4125, Model G4125 or G4214A, no relief valve, base mounted, **have been found to meet the requirements** (see X1.15). The pump shall have a V-belt or direct drive electric drive motor with a minimum power of 0.56 kW. Voltage and phase are optional. **The motor will run the Viking pump in an operational RPM range of 1140 r/min to 1200 r/min.**

Effective date of meeting.

**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

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**RELATED PRODUCTS**

- Cast Iron, Jacketed Pumps: Catalog Section 1402
- Cast Iron, Mag Drive Pumps: Catalog Section 1403
- Steel Externals, Non-Jacketed Pumps: Catalog Section 1301
- Stainless Steel, Non-Jacketed Pumps: Catalog Section 1701

**SERIES DESCRIPTION**

**124A, 124AE, 4124A, 4124AE, 324A, 4324A:**

The Universal Product Line has the broadest range of sealing options of all pumps built by Viking. The stuffing box on all sizes accepts packing, numerous component single mechanical seals, or a wide variety of cartridge seals.

The Universal Product Line is Viking Pump’s most versatile line of internal gear pumps due to the availability of many design and material options.



**L124A**

**4124B:**

The 4124B series heavy duty internal gear pumps have Behind the Rotor dynamic shaft seals. By locating the mechanical seal immediately behind the rotor, this prevents the shaft and bracket bushing from coming into contact with the liquid.



**K4124B**

**OPERATING RANGE:**

SERIES	NOMINAL FLOW		MAXIMUM PRESSURE		TEMPERATURE RANGE		VISCOSITY RANGE	
	GPM	m³h	PSI	Bar	°F	°C	SSU	cSt
<b>124A/AE*</b>	8 - 500	1.8 - 114	200	14	-60 to +450	-50 to +230	28 to 2,000,000	0.1 to 440,000
<b>4124A/AE*</b>	8 - 500	1.8 - 114	200	14	-60 to +450	-50 to +230	28 to 2,000,000	0.1 to 440,000
<b>4124B</b>	8 - 500	1.8 - 114	200	14	-60 to +450	-50 to +230	28 to 15,000	0.1 to 3,300
<b>324A</b>	600 - 1,600	136 - 364	200	14	-60 to +450	-50 to +230	28 to 2,000,000	0.1 to 440,000
<b>4324A</b>	600 - 1,600	136 - 364	200	14	-60 to +450	-50 to +230	28 to 2,000,000	0.1 to 440,000

\* AE available in sizes L, LQ, LL only.

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**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

**FEATURES & BENEFITS**

- Positive Displacement Internal Gear pumping principle handles a broad range of viscosities with constant flow rate
- Axial rotor thrust is controlled by double row ball bearing or tapered roller bearings; a bushing provides a secondary point of radial shaft support
- Rotatable bearing housing provides easy rotor end clearance adjustment for viscosity or to compensate wear
- Numerous material options are available for bushings, idler pins, shafts, rotors, idlers and elastomers
- Gear and pump geometry has been optimized based on more than 100 years of experience
- Footed cast iron bracket provides rigid mounting to help maintain alignment, which extends seal and bearing life
- Can use direct drive, gear reducer or gearmotor drive, or belt-drive
- Pressure relief valve standard on all except RS size pumps; less valve / plain head option available

**124A, 124AE, 4124A, 4124AE, 324A, 4324A:**

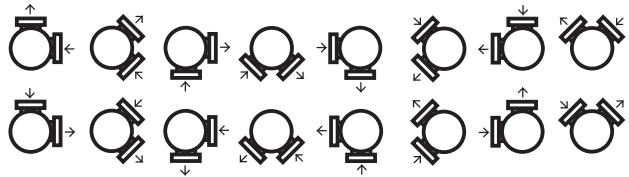
- Series designed with an enlarged bearing housing. Used in conjunction with a spacer coupling permits easy cartridge seal installation and removal in place without removing the head and rotor/shaft.
- Seal options include packing, single component seals, cartridge lip seals and cartridge single and double mechanical seals. Various seal flush plans are available.



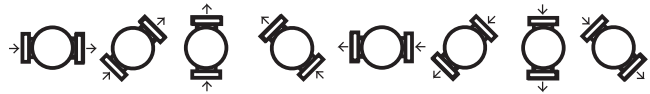
Viking Universal Product Line pumps carry a three year limited warranty. See catalog section 000 for details.

**PORT LOCATION OPTIONS**

**90° port options:**



**Opposite port options:**

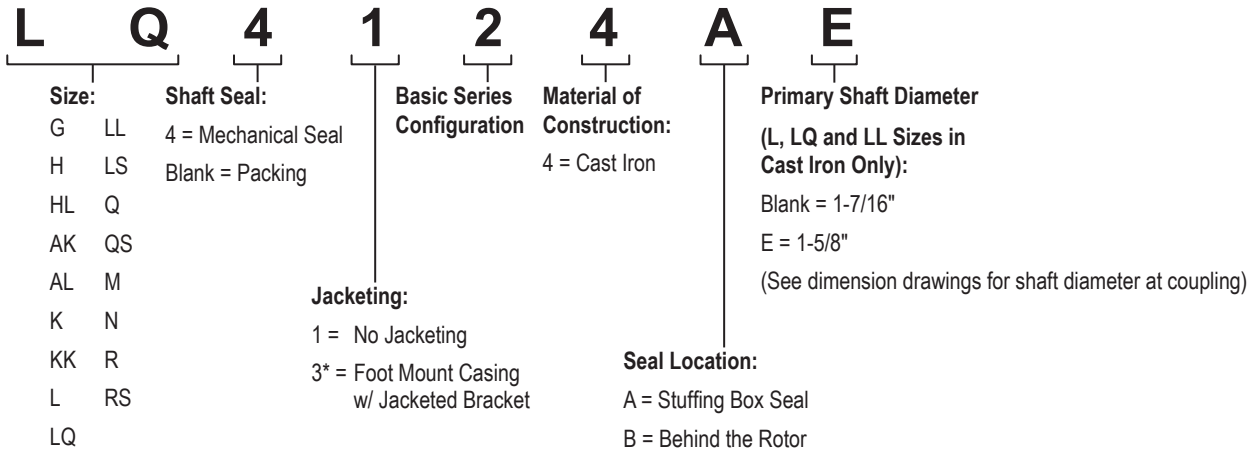


**NOTE:** See page 1401.9 for a complete list of casing options by size.

**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

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**MODEL NUMBER KEY**



\* Note: Only the N, R & RS sizes are foot mount casing with jacketed bracket.

**STANDARD MATERIALS OF CONSTRUCTION**

Component	Standard Material	
Casing	Cast Iron, ASTM A48, Class 35B	
Head	Cast Iron, ASTM A48, Class 35B	
Bracket	Cast Iron, ASTM A48, Class 35B	
Idler	Standard	① Cast Iron, ASTM A48, Class 35B
	Steel Fitted	①② Cast Iron, ASTM A48, Class 35B
Rotor	Standard	③ Cast Iron, ASTM A48, Class 35B
	Steel Fitted	④ Steel, ASTM A148, Grade 80-40
Shaft	⑤ Steel, ASTM A108, Grade 1045	
Idler Pin	Hardened Steel, ASTM A108, Grade 1045	
Idler Bushing	(4124A, 4124AE, 4324A, 4124B)	Carbon Graphite
	(124A, 124AE, 324A)	Bronze, ASTM B584 (B505), Alloy C93700
Bracket Bushing (no product contact on 4124B series)	(4124A, 4124AE, 4324A)	Carbon Graphite
	(124A, 124AE, 324A, 4124B)	Bronze, ASTM B584 (B505), Alloy C93700
Pressure Relief Valve	⑥ Cast Iron, ASTM A48, Class 35B	
Standard Packing (124A, 124AE, 324A)	Braided PTFE	
Standard Mechanical Seal (4124A, 4124AE, 4124B, 4324A)	Carbon vs. Silicon Carbide Faces, Viton™ Elastomers	
Optional Abrasive Liquid Seal (4124B)	Silicon Carbide vs. Silicon Carbide Faces, Viton™ Elastomers	

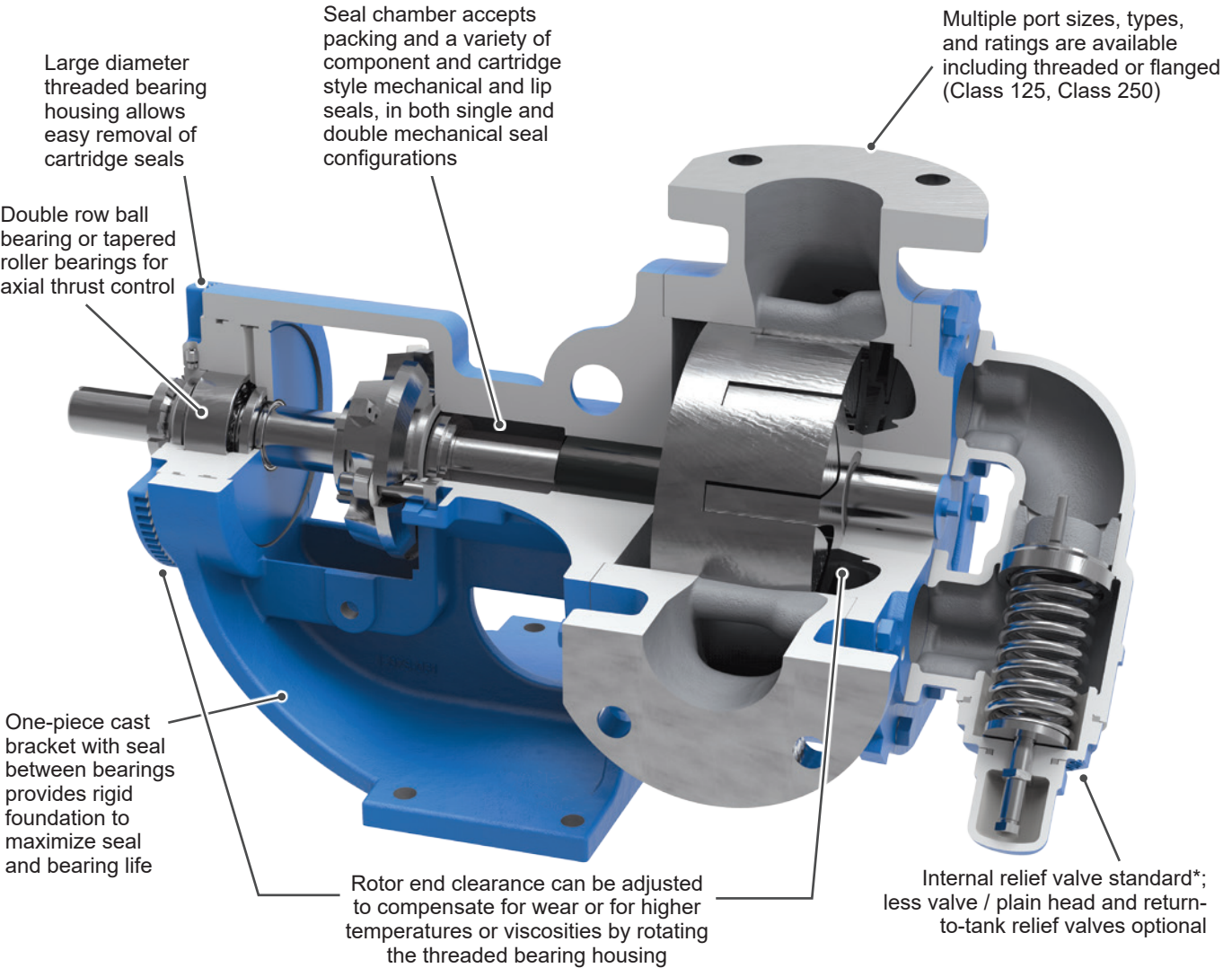
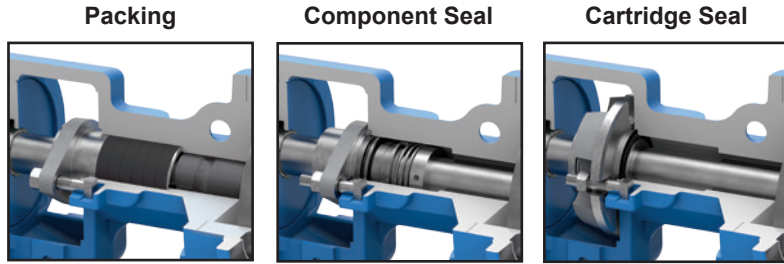
- ① G, H and HL sizes have a powdered metal idler: Powdered Metal MPIF 35, FC-0208-50 (G) , Powdered Metal MPIF 35, FC-0208-45 (H, HL)
- ② Q and QS sizes have a hardened steel idler when pump is steel fitted: ASTM A148 Grade 80-40.
- ③ AK, KK, LS, QS, N and RS sizes have ductile iron rotor: ASTM A536 Grade 60-40-18.
- ④ Material specification for HL steel rotor is AISI 8620, LS steel rotor is ASTM A148 80-50.
- ⑤ L, LQ, LL and LS sizes, including "A", "AE", and "B" models, are high strength steel ASTM A434 Type 4140 Grade BC or equivalent.
- ⑥ RS relief valve not available. Contact factory for options.

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**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

**CUTAWAY VIEW & PUMP FEATURES (124A/AE, 4124A/AE, 324A, 4324A)**

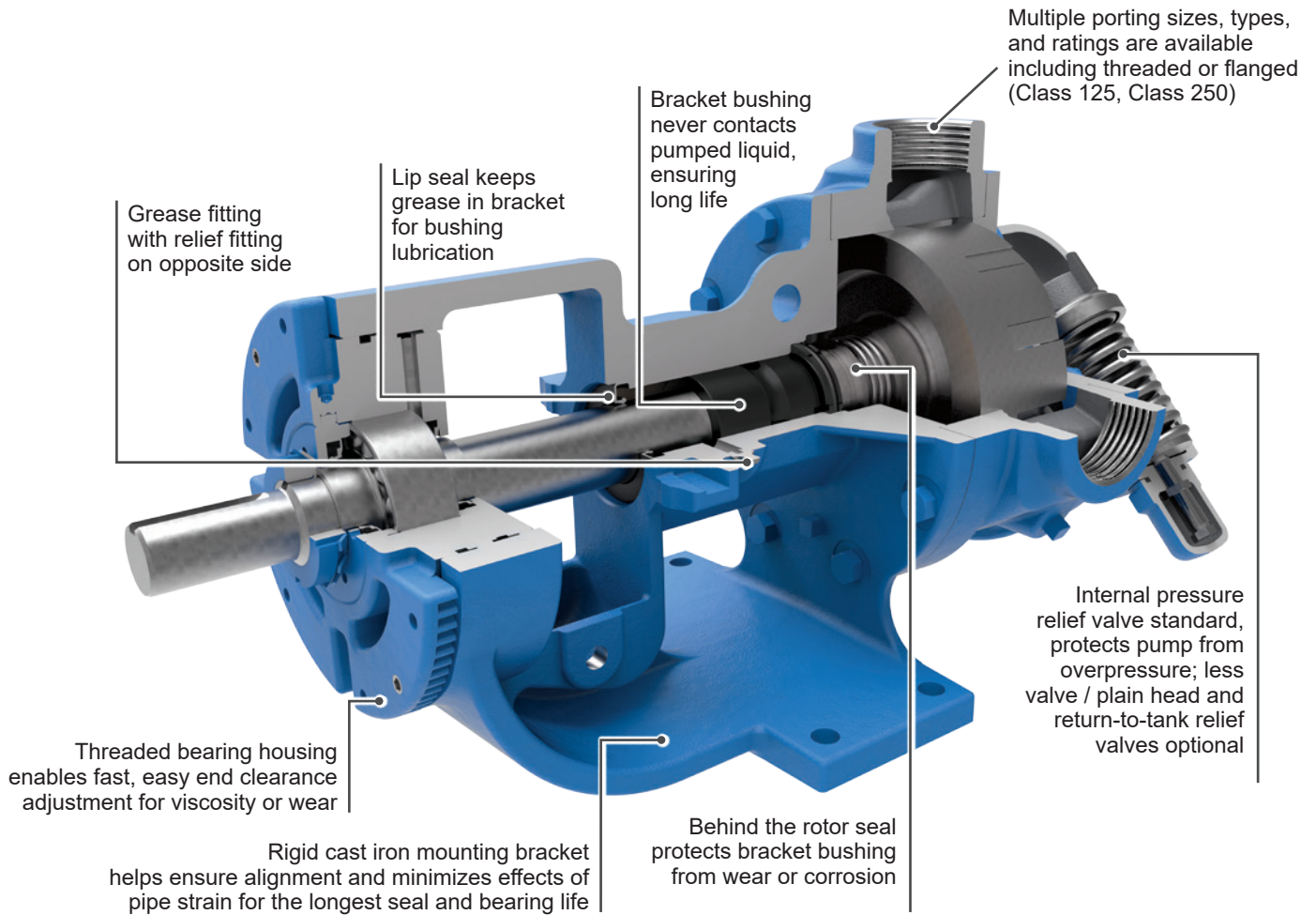


\* All except RS size

**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

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**CUTAWAY VIEW & PUMP FEATURES (4124B)**



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**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

## SPECIAL MATERIALS & OPTIONS SELECTION GUIDELINES

### For High Viscosities – Above 2,500 SSU (550 cSt)

- Steel fitted construction recommended above the following viscosities, according to pump size:

Viscosity	Pump Size																
	G	H	HL	AK	AL	K	KK	L	LQ	LL	LS	Q	QS	M	N	R	RS
SSU	7,500	25,000	7,500	25,000	25,000	25,000	75,000	25,000	25,000	2,500	75,000	7,500	75,000	25,000	75,000	25,000	75,000
cSt	1,700	5,500	1,700	5,500	5,500	5,500	17,000	5,500	5,500	550	17,000	1,700	17,000	5,500	17,000	5,500	17,000

- Extra clearances, depending on viscosity. See ES-2 for recommendations.
- Special Sealing:  
Viton™ or Buna N Type 1 component seals good up to 15,000 SSU (3,300 cSt).  
PTFE Type 9 seals good up to 25,000 SSU (5,500 cSt).  
Packed gland good up to 2,000,000 SSU (440,000 cSt).  
Cartridge triple lip seals available to 2,000,000 SSU (440,000 cSt).
- Larger ports may be required depending on suction conditions.
- Pump should be operated at slower than normal speeds, which may require a larger pump.
- For viscosities over 250,000 SSU (55,000 cSt), contact factory for additional pump construction and operation recommendations.

### For low viscosities or non-lubricating liquids – Below 100 SSU (20 cSt)

- Carbon graphite bushings.
- Pump should be operated at slower than normal speeds, which may require a larger pump.

### For high temperatures – Above 225°F (105°C)

- High temperature elastomers – Viton™ up to 350°F (175°C); Buna up to 225°F (105°C); PTFE up to 450°F (230°C);
- High temperature bushings recommended depending on temperature, size and specific material. See ESB-3 for recommendations.
- Additional operating clearances may be required depending on temperature, size and specific material. See ES-2 for recommendations.
- For temperatures above 450°F (230°C), special materials and sealing requirements may be needed. Contact factory for recommendations.
- Pump should be operated at slower than normal speeds, which may require a larger pump.

### For abrasive or dirty liquids

- If possible, filter or strain out the abrasives present.
- Wear resistant bushings - hardened cast iron, tungsten carbide or Colmonoy coated.
- Abrasive-resistant idler pin - tungsten carbide or Colmonoy plus TC filler coated pins.
- Hardened or hard-coated shaft.
- Abrasive-resistant seals.
- For high concentrations of abrasives or particle sizes greater than 250 microns (0.010 in), contact factory for recommendations.
- Pump should be operated at slower than normal speeds, which may require a larger pump.
- Consult factory for specific recommendations.

**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

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**SPECIFICATIONS – G THROUGH L SIZES**

Model Number	③ Standard NPT Port Size	Nominal Pump Rating (100 SSU & below)			④ Maximum Hydrostatic Pressure		① Maximum Discharge Pressure		② Maximum Recommended Temperature for Standard Pump		Approx. Shipping Weight with Valve	
	Inches	GPM	m <sup>3</sup> /h	RPM	PSIG	BAR	PSIG	BAR	°F	°C	Lbs.	Kg.
G124A	1	8	1.8	1750	400	28	200	14	450	230	25	11
G4124A	1	8	1.8	1750	400	28	200	14	350	175	25	11
G4124B	1	8	1.8	1750	400	28	200	14	350	175	22	10
H124A	1 ½	15	3.5	1750	400	28	200	14	450	230	38	17
H4124A	1 ½	15	3.5	1750	400	28	200	14	350	175	38	17
H4124B	1 ½	15	3.5	1750	400	28	200	14	350	175	38	17
HL124A	1 ½	30	7	1750	400	28	200	14	450	230	40	18
HL4124A	1 ½	30	7	1750	400	28	200	14	350	175	40	18
HL4124B	1 ½	30	7	1750	400	28	200	14	350	175	40	18
AK124A	2	65	15	1450	400	28	200	14	450	230	82	37
AK4124A	2	65	15	1450	400	28	200	14	350	175	82	37
AK4124B	2	65	15	1450	400	28	200	14	350	175	78	35
AL124A	2	90	20	1450	400	28	200	14	450	230	85	39
AL4124A	2	90	20	1450	400	28	200	14	350	175	85	39
K124A	2	80	18	780	400	28	200	14	450	230	105	48
K4124A	2	80	18	780	400	28	200	14	350	175	105	48
K4124B	2	80	18	780	400	28	200	14	350	175	105	48
KK124A	2	100	23	780	400	28	200	14	450	230	110	50
KK4124A	2	100	23	780	400	28	200	14	350	175	110	50
KK4124B	2	100	23	780	400	28	200	14	350	175	110	50
L124A	2	135	31	640	400	28	200	14	450	230	155	70
L124AE	2	135	31	640	400	28	200	14	450	230	155	70
L4124A	2	135	31	640	400	28	200	14	350	175	155	70
L4124AE	2	135	31	640	400	28	200	14	350	175	155	70
L4124B	2	135	31	640	400	28	200	14	350	175	155	70

① For maximum recommended discharge pressures at different viscosities, see performance curves, which can be electronically generated with the Viking Pump Curve Generator, located on [www.vikingpump.com](http://www.vikingpump.com). If suction pressure exceeds 50 PSIG, consult factory. Higher pressures possible with factory approval based on application details.

② Extra clearances are required above 225°F / 105°C. Higher temperatures can be handled with special construction, consult factory.

③ Ports are tapped for standard (NPT) pipe. Other thread standards available. G through L ports are at 90°.

④ Maximum hydrostatic pressure for standard pump construction. Rating is dependent on seal, gaskets and ports.



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**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

**SPECIFICATIONS – LQ THROUGH RS SIZES**

Model Number	③ Standard Port Size	Nominal Pump Rating (100 SSU & below)			④ Maximum Hydrostatic Pressure		① Maximum Discharge Pressure for 100 SSU liquid at rated speed		② Maximum Recommended Temperature for Standard Pump		Approx. Shipping Weight with Valve	
	Inches	GPM	m <sup>3</sup> /h	RPM	PSIG	BAR	PSIG	BAR	°F	°C	Lbs.	Kg.
LQ124A	2 ½	135	31	640	300	21	200	14	450	232	175	80
LQ124AE	2 ½	135	31	640	300	21	200	14	450	232	175	80
LQ4124A	2 ½	135	31	640	300	21	200	14	350	175	175	80
LQ4124AE	2 ½	135	31	640	300	21	200	14	350	175	175	80
LQ4124B	2 ½	135	31	640	300	21	200	14	350	175	175	80
LL124A	3	140	32	520	300	21	200	14	450	232	185	84
LL124AE	3	140	32	520	300	21	200	14	450	232	185	84
LL4124A	3	140	32	520	300	21	200	14	350	175	185	84
LL4124AE	3	140	32	520	300	21	200	14	350	175	185	84
LL4124B	3	140	32	520	300	21	200	14	350	175	185	84
LS124A	3	200	45	640	300	21	200	14	450	232	190	86
LS4124A	3	200	45	640	300	21	200	14	350	175	190	86
LS4124B	3	200	45	640	300	21	200	14	350	175	190	86
Q124A	4	300	68	520	250	17	200	14	450	232	440	200
Q4124A	4	300	68	520	250	17	200	14	350	175	440	200
Q4124B	4	300	68	520	250	17	200	14	350	175	440	200
QS124A	6	500	114	520	250	17	200	14	450	232	540	245
QS4124A	6	500	114	520	250	17	200	14	350	175	540	245
QS4124B	6	500	114	520	250	17	200	14	350	175	540	245
M124A	4	420	95	420	250	17	200	14	450	232	600	272
M4124A	4	420	95	420	250	17	200	14	350	175	600	272
N324A	6	600	136	350	250	17	200	14	450	232	810	367
N4324A	6	600	136	350	250	17	200	14	350	175	810	367
R324A	8	1100	250	280	250	17	200	14	450	232	1435	651
R4324A	8	1100	250	280	250	17	200	14	350	175	1435	651
RS324A	10	1600	364	280	250	17	125	8.5	450	232	2000	907
RS4324A	10	1600	364	280	250	17	125	8.5	350	175	2000	907

① For maximum recommended discharge pressures at different viscosities, see performance curves, which can be electronically generated with the Viking Pump Curve Generator, located on [www.vikingpump.com](http://www.vikingpump.com). If suction pressure exceeds 50 PSIG, consult factory. Higher pressures possible with factory approval based on application details.

② Extra clearances are required above 225°F / 105°C. Higher temperatures can be handled with special construction, consult factory.

③ Flange ports are suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.

LQ, LL, LS, Q & M ports are at 90°  
QS, N, R and RS ports are at 180° (opposite)

④ Maximum hydrostatic pressure for standard pump construction. Rating is dependent on seal, gaskets and ports.

**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

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**OPTIONAL CASINGS**

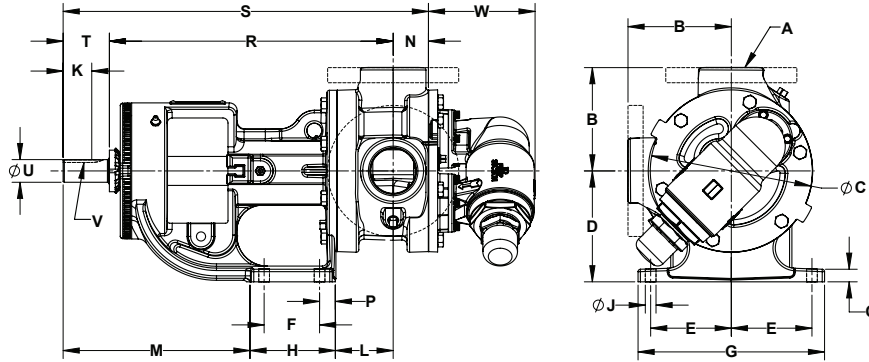
Size	Standard Casings		Optional Casings						
	Ports (Inches)	Rotatable Data							
G	1.5"①®	Fully Rotatable	1.5"②®	1.5"③®	2"②®				
H	1.5"①®	Fully Rotatable	1.5"②®	1.5"③®	2"②®				
HL	1.5"①®	Fully Rotatable	1.5"②®	1.5"③®	2"②®				
AK	1.5"①®	Fully Rotatable	1.5"②®	1.5"③®	2"②®				
AL	1.5"①®	Fully Rotatable	1.5"②®	1.5"③®	2"②®				
K	2"①®	Fully Rotatable	2"②®	2"③®	2.5"①⓪	2.5"②®	3"②®	4"②®	
KK	2"①®	Fully Rotatable	2"②®	2"③®	2.5"①⓪	2.5"②®	3"②®	4"②®	
L	2"①®	Fully Rotatable							
LQ	2.5"②®	Ports cannot face down	2.5"③®	3"②®	4"②®	6"②®*	Side 5"②®, Top 6"②		
LL	3"②®	Fully Rotatable	3"③®	4"②®	5"②®*				
LS	3"②®	Fully Rotatable	3"③®	4"②®*					
Q	4"②®	Fully Rotatable	4"③®	3"②®	5"②®	6"②⓪	Side 4"②®, Top 8"②	Side 4"②⓪, Top 8"②	Side 6"②®, Top 8"②
QS	6"②⓪	Rotatable with special casing	6"②®						
M	4"②®	Fully Rotatable	6"②®	6"②⓪					
N	6"②⓪	Not Rotatable	5"②⓪	6"②⓪					
R	8"②⓪	Not Rotatable	6"②⓪						
RS	10"②⓪	Not Rotatable	10"②						

- ① Port(s) tapped for standard (NPT) pipe.
  - ② Port(s) suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.
  - ③ Port(s) suitable for use with Class 250 ANSI cast iron companion flanges or flanged fittings.
  - ⓪ 90° port arranged for Left Hand inlet (viewed from shaft end)
  - Ⓝ Non-Rotatable Ports at 90° angle, contact factory for available orientation (right hand or left hand)
  - ⓪ Opposite Ports
  - ® 90° port arranged for Right Hand inlet (viewed from shaft end)
- \* Core smaller than port size

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**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

**DIMENSIONS – G THROUGH Q & M SIZES**



These dimensions are average and not for construction purposes. Certified prints on request.

NOTE: Dimensions "N" through "W" on next page

Model Number		A (in)		B	C	D	E	F	G	H	J	K	L	M
Packed	Mechanical Seal													
G124A	G4124A	① 1	in	2.50	3.66	2.75	1.62	1.31	4.00	2.38	0.34	0.57	1.21	4.87
	G4124B		mm	64	93	70	41	33	102	60	9	14	31	124
H124A HL124A	H4124A	① 1.5	in	3.00	4.75	3.50	2.75	2.25	6.75	3.50	0.47	0.99	3.38	5.19
	HL4124A HL4124B		mm	76	121	89	70	57	171	89	12	25	86	132
AK124A AL124A	AK4124A	① 2	in	4.50	6.75	5.25	2.88	2.00	6.75	4.03	0.41	1.67	2.82	8.84
	AL4124A AK4124B		mm	114	171	133	73	51	171	102	10	42	72	225
K124A KK124A	K4124A	① 2	in	5.12	8.00	5.50	4.00	2.75	9.25	4.00	0.53	1.42	3.00	9.38
	KK4124A KK4124B		mm	130	203	140	102	70	235	102	13	36	76	238
L124A/AE	L4124A/AE	① 2	in	6.50	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42 ④	3.38	9.12
	L4124B		mm	165	260	178	111	102	254	137	13	36 ④	86	232
LQ124A/AE	LQ4124A/AE	② 2.5	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42 ④	3.38	9.12
	LQ4124B		mm	183	260	178	111	102	254	137	13	36 ④	86	232
LL124A/AE	LL4124A/AE	② 3	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42 ④	3.38	9.12
	LL4124B		mm	183	260	178	111	102	254	137	13	36 ④	86	232
LS124A	LS4124A	② 3	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	2.55	4.75	9.12
	LS4124B		mm	183	260	178	111	102	254	137	13	65	121	232
Q124A	Q4124A	② 4	in	8.25	14.00	8.75	4.12	4.00	10.00	6.00	0.69	3.58	6.62	11.12
	Q4124B		mm	210	356	222	105	102	254	152	18	91	168	282
M124A	M4124A	② 4	in	9.50	17.35	10.00	5.00	6.00	12.00	8.53	0.69	3.50	7.75	8.10
			mm	241	441	254	127	152	305	217	18	89	197	206

① Ports are tapped for standard (NPT) pipe. Other thread standards available.

② Ports are suitable for use with Class 125 ANSI cast iron.

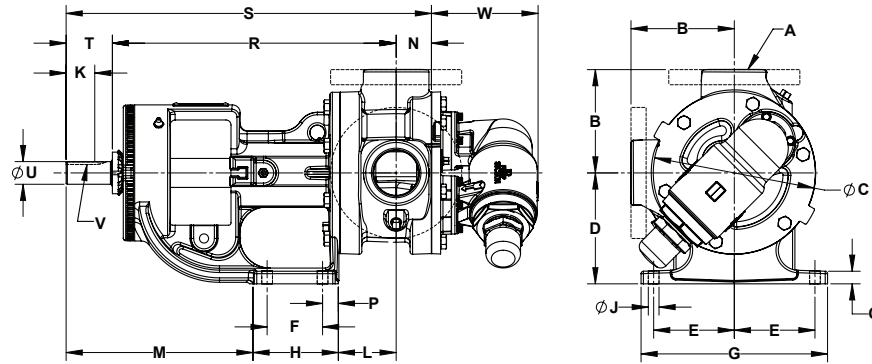
③ Ports are suitable for Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.

④ "K" dimension for L, LQ & LL sizes is for "A" and "B" models. "K" dimension for L, LQ & LL size "AE" models is 1.30" (33.0 mm).

**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

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**DIMENSIONS – G THROUGH Q & M SIZES (CONTINUED)**



These dimensions are average and not for construction purposes. Certified prints on request.

NOTE: Dimensions "A" through "M" on previous page

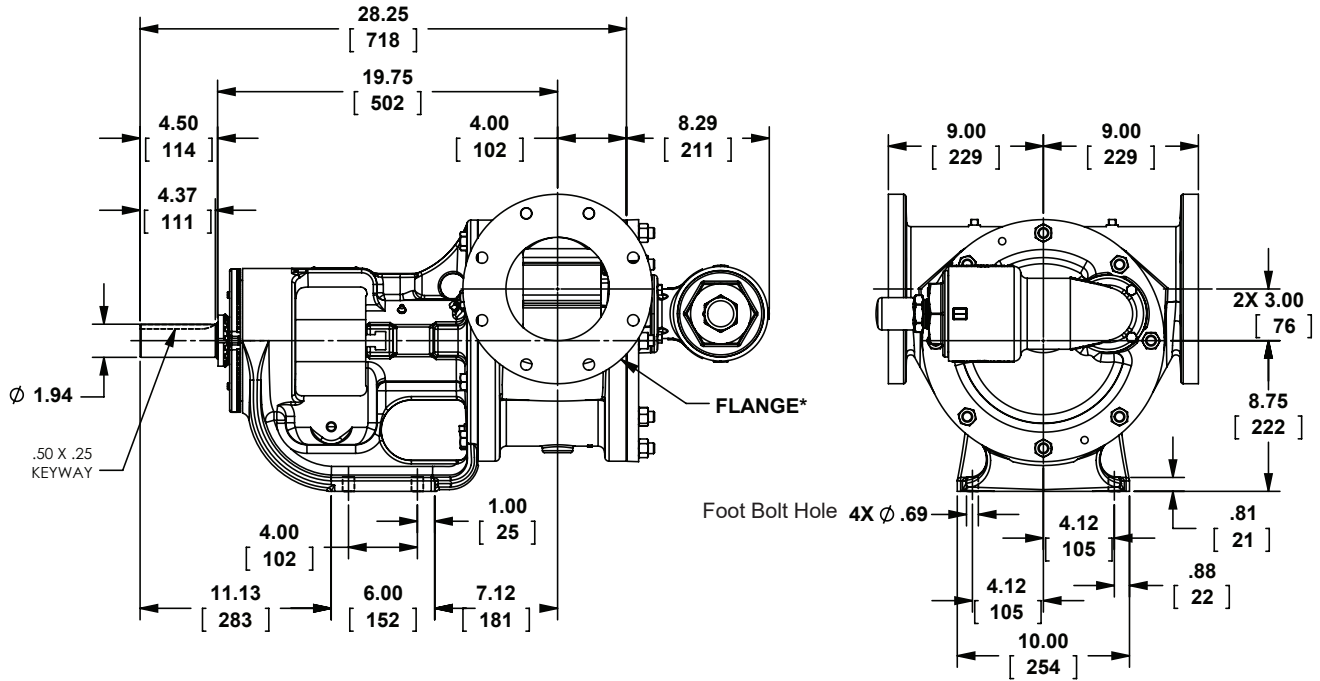
Model Number			N	O	P	R	S	T	U (in)	V (in)	W
Packed	Mechanical Seal										
G124A	G4124A G4124B	in	1.09	0.31	0.63	7.40	9.55	1.06	0.50	.12 x .06	2.71
		mm	28	8	16	188	143	27			69
H124A HL124A	H4124A H4124B HL4124A HL4124B	in	1.19	0.56	0.62	10.44	13.25	1.62	0.75	.19 x .09	2.85
		mm	30	14	16	265	337	41			72
AK124A AL124A	AK4124A AL4124A AK4124B	in	2.00	0.44	1.00	13.19	17.69	2.50	1.00	.25 x .12	4.83
		mm	51	11	25	335	449	64			123
K124A KK124A	K4124A K4124B KK4124A KK4124B	in	1.75	0.62	0.62	14.12	18.12	2.25	1.12	.25 x .12	5.25
		mm	44	16	16	359	460	57			133
L124A	L4124A	in	1.75	0.62	0.62	15.62	19.62	2.25	1.12	.25 x .12	5.43
		mm	44	16	16	397	498	57			138
L124AE	L4124AE L4124B	in	1.75	0.62	0.62	15.62	19.62	2.35	1.44	.38 x .19	5.43
		mm	44	16	16	397	498	60			138
LQ124A	LQ4124A	in	1.75	0.62	0.62	15.62	19.62	2.25	1.12	.25 x .12	5.43
		mm	44	16	16	397	498	57			138
LQ124AE	LQ4124AE LQ4124B	in	1.75	0.62	0.62	15.62	19.62	2.35	1.44	.38 x .19	5.43
		mm	44	16	16	397	498	60			138
LL124A	LL4124A	in	2.25	0.62	0.62	15.62	20.12	2.25	1.12	.25 x .12	5.43
		mm	57	16	16	397	511	57			138
LL124AE	LL4124AE LL4124B	in	2.25	0.62	0.62	15.62	20.12	2.35	1.44	.38 x .19	5.43
		mm	57	16	16	397	511	60			138
LS124A	LS4124A LS4124B	in	2.44	0.62	0.62	15.75	21.69	3.50	1.44	.38 x .19	5.43
		mm	62	16	16	400	551	89			138
Q124A	Q4124A Q4124B	in	3.00	0.8	1.00	19.25	26.75	4.50	1.94	.50 x .25	8.25
		mm	76	20	25	489	679	114			210
M124A	M4124A	in	4.00	1.00	1.52	20.13	28.38	4.25	1.94	.50 x .25	8.61
		mm	102	25	39	511	721	108			219

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**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

**DIMENSIONS – QS SIZE**

Dimensions shown in inches with millimeter equivalent shown in parentheses



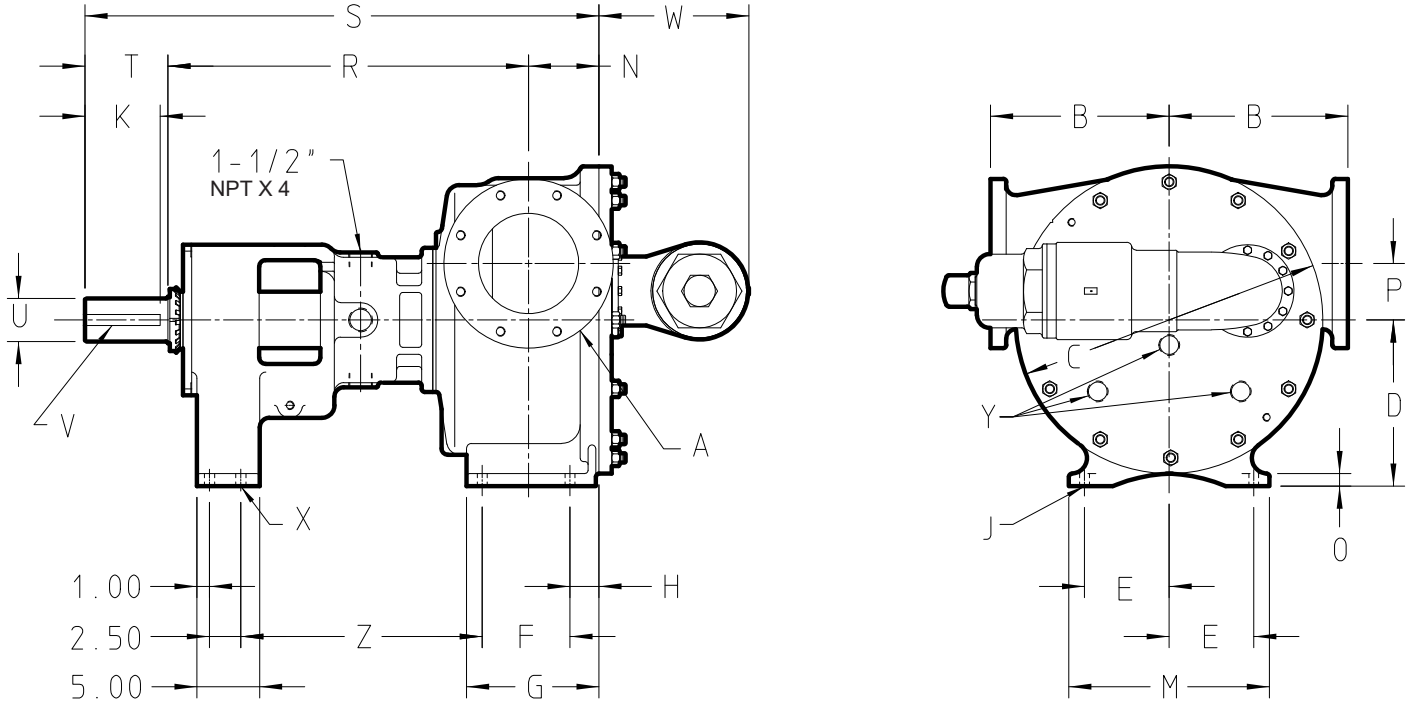
\* 124A/4124A ports suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.

**NOTE:** Flanges are 6", suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings. They are studded, not through-bolt.

**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

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**DIMENSIONS – N, R & RS SIZES – JACKETED BRACKET (324A, 4324A)**



Model Number	Stuffing Box Seal	A (in)		B	C	D	E	F	G	H	J	K	M	N	O	P	R	S	T	U (in)	V (in)	W	X	Y	Z
N324A	N4324A	①	in	9.75	17.25	9.50	5.00	6.25	8.69	1.62	0.69	4.50	12.00	4.50	1.00	3.00	26.00	36.50	6.00	2.44	.62 x.31	8.63	0.69	—	18.94
		6	mm	248	438	241	127	159	221	41	18	114	305	114	25	76	660	927	152						
R324A	R4324A	①	in	14.25	24.50	13.25	6.75	7.00	10.56	2.31	0.78	6.00	16.00	5.62	1.00	4.50	28.75	41.00	6.62	3.44	.88 x.44	12.00	0.69	1.25	19.25
		8	mm	362	622	337	171	178	268	59	20	152	406	143	25	114	730	1041	168						
RS324A	RS4324A	①	in	14.25	24.5	13.25	6.75	7.00	13.12	4.81	0.88	6.00	16.46	8.12	1.30	4.50	28.55	43.49	6.62	3.44	.88 x.44	—	0.88	1.25	19.25
		10	mm	362	622	337	171	178	333	122	22	152	418	206	33	114	725	1105	168						

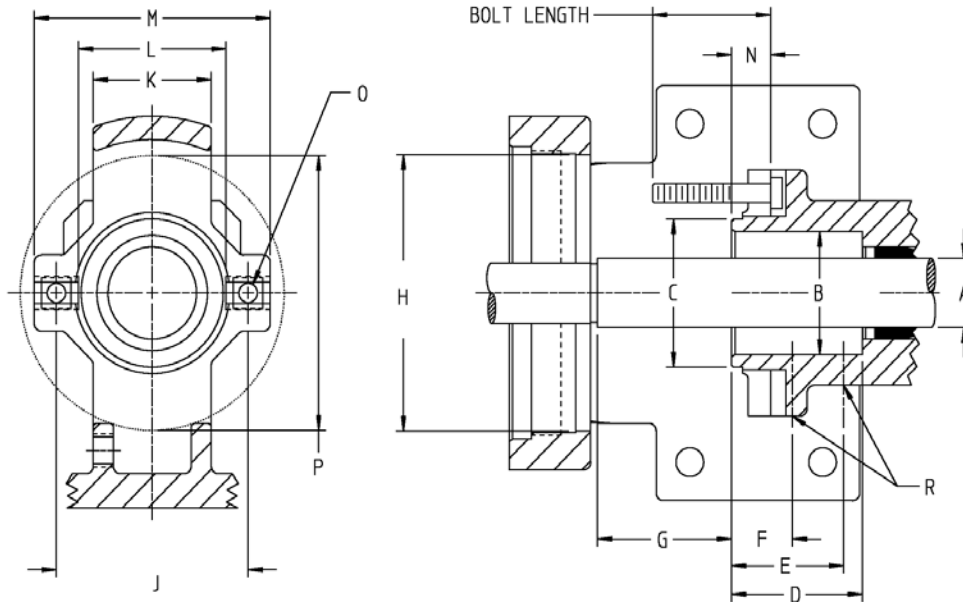
① Ports are suitable for use with Class 125 ANSI cast iron (324A/4324A)

**NOTE:** The N size is standard with a jacketed bracket and non-jacketed head and non-jacketed relief valve, while the “R” size is standard with a jacketed bracket, a jacketed head, and a non-jacketed relief valve. “RS” contact factory for jacketing options. RS relief valve not available. Contact factory for options.

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**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

**DIMENSIONS – STUFFING BOX SEAL CHAMBER (EXCEPT 4124B)**



Pump Size		A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
G	In	0.75	1.63	2.12	1.91	1.38	0.57	1.72	3.87	2.74 to 3.12	1.64	2.24	3.62	1.00	5/16	3.87	1/8
	mm		41	54	49	38	15	44	98	70 to 79	42	57	92	25		98	3
H & HL	In	1.12	2.00	2.41	2.22	1.90	1.03	2.27	4.50	3.00 to 3.50	2.00	2.50	4.00	0.66	5/16	4.47	1/8
	mm		51	61	56	48	26	58	114	76 to 89	51	64	102	17		114	3
AK & AL	In	1.44	2.31	2.69	2.75	2.25	1.24	3.03	5.25	3.14 to 4.56	2.50	3.00	5.00	0.47	7/16	6.15	1/4
	mm		59	68	70	57	32	77	133	80 to 116	64	76	127	12		156	6
K & KK	In	1.44	①2.31	3.00	3.13	2.25	1.25	3.00	5.25	3.50 to 4.50	2.50	3.00	5.00	0.38	7/16	5.25	1/4
	mm		①58.7	76	80	57	32	76	133	89 to 114	64	76	127	10		133	6
L, LQ, & LL (A)	In	1.44	①2.31	3.00	3.13	2.25	1.25	4.00	5.25	3.50 to 4.50	2.50	3.00	5.00	0.44	7/16	5.25	1/4
	mm		①58.7	76	80	57	32	102	133	89 to 114	64	76	127	11		133	6
L, LQ, & LL (AE)	In	1.62	2.38	3.00	3.13	2.25	1.16	3.52	5.25	3.50 to 4.50	3.00	3.00	5.00	0.46	7/16	5.25	1/4
	mm		60	76	80	57	30	89	133	89 to 114	76	76	127	12		133	6
LS	In	1.62	2.38	2.80	2.70	2.25	1.16	3.52	5.25	3.25 to 4.50	3.00	2.80	5.00	0.46	7/16	5.25	1/4
	mm		60	71	69	57	30	89	133	83 to 114	76	71	127	12		133	6
Q & QS	In	2.44	3.42	4.50	4.00	2.50	1.53	4.10	6.75	5.50 to 6.25	3.20	4.50	7.20	0.56	5/8	6.75	1/4
	mm		87	114	102	64	39	104	171	140 to 159	81	114	183	14		171	6
M	In	2.44	3.44	—	3.97	2.50	1.53	4.16	6.75	5.44 to 6.26	3.28	4.50	7.20	0.72	5/8	7.37	1/4
	mm		87	—	101	64	39	106	171	138 to 159	83	114	183	18		187	6
N	In	3.44	4.69	—	5.56	1.65	—	4.91	8.81	6.75	—	—	—	—	②3/4	9.00	1/4
	mm		119	—	141	42	—	125	224	171	—	—	—	—		229	6
R & RS	In	4.50	5.75	—	5.56	1.53	—	4.79	9.81	7.75	—	—	—	—	②3/4	9.81	1/4
	mm		146	—	141	39	—	122	249	197	—	—	—	—		249	6

① Bracket is counter bored to a diameter of 2.687 inches (68 mm), 0.12 inches (3 mm) deep from stuffing box face.

② Studs are used in place of cap screws.

**UNIVERSAL PRODUCT LINE:  
CAST IRON — NON-JACKETED PUMPS**  
SERIES 124A, 124AE, 4124A, 4124AE, 4124B, 324A, 4324A

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**NPSH REQUIRED**

Printed performance curves are not available.

Performance curves can be electronically generated with the Viking Pump Curve Generator on [vikingpump.com](http://vikingpump.com).

NPSHR data is not available on the pump selector.

**NPSH (Net Positive Suction Head):** The  $NPSH_R$  (Net Positive Suction Head Required by the pump) is given in the table below and applies for viscosities through 750 SSU.  $NPSH_A$  (Net Positive Suction Head – Available in the system) must be greater than the  $NPSH_R$ . For a complete explanation of NPSH, see Application Data Sheet AD-19.

**FOR VISCOSITIES UP TO 750 SSU –** See  $NPSH_R$  table below.

**$NPSH_R$  for high viscosities can be estimated using the following method:**

1. Calculate line loss for a 1 foot long pipe of a diameter matching the pump inlet port size. Use your flow rate and max viscosity.
2. Convert this value into Feet of Liquid (S.G. 1.0)
3. Add this value to the  $NPSH_R$  value in the chart below.

$NPSH_R$  – FEET OF LIQUID (Specific Gravity 1.0), Viscosities up to 750 SSU

PUMP SIZE	PUMPS SPEED, RPM														
	100	125	155	190	230	280	350	420	520	640	780	950	1150	1450	1750
G	—	—	—	—	—	—	—	1.8	2.0	2.2	2.6	3.1	3.9	5.6	7.6
H, HL	—	—	—	—	1.7	1.8	1.9	2.1	2.4	2.8	3.4	4.5	6.2	9.5	13.5
AK, AL	—	—	1.6	1.7	1.8	2.0	2.3	2.7	3.2	3.9	5.5	7.7	11.2	—	—
K, KK	—	1.7	1.8	1.9	2.1	2.3	2.8	3.3	4.4	6.3	9.1	—	—	—	—
L	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	10.8	—	—	—	—	—
LQ	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	10.8	—	—	—	—	—
LL	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	—	—	—	—	—	—
LS	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	10.8	—	—	—	—	—
Q, QS	1.9	2.1	2.3	2.7	3.3	4.2	6.1	8.4	12.7	—	—	—	—	—	—
M	2.1	2.3	2.8	3.4	4.3	6.0	9.0	12.7	—	—	—	—	—	—	—
N	2.1	2.3	3.5	4.5	6.3	9.5	15.0	—	—	—	—	—	—	—	—
R	6.1	7.1	8.3	10.1	12.1	15.2	—	—	—	—	—	—	—	—	—
RS	7.0	8.5	10.4	13.1	17.2	22.4	—	—	—	—	—	—	—	—	—





**Mechanical Test (MT) – Group**

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# Oil Sight Glass Calibration

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## 1. **SAFETY INFORMATION**

- 1.1. See PPE Assessments, where posted, for guidance on proper Personal Protective Equipment.
- 1.2. Follow all Lab PPE requirements.

## 2. **PURPOSE**

- 2.1. This document will show the process for oil level calibration for oil consumption of sequence VIE Tests.

## 3. **EQUIPMENT & PARTS**

- 3.1. Laser Level, self leveling or manual with bubble levels
- 3.2. Camera and mount, to be wired to stand's computer
- 3.3. Scale mounted next to the oil sight glass, notched to allow for adjustment
- 3.4. Stand for the laser level, using magnet on laser or a small shelf, adjustable for height (see instructions for examples)

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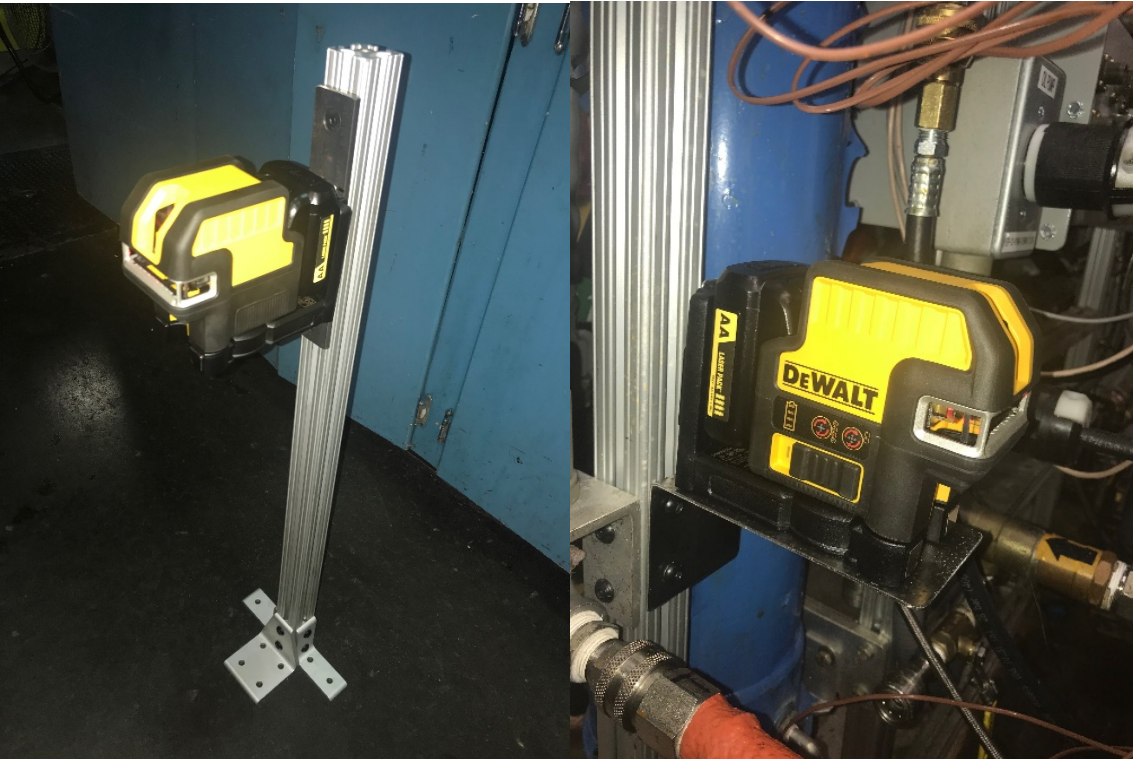
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#### 4. HARDWARE PREPARATION

4.1. Machine slots into the scale to allow to be mounted and adjusted next to the sight glass using bolts/screws (see figure)



4.2. Create a stand for the laser that allows for height adjustment (see figure for examples)



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4.3. Mount camera near engine pointed towards oil sight glass and scale (see figure).



## 5. OIL LEVELING INSTRUCTIONS

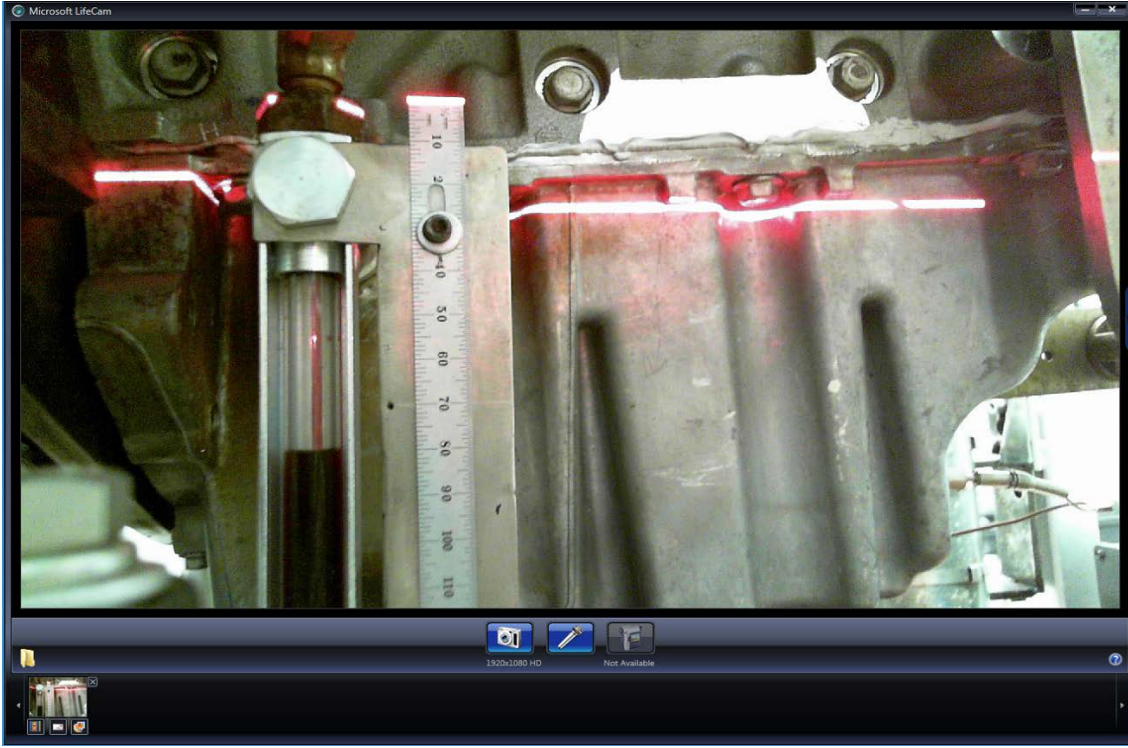
5.1. While engine is cold/not running, place level on stand and adjust height until horizontal laser is even with the bottom of the rearmost tab on the oil pan (See figure).



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- 5.2. Adjust scale so that the very top of the scale (the zero of the scale) is even with the horizontal laser, to be sure that the oil pan tab and the scale are at the same level (see view from camera) (screenshot was taken during test, oil level in this picture is not to be taken as part of the procedure).



- 5.3. Put laser away for safekeeping and to avoid damage
- 5.4. Measure 5.9L of BL oil and pour into the engine
- 5.5. Start engine and ramp to flush 1A conditions
- 5.6. Once stabilized at the above conditions, the level on the sight glass is to be recorded and marked as the full level. This full mark should be  $65 \pm 5$  mm from the bottom of the oil pan tab, per ASTM sequence VIE Procedure.
- 5.7. With the proper full mark established on the oil pan sight glass tube and the engine running at Flush conditions, drain 200 mL of oil from the engine at the outlet (top) of the oil heater. Allow a few minutes for system to stabilize then record the scale level for 200 mL low.



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5.8. Repeat above in increments of 200 mL until a total of 1800 mL has been removed from engine. Record the sight glass levels in increments of 200 mL. Its is recommended that an excel table such as this one is used to track each engine’s level.

Oil Level (mL removed from full level)	Enter Scale Reading (mm)
0	70
200	74
400	78
600	84
800	92
1000	98
1200	103
1400	106
1600	108
1800	110

5.9. At each point in the test where oil consumption is to be recorded, record the level from the scale as viewed from the live camera feed. Use the recorded data to linearly interpolate the level of oil consumption.

**6. MAINTENANCE**

6.1. Be sure to keep laser level in a controlled case to prevent damage to the electronics or pendulum that could ruin self leveling capabilities.

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Document Revision Log GasW406

Revision Level	Date Approved	Approved By	Revision Description
0	06/12/2012	NAML	Update Work Instruction for VID
1	8/17/2015	NAML	Update for VIE
2	04/25/2017	JABS	Specified flush conditions
3	08/22/2017	JABS	Added step to vent sight glass
4			Updated procedure to use new laser level and camera method

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