

**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — MAG DRIVE PUMPS**
SERIES 8123A

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RELATED PRODUCTS

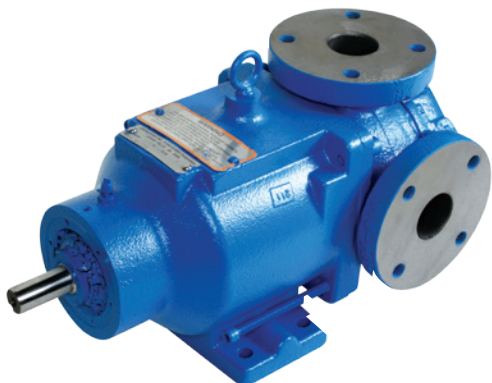
Steel Externals, Non-Jacketed Pumps: Catalog Section 1301
 Cast Iron, Mag Drive Pumps: Catalog Section 1403
 Stainless Steel, Mag Drive Pumps: Catalog Section 1703

SERIES DESCRIPTION

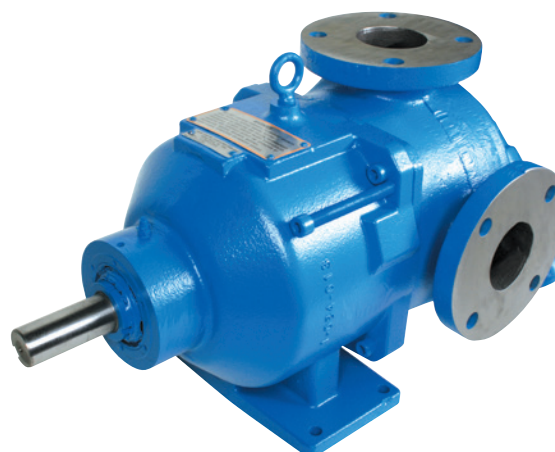
The 8123A Series is the ideal sealing technology within Viking’s Universal Product Line pumps. It is dimensionally interchangeable with other Universal Product Line pumps, allowing an easy upgrade from packed or mechanical seals to sealless technology.

The 8123A Series’ canister is hermetically sealed, providing the highest level of liquid containment available by eliminating traditional dynamic shaft seals traditionally associated with hazardous, hard-to-seal, or expensive liquids. It also eliminates housekeeping issues and downtime due to seal failure. This product is designed to handle a broad range of applications (such as caustics, isocyanates, adhesives, solvents and mercaptans) requiring continuous duty at pressures up to 200 PSI (14 Bar)

This Series features 9 different sizes with flows to 500 GPM (114 m³/h) They may be applied to both thin and thick liquids, and operate in either direction. They are also capable of operating under suction lift conditions. The 8123A series continues the tradition of most robust line of internal gear pumps built by Viking Pump.



HL8123A



LL8123A

OPERATING RANGE

| SERIES | NOMINAL FLOW | | MAXIMUM PRESSURE | | TEMPERATURE RANGE | | VISCOSITY RANGE* | |
|--------|--------------|-----------|------------------|-----|-------------------|-------------|------------------|-------------|
| | GPM | m³h | PSI | Bar | °F | °C | SSU | cSt |
| 8123A | 15 - 500 | 3.4 - 114 | 200 | 14 | -20 to +500 | -30 to +260 | 28 to 250,000 | 1 to 55,000 |

* Samarium cobalt magnets required for temperatures over 225° F (105°C)

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UNIVERSAL PRODUCT LINE: STEEL EXTERNALS — MAG DRIVE PUMPS SERIES 8123A

FEATURES & BENEFITS

- Positive displacement, internal gear pumping principle.
- Gear and pump geometry has been optimized based on more than 100 years of experience. These pumps are designed to provide exceptional reliability and freedom from down time and maintenance.
- Drop in foot print allows direct replacement of a Viking Universal Seal pump without re-piping.
- Foot-mounted design.
- Available with 90° ports, which can be rotated in 90° degree increments, or with 180° ports (Check individual sizes).
- Ports are threaded or flanged.
- Pumps come with an adjustable internal pressure relief valve on standard design.
- The pump operates in either direction, allowing one pump to be used for both loading and unloading. There is a slight reduction in capacity at viscosities less than 100 SSU with counter-clockwise rotation.
- Adjustable end clearance for fluid viscosity or temperature by use of head shims.
- Static O-rings at key points assures liquid containment.
- Pumps conforming to ATEX hazard prevention requirements are available
- Short-term Run-dry Capability. Unlike many mag drive pumps, the 8123A series may be run dry for short periods, such as for clear lines when unloading, or in the case of accidental empty tank situations.

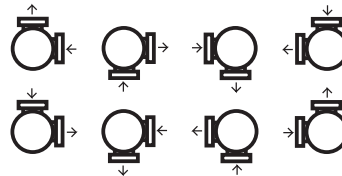
PORT LOCATION OPTIONS

Revolvable Pump Casings Standard on H through LS Sizes

All 8123A pumps are equipped with pump casings that can be positioned to meet common piping configurations. H through Q sizes have standard 90° ports which can be turned to any of four positions. The QS size has standard 180° ports with an option of 90° ports allowing you to achieve any of four positions, like the other sizes. Optional opposite ports are available on other sizes and materials. Direction of flow is reversible so any given port can be used as suction or discharge. The relief valve must “point “ to the suction port in all cases.

* H, HL, K, KK, LQ & LL ports can't face down.

90° port options:



Opposite ports:



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

MODEL NUMBER KEY

| | | | | | | |
|--------------|----------|-----------------------|--------------------------|-----------------------------------|----------------------------------|-------------------------------|
| L | S | 8 | 1 | 2 | 3 | A-325 |
| Size: | | Shaft Sealing: | | Basic Series Configuration | | Series Edition: |
| H | LQ | 8 = Sealless | | | | A = Original Design |
| HL | LL | | | | | |
| K | LS | | Jacketing: | | Material of Construction: | Torque Specifications: |
| KK | Q | | 1 = Non-Jacketed Bracket | | 3 = Steel Externals | H-HL = 40 Ft-lb |
| QS | | | | | | K-KK = 90 Ft-lb |
| | | | | | | K-KK = 180 Ft-lb |
| | | | | | | LQ-LS = 325 Ft-lb |
| | | | | | | Q-QS = 425 Ft-lb |
| | | | | | | Q-QS = 900 Ft-lb |

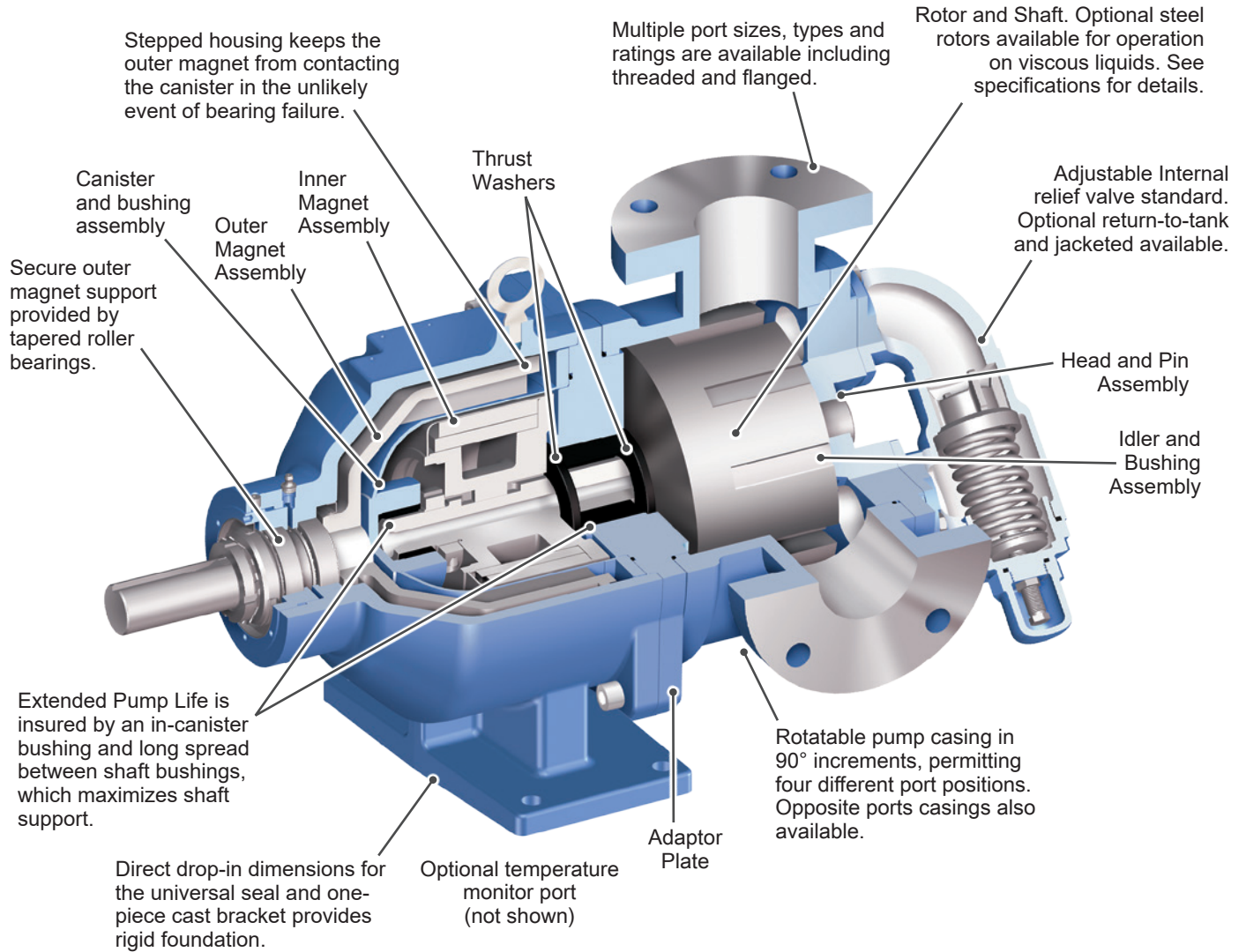
Note: Model numbers for the 8123A series, begin with the size, followed by the pump series. The last number of the series indicates the material of construction for the external components. This is followed by the coupling and drive unit designations.

Neodymium iron boron magnets are the standard. For application temperatures over 225°F (105°C), Samarium Cobalt magnets are available in all sizes.

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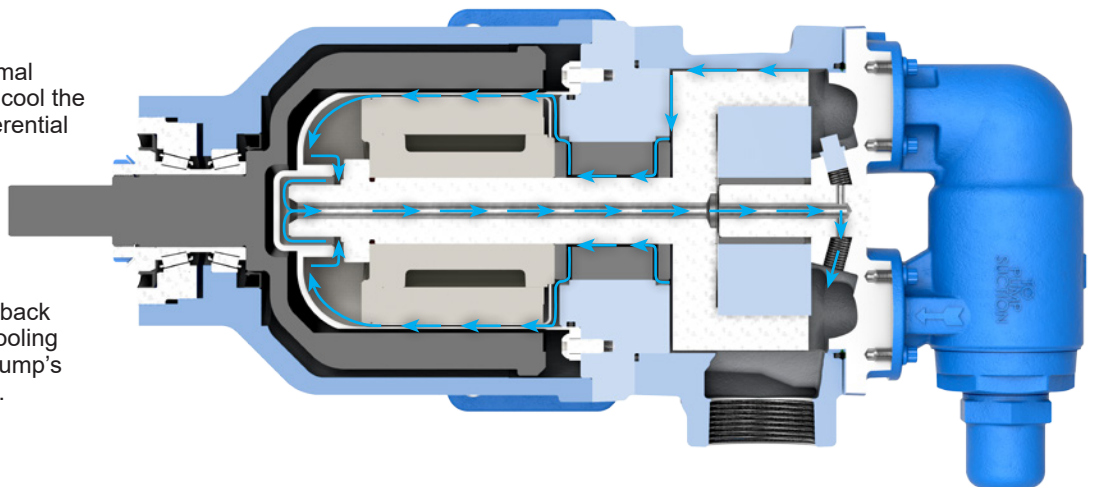
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CUTAWAY VIEW & PUMP FEATURES



H through LS hollow shaft circulation illustrated below. Q & QS circulation is reversed - not illustrated (idler pin open to discharge port).

Positive Cooling Flow
(indicated by small arrows) minimizes potential for thermal product degradation and to cool the magnet area. Pressure differential from the discharge side causes a cooling flow between the pump shaft and bushing, and the canister and magnet through the shaft interior and hollow idler pin back to the pump suction. This cooling flow is reversed when the pump's direction of flow is reversed.



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**UNIVERSAL PRODUCT LINE:
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STANDARD MATERIALS OF CONSTRUCTION

| Component | Standard Material | |
|--------------------------------|---------------------------------------|--|
| Casing | Steel, ASTM A216, Grade WCB | |
| Head | Steel, ASTM A216, Grade WCB | |
| Bracket | Cast Iron, ASTM A48, Class 35B | |
| Idler | Standard | ② Cast Iron, ASTM A48, Class 35B |
| | Optional | ④ Consult Factory |
| Rotor | Standard | ① Cast Iron, ASTM A48, Class 35B |
| | Optional | Steel, ASTM A148, Grade 80-50 |
| Rotor Shaft | Hardened Steel, ASTM A108, Grade 1045 | |
| Idler Pin | Hardened Steel, ASTM A108, Grade 1045 | |
| Idler Bushing | Standard | Carbon Graphite |
| | Optional | Hardened Cast Iron, Silicon Carbide |
| Internal Pressure Relief Valve | ⑤ Steel, ASTM A216, Grade WCB | |
| Canister | 316L Stainless Steel | |
| Canister Bushing | Standard | Carbon Graphite |
| | Optional | Hardened Cast Iron, Siliconized Graphite |
| Thrust Washers | Standard | ③ Hardened Cast Iron |
| | Optional | Silicon Carbide |
| Coupling Magnets | Standard | Neodymium Iron Boron |
| | Optional | Samarium Cobalt |
| O-Rings | Standard | FKM |
| | Optional | PTFE (Derivative) Encapsulated, FFKM |
| Adaptor Plate | Steel, ASTM A216, Grade WCB | |
| Adaptor Bushing | Standard | Carbon Graphite |
| | Optional | Hardened Cast Iron, Silicon Carbide |

- ① KK, LS and QS sizes have ductile iron rotor, ASTM A536 Grade 60-40-18.
 ② H and HL sizes have powdered metal idler, MPIF Std 35 FC-0208-50.
 ③ Q and QS contains two sets of thrust washers, one set is carbon graphite as standard.
 ④ Q and QS steel fitted pumps use a hardened steel idler ASTM A148 Grade 80-40.
 ⑤ LQ, LL and LS size relief valve bodies are stainless steel.

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 |
| SSU | 25,000 | 7,500 | 25,000 | 75,000 | 25,000 | 2,500 | 75,000 | 7,500 | 75,000 |
| cSt | 5,500 | 1,700 | 5,500 | 17,000 | 5,500 | 550 | 17,000 | 1,700 | 17,000 |

- Extra clearances required, depending on viscosity. Contact factory for clearance specifications.
- 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 Low Viscosities or Non-Lubricating Liquids – Below 100 SSU (20 cSt)

- Carbon graphite bushings.
- Silicon carbide thrust washers.

For High Temperatures – Above 225° F (105°C)

- Samarium cobalt magnets required. Maximum temperature is 500°F (260°C), contact factory for special material requirements for temperatures above 400°F (205°C)
- High temperature elastomers – FKM up to 350°F (175°C); PTFE up to 400°F (205°C); or FFKM up to 550°F (290°C);
- High temperature relief valve above 350°F (175°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 ESB-2 for recommendations.

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SPECIFICATIONS

| Model Number | ③ Standard Port Size Inches | ④ Capacity at Maximum Rated Speed GPM m ³ /h RPM | | | Maximum Hydrostatic Pressure PSIG BAR | | ① Maximum Discharge Pressure PSIG BAR | | ② Maximum Recommended Temperature for Standard Pump | | | | Approx. Shipping Weight with Valve Lbs. Kg. | |
|--------------|--------------------------------|--|-----|------|---|----|---|----|---|-----|-------------------------------|-----|---|-----|
| | | | | | | | | | Standard Construction | | High Temperature Construction | | | |
| | | | | | | | | | °F | °C | °F | °C | | |
| H8123A | 1.5 | 15 | 3.4 | 1750 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 70 | 32 |
| HL8123A | 1.5 | 30 | 7 | 1750 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 70 | 32 |
| K8123A | 2 | 80 | 18 | 780 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 205 | 93 |
| KK8123A | 2 | 100 | 23 | 780 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 205 | 93 |
| LQ8123A | 2.5 | 135 | 30 | 640 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 295 | 134 |
| LL8123A | 3 | 170 | 39 | 640 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 315 | 143 |
| LS8123A | 3 | 200 | 45 | 640 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 350 | 159 |
| Q8123A | 4 | 300 | 68 | 520 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 730 | 331 |
| QS8123A | 6 | 500 | 114 | 520 | 400 | 28 | 200 | 14 | 225 | 105 | 500 | 260 | 805 | 365 |

① For maximum recommended discharge pressures see performance curves, which can be electronically generated with the Viking Pump Curve Generator, located on www.vikingpump.com.

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

③ Ports are suitable for ANSI Class 150 steel or stainless steel companion flanges or flanged fittings. Other options are available, consult factory.

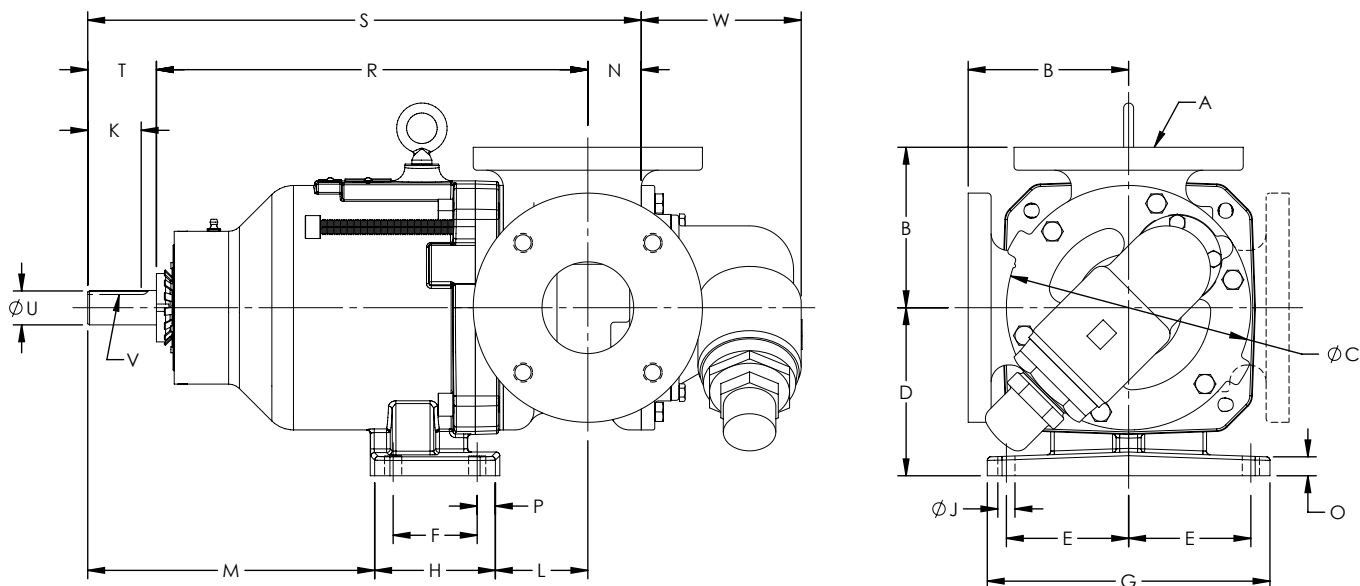
④ Nominal capacity on medium viscosity liquids with clockwise rotation.

There is a slight reduction in capacity at viscosities less than 100 SSU with counter-clockwise rotation.

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DIMENSIONS — SIZES H THROUGH LS



| Model Number | A (in) | | B | C | D | E | F | G | H | J | K | L | M | N | O | P | R | S | T | ②U | V | W |
|-------------------|----------|----|------|-------|------|------|------|-------|------|------|------|------|------|------|------|------|-------|-------|------|------|-----------|------|
| H8123A HL8123A | 1.5 | in | 4.00 | 4.75 | 3.50 | 2.75 | 2.25 | 6.75 | 3.50 | 0.47 | 0.99 | 3.38 | 5.19 | 1.19 | 0.56 | 0.63 | 10.45 | 13.26 | 1.62 | 0.75 | .19 x .09 | 2.90 |
| | | mm | 102 | 121 | 89 | 70 | 57 | 171 | 89 | 12 | 25 | 86 | 132 | 30 | 14 | 16 | 266 | 337 | 41 | 19 | | 74 |
| K8123A K8123A | 2 | in | 5.25 | 8.00 | 5.50 | 4.00 | 2.75 | 9.25 | 3.95 | 0.56 | 1.42 | 3.03 | 9.39 | 1.75 | 0.62 | 0.60 | 14.12 | 18.12 | 2.25 | 1.13 | .25 x .12 | 5.25 |
| | | mm | 133 | 203 | 140 | 102 | 70 | 235 | 100 | 14 | 36 | 77 | 239 | 44 | 16 | 15 | 359 | 460 | 57 | 28 | | 133 |
| LQ8123A | ① 2.5 | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.40 | 0.56 | 2.55 | 3.37 | 9.11 | 1.75 | 0.62 | 0.63 | 14.50 | 19.63 | 3.38 | 1.44 | .38 x .19 | 5.40 |
| | | mm | 183 | 260 | 178 | 112 | 102 | 254 | 137 | 14 | 65 | 86 | 231 | 44 | 16 | 16 | 369 | 499 | 86 | 36 | | 137 |
| LL8123A | ① 3 | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.40 | 0.56 | 2.55 | 3.37 | 9.11 | 2.25 | 0.62 | 0.63 | 14.50 | 20.13 | 3.38 | 1.44 | .38 x .19 | 5.40 |
| | | mm | 183 | 260 | 178 | 112 | 102 | 254 | 137 | 14 | 65 | 86 | 231 | 57 | 16 | 16 | 369 | 511 | 86 | 36 | | 137 |
| LS8123A | ① 3 | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.40 | 0.56 | 2.55 | 4.74 | 9.11 | 2.44 | 0.62 | 0.63 | 15.87 | 21.69 | 3.38 | 1.44 | .38 x .19 | 5.40 |
| | | mm | 183 | 260 | 178 | 112 | 102 | 254 | 137 | 14 | 65 | 120 | 231 | 62 | 16 | 16 | 403 | 551 | 86 | 36 | | 137 |

① Series 8123A ports are suitable for 150# ANSI steel or stainless steel companion flanges or flanged fittings.

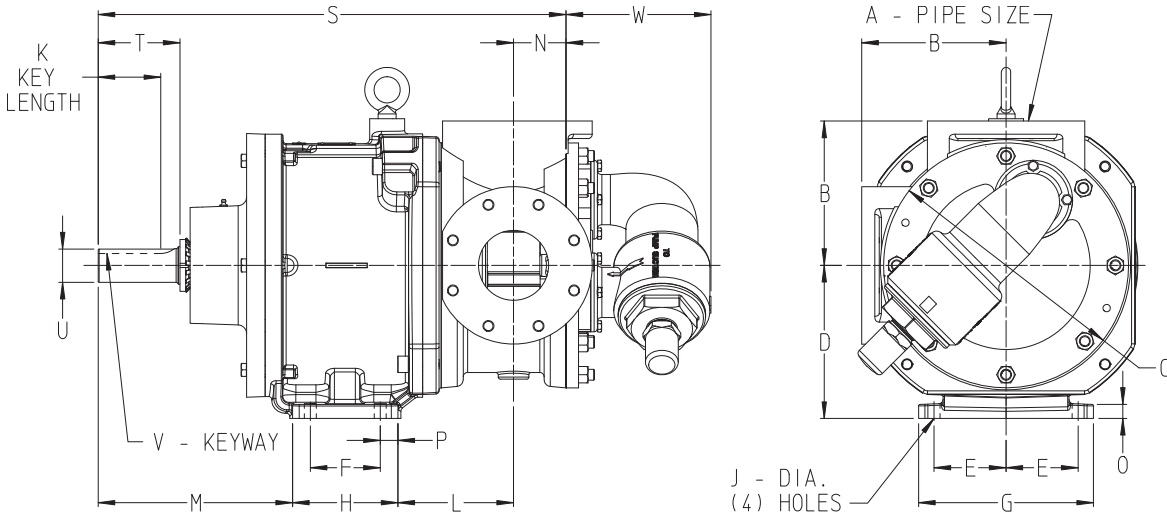
② When replacing on existing units, sizes LQ and LL "A" will require a different size coupling half.

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

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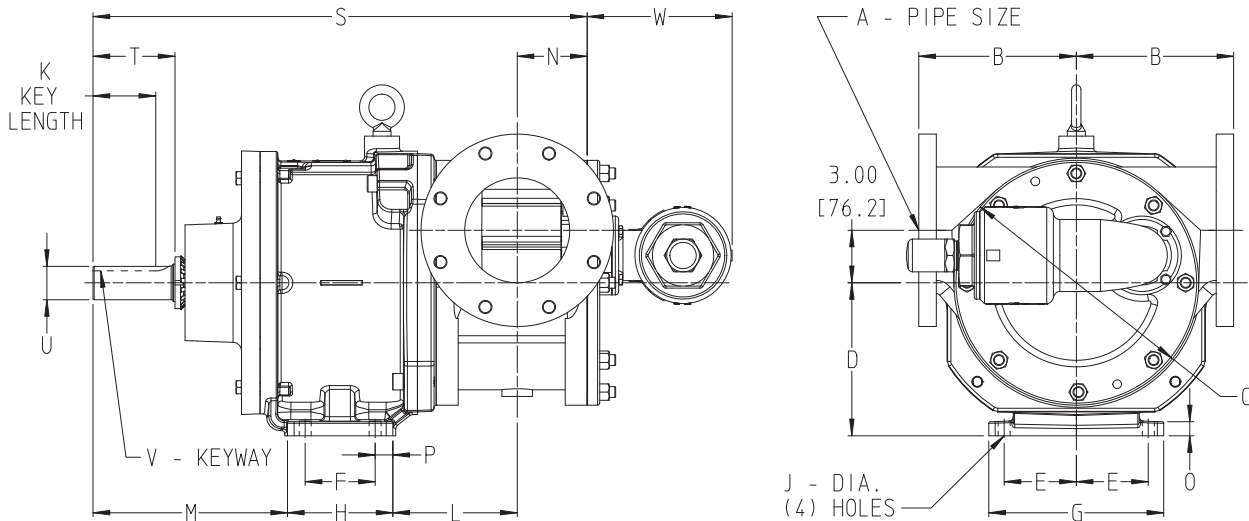
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DIMENSIONS — SIZE Q



| Model Number | A (in) | | B | C | D | E | F | G | H | J | K | L | M | N | O | P | S | T | U (in) | V (in) | W |
|--------------|--------|----|------|-------|------|------|------|-------|------|------|------|------|-------|------|------|------|-------|------|--------|--------------|------|
| Q8123A | ① 4 | in | 8.25 | 14.00 | 8.75 | 4.12 | 4.00 | 10.00 | 6.00 | 0.69 | 3.58 | 6.62 | 11.13 | 3.00 | 0.80 | 1.00 | 26.75 | 4.68 | 1.94 | .50 x .25 | 8.29 |
| | | mm | 210 | 356 | 222 | 105 | 102 | 254 | 152 | 18 | 91 | 168 | 283 | 76 | 20 | 25 | 679 | 119 | | | 211 |

DIMENSIONS — SIZE QS



| Model Number | A (in) | | B | C | D | E | F | G | H | J | K | L | M | N | O | P | S | T | U (in) | V (in) | W |
|--------------|--------|----|------|-------|------|------|------|-------|------|------|------|------|-------|------|------|------|-------|------|--------|--------------|------|
| QS8123A | ① 6 | in | 9.00 | 14.00 | 8.75 | 4.12 | 4.00 | 10.00 | 6.00 | 0.69 | 3.58 | 7.12 | 11.13 | 4.00 | 0.80 | 1.00 | 28.25 | 4.68 | 1.94 | .50 x .25 | 8.29 |
| | | mm | 229 | 356 | 222 | 105 | 102 | 254 | 152 | 18 | 91 | 181 | 283 | 102 | 20 | 25 | 718 | 119 | | | 211 |

① Ports are suitable for use with Class 150 ANSI steel or stainless steel 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.

NPSH_R 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 | — | — | — | — | — | — |

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**UNIVERSAL PRODUCT LINE:
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**SELECTING THE CORRECT
VIKING MAG DRIVE® COUPLING**

1. Find pump HP and speed from the performance curves, which can be electronically generated with the Viking Pump Curve Generator, located on www.vikingpump.com.
2. Calculate the application torque (T), using this formula:

$$T \text{ (FT-LB)} = \frac{\text{HP}}{\text{SPEED}} \times 5252$$
3. Select the temperature correction factor (TCF) from Table 1 or Table 2.

| STANDARD NEODYMIUM MAGNETS (For Application Temperatures Below 225°F.) | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|
| Application Temp. (°F) | AMB | 100 | 125 | 150 | 175 | 200 | 225 |
| TCF | 1.0 | .94 | .88 | .82 | .76 | .70 | .64 |

Table 1: Temperature Correction Factors

| OPTIONAL SAMARIUM COBALT MAGNETS (For Application Temperatures Above 225°F.) | | | | | |
|---|-----|-----|-----|-----|-----|
| Application Temp. (°F) | 175 | 200 | 300 | 400 | 500 |
| TCF | .74 | .73 | .69 | .63 | .59 |

Table 2: Temperature Correction Factors

4. Divide calculated application torque by TCF to get adjusted application torque.
5. Select coupling with rating equal to or greater than “adjusted application torque” from Table 3.

| MAGNETIC COUPLING TORQUE RATING TABLE | |
|---------------------------------------|-----------------|
| Pump Size | Torque (FT-LBS) |
| H & HL | 40 |
| K & KK | 90 |
| | 180 |
| LQ, LL, LS | 325 |
| Q & QS | 425 |
| | 900 |

Table 3

EXAMPLE

1. An HL8123A is required to pump 30 GPM of 20 cSt liquid at 1750 RPM, 50 PSI differential pressure

Temperature is 150°F.

From the pump selector, required HP is 2.8.

2. Calculate torque (T).

$$\begin{aligned} \text{TORQUE (T)} &= \frac{2.8}{1750} \times 5252 \\ &= 8.40 \text{ FT-LB} \end{aligned}$$

3. From the temperature correction factor table, the correction factor (TCF) = .82.

4. Calculate adjusted application torque.

$$\begin{aligned} \text{ADJUSTED APPLICATION TORQUE} &= \frac{8.40}{0.82} \\ &= 10.25 \text{ FT-LB} \end{aligned}$$

5. Select coupling.

THE NEODYMIUM 40 FT-LB COUPLING IS THE PROPER SELECTION