

# UNIVERSAL PRODUCT LINE: CAST IRON — JACKETED PUMPS

224A Series™, 224AE Series™, 1224A Series™, 1224AE Series™, 4224A Series™, 4224AE Series™, 4224B Series™, 324A Series™, 1324A Series™, 4324A Series™

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## RELATED PRODUCTS

Cast Iron, Non-Jacketed Pumps: Catalog Section 1401  
Steel Externals, Jacketed Pumps: Catalog Section 1302  
Stainless Steel, Jacketed Pumps: Catalog Section 1702

## OPERATING RANGE

SERIES	NOMINAL FLOW		MAXIMUM PRESSURE		TEMPERATURE RANGE		VISCOSITY RANGE	
	GPM	m <sup>3</sup> h	PSI	Bar	°F	°C	SSU	cSt
224A Series™ 224AE Series™ **	15 - 500	3 - 114	200	14	-60 to +450	-50 to +230	28 to 2,000,000	0.1 to 440,000
1224A Series™ 1224AE Series™ **	8 - 400	1.8 - 91	200	14	0 to +350	-15 to +175	100 to 2,000,000	20 to 440,000
4224A Series™ 4224AE Series™ **	15 - 500	3 - 114	200	14	-60 to +450	-50 to +230	28 to 2,000,000	0.1 to 440,000
4224B Series™	15 - 500	3 - 114	200	14	-60 to +450	-50 to +230	28 to 250,000	0.1 to 55,000
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

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

## SERIES DESCRIPTION

### 224A Series™, 224AE Series™, 4224A Series™, 4224AE Series™, 324A Series™, 4324A Series™:

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.

### 4224B Series™:

The 4224B 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.

### 1224A Series™, 1224AE Series™, 1324A Series™:

Viking Pump is the leader in internal gear innovation and the latest development is the O-Pro™ Seal technology. The NEW Universal Seal Product Line comes with the O-Pro Barrier Seal factory installed. The Universal Product Line combines the tested reliability of the Universal pump & O-rings to create a robust seal and lubrication chamber, all in one.



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### 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; bushings provided a secondary point of radial shaft support
- Rotatable bearing housing provides easy rotor end clearance adjustment to compensate for viscosity or 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

**224A Series™, 224AE Series™, 1224A Series™, 1224AE Series™, 4224A Series™, 4224AE Series™, 324A Series™, 1324A Series™, 4324A Series™:**

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

**3 Year Limited  
Warranty**

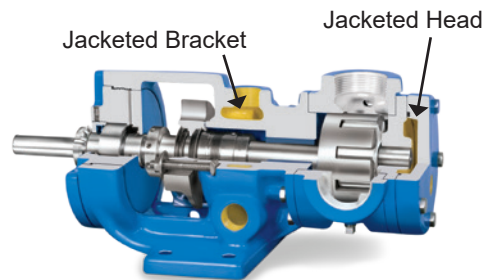
Viking Universal Product Line pumps carry a three year limited warranty. See catalog section 000 for details.

### JACKETING

Jacketed pumps provide a cavity, or jacket, on the external wall of the pump through which steam or heat transfer liquid can be passed to control the temperature of the fluid in the pump. The heat transfer medium flows in a closed loop back to the boiler or heater. Applications include “melting” ambient temperature solids like asphalt which solidify in the pump when it cools, and maintaining precise temperature control in processes like manufacturing polymers and epoxy resins.

#### Standard-Jacketed Pumps

Standard-Jacketed pumps include the 224A Series™, 1224A Series™, 4224A Series™, 224AE Series™, 4224AE Series™ & 4224B Series™. They feature jacketing on the head and bracket only, and are typically used for melting ambient temperature solids.



**Standard-Jacketed Pump Cutaway – HL4224A**

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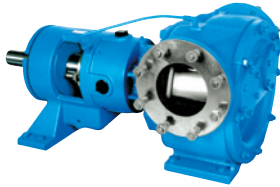
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## RELIEF VALVE CONFIGURATIONS

Jacketed pumps are provided with a jacketed head with no relief valve as standard. Integral pressure relief valves in jacketed and non-jacketed configurations are available on L through N sizes, but require a non-jacketed valve-type head.

The N size 324A Series™, 1324A Series™ & 4324A Series™ pumps are standard with a jacketed bracket, non-jacketed head and non-jacketed relief valve. A jacketed head, or a jacketed relief valve with non-jacketed valve-type head, is available as an option.

The R size 324A Series™, 1324A Series™ & 4324A Series™ pumps are standard with a jacketed bracket, a jacketed head and a non-jacketed relief valve. RS models have a jacketed bracket and head with no relief valve.



**N4324A**  
Non-Jacketed Head with  
Coverplates Shown

## PORTING & SEALING

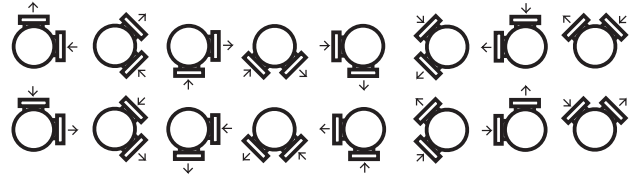
A variety of opposite and 90° port configurations are available, including top suction with bottom or side discharge designs typically mounted at the bottom of a tank or reactor.

Jacketed port options for steam or heat transfer liquid are threaded.

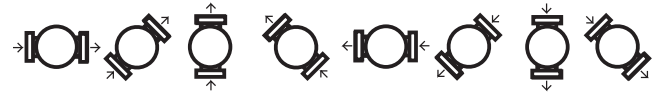
The seal chamber design accepts packing, O-Pro™ seal, component seals or cartridge seals. Seal plans, including API plan 53 and 54, are available. (Not for 4224B)

## REVOLVABLE PUMP CASINGS

### 90° port options:



### Opposite port options:



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

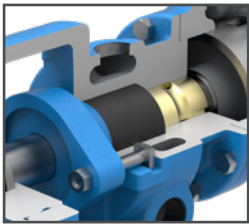
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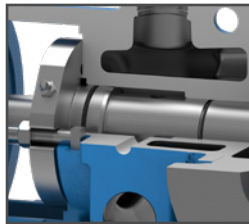
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### CUTAWAY VIEW & PUMP FEATURES (224A SERIES™, 224AE SERIES™, 1224 SERIES™, 1224AE SERIES™, 4224A SERIES™, 4224AE SERIES™, 324A SERIES™, 1324A SERIES™, 4324A SERIES™)

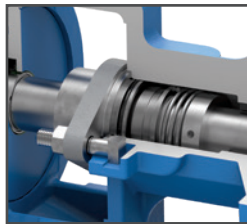
Packing



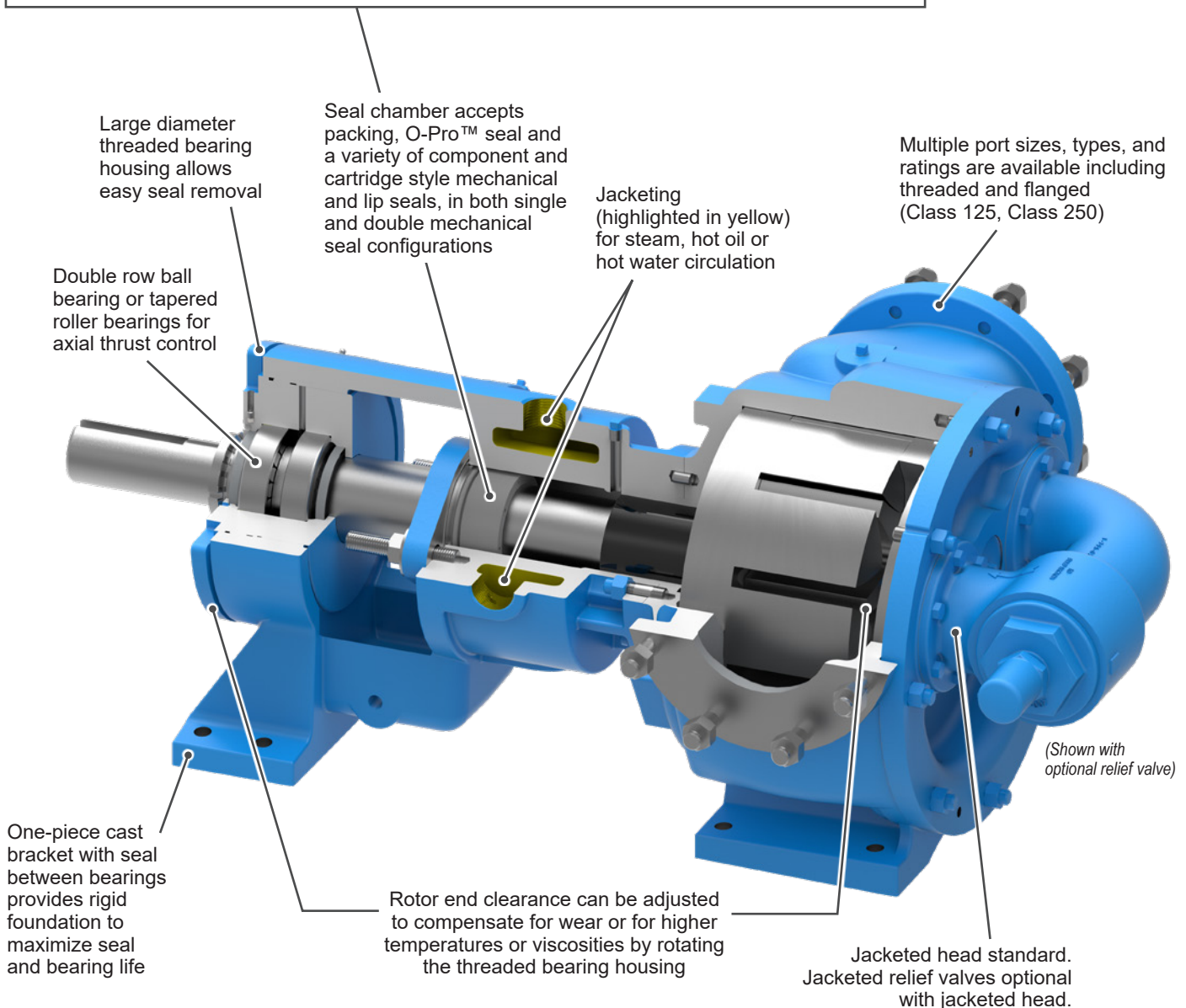
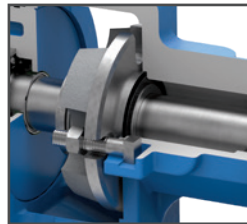
O-Pro™ Barrier Seal



Component Seal



Cartridge Seal

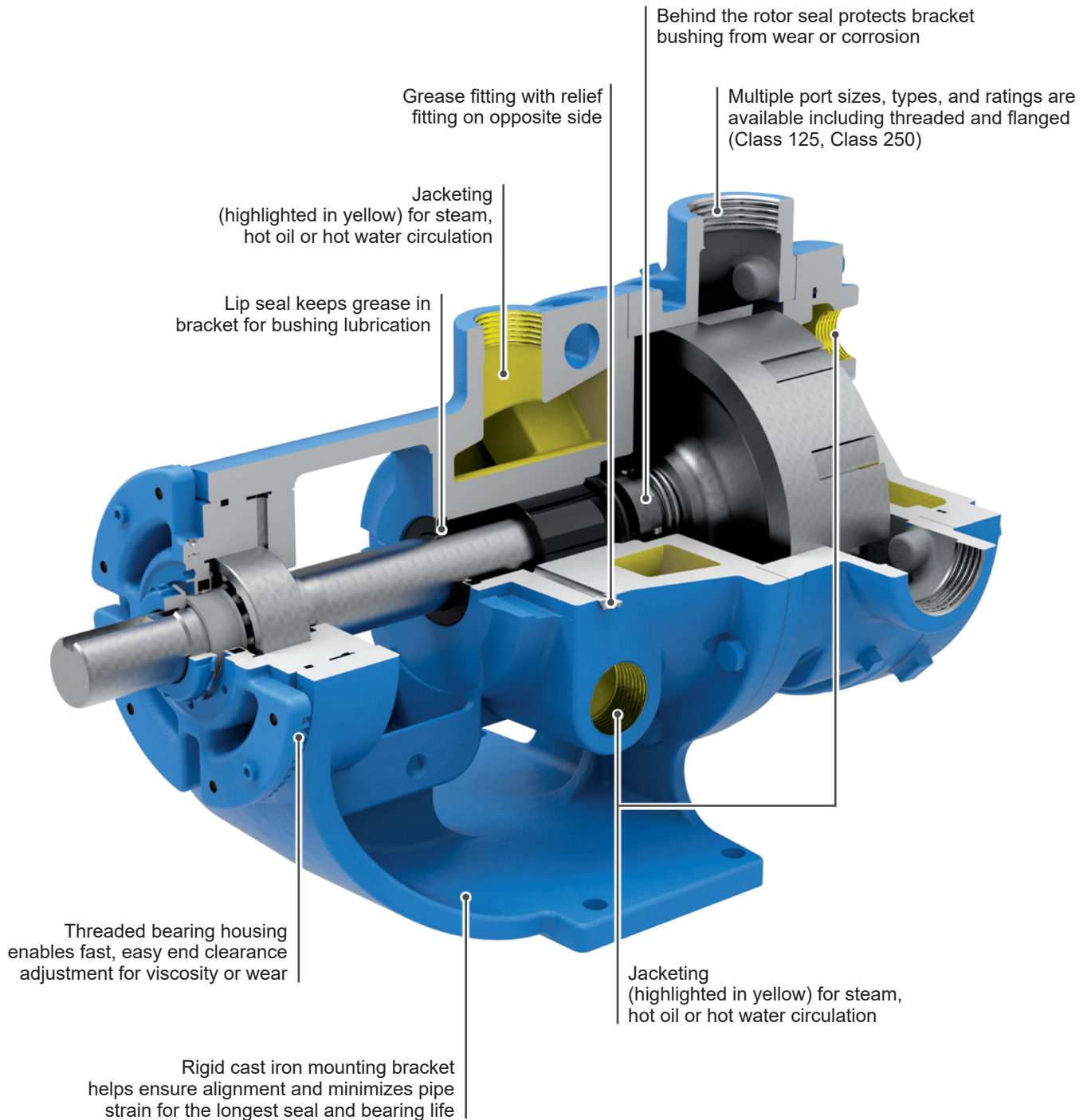


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## CUTAWAY VIEW & PUMP FEATURES (4224B SERIES™)





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### MODEL NUMBER KEY

<b>L</b>	<b>Q</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>A</b>	<b>E</b>
<b>Size:</b>	<b>Shaft Seal:</b>		<b>Basic Series Configuration</b>	<b>Material of Construction:</b>		<b>Primary Shaft Diameter (L, LQ and LL Sizes in Cast Iron Only):</b>	
H LS	1 = O-Pro™ Seal			4 = Cast Iron		Blank = 1-7/16"	
HL Q	4 = Mechanical Seal					E = 1-5/8"	
K QS	Blank = Packing					(See dimension drawings for shaft diameter at coupling)	
KK M			<b>Jacketing:</b>		<b>Seal Location:</b>		
L N			2 = Jacketed		A = Stuffing Box Seal		
LQ R			3* = Foot Mount Casing w/ Jacketed Bracket		B = Behind the Rotor		
LL RS							<b>* Only the N through RS sizes are foot mount with jacketed bracket (3).</b>

### STANDARD MATERIALS OF CONSTRUCTION

Component	Standard Material	
Casing	Cast Iron, ASTM A48, Class 35B	
Head	Cast Iron, ASTM A48, Class 35B	
Head Plate	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
Rotor Shaft	(4124A Series™, 4124AE Series™, 4324A Series™, 4124B Series™)	⑤ Steel, ASTM A108, Grade 1045
	(1224A Series™, 1224AE Series™, 1324A Series™)	Hardened High Strength Steel, ASTM A434, Grade 4140, Class BC
Idler Pin	Hardened Steel, ASTM A108, Grade 1045	
Idler Bushing	(4224A, 4324A, 4224B)	Carbon Graphite
	(1224A Series™, 1224AE Series™, 1324A Series™)	Hardened Cast Iron
	(224A, 324A)	Bronze, ASTM B584 (B505), Alloy C93700
Bracket Bushing (no product contact on 4224B series) <i>(Note: not applicable on 1124A Series™, 1124AE Series™ or 1324A Series™)</i>	(4224A, 4224AE, 4324A)	Carbon Graphite
	(224A, 224AE, 324A, 4224B)	Bronze, ASTM B584 (B505), Alloy C93700
Pressure Relief Valve	⑥ Cast Iron, ASTM A48, Class 35B	
Standard Packing (224A, 224AE, 324A)	Braided PTFE	
O-Pro™ Barrier Seal (1224A Series™, 1224AE Series™ or 1324A Series™)	Hardened Cast Iron, Sanitary FKM Elastomers	
Standard Mechanical Seal (4224A, 4224AE, 4224B, 4324A)	Carbon vs. Silicon Carbide Faces, PTFE Elastomers	
Optional Abrasive Liquid Seal (4224B)	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

② Q and QS sizes have a 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 K, KK, L, LQ, LL and LS sizes, including "A", "AE", "E" 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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## 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	K	KK	L	LQ	LL	LS	Q	QS	M	N	R	RS
SSU	25,000	7,500	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	5,500	1,700	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. Contact factory for clearance specifications.
- Special Sealing:  
Fluoroelastomer (FKM) 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.
- O-Pro™ seals are not recommended for viscosities less than 100 SSU (20 cSt)

### For high temperatures – Above 225° F (107°C)

- High temperature elastomers – Buna up to 225°F (105°C); FKM up to 350°F (175°C); PTFE up to 450°F (230°C); FFKM up to 550°F (290°C); Grafoil up to 700°F. (370°C). High temp packing in excess of 500°F (260°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 shafting.
- 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.

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### SPECIFICATIONS – H, HL, K, KK, L, LQ, LL, LS, Q SIZES

Model Number	③ Standard Port Size	Nominal Pump Rating (100 SSU & below)			Max. Hydrostatic Pressure ④		① Maximum Discharge Pressure		Max. Recommended Temp. for Standard Pump		Approx. Shipping Weight with Valve	
	Inches	GPM	m <sup>3</sup> /h	RPM	PSIG	BAR	PSIG	BAR	°F	°C	Lbs.	Kg.
H224A	1 ½	15	3.5	1750	400	28	200	14	450	230	38	17
H1224A	1 ½	8	1.8	1000	400	28	200	14	350	175	41	19
H4224A	1 ½	15	3.5	1750	400	28	200	14	450	230	38	17
H4224B	1 ½	15	3.5	1750	400	28	200	14	450	230	38	17
HL224A	1 ½	30	7	1750	400	28	200	14	450	230	40	18
HL1224A	1 ½	18	4	1000	400	28	200	14	350	175	41	19
HL4224A	1 ½	30	7	1750	400	28	200	14	450	230	40	18
HL4224B	1 ½	30	7	1750	400	28	200	14	450	230	40	18
K224A	2	80	18	780	400	28	200	14	450	230	105	48
K1224A	2	80	18	780	400	28	200	14	350	175	117	53
K4224A	2	80	18	780	400	28	200	14	450	230	105	48
K4224B	2	75	17	780	400	28	200	14	450	230	105	48
KK224A	2	100	23	780	400	28	200	14	450	230	110	50
KK1224A	2	100	23	780	400	28	200	14	350	175	117	53
KK4224A	2	100	23	780	400	28	200	14	450	230	110	50
KK4224B	2	100	23	780	400	28	200	14	450	230	110	50
L224A	2	135	31	640	400	28	200	14	450	230	155	70
L224AE	2	135	31	640	400	28	200	14	450	230	155	70
L1224A	2	135	31	640	400	28	200	14	350	175	161	73
L1224AE	2	135	31	640	400	28	200	14	350	175	161	73
L4224A	2	135	31	640	400	28	200	14	450	230	155	70
L4224AE	2	135	31	640	400	28	200	14	450	230	155	70
L4224B	2	135	31	640	400	28	200	14	450	230	155	70
LQ224A	2 ½	135	31	640	300	21	200	14	450	230	175	80
LQ224AE	2 ½	135	31	640	300	21	200	14	450	230	175	80
LQ1224A	2 ½	135	31	640	300	21	200	14	350	175	205	93
LQ1224AE	2 ½	135	31	640	300	21	200	14	350	175	205	93
LQ4224A	2 ½	135	31	640	300	21	200	14	450	230	175	80
LQ4224AE	2 ½	135	31	640	300	21	200	14	450	230	175	80
LQ4224B	2 ½	135	31	640	300	21	200	14	450	230	175	80
LL224A	3	140	32	520	300	21	200	14	450	230	185	84
LL224AE	3	140	32	520	300	21	200	14	450	230	185	84
LL1224A	3	140	32	520	300	21	200	14	350	175	194	88
LL1224AE	3	140	32	520	300	21	200	14	350	175	194	88
LL4224A	3	140	32	520	300	21	200	14	450	230	185	84
LL4224AE	3	140	32	520	300	21	200	14	450	230	185	84
LL4224B	3	140	32	520	300	21	200	14	450	230	185	84
LS224A	3	200	45	640	300	21	200	14	450	230	190	86
LS1224A	3	200	45	640	300	21	200	14	350	175	234	106
LS4224A	3	200	45	640	300	21	200	14	450	230	190	86
LS4224B	3	200	45	640	300	21	200	14	450	230	190	86
Q224A	4	300	68	520	250	17	200	14	450	230	440	200
Q1224A	4	275	62	470	250	17	200	14	350	175	324	147
Q4224A	4	300	68	520	250	17	200	14	450	230	440	200
Q4224B	4	300	68	520	250	17	200	14	450	230	440	200

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 on sizes H through L. Other thread standards available. Sizes LQ through RS have flange ports suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.

G through 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.



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## SPECIFICATIONS – QS, M, N, R, RS SIZES

Model Number	③ Standard Port Size	Nominal Pump Rating (100 SSU & below)			Max. Hydrostatic Pressure ④		① Maximum Discharge Pressure		Max. Recommended Temp. for Standard Pump		Approx. Shipping Weight with Valve	
	Inches	GPM	m³/h	RPM	PSIG	BAR	PSIG	BAR	°F	°C	Lbs.	Kg.
QS224A	6	500	114	520	250	17	200	14	450	230	540	245
QS1224A	6	400	91	470	250	17	200	14	350	175	318	144
QS4224A	6	500	114	520	250	17	200	14	450	230	540	245
QS4224B	6	500	114	520	250	17	200	14	450	230	540	245
M224A	4	420	95	420	250	17	200	14	450	230	600	272
M4224A	4	420	95	420	250	17	200	14	450	230	600	272
N324A	6	600	136	350	250	17	200	14	② 450	② 230	810	367
N1324A	6	550	125	330	250	17	200	14	350	175	937	425
N4324A	6	600	136	350	250	17	200	14	② 450	② 230	810	367
R324A	8	1,100	250	280	250	17	200	14	② 450	② 230	1,435	651
R1324A	8	1,000	227	260	250	17	200	14	350	175	1,523	691
R4324A	8	1,100	250	280	250	17	200	14	② 450	② 230	1,435	651
RS324A	10	1,600	364	280	250	17	125	9	② 450	② 230	2,000	907
RS1324A	10	1,500	340	260	250	17	125	9	350	175	1,987	901
RS4324A	10	1,600	364	280	250	17	125	9	② 450	② 230	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](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 on sizes H through L. Other thread standards available. Sizes LQ through RS have flange ports suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings. G through 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.

## OPTIONAL CASINGS – H THROUGH RS SIZES\*\*

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

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.

Ⓡ Non-Rotatable Ports at 90 degree angle, contact factory for available orientation (right hand or left hand)

Ⓡ Opposite Ports

Ⓡ 90° port arranged for Right Hand inlet (viewed from shaft end)

Contact factory for flange details (e.g. Flat face or raised face flanges)

\* Standard-Jacketed Pumps have a jacketed bracket and head, but the casing is not jacketed. They have the series designations 224A/4224A & AE. Also the N324A & N4324A are standard with a jacketed bracket and non-jacketed head and Relief Valve, while the R324A & R4324A are standard with a jacketed bracket and jacketed head and non-jacketed Relief Valve. Fully-Jacketed pumps use the Standard-Jacketed Pumps' series designation, but substitute a Fully-Jacketed Casing from the list above instead of the Standard-Jacketed Pumps' non-jacketed casing.

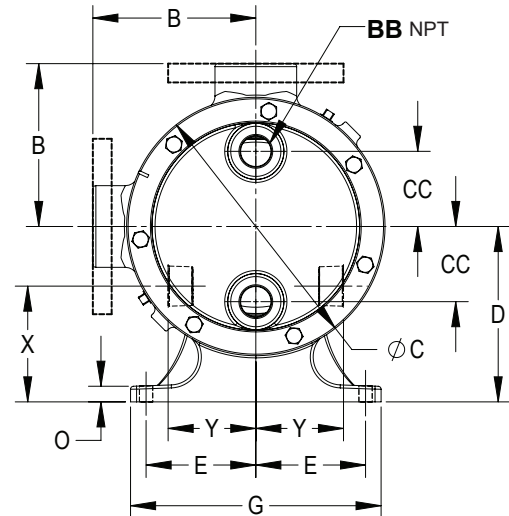
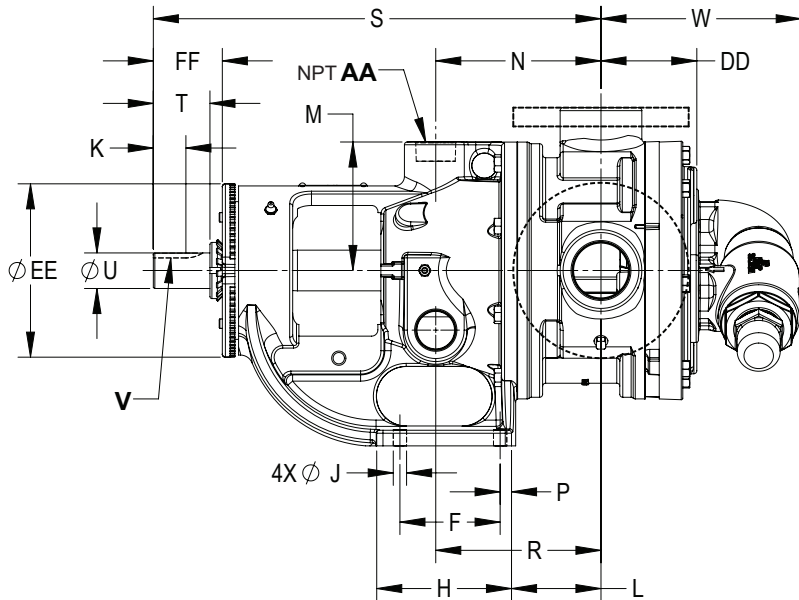
\*\* Not available for 1124A Series™, 1124AE Series™, 1324A Series™ or 4224B Series™ pumps.

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## UNIVERSAL PRODUCT LINE: CAST IRON — JACKETED PUMPS

224A Series™, 224AE Series™, 1224A Series™, 1224AE Series™, 4224A Series™, 4224AE Series™, 4224B Series™, 324A Series™, 1324A Series™, 4324A Series™

### DIMENSIONS – H THROUGH Q & M SIZES



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

NOTE: Dimensions "P" through "FF" on next page

Model Number			A (in)		B	C	D	E	F	G	H	J	K	L	M	N	O
Packed	O-Pro™ Seal	Mechanical Seal															
H224A HL224A	H1224A HL1224A	H4224A H4224B HL4224A HL4224B	① 1.5	in	3.00	4.75	3.50	2.75	2.25	6.75	3.50	0.47	0.99	3.38	2.38	4.00	0.56
				mm	76	121	89	70	57	171	89	12	25	86	61	102	14
K224A KK224A	K1224A KK1224A	K4224A K4224B KK4224A KK4224B	① 2	in	5.12	8.00	5.50	4.00	2.75	9.25	4.00	0.53	1.42	3.00	4.00	5.75	0.62
				mm	130	203	140	102	70	235	102	14	36	76	102	146	16
L224A	L1224A	L4224A	① 2	in	6.50	10.25	7.00	4.38	4.00	10.00	5.38	0.53	2.00	3.38	5.12	6.56	0.62
				mm	165	260	178	111	102	254	137	14	50.8	86	130	167	16
L224AE	L1224AE	L4224AE L4224B	① 2	in	6.50	10.25	7.00	4.38	4.00	10.00	5.38	0.53	3.25	3.38	5.12	6.56	0.62
				mm	165	260	178	111	102	254	137	14	82.6	86	130	167	16
LQ224A	LQ1224A	LQ4224A	② 2.5	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	2.00	3.38	5.12	6.56	0.62
				mm	183	260	178	111	102	254	137	14	50.8	86	130	167	16
LQ224AE	LQ1224AE	LQ4224AE LQ4224B	② 2.5	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	3.25	3.38	5.12	6.56	0.62
				mm	183	260	178	111	102	254	137	14	82.6	86	130	167	16
LL224A	LL1224A	LL4224A	② 3	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	2.00	3.38	5.12	6.56	0.62
				mm	183	260	178	111	102	254	137	14	50.8	86	130	167	16
LL224AE	LL1224AE	LL4224AE LL4224B	② 3	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	3.25	3.38	5.12	6.56	0.62
				mm	183	260	178	111	102	254	137	14	82.6	86	130	167	16
LS224A	LS1224A	LS4224A LS4224B	② 3	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	2.55	4.75	5.12	7.40	0.62
				mm	183	260	178	111	102	254	137	14	65	121	130	188	16
Q224A	Q1224A	Q4224A Q4224B	② 4	in	8.25	14.00	8.75	4.12	4.00	10.00	6.00	0.69	3.58	6.62	7.00	7.62	0.75
				mm	210	356	222	105	102	254	152	18	91	168	178	194	19
M224A	—	M4224A	② 4	in	9.50	17.35	10.00	5.00	6.00	12.00	8.64	0.69	3.50	7.65	8.63	8.32	1.00
				mm	241	441	254	127	152	305	220	18	89	194	219	211	25

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

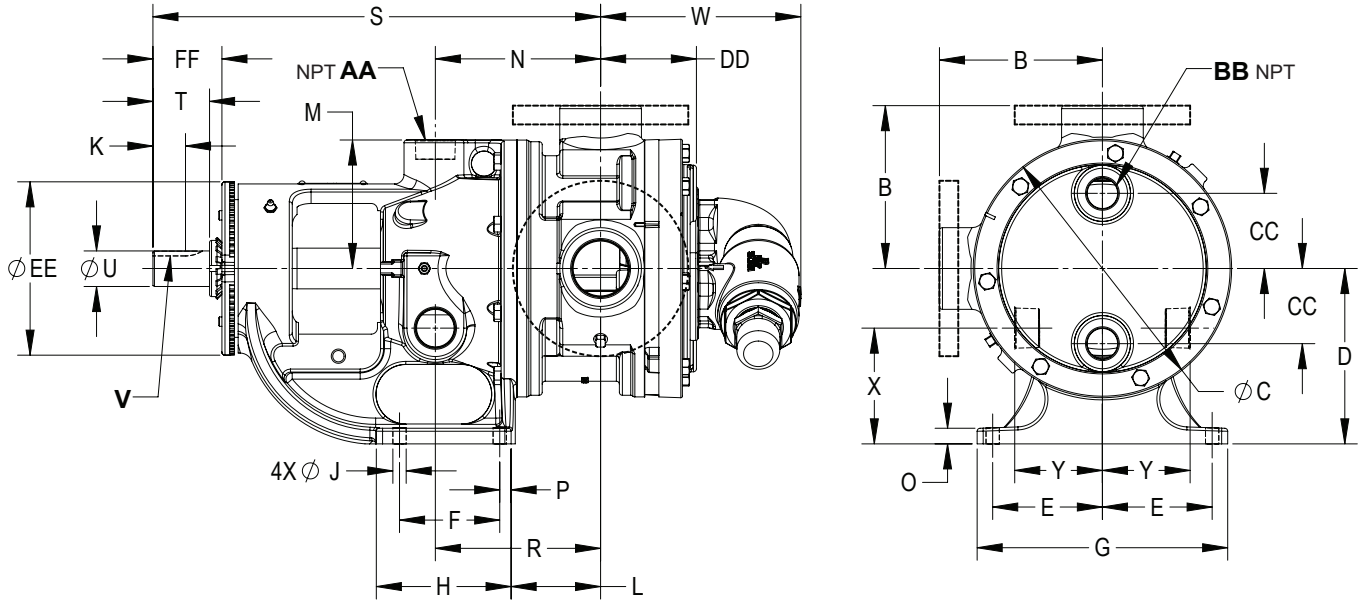
② Ports are suitable for use with Class 125 ANSI cast iron.

# UNIVERSAL PRODUCT LINE: CAST IRON — JACKETED PUMPS

224A Series™, 224AE Series™, 1224A Series™, 1224AE Series™, 4224A Series™, 4224AE Series™, 4224B Series™, 324A Series™, 1324A Series™, 4324A Series™

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## DIMENSIONS – H THROUGH Q & M SIZES (CONTINUED)



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

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

Model Number			P	R	S	T	U (in)	V (in)	W*	X	Y	AA (in)	BB (in)	CC	DD	EE	FF
Packed	O-Pro™ Seal	Mechanical Seal															
H224A HL224A	H1224A HL1224A	H4224A	in 0.62	4.00	12.06	1.62	0.75	.19 x .09	4.04	1.80	1.83	0.75	0.50	0.94	2.41	5.75	2.30
		H4224B HL4224A HL4224B	mm 16	102	306	41											
K224A KK224A	K1224A KK1224A	K4224A	in 0.62	5.75	16.38	2.25	1.12	.25 x .12	7.00	3.38	2.75	1.25	1.25	1.75	3.25	6.75	2.92
		K4224B KK4224A KK4224B	mm 16	146	416	57											
L224A	L1224A	L4224A	in 0.62	6.56	17.88	2.25	1.12	.25 x .12	7.18	4.62	3.25	1.25	1.00	3.00	3.81	6.75	2.93
			mm 16	167	454	57											
L224AE	L1224AE	L4224AE L4224B	in 0.62	6.56	17.88	2.35	1.44	.38 x .19	7.18	4.62	3.25	1.25	1.00	3.00	3.81	6.75	2.93
			mm 16	167	454	60											
LQ224A	LQ1224A	LQ4224A	in 0.62	6.56	17.88	2.25	1.12	.25 x .12	7.18	4.62	3.25	1.25	1.00	3.00	3.81	6.75	2.93
			mm 16	167	454	57											
LQ224AE	LQ1224AE	LQ4224AE LQ4224B	in 0.62	6.56	17.88	2.35	1.44	.25 x .12	7.18	4.62	3.25	1.25	1.00	3.00	3.81	6.75	2.93
			mm 16	167	454	60											
LL224A	LL1224A	LL4224A	in 0.62	6.56	17.88	2.25	1.12	.25 x .12	7.18	4.62	3.25	1.25	1.00	3.00	4.31	6.75	2.93
			mm 16	167	454	57											
LL224AE	LL1224AE	LL4224AE LL4224B	in 0.62	6.56	17.88	2.35	1.44	.25 x .12	7.18	4.62	3.25	1.25	1.00	3.00	4.31	6.75	2.93
			mm 16	167	454	60											
LS224A	LS1224A	LS4224A LS4224B	in 0.62	7.00	19.25	3.50	1.44	.38 x .19	7.72	4.40	3.30	1.25	1.00	3.00	4.50	7.00	4.03
			mm 16	178	489	89											
Q224A	Q1224A	Q4224A Q4224B	in 1.00	6.62	23.75	4.50	1.94	.50 x .25	11.25	5.50	4.50	1.50	1.25	---	4.57	8.38	5.35
			mm 25	168	603	114								286	140	114	---
M224A	—	M4224A	in 1.62	6.96	24.38	4.25	1.94	.50 x .25	8.61	5.50	6.00	1.50	1.50	4.33	5.88	8.38	4.96
			mm 41	177	619	108								219	140	152	100

\* Non-jacketed valve only.

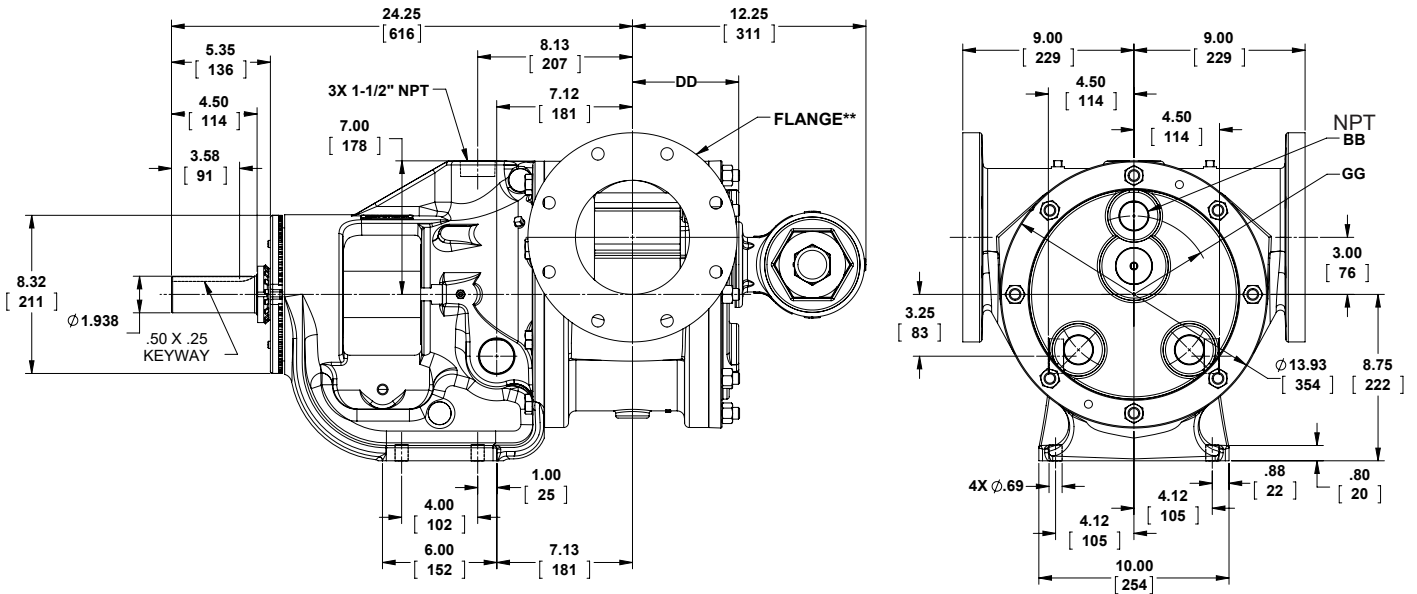
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## UNIVERSAL PRODUCT LINE: CAST IRON — JACKETED PUMPS

224A Series™, 224AE Series™, 1224A Series™, 1224AE Series™, 4224A Series™, 4224AE Series™, 4224B Series™, 324A Series™, 1324A Series™, 4324A Series™

### DIMENSIONS – QS SIZE

Dimensions shown in inches with millimeter equivalent shown in parentheses



Model Number			BB*	DD	GG
Packed	O-Pro™ Seal	Mechanical Seal			
QS224A	QS1224A	QS4224A QS4224B	1.25	5.57 (141)	4.12 (105)

\* Ports for steam or hot oil jacketing are inch standard NPT threads.

224A/4224A ports suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.

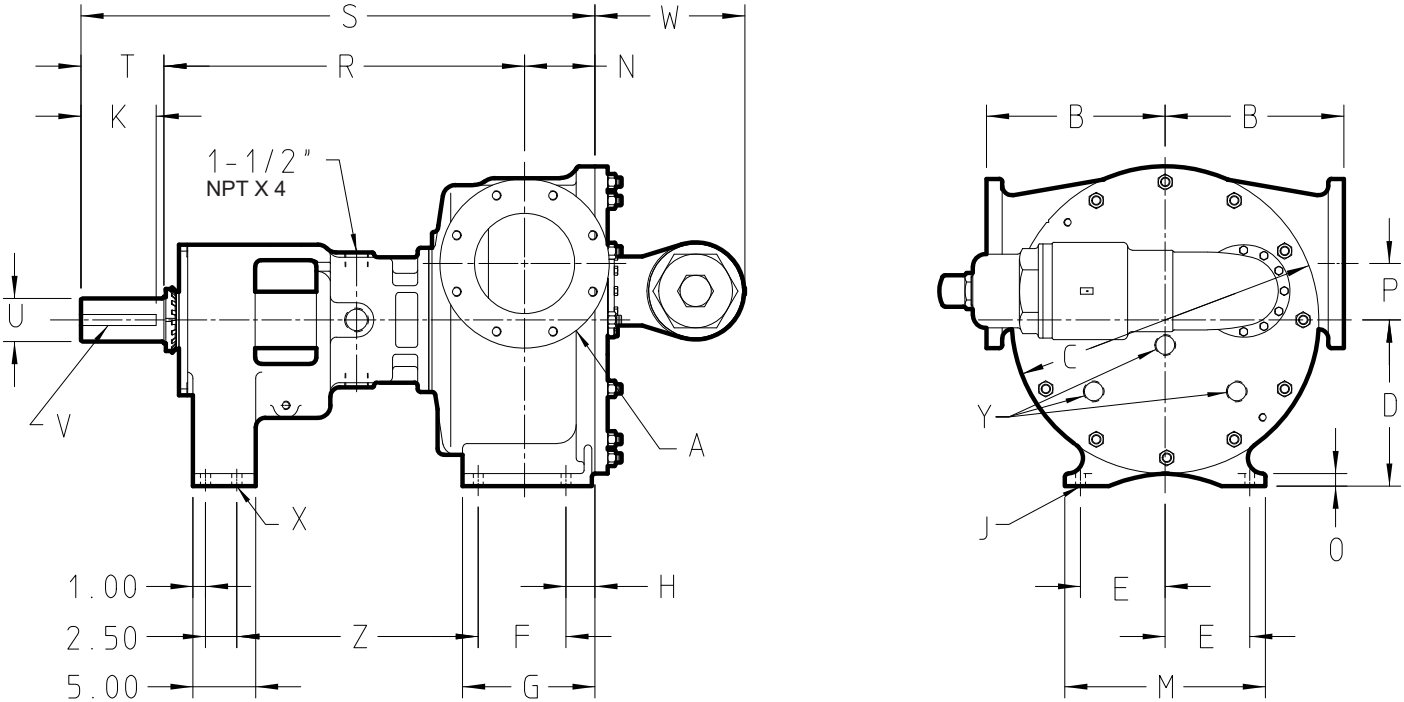
**NOTE:** Flanges are 6", suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings. They are studded, not through-bolt.

# UNIVERSAL PRODUCT LINE: CAST IRON — JACKETED PUMPS

224A Series™, 224AE Series™, 1224A Series™, 1224AE Series™, 4224A Series™, 4224AE Series™, 4224B Series™, 324A Series™, 1324A Series™, 4324A Series™

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



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

Model Number			N	O	P	R	S	T	U (in)	V (in)	W	X	Y (in)	Z	
Packed	O-Pro™ Seal	Stuffing Box Seal													
N324A	N1324A	N4324A	in	4.50	1.00	3.00	26.00	36.50	6.00	2.44	.62 x.31	8.63	0.69	N/A	18.94
			mm	114	25	76	660	927	152			219	18	481	
R324A	R1324A	R4324A	in	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
			mm	143	25	114	730	1041	168			305	18	NPT	489
RS324A	RS1324A	RS4324A	in	8.12	1.30	4.50	28.55	43.49	6.62	3.44	.88 x.44	12.00	0.88	1.25	19.25
			mm	206	33	114	725	1105	168			305	22	NPT	489

**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.

⊙ Ports are suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.

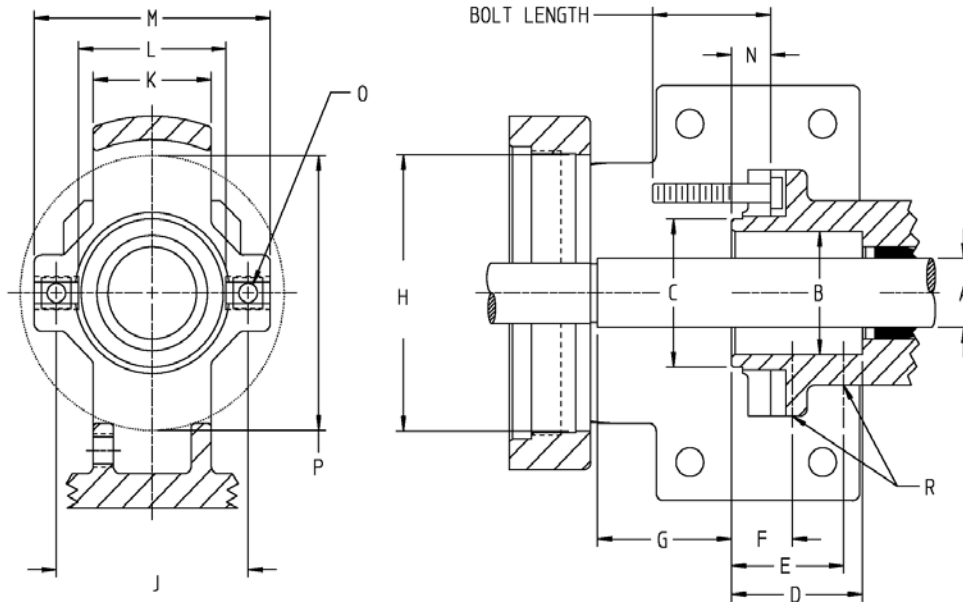


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## UNIVERSAL PRODUCT LINE: CAST IRON — JACKETED PUMPS

224A Series™, 224AE Series™, 1224A Series™, 1224AE Series™, 4224A Series™, 4224AE Series™, 4224B Series™, 324A Series™, 1324A Series™, 4324A Series™

### DIMENSIONS – STUFFING BOX SEAL CHAMBER (EXCEPT 4224B)



Pump Size		A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
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
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
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
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
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
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
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
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
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

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 — JACKETED PUMPS

224A Series™, 224AE Series™, 1224A Series™, 1224AE Series™, 4224A Series™, 4224AE Series™, 4224B Series™, 324A Series™, 1324A Series™, 4324A Series™

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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
H, HL	—	—	—	—	1.7	1.8	1.9	2.1	2.4	2.8	3.4	4.5	6.2	9.5	13.5
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	—	—	—	—	—	—	—	—	—