

UNIVERSAL PRODUCT LINE: STEEL EXTERNALS — JACKETED PUMPS

SERIES 4223AA, 4323AA (API 682 Seal)

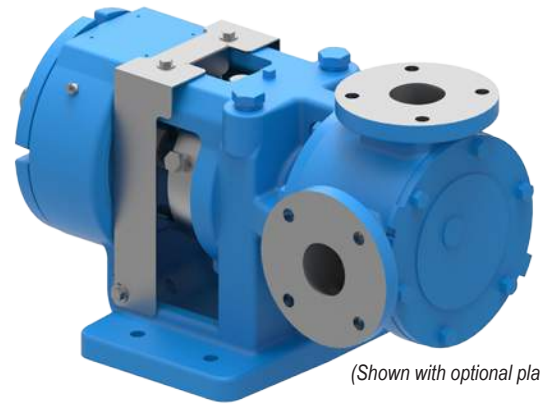
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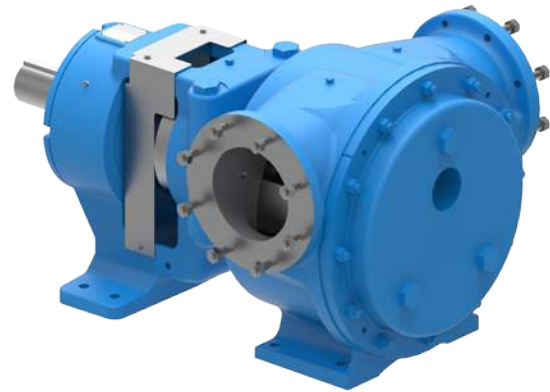
SERIES DESCRIPTION

4223AA & 4323AA Series pumps offer all of the features, benefits and options of the Universal Product Line pumps with steel externals construction, but feature a larger bracket that enables use of API 682-compliant cartridge seals. This is the most versatile model available with the widest choice of options, yet offers the ability to use most brands and styles of API 682 seals and API seal plans.



(Shown with optional plain head)

KK4223AA



R4323AA

RELATED PRODUCTS

Steel Externals, Jacketed Pumps (API 676 Compliant):
Catalog Section 1305

Stainless Steel, Jacketed Pumps (API 676 Compliant):
Catalog Section 1705

OPERATING RANGE

| SERIES | NOMINAL FLOW | | MAXIMUM PRESSURE | | TEMPERATURE RANGE | | VISCOSITY RANGE | |
|---------------|--------------|------------------|------------------|-----|-------------------|-------------|-----------------|------------|
| | GPM | m ³ h | PSI | Bar | °F | °C | SSU | cSt |
| 4223AA | 15 - 1,600 | 3.4 - 364 | 200 | 14 | -20 to +550 | -30 to +290 | 28 to 35,000 | 1 to 7,500 |
| 4323AA | 15 - 1,600 | 3.4 - 364 | 200 | 14 | -20 to +550 | -30 to +290 | 28 to 35,000 | 1 to 7,500 |

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SERIES 4223AA, 4323AA (API 682 Seal)

FEATURES & BENEFITS

- Jacketed bracket with API 682 seal chamber standard
- Dual tapered roller-type thrust bearings with 25,000 hour L-10 life standard
- All Universal Product Line Displacements (H, HL, K, KK, LQ, LL, LS, Q, QS, N, R & RS)
- All Universal Product Line head options (Plain Head or With Relief Valve). Note: Standard is less valve. Integral relief valve not allowed by API 676 unless specified by user.
- All Universal Product Line flange options (Class 150 or 300 Flat Face or Raised Face)
- All Universal Product Line porting options (90° or opposite porting, rotatable to any position)
- All Universal Product Line jacketing options (jacketed casing, jacketed head, jacketed relief valve)
- All Universal Product Line material options (standard steel, low temperature steel, NACE-compliant steel), various bushing and gasketing or O-ring options
- Reversible direction of flow for line stripping
- Standard with jacketed bracket.

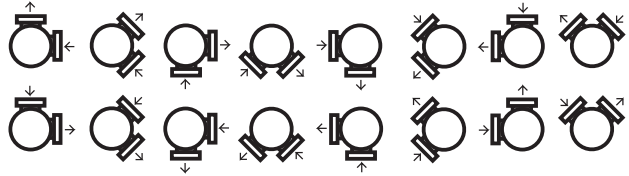
A full list of deviations from the API 676 specification is found in TR-701.



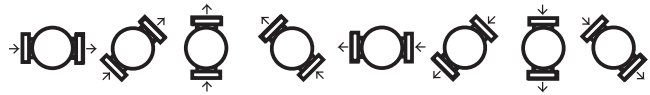
Viking Universal Product Line pumps carry a three year limited warranty. See catalog section 000 for details.

REVOLVABLE PUMP CASINGS

90° port options:



Opposite port options:



NOTE: See page 1304.5 for a complete list of casing options by size.

MATERIALS OF CONSTRUCTION

| Component | Standard Material | |
|----------------------------|---|----------------------------------|
| Casing | ⑤ Steel, ASTM A216, Class WCB | |
| Head | ⑤ Steel, ASTM A216, Class WCB | |
| Optional Head Jacket Plate | Steel, ASTM A216, Class WCB | |
| Bracket | ⑤ Steel, ASTM A216, Class WCC | |
| Idler | ②③ Cast Iron, ASTM A48, Class 35B | |
| Rotor | Standard | ① Cast Iron, ASTM A48, Class 35B |
| | Steel Fitted | ④ Steel, ASTM A148, Grade 80-40 |
| Rotor Shaft | ⑤ Steel, ASTM A108, Grade 1045 | |
| Idler Pin | Hardened Steel, ASTM A108, Grade 1045 | |
| Idler Bushing | Carbon Graphite | |
| Bracket Bushing | Carbon Graphite | |
| Relief Valve | Steel, ASTM A216, Class WCB | |
| Standard Mechanical Seal | SS Gland, Carbon / Silicon Carbide / FKM Elastomers | |

- ① KK, LS, QS, N and RS sizes have ductile iron rotor, ASTM A536 Grade 60-40-18.
- ② Steel fitted Q and QS sizes have steel idler.
- ③ H and HL sizes have powdered metal idler, MPIF Std 35 FC-0208-50.
- ④ Material specification for HL steel rotor is AISI 8620, LS steel rotor is ASTM A148 80-50.
- ⑤ Traceability standard. **Note:** head-mounted relief valve or cover plate traceability is optional, not standard.

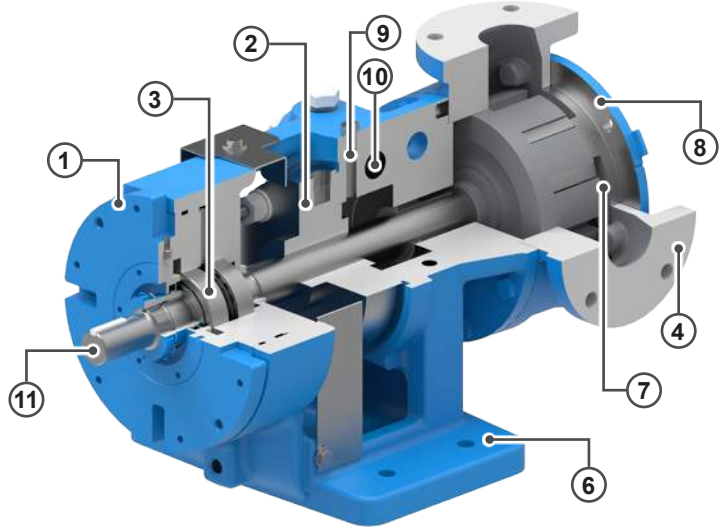
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STEEL EXTERNALS — JACKETED PUMPS**
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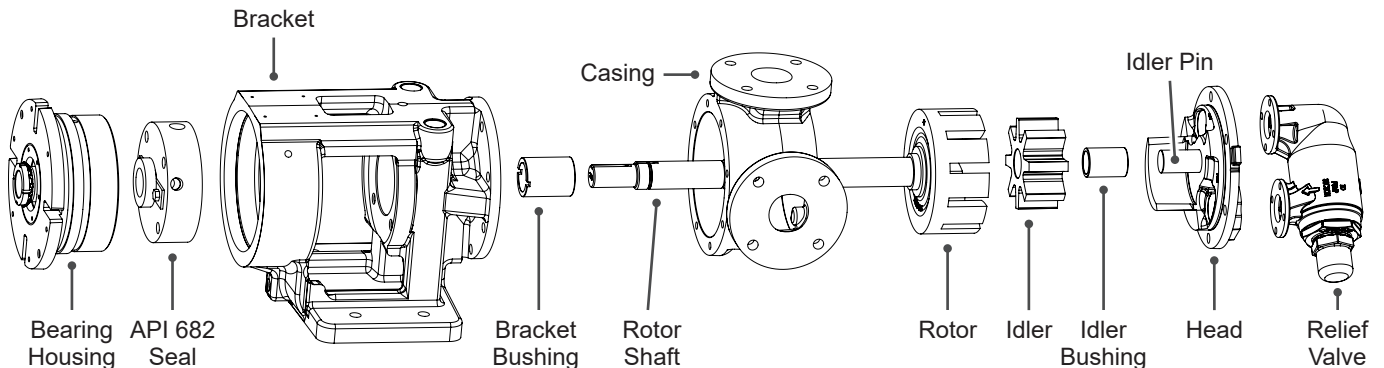
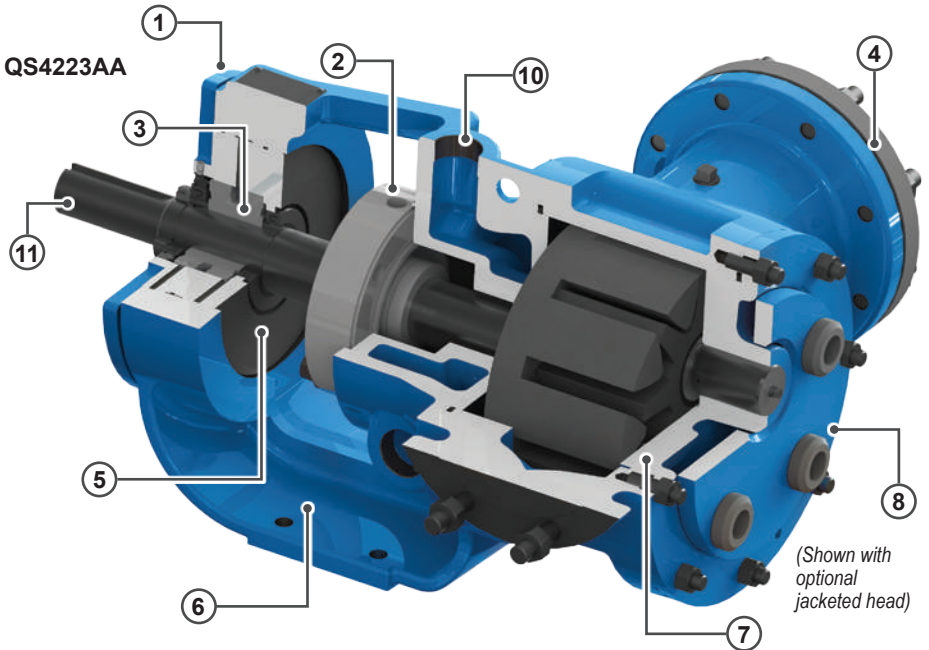
CUTAWAY VIEW & PUMP FEATURES

1. Large diameter threaded bearing housing allows easy removal of cartridge seals.
2. Seal chamber accepts most brands of cartridge seals conforming to API 682. Plan 13 standard, other seal plans available.
3. Tapered roller thrust bearings provide minimum 25,000 hour L-10 life at maximum flow, pressure and viscosity.
4. Multiple port sizes, types, and ratings are available including threaded, raised and flat face flanged (Class 150 & Class 300).
5. Bearing housing protected by lip seals standard, with labyrinth seal option
6. One-piece cast bracket provides rigid foundation to maximize seal and bearing life.
7. Rotor end clearance can be adjusted to compensate for wear or for higher temperatures or viscosities by rotating the threaded bearing housing (1).
8. Plain head standard. Head Jacket Optional (shown).
9. Seal chamber venting port for start-up and draining pump prior to maintenance.
10. Jacketed bracket enables heating or cooling. Option casing and head jacking.
11. Rectangular keyways transmit more torque.

KK4223AA



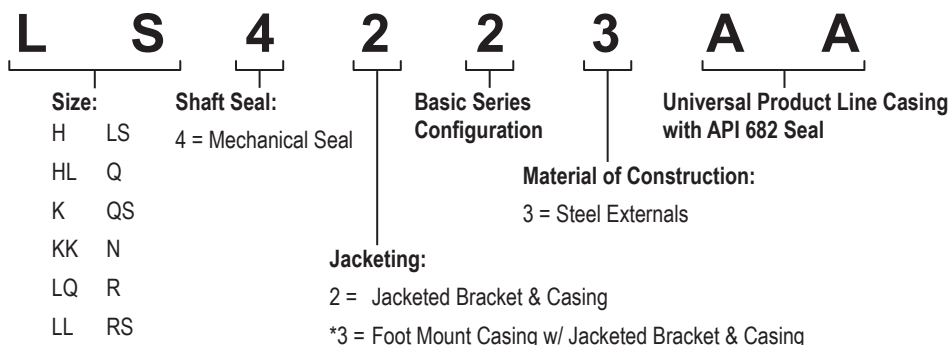
QS4223AA



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UNIVERSAL PRODUCT LINE: STEEL EXTERNALS — JACKETED PUMPS SERIES 4223AA, 4323AA (API 682 Seal)

MODEL NUMBER KEY



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

SPECIFICATIONS

| Model Number | ③ Standard Port Size | Nominal Pump Rating (100 SSU & below) | | | ④ Maximum Hydrostatic Pressure | | ① Maximum Discharge Pressure | | ② Maximum Recommended Temperature for Standard Pump | | Approximate Shipping Weight with Valve | |
|--------------|----------------------|---------------------------------------|-------------------|------|--------------------------------|-----|------------------------------|-----|---|-----|--|-------|
| | Inches | GPM | m ³ /h | RPM | PSIG | BAR | PSIG | BAR | °F | °C | Lbs. | Kg. |
| H4223AA | 1 ½ | 15 | 3.4 | 1750 | 400 | 28 | 200 | 14 | 350 | 180 | 170 | 77 |
| HL4223AA | 1 ½ | 30 | 6.8 | 1750 | 400 | 28 | 200 | 14 | 350 | 180 | 170 | 77 |
| K4223AA | 2 | 80 | 18 | 780 | 400 | 28 | 200 | 14 | 350 | 180 | 215 | 98 |
| KK4223AA | 2 | 100 | 23 | 780 | 400 | 28 | 200 | 14 | 350 | 180 | 215 | 98 |
| LQ4223AA | 2 ½ | 135 | 31 | 640 | 400 | 28 | 200 | 14 | 350 | 180 | 345 | 156 |
| LL4223AA | 3 | 140 | 32 | 520 | 400 | 28 | 200 | 14 | 350 | 180 | 350 | 159 |
| LS4223AA | 3 | 200 | 45 | 640 | 400 | 28 | 200 | 14 | 350 | 180 | 360 | 163 |
| Q4223AA | 4 | 300 | 68 | 520 | 400 | 28 | 200 | 14 | 350 | 180 | 640 | 290 |
| QS4223AA | 6 | 500 | 114 | 520 | 400 | 28 | 200 | 14 | 350 | 180 | 700 | 318 |
| N4223AA | 6 | 600 | 136 | 350 | 400 | 28 | 200 | 14 | 350 | 180 | 1,015 | 460 |
| R4323AA | 8 | 1,100 | 250 | 280 | 400 | 28 | 200 | 14 | 350 | 180 | 2,050 | 930 |
| RS4323AA | 10 | 1,600 | 364 | 280 | 400 | 28 | 125 | 9 | 350 | 180 | 2,450 | 1,111 |

NOTE: H-N size pumps are standard with a jacketed bracket and plain head.
R size pumps are standard with a jacketed bracket and jacketed head.
RS size pumps are standard with a jacketed bracket, jacketed casing and jacketed head.

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 Higher temperatures can be handled with special construction and/or extra clearances, consult factory. Temperature based on Fluoroelastomer (FKM) seal as standard. Lower temperature limits may be required when using other seal elastomers

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

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

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OPTIONAL CASINGS – H THROUGH RS SIZES

| Size | Standard Casings | | Non-Jacketed Casing Options | | | | | | | Fully-Jacketed Casing Options |
|------|------------------|-------------------------------|-----------------------------|--------|--------|-------|-------|------|------|-------------------------------|
| | 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® | Fully Rotatable | 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® | Fully Rotatable | 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"①® | Ports cannot face down | 2.5"②® | 3"②® | 4"①® | 4"②® | 6"①® | | | 3"①®, 3"②®, 4"②® |
| LL | 3"①® | Ports cannot face down | 3"②® | 4"①® | 4"②® | | | | | |
| LS | 3"①® | Fully Rotatable | 3"②® | 4"①® | 4"②® | | | | | 4"①®, 6"①®, 4"②® |
| Q | 4"①® | Fully Rotatable | 4"②® | 5"①® | 5"②® | 6"①®* | 6"②®* | 6"①◎ | 6"②◎ | 4"①®, 4"②® |
| QS | 6"①◎ | Rotatable with special casing | 6"①® | 6"②◎ | | | | | | 6"①®, 6"②◎ |
| N | 6"①◎ | Not Rotatable | | | | | | | | 6"①®, 8"②◎ |
| R | 8"①◎ | Not Rotatable | | | | | | | | 8"①◎ |
| RS | 10"①◎ | Not Rotatable | | | | | | | | |

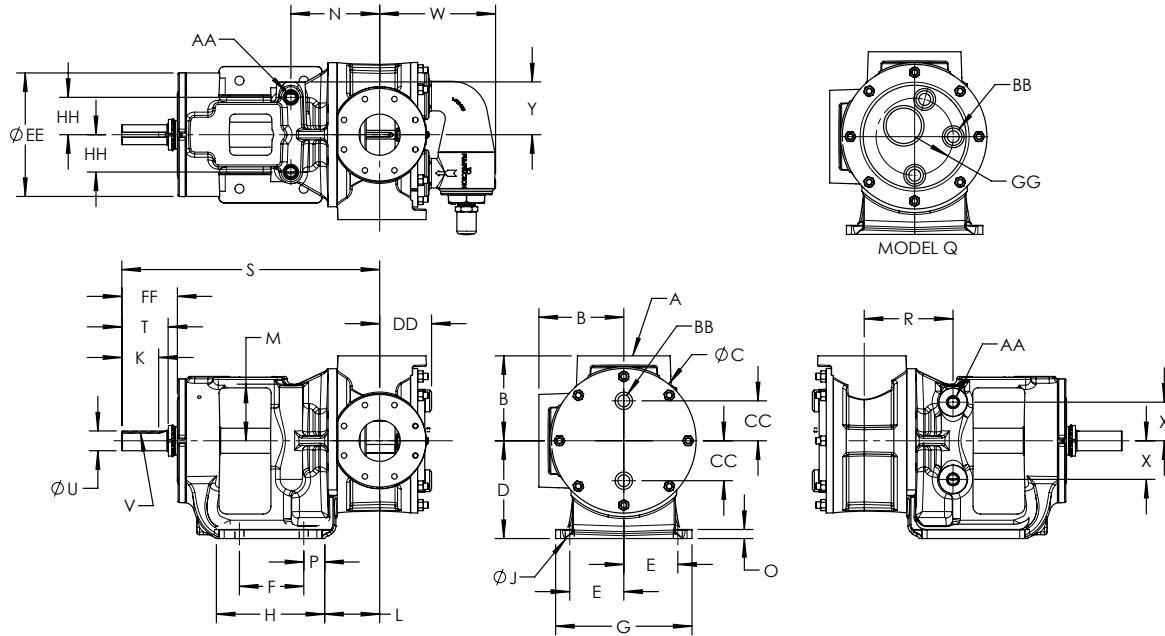
- ① Ports suitable for Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.
- ② Ports suitable for Class 300 ANSI steel or stainless steel companion flanges or flanged fittings.

- Ⓝ 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



| Model Number | A (in) | | B | C | D | E | F | G | H | J | K | L | M | N | O | P |
|---------------------|--------|----|------|-------|------|------|------|-------|-------|------|------|------|------|------|------|------|
| H4223AA HL4223AA | ① 1.5 | in | 4.00 | 4.75 | 6.00 | 4.25 | 5.00 | 11.00 | 8.63 | 0.47 | 0.99 | 3.83 | 3.83 | 5.95 | 0.94 | 1.61 |
| | | mm | 102 | 121 | 152 | 108 | 127 | 279 | 219 | 12 | 25 | 97 | 97 | 151 | 24 | 41 |
| K4223AA KK4223AA | ① 2 | in | 5.25 | 8.00 | 6.50 | 4.38 | 3.50 | 11.00 | 7.74 | 0.53 | 1.42 | 4.62 | 4.00 | 6.02 | 0.94 | 2.00 |
| | | mm | 133 | 203 | 165 | 111 | 89 | 279 | 197 | 13 | 36 | 117 | 102 | 153 | 24 | 51 |
| LQ4223AA | ① 2.5 | in | 7.19 | 10.25 | 7.00 | 5.00 | 5.00 | 12.50 | 8.39 | 0.53 | 2.55 | 3.38 | 4.34 | 7.01 | 0.81 | 1.38 |
| | | mm | 183 | 260 | 178 | 127 | 127 | 318 | 213 | 13 | 65 | 86 | 110 | 178 | 21 | 35 |
| LL4223AA | ① 3 | in | 7.19 | 10.25 | 7.00 | 5.00 | 5.00 | 12.50 | 8.39 | 0.53 | 2.55 | 3.38 | 4.34 | 7.01 | 0.81 | 1.38 |
| | | mm | 183 | 260 | 178 | 127 | 127 | 318 | 213 | 13 | 65 | 86 | 110 | 178 | 21 | 35 |
| LS4223AA | ① 3 | in | 7.19 | 10.25 | 7.00 | 5.00 | 5.00 | 12.50 | 8.39 | 0.53 | 2.55 | 4.55 | 4.34 | 8.18 | 0.81 | 1.38 |
| | | mm | 183 | 260 | 178 | 127 | 127 | 318 | 213 | 13 | 65 | 116 | 110 | 208 | 21 | 35 |
| Q4223AA | ① 4 | in | 8.25 | 14.00 | 9.50 | 5.25 | 6.25 | 13.25 | 10.52 | 0.69 | 3.58 | 5.35 | 5.50 | 8.63 | 1.08 | 2.03 |
| | | mm | 210 | 356 | 241 | 133 | 159 | 337 | 267 | 18 | 91 | 136 | 140 | 219 | 27 | 52 |

| Model Number | | R | S | T | U (in) | V (in) | W | X | Y | AA (in) | BB (in) | CC | DD | EE | FF | GG | HH |
|---------------------|----|------|-------|------|--------|-----------|-------|------|------|---------|---------|------|------|-------|------|------|------|
| H4223AA HL4223AA | in | 5.95 | 16.91 | 1.59 | 0.75 | .19 x .07 | 4.04 | 2.38 | 3.63 | 3/4" | 1/2" | 0.94 | 2.41 | 8.38 | 2.30 | — | 2.38 |
| | mm | 151 | 430 | 40 | | | 103 | 60 | 92 | | | 24 | 61 | 213 | 58 | — | 60 |
| K4223AA KK4223AA | in | 6.02 | 18.58 | 2.29 | 1.12 | .25 x .10 | 7.00 | 2.63 | 3.62 | 3/4" | 1/4" | 1.75 | 3.25 | 8.43 | 2.92 | — | 2.41 |
| | mm | 153 | 472 | 58 | | | 178 | 67 | 92 | | | 44 | 83 | 214 | 74 | — | 61 |
| LQ4223AA | in | 7.01 | 23.01 | 3.50 | 1.12 | .38 x .14 | 7.18 | 3.00 | 4.25 | 1" | 1" | 3.00 | 3.81 | 8.43 | 4.33 | — | 2.75 |
| | mm | 178 | 584 | 89 | | | 182 | 76 | 108 | | | 76 | 97 | 214 | 110 | — | 70 |
| LL4223AA | in | 7.01 | 23.01 | 3.50 | 1.12 | .38 x .14 | 7.18 | 3.00 | 4.25 | 1" | 1" | 3.00 | 4.31 | 8.43 | 4.33 | — | 2.75 |
| | mm | 178 | 584 | 89 | | | 182 | 76 | 108 | | | 76 | 109 | 214 | 110 | — | 70 |
| LS4223AA | in | 8.18 | 24.15 | 3.50 | 1.44 | .38 x .14 | 7.18 | 3.00 | 4.25 | 1" | 1" | 3.00 | 4.50 | 8.43 | 4.33 | — | 2.75 |
| | mm | 208 | 613 | 89 | | | 182 | 76 | 108 | | | 76 | 114 | 214 | 110 | — | 70 |
| Q4223AA | in | 8.63 | 25.06 | 4.50 | 1.94 | .50 x .20 | 11.25 | 3.75 | 5.13 | 1" | 1" | — | 4.57 | 12.09 | 5.40 | 3.75 | 3.63 |
| | mm | 219 | 637 | 114 | | | 286 | 95 | 130 | | | — | 116 | 307 | 137 | 95 | 92 |

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

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

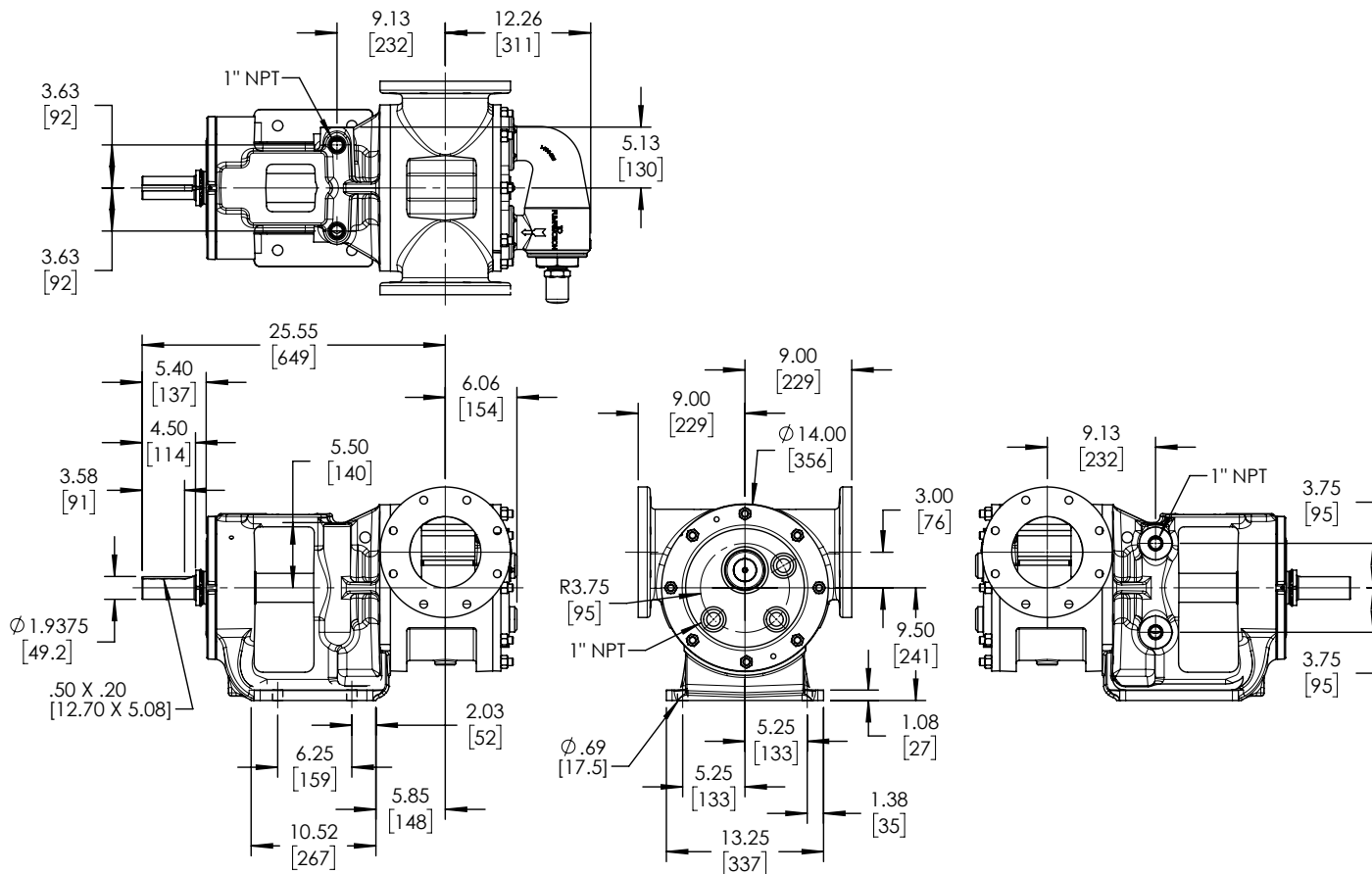
③ BB dimension for Q4223A is 1".

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

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DIMENSIONS — QS SIZE



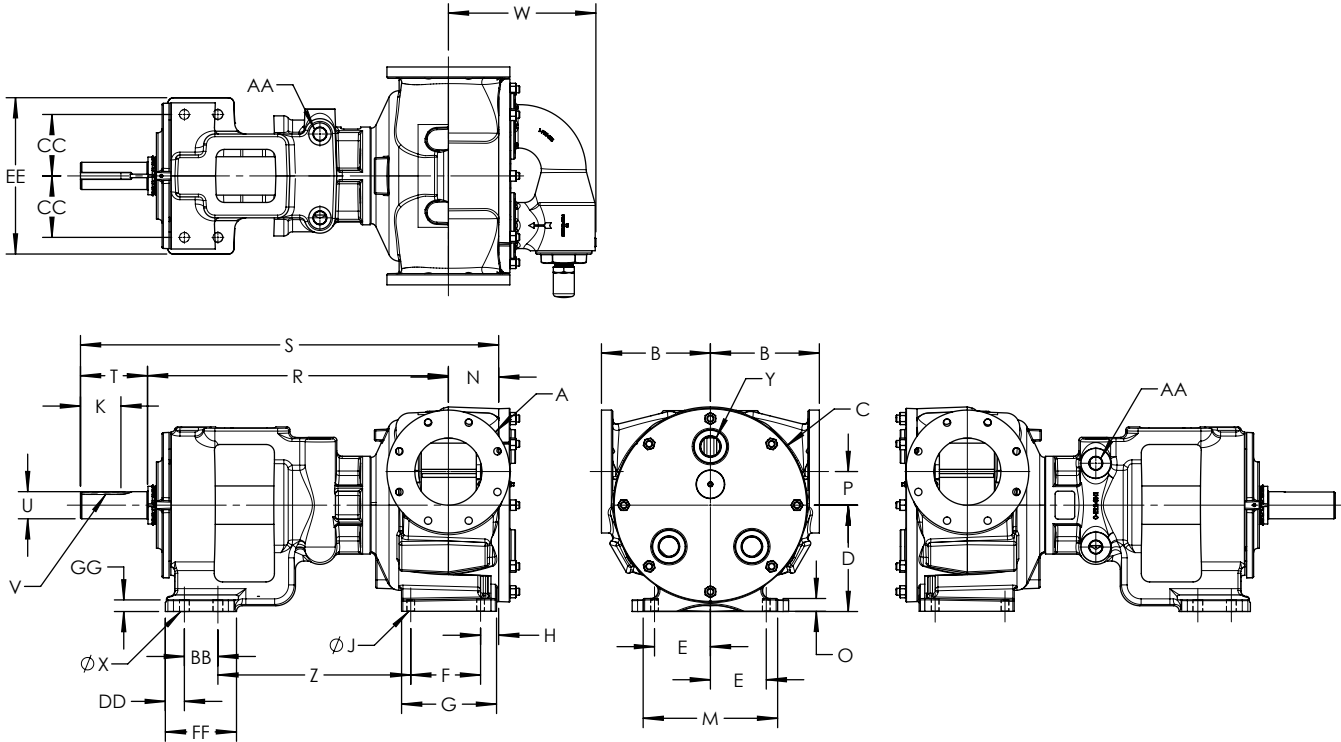
| Model Number | BB* | DD | GG |
|--------------|------|------------|-----------|
| QS4223AA | 1.00 | 6.06 (153) | 3.75 (95) |

* Ports for steam or hot oil jacketing are inch standard NPT threads. Metric (mm) equivalents are for information only, and do not indicate a metric thread size.

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DIMENSIONS – N, R, RS SIZES – JACKETED BRACKET



| Model Number | A (in) | | B | C | D | E | F | G | H | J | K | M | N | O | P | R | S |
|--------------|---------|----|-------|-------|-------|------|------|-------|------|------|------|-------|------|------|------|-------|-------|
| N4323AA | 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 | 1.00 | 3.00 | 26.00 | 37.43 |
| | | mm | 248 | 438 | 241 | 127 | 159 | 221 | 41 | 18 | 114 | 305 | 114 | 25 | 76 | 660 | 951 |
| R4323AA | ① 8 | in | 14.25 | 24.50 | 13.25 | 6.75 | 7.00 | 10.56 | 2.31 | 0.88 | 6.00 | 16.00 | 5.62 | 1.00 | 4.50 | 28.75 | 41.25 |
| | | mm | 362 | 622 | 337 | 171 | 178 | 268 | 59 | 22 | 152 | 406 | 143 | 25 | 114 | 730 | 1048 |
| RS4323AA | ① 10 | in | 14.25 | 24.50 | 13.25 | 6.75 | 7.00 | 13.12 | 4.81 | 0.88 | 6.00 | 16.46 | 8.12 | 1.30 | 4.50 | 28.55 | 43.29 |
| | | mm | 362 | 622 | 337 | 171 | 178 | 333 | 122 | 22 | 152 | 418 | 206 | 33 | 114 | 725 | 1100 |

| Model Number | | T | U (in) | V (in) | W | X | Y | Z | AA (in) | BB | CC | DD | EE | FF | GG |
|--------------|----|------|--------|-----------|-------|------|--------|-------|---------|------|------|------|-------|------|------|
| N4323AA | in | 6.00 | 2.44 | .62 X .23 | 8.63 | 0.69 | 1" | 17.28 | 1.00 | 3.00 | 5.50 | 1.70 | 14.00 | 6.37 | 1.19 |
| | mm | 152 | | | 219 | 18 | | 439 | | 76 | 140 | 43 | 356 | 162 | 30 |
| R4323AA | in | 6.62 | 3.44 | .88 X .32 | 12.00 | 0.88 | 1-1/4" | 16.08 | 1.50 | 3.25 | 7.75 | 2.01 | 19.00 | 7.17 | 1.20 |
| | mm | 168 | | | 305 | 22 | | 408 | | 83 | 197 | 51 | 483 | 182 | 31 |
| RS4323AA | in | 6.62 | 3.44 | .88 X .32 | — | 0.88 | 1-1/2" | 16.08 | 1.50 | 3.25 | 7.75 | 2.01 | 19.00 | 7.17 | 1.20 |
| | mm | 168 | | | — | 22 | | 408 | | 83 | 197 | 51 | 483 | 182 | 31 |

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

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

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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.

NPSHR data is not available on the curve generator.

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 | — | — | — | — | — | — | — | — | — |