UNIVERSAL PRODUCT LINE:
CAST IRON — NON-JACKETED PUMPS

124C Series™, 1124C Series™, 4124C Series™, 324A Series™, 1324A Series™, 4324A Series™

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RELATED PRODUCTS

Cast Iron, Jacketed Pumps: Catalog Section 2402-IN

Cast Iron, Mag Drive Pumps: Catalog Section 1403

Steel Externals, Non-Jacketed Pumps: Catalog Section 2301

Stainless Steel, Non-Jacketed Pumps: Catalog Section 2701

SERIES DESCRIPTION

124C Series™, 1124C Series™, 4124C Series™:

The Universal Product Line has the broadest range of sealing options of all pumps built by Viking Pump. The U-Plus™ bracket design accepts numerous component seals for use in the stuffing box or behind the rotor, packing, cartridge seals and Viking Pump's own O-Pro® seals.

This is Viking Pump's most versatile line of internal gear pumps with many design and material options. These series are available with the ProPort™ casing and a wide variety of port types and sizes as well as both 90 degree and opposite port arrangements,* enabling flexibility when connecting to piping.

324A Series™, 1324A Series™, 4324A Series™:

Viking's largest size product series in the Universal Product Line offer high capacity and a variety of sealing arrangements including component or cartridge mechanical seals, packing and O-Pro® seals. These products come standard with a jacketed bracket and optional jacketed head.

HL124C

QS4124C

KK1124C

N324A

*90 degree port arrangements available in sizes H-Q

OPERATING RANGE

SERIES	NOMINAL FLOW		MAXIMUM PRESSURE		TEMPERATURE RANGE		VISCOSITY RANGE	
	GPM	m^3h	PSI	Bar	°F	°C	SSU	cSt
124C Series™	8 - 500	1.8 - 114	200	14	−60 to +450	−50 to +230	28 to 2,000,000	0.1 to 440,000
1124C Series™	8 - 400	1.8 - 91	200	14	0 to +350	−15 to +175	100 to 2,000,000	20 to 440,000
4124C Series™	8 - 500	1.8 - 114	200	14	−60 to +450	−50 to +230	28 to 2,000,000	0.1 to 440,000
324A Series™	600 - 1,600	136 - 364	200	14	−60 to +450	−50 to +230	28 to 2,000,000	0.1 to 440,000
1324A Series™	550 - 1,500	125 - 340	200	14	0 to +350	−15 to +175	100 to 75,000 *	20 to 17,000 *
4324A Series™	600 - 1,600	136 - 364	200	14	−60 to +450	−50 to +230	28 to 2,000,000	0.1 to 440,000

* Consult factory for viscosities exceeding the stated operating range

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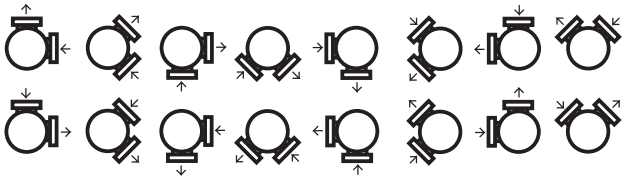
FEATURES & BENEFITS

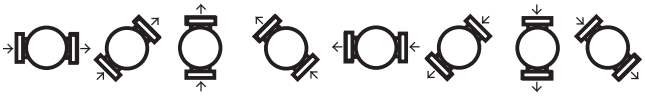
- Positive displacement internal gear pump principle handles a broad range of viscosities with constant flow rate
- **ProPort™ Casing (124C Series™, 1124C Series™ & 4124C Series™):**
  - » Adaptable port design offers a variety of port sizes and types, enabling flexibility when connecting pumps to piping
  - » H-Q sizes available with optional opposite porting
  - » Casing drain allows the pump to be drained without removing the head
  - » Optional O-ring joint seals for high pressure or difficult to seal applications
  - » Internal circulation promotes flow behind the rotor
- **U-Plus™ Bracket (124C Series™, 1124C Series™ & 4124C Series™):**
  - » Seal options include packing, O-Pro® Barrier, single component seals, cartridge lip seals and cartridge single or double mechanical seals
  - » Stainless steel window guards offer protection from rotating parts
- Footed one-piece bracket provides rigid mounting to help maintain alignment, which helps extend seal and bearing life
- 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
- Axial thrust is controlled by a double row ball bearing or tapered roller bearings; bushings provide a secondary point of radial shaft support
- Rotatable bearing housing provides easy rotor end clearance adjustment to compensate for viscosity, temperature or wear
- Numerous material options are available for bushings, idler pins, shafts, idlers, rotors & elastomers
- 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

PORT LOCATION OPTIONS

90° port options:



Opposite port options:



NOTE: See page 2402.8 for a complete list of casing options by size.

ProPort™ casing with adaptable port design.

Refer to page 2401.05 for complete list of port options.

MODEL NUMBER KEY

L S 4 1 2 4 C

Size:
H Q
HL QS
KK N
L R
LS RS

Shaft Seal:
4 = Mechanical Seal
1 = O-Pro® Seal
Blank = Packing

Jacketing:
1 = No Jacketing
3* = Foot Mount Casing w/ Jacketed Bracket

Basic Series Configuration

Material of Construction:
4 = Cast Iron

Seal Location:
A = Stuffing Box Seal
C = U-Plus™ Bracket for Stuffing Box or Behind the Rotor Seals

* 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	Hardened High Strength Steel, ASTM A434, Grade 4140, Class BC	
Idler Pin	Hardened Steel, ASTM A108, Grade 1045	
Idler Bushing	**(4124C Series™, 4324A Series™)**	Carbon Graphite
	(1124C Series™, 1324A Series™)	Hardened Cast Iron
	(124C Series™, 324A Series™)	Bronze, ASTM B584 (B505), Alloy C93700
Bracket Bushing *(Note: not applicable on 1124C Series™ or 1324A Series™)*	**(4124C Series™, 4324A Series™)**	Carbon Graphite
	(124C Series™, 324A Series™)	Bronze, ASTM B584 (B505), Alloy C93700
Pressure Relief Valve	⑤ Cast Iron, ASTM A48, Class 35B	
Standard Packing	**(124C Series™, 324A Series™)**	Braided PTFE
O-Pro® Barrier Seal	**(1124C Series™, 1324A Series™)**	Hardened Cast Iron, Sanitary FKM Elastomers
Standard Mechanical Seal	**(4124C Series™, 4324A Series™)**	Carbon vs. Silicon Carbide Faces, FKM Elastomers
Optional Abrasive Liquid Seal	**(4124C Series™)**	Silicon Carbide vs. Silicon Carbide Faces, FKM Elastomers

① H and HL sizes have a powdered metal idler: Powdered Metal MPIF 35, FC-0208-50 (H, HL)
② Q and QS sizes have a hardened steel idler when pump is steel fitted: ASTM A148 Grade 80-40.
③ 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 RS relief valve not available. Contact factory for options.

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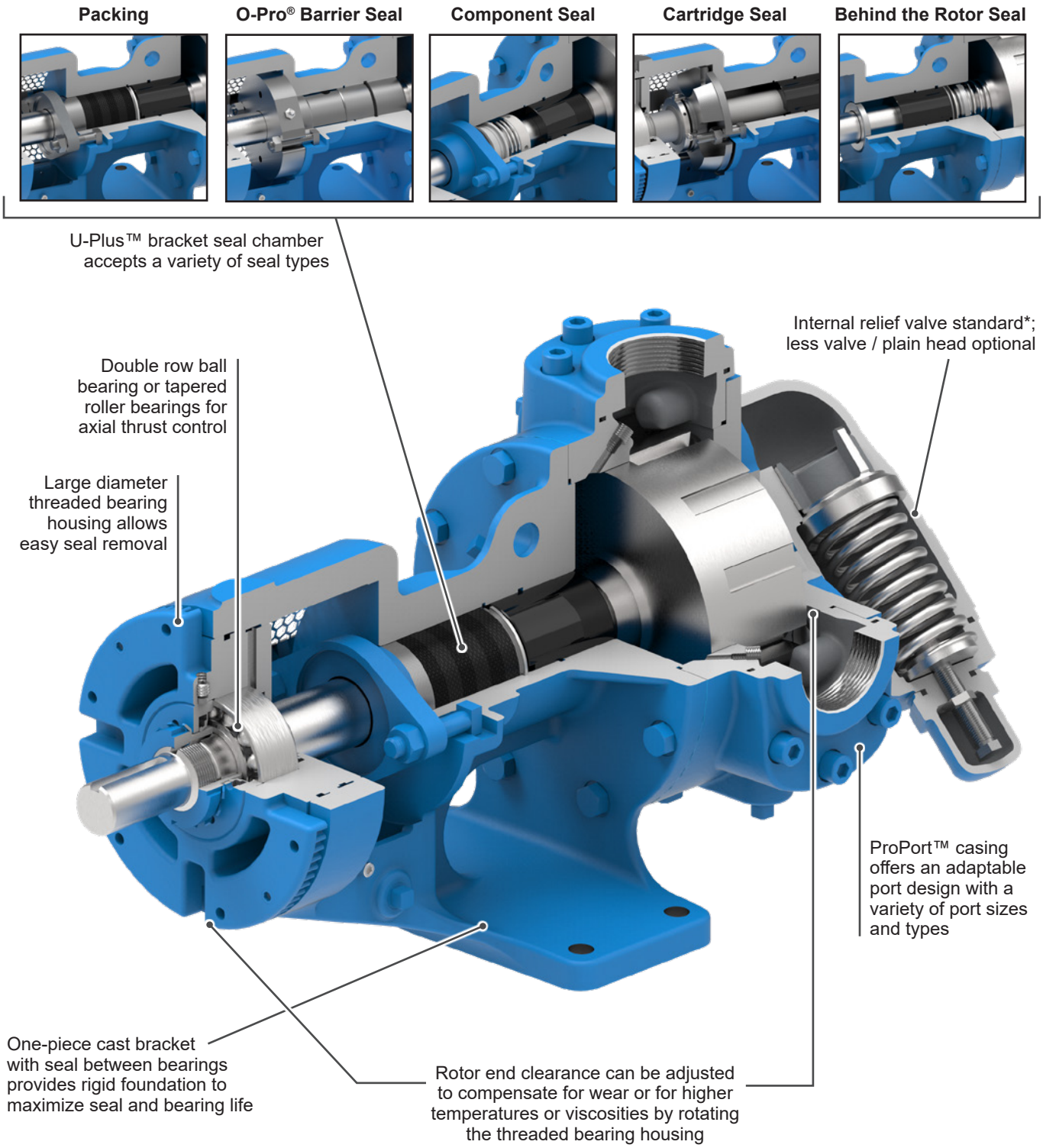
CUTAWAY VIEW & PUMP FEATURES



* All except RS size

PORT OPTIONS FOR PROPORT™ CASING

Port Options	Pump Sizes						
	H	HL	KK	L	LS	Q	QS
1.5" NPT	S **	S **					
2" NPT			S	S			
1.5" Class 125 ①	✓	✓					
1.5" Class 250 ②	✓	✓					
2" Class 125 ①	✓	✓	✓				
2" Class 250 ②	✓	✓	✓				
2.5" Class 125 ①				✓			
2.5" Class 250 ②				✓			
3" Class 125 ①			✓	✓	S		
3" Class 250 ②			✓	✓	✓		
4" Class 125 ①			✓	✓	✓	S	
4" Class 250 ②				✓	✓	✓	
6" Class 125 ①						✓	S
6" Class 250 ②						✓	✓
DIN 32 PN16 *	✓	✓					
DIN 40 PN16 *	✓	✓					
DIN 50 PN16 *	✓	✓	✓				
DIN 65 PN16 *			✓	✓			
DIN 80 PN16 *			✓	✓	✓		
DIN 100 PN16 *				✓	✓	✓	✓
DIN 150 PN16 *						✓	✓

✓ = Available Port Option

S = Standard Porting

① = Ports are suitable for use with Class 150 steel or stainless steel companion flanges or flanged fittings

② = Ports are suitable for use with Class 300 steel or stainless steel companion flanges or flanged fittings

* Ports are suitable for use with DIN PN16 steel or stainless steel companion flanges or flanged fittings

** Please note dimensional difference when replacing legacy product.

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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									
	H	HL	KK	L	LS	Q	QS	N	R	RS
SSU	25,000	7,500	75,000	25,000	75,000	7,500	75,000	75,000	25,000	75,000
cSt	5,500	1,700	17,000	5,500	17,000	1,700	17,000	17,000	5,500	17,000

- Extra clearances, depending on viscosity. See ES-2 for recommendations.
- Special Sealing:
  FKM 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).
  O-Pro® Barrier seals good up to 2,000,000 SSU (440,000 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.
- O-Pro® Barrier seals are not recommended for viscosities less than 100 SSU (20 cSt).

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

- High temperature elastomers – FKM 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.

SPECIFICATIONS

Model Number	③ ④ Standard Port Size	Nominal Pump Rating (100 SSU & below)			⑤ Maximum Hydrostatic Pressure		① Maximum Discharge Pressure		② Maximum Recommended Temperature for Standard Pump		Approx. Shipping Weight with Valve	
	Inches	GPM	m^3/h	RPM	PSIG	BAR	PSIG	BAR	°F	°C	Lbs.	Kg.
H124C	1 ½	15	3.5	1750	400	28	200	14	450	230	39	18
H1124C	1 ½	8	1.8	1000	400	28	200	14	350	175	42	19
H4124C	1 ½	15	3.5	1750	400	28	200	14	350	175	39	18
HL124C	1 ½	30	7	1750	400	28	200	14	450	230	39	18
HL1124C	1 ½	18	4	1000	400	28	200	14	350	175	42	19
HL4124C	1 ½	30	7	1750	400	28	200	14	350	175	39	18
KK124C	2	100	23	780	400	28	200	14	450	230	108	49
KK1124C	2	100	23	780	400	28	200	14	350	175	114	52
KK4124C	2	100	23	780	400	28	200	14	350	175	108	49
L124C	2	135	31	640	400	28	200	14	450	230	170	77
L1124C	2	135	31	640	400	28	200	14	350	175	175	79
L4124C	2	135	31	640	400	28	200	14	350	175	170	77
LS124C	3	200	45	640	300	21	200	14	450	232	224	101
LS1124C	3	200	45	640	300	21	200	14	350	175	229	104
LS4124C	3	200	45	640	300	21	200	14	350	175	224	102
Q124C	4	300	68	520	250	17	200	14	450	232	481	218
Q1124C	4	275	62	470	250	17	200	14	350	175	493	224
Q4124C	4	300	68	520	250	17	200	14	350	175	482	218
QS124C	6	500	114	520	250	17	200	14	450	232	554	251
QS1124C	6	400	91	470	250	17	200	14	350	175	566	257
QS4124C	6	500	114	520	250	17	200	14	350	175	554	251
N324A	6	600	136	350	250	17	200	14	450	232	810	367
N1324A	6	550	125	330	250	17	200	14	350	175	937	425
N4324A	6	600	136	350	250	17	200	14	350	175	810	367
R324A	8	1,100	250	280	250	17	200	14	450	232	1,435	651
R1324A	8	1,000	227	260	250	17	200	14	350	175	1,523	961
R4324A	8	1,100	250	280	250	17	200	14	350	175	1,435	651
RS324A	10	1,600	364	280	250	17	125	8.5	450	232	2,000	907
RS1324A	10	1,500	340	260	250	17	125	8.5	350	175	1,973	895
RS4324A	10	1,600	364	280	250	17	125	8.5	350	175	2,000	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. 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 H-L size ports are tapped for standard (NPT) pipe. Other thread standards available. H through L ports are at 90°.

LS-RS size flange ports are suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.
LS, Q ports are at 90°
QS, N, R, RS ports are at 180° (opposite)

④ Q & QS sizes are standard with ProPort™ casing.

⑤ Maximum hydrostatic pressure for standard pump construction. Rating is dependent on seal, gaskets and ports.

UNIVERSAL PRODUCT LINE:
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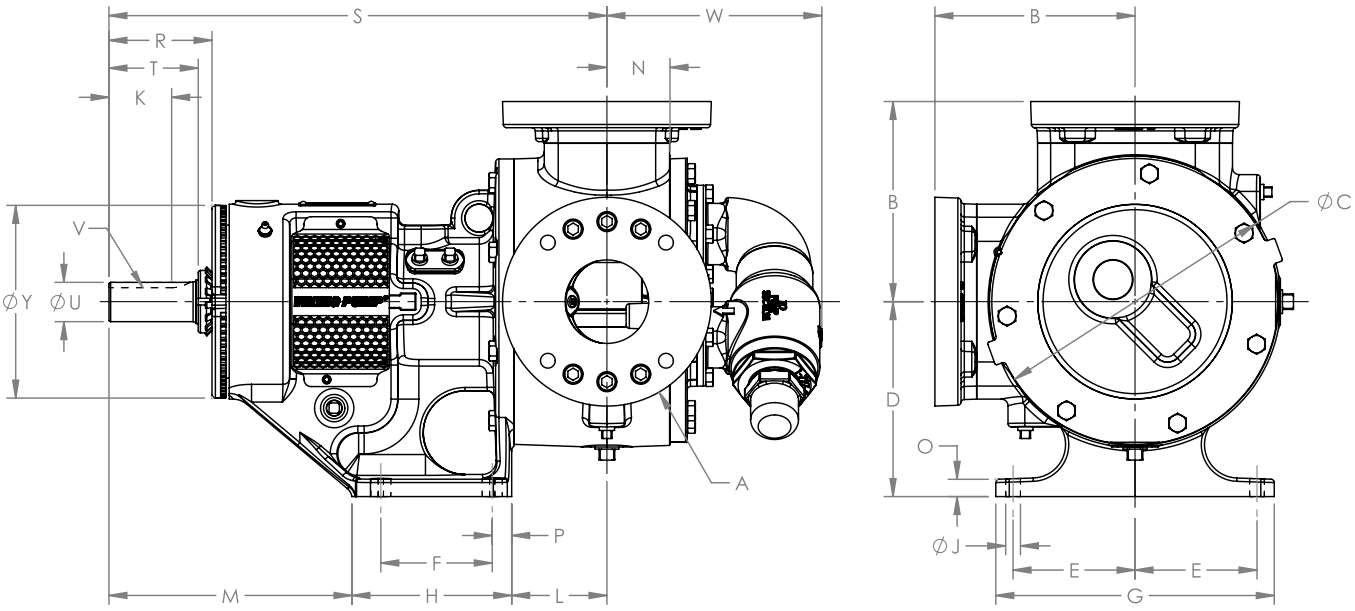
124C Series™, 1124C Series™, 4124C Series™, 324A Series™, 1324A Series™, 4324A Series™

DIMENSIONS – H, HL, KK, L, LS, Q SIZES



Model Number			①						②③						
Packed	O-Pro® Seal	Mechanical Seal	A (in)		B	C	D	E	F	G	H	J	K	L	M
H124C HL124C	H1124C HL1124C	H4124C HL4124C	④1.5	in	3.50	4.75	3.50	2.75	2.25	6.75	3.50	0.47	0.99	3.38	5.19
				mm	89	121	89	70	57	171	89	12	25	86	132
KK124C	KK1124C	KK4124C	2	in	5.25	8.00	5.50	4.00	2.75	9.25	4.00	0.53	1.42	3.00	9.38
				mm	133	203	140	102	70	235	102	13	36	76	238
L124C	L1124C	L4124C	2	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	2.25	3.58	8.89
				mm	183	260	178	111	102	254	137	13	57	91	226
LS124C	LS1124C	LS4124C	3	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	2.55	4.75	9.12
				mm	183	260	178	111	102	254	137	13	65	121	232
Q124C	Q1124C	Q4124C	4	in	8.25	14.00	8.75	4.12	4.00	10.00	6.00	0.69	3.58	6.62	11.12
				mm	210	356	222	105	102	254	152	18	91	168	282

Model Number						②③							
Packed	O-Pro® Seal	Mechanical Seal		N	O	P	R	S	T	U (in)	V (in)	W	Y
H124C HL124C	H1124C HL1124C	H4124C HL4124C	in	1.19	0.56	0.62	2.20	12.06	1.62	0.75	.19 x .09	4.04	5.75
			mm	30	14	16	56	306	41			103	146
KK124C	KK1124C	KK4124C	in	1.75	0.62	0.62	2.84	16.38	2.25	1.12	.25 x .12	7.00	6.75
			mm	44	16	16	72	416	57			178	171
L124C	L1124C	L4124C	in	1.75	0.62	0.62	3.70	17.87	3.13	1.44	.38 x .19	7.18	7.00
			mm	44	16	16	94	454	80			182	178
LS124C	LS1124C	LS4124C	in	2.44	0.62	0.62	3.90	19.25	3.50	1.44	.38 x .19	7.72	7.00
			mm	62	16	16	99	489	89			196	178
Q124C	Q1124C	Q4124C	in	3.00	0.80	1.00	5.20	23.75	4.50	1.94	.50 x .25	11.25	8.38
			mm	76	20	25	132	603	114			286	213

① Unless otherwise noted, ports are suitable for class 125 ANSI iron companion flanges or flanged fittings.

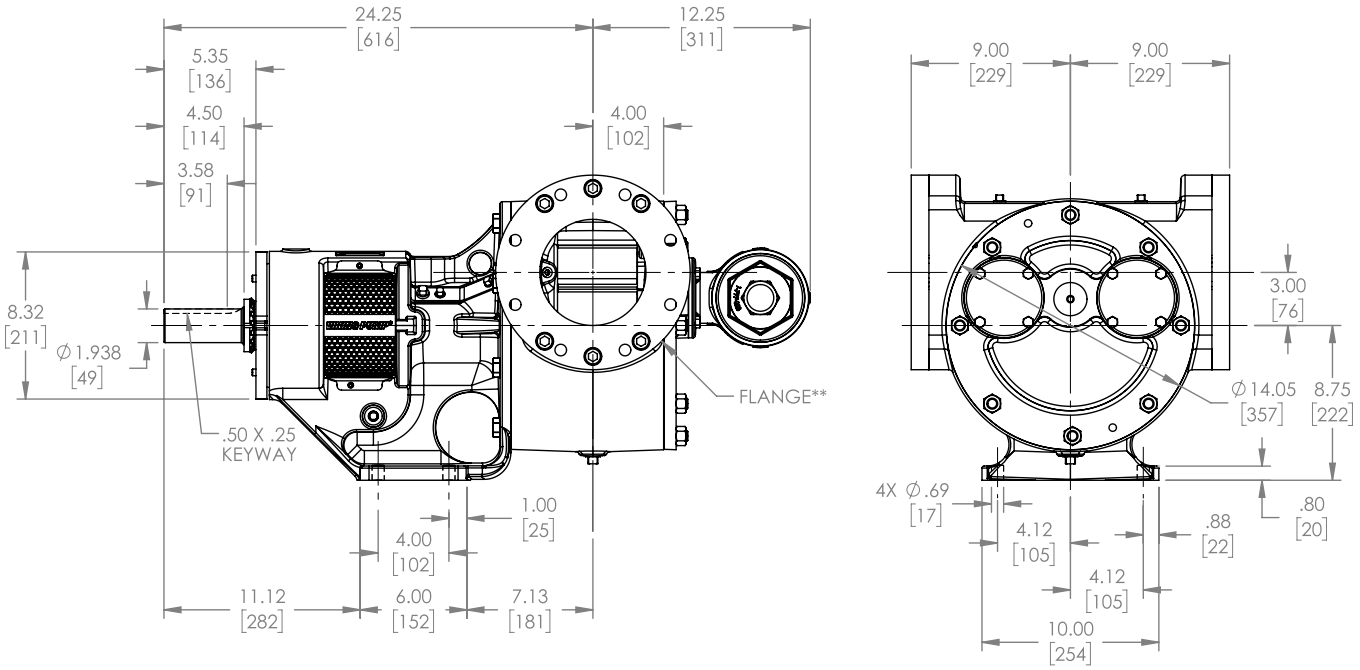
② H-HL bracket foot has slotted foot mounting holes. Dimension F = 1.65-2.38 [42-60] and dimension P = 0.52-0.65 [13-16].

③ L-LL-LS bracket foot has slotted foot mounting holes. Dimension F = 3.81-4.19 [81-106] and dimension P = 0.45-0.64 [12-16].

④ H-HL Pro-Port™ Casing has a different port centerline compared to the integral port casing.

DIMENSIONS – QS SIZE

Dimensions shown in inches with millimeter equivalent shown in parentheses



* 124C Series™, 1124C Series™, 4124C Series™ 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.

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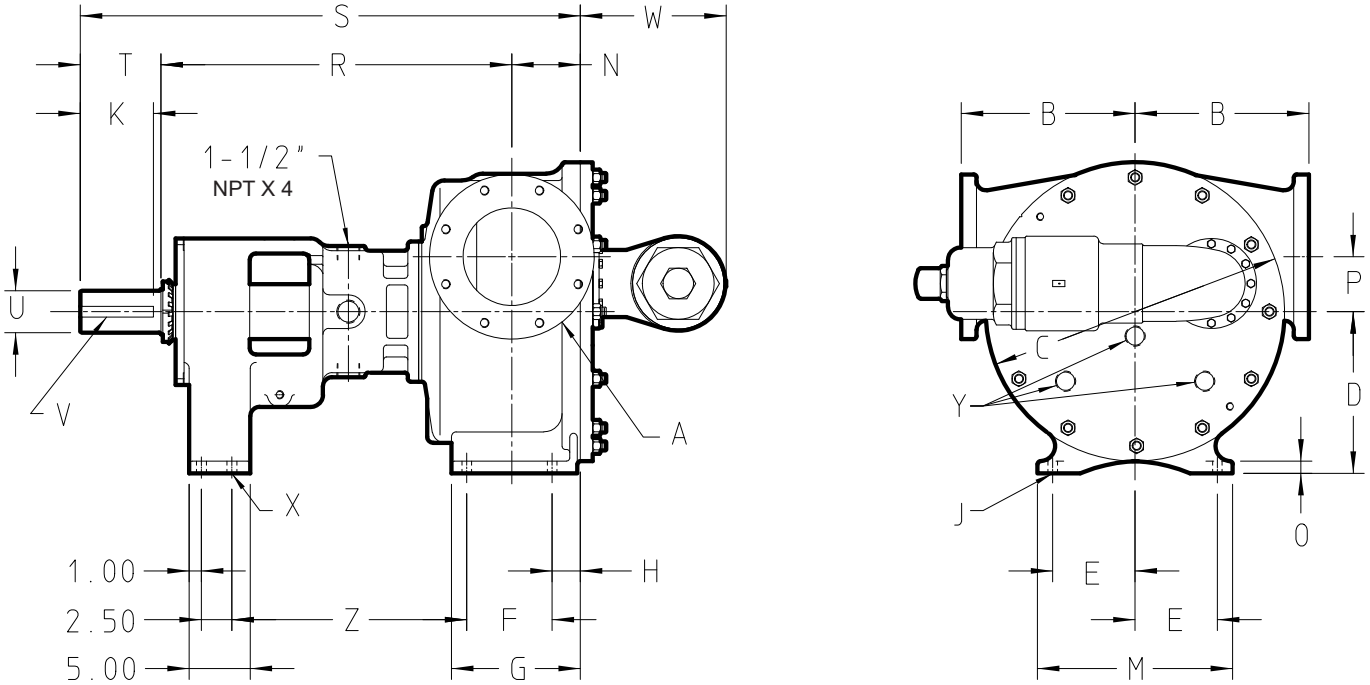
DIMENSIONS – N, R, RS SIZES – JACKETED BRACKET (324A SERIES™, 1324A SERIES™, 4324A SERIES™)



Model Number			A (in)		B	C	D	E	F	G	H	J	K	M	N
Packed	O-Pro® Seal	Stuffing Box Seal													
N324A	N1324A	N4324A	① 6	in	9.75	17.25	9.50	5.00	6.25	8.69	1.62	0.69	4.50	12.00	4.50
				mm	248	438	241	127	159	221	41	18	114	305	114
R324A	R1324A	R4324A	① 8	in	14.25	24.50	13.25	6.75	7.00	10.56	2.31	0.78	6.00	16.00	5.62
				mm	362	622	337	171	178	268	59	20	152	406	143
RS324A	RS1324A	RS4324A	① 10	in	14.25	24.5	13.25	6.75	7.00	13.12	4.81	0.88	6.00	16.46	8.12
				mm	362	622	337	171	178	333	122	22	152	418	206

Model Number				O	P	R	S	T	U (in)	V (in)	W	X	Y	Z
Packed	O-Pro® Seal	Stuffing Box Seal												
N324A	N1324A	N4324A	in	1.00	3.00	26.00	36.50	6.00	2.44	.62 x.31	8.63	0.69	—	18.94
			mm	25	76	660	927	152			219	18	—	481
R324A	R1324A	R4324A	in	1.00	4.50	28.75	41.00	6.62	3.44	.88 x.44	12.00	0.69	1.25	19.25
			mm	25	114	730	1041	168			305	18	32	489
RS324A	RS1324A	RS4324A	in	1.30	4.50	28.55	43.49	6.62	3.44	.88 x.44	—	0.88	1.25	19.25
			mm	33	114	725	1105	168			—	22	32	489

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

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.

NPSH REQUIRED

Printed performance curves are not available.

Performance curves can be electronically generated with the Viking Pump Curve Generator on 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.

PUMP SIZE	PUMPS SPEED, RPM														
	100	125	155	190	230	280	350	420	520	640	780	950	1150	1450	1750
H, HL	—	—	—	—	1.7	1.8	1.9	2.1	2.4	2.8	3.4	4.5	6.2	9.5	13.5
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	—	—	—	—	—
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	—	—	—	—	—	—
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	—	—	—	—	—	—	—	—	—

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