

UNIVERSAL PRODUCT LINE: STEEL EXTERNALS — JACKETED PUMPS

SERIES 223A, 4223A, 323A, 4323A

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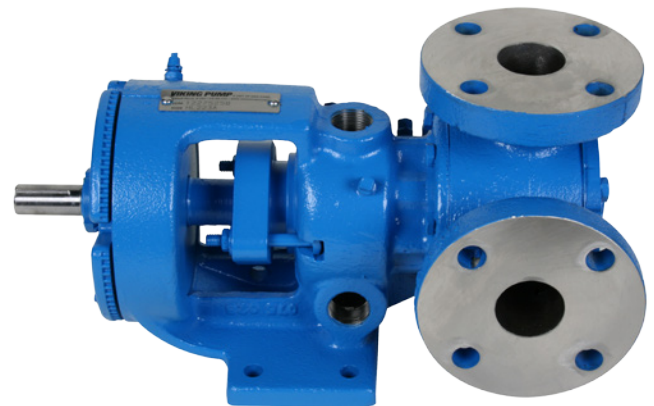
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SERIES DESCRIPTION

Pumps are designed for a broad range of applications, from thin to thick, requiring continuous duty at pressures up to 200 PSI (14 Bar). Even higher pressures are possible with high fluid viscosities at reduced operating speeds (consult factory). They are also capable of operating under suction lift conditions and operate equally well in either direction.

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.



HL223A

RELATED PRODUCTS

Steel Externals, Non-Jacketed Pumps: Catalog Section 1301

Cast Iron, Jacketed Pumps: Catalog Section 1402

Stainless Steel, Jacketed Pumps: Catalog Section 1702

OPERATING RANGE

| SERIES | NOMINAL FLOW | | MAXIMUM PRESSURE | | TEMPERATURE RANGE | | VISCOSITY RANGE | |
|--------|--------------|------------------|------------------|-----|-------------------|-------------|-----------------|--------------|
| | GPM | m ³ h | PSI | Bar | °F | °C | SSU | cSt |
| 223A | 15 - 500 | 3 - 114 | 200 | 14 | -20 to +800 | -25 to +425 | 28 to 2,000,000 | 1 to 440,000 |
| 4223A | 15 - 500 | 3 - 114 | 200 | 14 | -20 to +800 | -25 to +425 | 28 to 2,000,000 | 1 to 440,000 |
| 323A | 600 - 1,600 | 136 - 364 | 200 | 14 | -20 to +800 | -25 to +425 | 28 to 2,000,000 | 1 to 440,000 |
| 4323A | 600 - 1,600 | 136 - 364 | 200 | 14 | -20 to +800 | -25 to +425 | 28 to 2,000,000 | 1 to 440,000 |

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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
- 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.
- Steel externals for petroleum refineries, petrochemical plants and similar customers who require higher temperature and higher working pressures than cast iron pumps can provide

3 Year Limited
Warranty

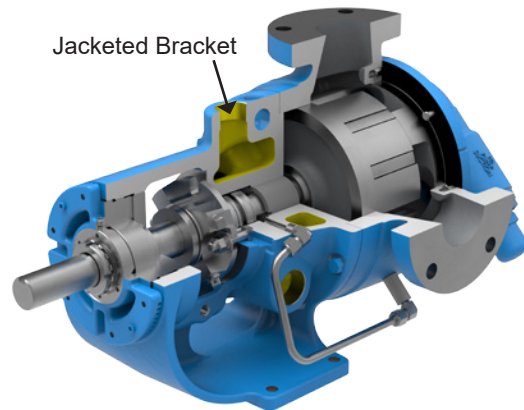
Viking Universal Product Line pumps carry a three year limited warranty. See catalog section 000 for details.

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 series 223A & 4223A. They feature jacketing on the head and bracket only, and are typically used for melting ambient temperature solids.



LS4223A
Jacketed Pump Cutaway

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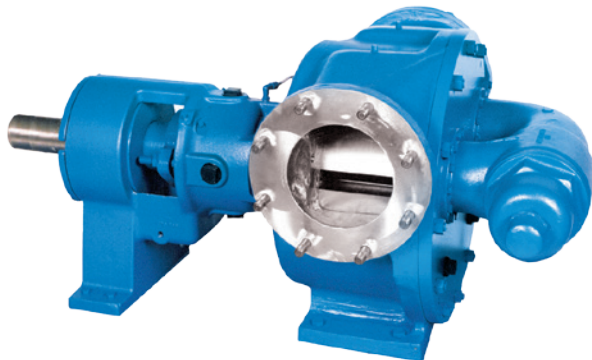
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RELIEF VALVE CONFIGURATIONS

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 “LQ” through “N” sizes, but require a non-jacketed valve-type head.

The “N” 323A & 4323A 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” 323A & 4323A 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.



**R4323A
Jacketed Head with
Non-Jacketed Relief
Valve Shown**

PORTING & SEALING

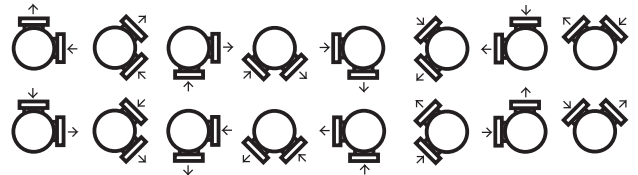
A variety of opposite and 90° port configurations are available, including top suction with bottom or side discharge designs typically mounted at the bottom of a tank or reactor.

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

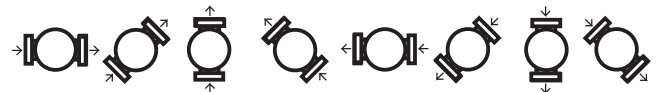
The seal chamber design accepts packing, component seals or cartridge seals. Seal plans, including API plan 53 and 54, are available.

REVOLVABLE PUMP CASINGS

90° port options:



Opposite port options:



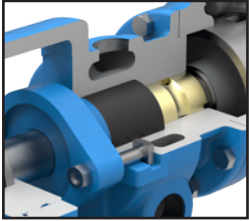
NOTE: See page 1302.8 for a complete list of casing options by size.

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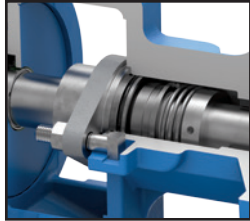
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CUTAWAY VIEW & PUMP FEATURES

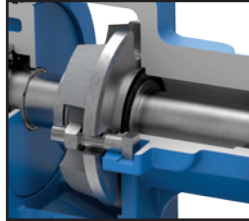
Packing



Component Seal



Cartridge Seal

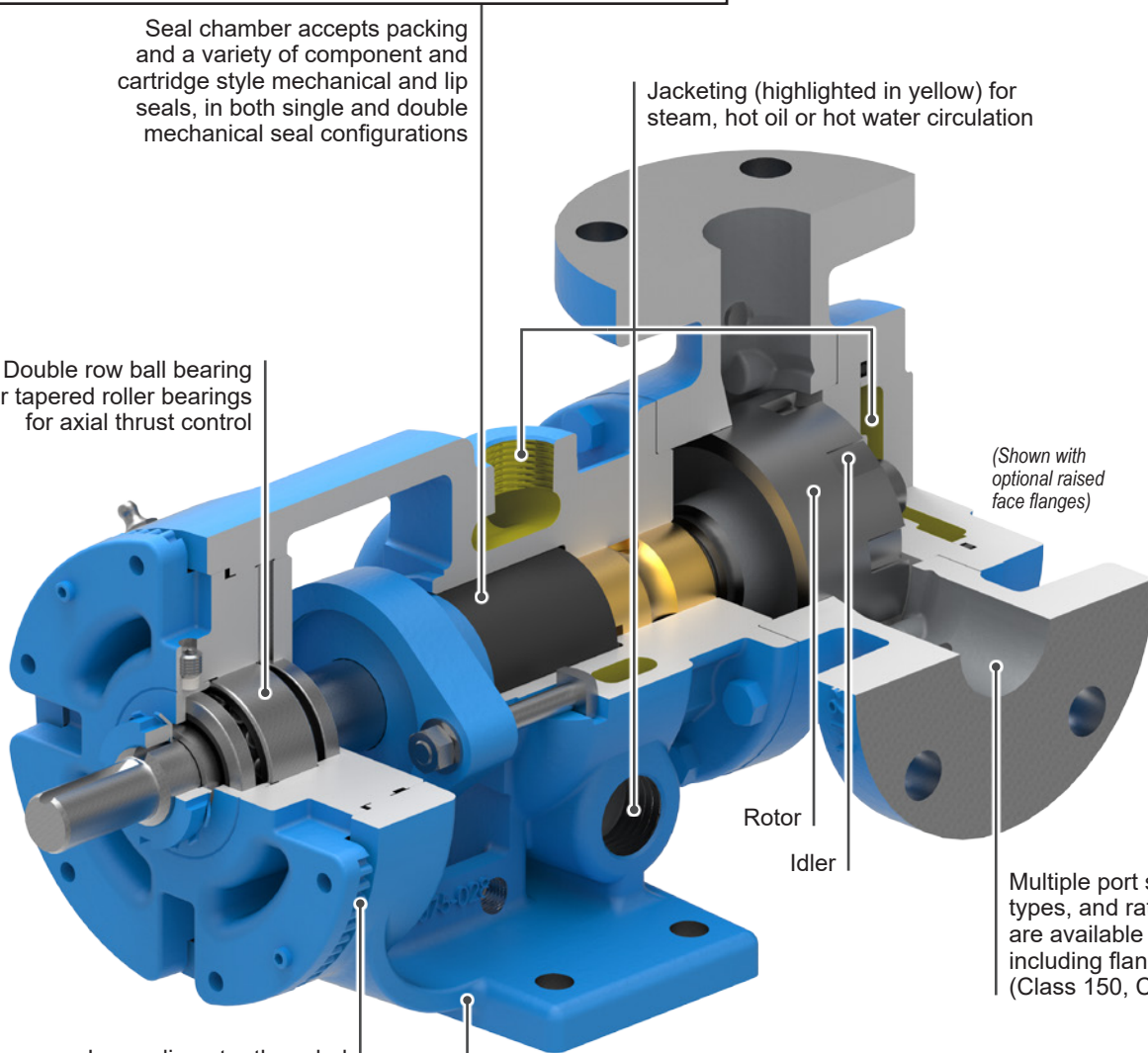


Seal chamber accepts packing and a variety of component and cartridge style mechanical and lip seals, in both single and double mechanical seal configurations

Jacketing (highlighted in yellow) for steam, hot oil or hot water circulation

Double row ball bearing or tapered roller bearings for axial thrust control

(Shown with optional raised face flanges)



Rotor

Idler

Large diameter threaded bearing housing allows easy removal of cartridge seals

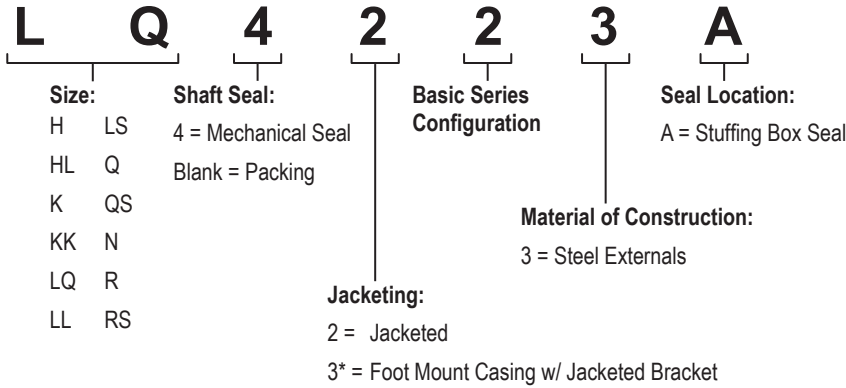
One-piece cast bracket with seal between bearings provides rigid foundation to maximize seal and bearing life

Multiple port sizes, types, and ratings are available including flanged (Class 150, Class 300)

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MODEL NUMBER KEY



* Only the N through RS sizes are foot mount with jacketed bracket (3).

STANDARD MATERIALS OF CONSTRUCTION

| Component | Standard Material | |
|---|--|--|
| Casing | Steel, ASTM A216, Class WCB | |
| Head | Steel, ASTM A216, Class WCB | |
| Head Plate | Steel, ASTM A216, Class WCB | |
| Bracket | Steel, ASTM A216, Class WCB | |
| Idler | Standard | ① Cast Iron, ASTM A148, Class 35B |
| | Steel Fitted | ①② Cast Iron, ASTM A148, Class 35B |
| Rotor | Standard | ③ Cast Iron, ASTM A148, 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 | (4224A, 4324A) | Carbon Graphite |
| | (224A, 324A) | Bronze, ASTM B584 (B505), Alloy C93700 |
| Bracket Bushing | (4124A, 4324A) | Carbon Graphite |
| | (124A, 324A) | Bronze, ASTM B584 (B505), Alloy C93700 |
| Pressure Relief Valve | ⑥ Steel, ASTM A216, Class WCB | |
| Standard Packing (123A, 323A) | Braided PTFE | |
| Standard Mechanical Seal (4123A, 4323A) | Carbon vs. Silicon Carbide Faces, FKM Elastomers | |

- ① 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 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 LQ, LL and LS sizes are high strength steel ASTM A434 Type 4140 Grade BC or equivalent.
- ⑥ LQ, LL and LS relief valve bodies are stainless steel.

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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 | LQ | LL | LS | Q | QS | N | R | RS |
| SSU | 25,000 | 7,500 | 25,000 | 75,000 | 25,000 | 2,500 | 75,000 | 7,500 | 75,000 | 75,000 | 25,000 | 75,000 |
| cSt | 5,500 | 1,700 | 5,500 | 17,000 | 5,500 | 550 | 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).
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 – 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.

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SPECIFICATIONS

| Model Number | ③ Standard Port Size | Nominal Pump Rating (100 SSU & below) | | | Max. Hydrostatic Pressure | | ① Maximum Discharge Pressure | | Max. Recommended Temperature for Standard Pump | | Approx. Shipping Weight with Valve | |
|--------------|----------------------|---------------------------------------|-------------------|------|---------------------------|-----|------------------------------|-----|--|-----|------------------------------------|-------|
| | Inches | GPM | m ³ /h | RPM | PSIG | BAR | PSIG | BAR | °F | °C | Lbs. | Kg. |
| H223A | 1 ½ | 15 | 3 | 1750 | 400 | 28 | 200 | 14 | 450 | 230 | 42 | 19 |
| H4223A | 1 ½ | 15 | 3 | 1750 | 400 | 28 | 200 | 14 | 450 | 230 | 42 | 19 |
| HL223A | 1 ½ | 30 | 6.8 | 1750 | 400 | 28 | 200 | 14 | 450 | 230 | 45 | 20 |
| HL4223A | 1 ½ | 30 | 6.8 | 1750 | 400 | 28 | 200 | 14 | 450 | 230 | 45 | 20 |
| K223A | 2 | 80 | 18 | 780 | 400 | 28 | 200 | 14 | 450 | 230 | 120 | 54 |
| K4223A | 2 | 80 | 18 | 780 | 400 | 28 | 200 | 14 | 450 | 230 | 120 | 54 |
| KK223A | 2 | 100 | 23 | 780 | 400 | 28 | 200 | 14 | 450 | 230 | 125 | 57 |
| KK4223A | 2 | 100 | 23 | 780 | 400 | 28 | 200 | 14 | 450 | 230 | 125 | 57 |
| LQ223A | 2 ½ | 135 | 31 | 640 | 400 | 28 | 200 | 14 | 450 | 230 | 190 | 86 |
| LQ4223A | 2 ½ | 135 | 31 | 640 | 400 | 28 | 200 | 14 | 450 | 230 | 190 | 86 |
| LL223A | 3 | 140 | 32 | 520 | 400 | 28 | 200 | 14 | 450 | 230 | 210 | 95 |
| LL4223A | 3 | 140 | 32 | 520 | 400 | 28 | 200 | 14 | 450 | 230 | 210 | 95 |
| LS223A | 3 | 200 | 45 | 640 | 400 | 28 | 200 | 14 | 450 | 230 | 210 | 95 |
| LS4223A | 3 | 200 | 45 | 640 | 400 | 28 | 200 | 14 | 450 | 230 | 210 | 95 |
| Q223A | 4 | 300 | 68 | 520 | 400 | 28 | 200 | 14 | 450 | 230 | 490 | 222 |
| Q4223A | 4 | 300 | 68 | 520 | 400 | 28 | 200 | 14 | 450 | 230 | 490 | 222 |
| QS223A | 6 | 500 | 114 | 520 | 400 | 28 | 200 | 14 | 450 | 230 | 590 | 268 |
| QS4223A | 6 | 500 | 114 | 520 | 400 | 28 | 200 | 14 | 450 | 230 | 590 | 268 |
| N323A | 6 | 600 | 136 | 350 | 400 | 28 | 200 | 14 | ② 450 | 230 | 810 | 367 |
| N4323A | 6 | 600 | 136 | 350 | 400 | 28 | 200 | 14 | ② 450 | 230 | 810 | 367 |
| R323A | 8 | 1,100 | 250 | 280 | 400 | 28 | 200 | 14 | ② 450 | 230 | 1,435 | 651 |
| R4323A | 8 | 1,100 | 250 | 280 | 400 | 28 | 200 | 14 | ② 450 | 230 | 1,435 | 651 |
| RS323A | 10 | 1,600 | 364 | 280 | 400 | 28 | 125 | 9 | ② 450 | 230 | 2,500 | 1,140 |
| RS4323A | 10 | 1,600 | 364 | 280 | 400 | 28 | 125 | 9 | ② 450 | 230 | 2,500 | 1,140 |

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

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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" ①®, 2" ②® | 2"②® |
| HL | 1.5"①® | Fully Rotatable | 1.5" ②®, 2" ①®, 2" ②® | 2"②® |
| K | 2"①® | Ports cannot face down | 2" ②®, 2.5" ①®, 2.5" ②®, 3" ①®, 3" ②®, 4" ①®, 4" ②® | 3"①®, 4"①®, 3"②®, 3"②⊙ |
| KK | 2"①® | Ports cannot face down | 2" ②®, 2.5" ①®, 2.5" ②®, 3" ①®, 3" ②®, 4" ①®, 4" ②® | 3"①®, 4"①®, 3"②®, 3"②⊙ |
| LQ | 2.5"②® | Ports cannot face down | 2.5" ②®, 3" ②®, 4" ①®, 4" ②®, 6" ①® | 3"①®, 3"②®, 4"②® |
| LL | 3"②® | Ports cannot face down | 3" ②®, 4" ①®, 4" ②® | |
| LS | 3"②® | Fully Rotatable | 4"①® | 4"①®, 6"①®, 4"②® |
| Q | 4"②® | Fully Rotatable | 4" ②®, 5" ①®, 5" ②®, 6" ①®*, 6" ②®*, 6" ①⊙, 6" ②⊙ | 4"①®, 4"②® |
| QS | 6"②⊙ | Rotatable with special casing | 6" ①®, 6" ②⊙ | 6"①®, 6"②⊙ |
| N | 6"②⊙ | Not Rotatable | | 6"①®, 8"②⊙ |
| R | 8"②⊙ | Not Rotatable | | 8"①⊙ |
| RS | 10"②⊙ | Not Rotatable | | |

① Ports suitable for Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.

② Ports suitable for Class 300 ANSI steel or stainless steel companion flanges or flanged fittings.

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

⊙ Opposite Ports

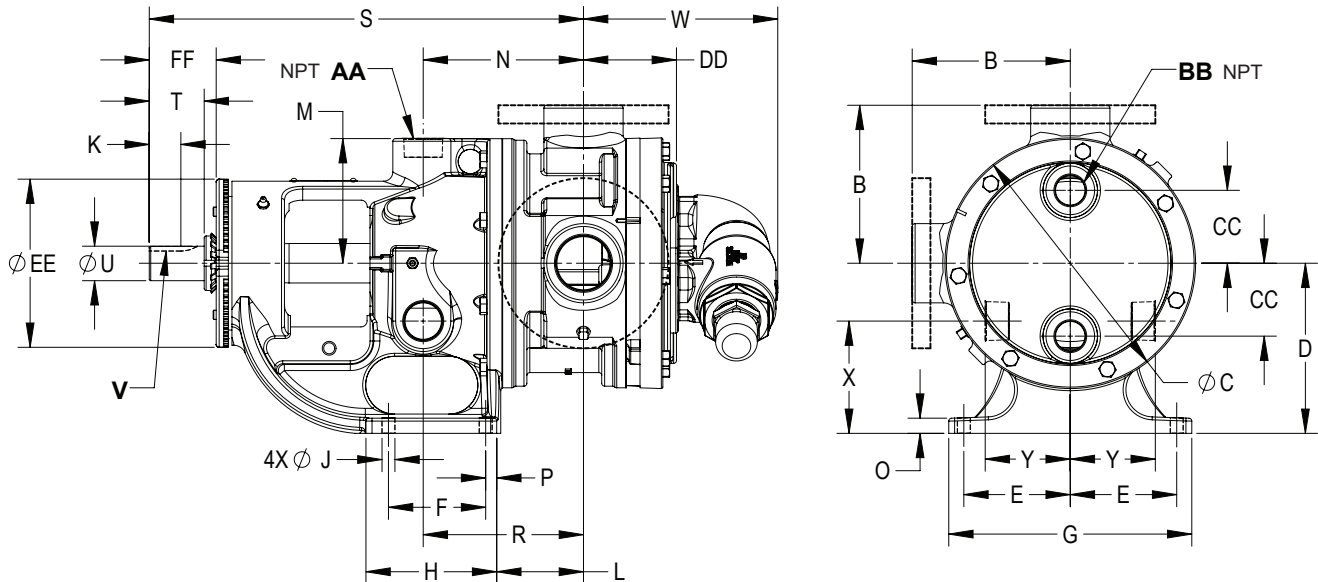
® 90° port arranged for Right Hand inlet (viewed from shaft end)

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DIMENSIONS – H THROUGH Q SIZES (223A, 4223A)



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

| Model Number | | A (in) | | B | C | D | E | F | G | H | J | K | L | M | N | O |
|--------------|-----------------|-----------|----|------|-------|------|------|------|-------|------|------|------|------|------|------|------|
| Packed | Mechanical Seal | | | | | | | | | | | | | | | |
| H223A | H4223A | ③ 1.5 | in | 4.00 | 4.75 | 3.50 | 2.75 | 2.25 | 6.75 | 3.50 | 0.47 | 0.99 | 3.38 | 2.38 | 4.00 | 0.56 |
| HL223A | HL4223A | | mm | 102 | 121 | 89 | 70 | 57 | 171 | 89 | 12 | 25 | 86 | 61 | 102 | 14 |
| K223A | K4223A | ③ 2 | in | 5.25 | 8.00 | 5.50 | 4.00 | 2.75 | 9.25 | 4.00 | 0.53 | 1.42 | 3.00 | 4.00 | 5.75 | 0.62 |
| KK223A | KK4223A | | mm | 133 | 203 | 140 | 102 | 70 | 235 | 102 | 14 | 36 | 76 | 102 | 146 | 16 |
| LQ223A | LQ4223A | ③ 2.5 | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 1.42 | 3.38 | 5.12 | 6.56 | 0.62 |
| | | | mm | 183 | 260 | 178 | 111 | 102 | 254 | 137 | 14 | 36 | 86 | 130 | 167 | 16 |
| LL223A | LL4223A | ③ 3 | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 1.42 | 3.38 | 5.12 | 6.56 | 0.62 |
| | | | mm | 183 | 260 | 178 | 111 | 102 | 254 | 137 | 14 | 36 | 86 | 130 | 167 | 16 |
| LS223A | LS4223A | ③ 2 | 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 |
| Q223A | Q4223A | ③ 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 |

| Model Number | | P | R | S | T | U (in) | V (in) | W* | X | Y | AA (in) | BB (in) | CC | DD | EE | FF | |
|--------------|-----------------|----|------|------|-------|-----------|-----------|-----------|-------|------|------------|------------|------|------|------|------|------|
| Packed | Mechanical Seal | | | | | | | | | | | | | | | | |
| H223A | H4223A | 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 |
| HL223A | HL4223A | mm | 16 | 102 | 306 | 41 | | | 103 | 46 | 47 | | | 175 | 3.25 | 6.75 | 2.92 |
| K223A | K4223A | 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 |
| KK223A | KK4223A | mm | 16 | 146 | 416 | 57 | | | 178 | 86 | 70 | | | 44 | 83 | 171 | 74 |
| LQ223A | LQ4223A | 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 | | | 182 | 117 | 83 | | | 76 | 97 | 171 | 74 |
| LL223A | LL4223A | in | 0.62 | 6.56 | 17.88 | 2.25 | 1.13 | .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 | | | 182 | 117 | 83 | | | 76 | 110 | 171 | 74 |
| LS223A | LS4223A | 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 | | | 196 | 112 | 84 | | | 76 | 114 | 178 | 102 |
| Q223A | Q4223A | in | 1.00 | 6.62 | 23.75 | 4.50 | 1.94 | .50 X .25 | 11.25 | 5.50 | 4.50 | 1.50 | 1.00 | — | 4.57 | 8.38 | 5.35 |
| | | mm | 25 | 168 | 603 | 114 | | | 286 | 140 | 114 | | | — | 116 | 213 | 136 |

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

* Non-jacketed valve only.

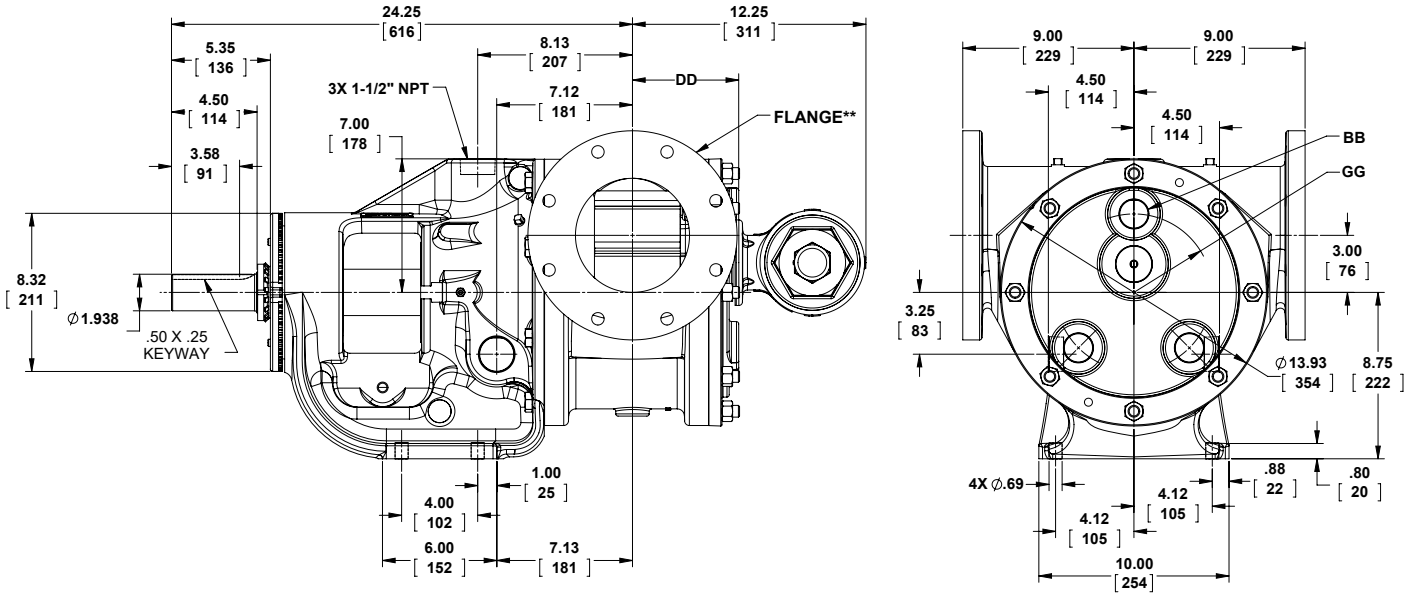
② Ports are suitable for use with Class 125 ANSI cast iron.

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**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS
SERIES 223A, 4223A, 323A, 4323A**

DIMENSIONS – QS SIZE (223A, 4223A)

Dimensions shown in inches with millimeter equivalent shown in parentheses



| Model Number | | BB* | DD | GG |
|--------------|-----------------|------|------------|-----------|
| Packed | Mechanical Seal | | | |
| QS223A | QS4223A | 1.00 | 6.06 (153) | 3.75 (95) |

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

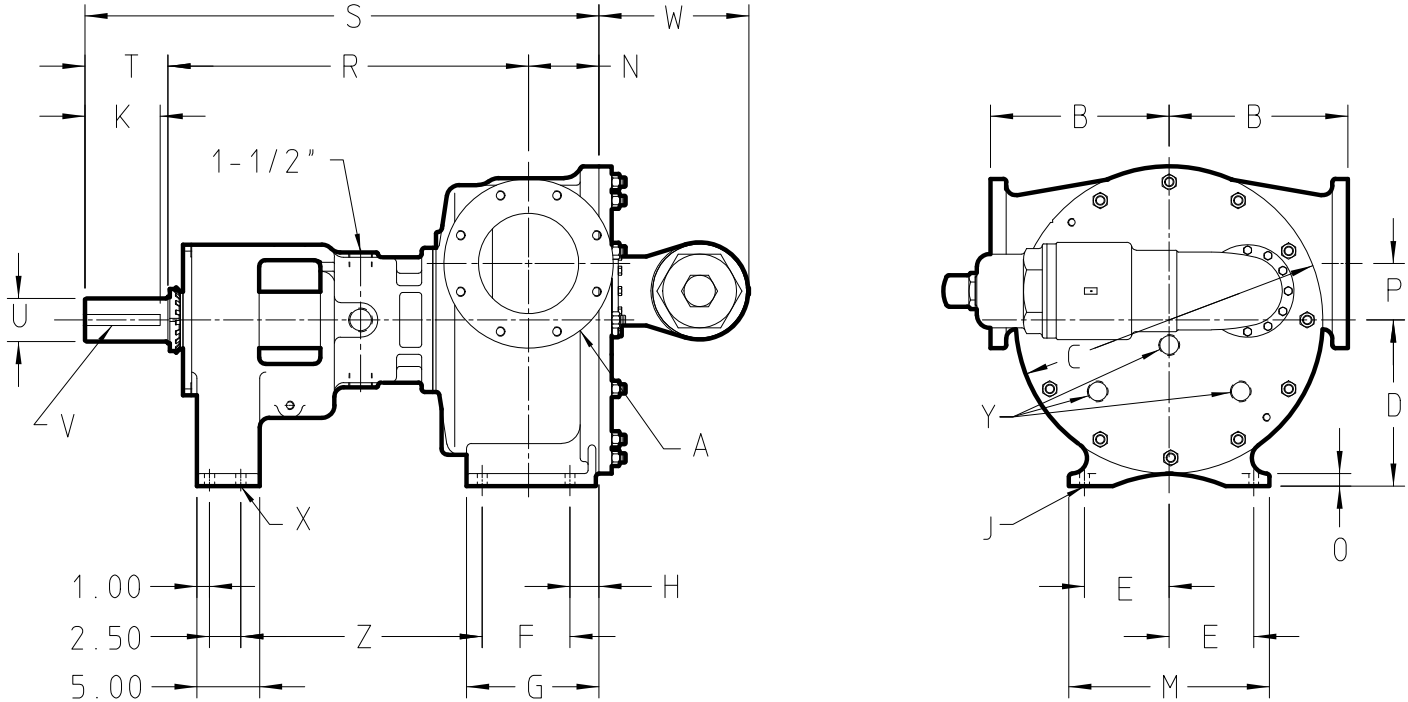
223A/4223A ports suitable for use with Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.

**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS**

SERIES 223A, 4223A, 323A, 4323A

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DIMENSIONS – N & R SIZES – JACKETED BRACKET (323A, 4323A)



| Model Number | | 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 (in) | Z |
|--------------|----------------------|-----------|----|-------|-------|-------|------|------|-------|------|------|------|-------|------|------|------|-------|-------|------|-----------|-------------|-------|------|-----------|-------|
| Packed | Stuffing Box Seal | | | | | | | | | | | | | | | | | | | | | | | | |
| N323A | N4323A | 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 | N/A | 18.94 |
| | | 6 | mm | 248 | 438 | 241 | 127 | 159 | 221 | 41 | 18 | 114 | 305 | 114 | 25 | 76 | 660 | 927 | 152 | | | | | | |
| R323A | R4323A | 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 | | | | | | |

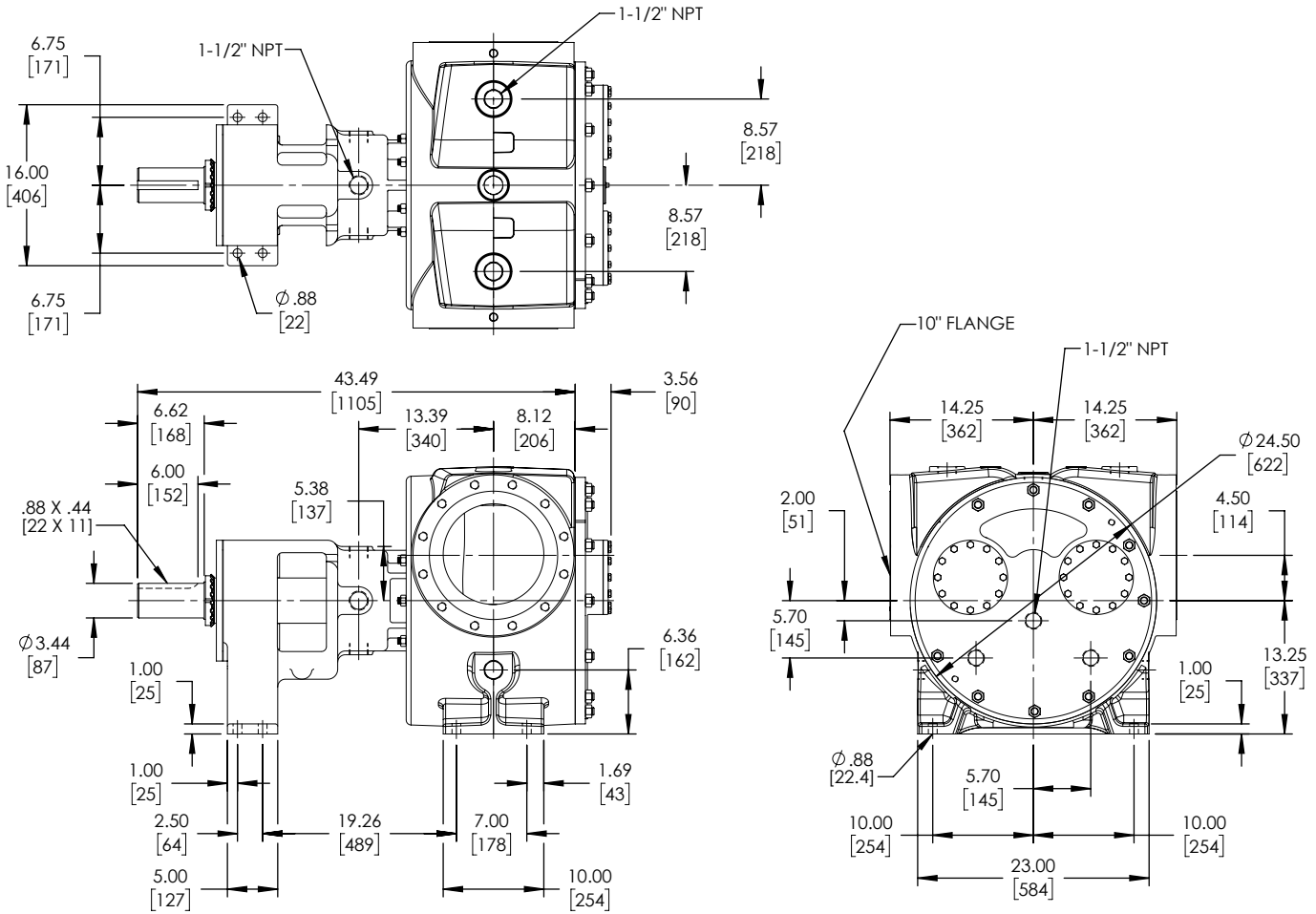
NOTE: The N size is standard with a jacketed bracket and non-jacketed head and non-jacketed relief valve, while the “R” size is standard with a jacketed bracket, a jacketed head, and a non-jacketed relief valve. “RS” contact factory for jacketing options.

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

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**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS
SERIES 223A, 4223A, 323A, 4323A**

DIMENSIONS – RS SIZE – JACKETED BRACKET (323A, 4323A)



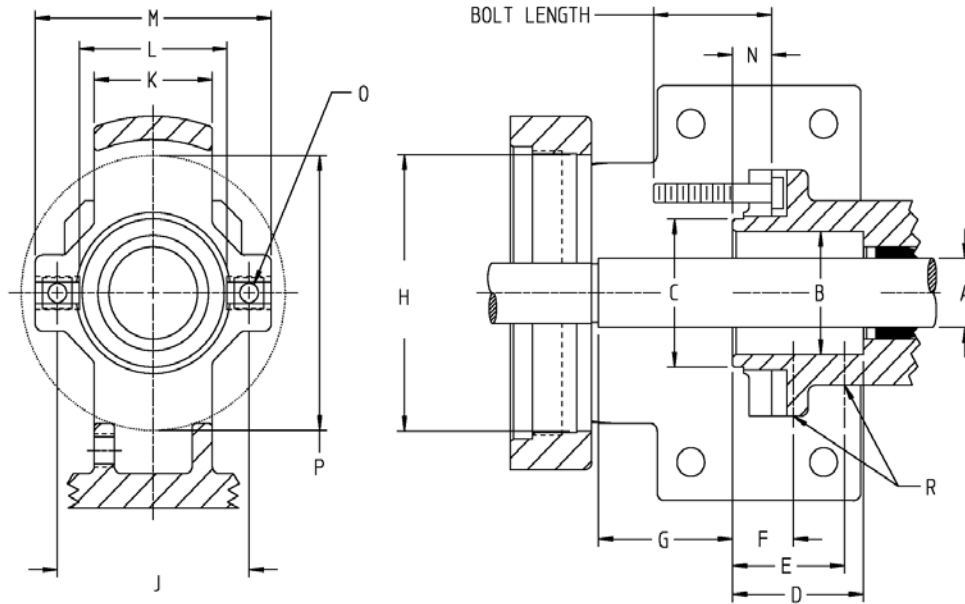
NOTE: RS size pumps are only available with a jacketed casing, as shown.

**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS**

SERIES 223A, 4223A, 323A, 4323A

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DIMENSIONS – STUFFING BOX SEAL CHAMBER



| 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 | 3 |
| 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 |
| LQ, & LL | 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 |
| 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 |
| 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.

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**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS
SERIES 223A, 4223A, 323A, 4323A**

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.

$NPSH_R$ – 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 | — | — | — | — |
| 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 | — | — | — | — | — | — |
| 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 | — | — | — | — | — | — | — | — | — |



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