897 Series pumps are designed to provide positive displacement pumping capability in those situations that require the highest assurance of liquid containment. These mag drive pumps provide for the safe, trouble-free transfer of hazardous, EPA-regulated fluids without electronic monitoring as required with mechanical face-type shaft seals. Hard-to-seal liquids are also easily handled with the Viking Mag Drive which eliminates the high cost of mechanical seal replacement and repair. A variety of coupling sizes are available for flow requirements to 75 GPM. The torque-carrying ability of high-strength magnets allows pumps to be coupled with gear reducers for slow-speed handling of viscous liquids. The self-priming positive-displacement pumping principle provides low-shear, non-pulsing flow. Internal gear pumps are available in stainless steel, steel, and cast iron construction.
FEATURES & BENEFITS

• Internal Gear
  » With only two moving parts, Viking Mag Drive and Viking’s gear-within-a-gear principle provides low-shear pumping.

• Magnetic Coupling
  » Viking Mag Drive magnetically couples the pump to the driver. Magnetic force passing through a stainless steel canister is used to drive the inner coupling, eliminating the need for shaft seals.

STANDARD MATERIALS OF CONSTRUCTION

<table>
<thead>
<tr>
<th>Component</th>
<th>Standard Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing</td>
<td>Stainless Steel, ASTM A743, Grade CF8M</td>
</tr>
<tr>
<td>Head</td>
<td>Stainless Steel, ASTM A743, Grade CF8M Case hardened</td>
</tr>
<tr>
<td>Idler Standard</td>
<td>PPS Composite</td>
</tr>
<tr>
<td>Idler Optional</td>
<td>Non-Galling Stainless</td>
</tr>
<tr>
<td>Rotor</td>
<td>Stainless Steel, ASTM A743, Grade CF8M Case hardened</td>
</tr>
<tr>
<td>Rotor Shaft</td>
<td>Hard Coated Stainless Steel, ASTM A276, Type 316 Hard Coated</td>
</tr>
<tr>
<td>Idler Pin</td>
<td>Hard Coated Stainless Steel, ASTM A276, Type 316 Hard Coated</td>
</tr>
<tr>
<td>Idler &amp; Casing Bushing</td>
<td>Carbon Graphite</td>
</tr>
<tr>
<td>Internal Pressure Relief Valve</td>
<td>Stainless Steel, ASTM A743, Grade CF8M</td>
</tr>
<tr>
<td>Canister</td>
<td>316L Stainless Steel</td>
</tr>
<tr>
<td>Coupling Magnets Standard</td>
<td>Neodymium Iron Boron</td>
</tr>
<tr>
<td>Coupling Magnets Optional</td>
<td>Samarium Cobalt</td>
</tr>
<tr>
<td>O-rings Standard</td>
<td>PTFE (Derivative) Encapsulated</td>
</tr>
<tr>
<td>O-rings Optional</td>
<td>FKM, FFKM</td>
</tr>
</tbody>
</table>

① Standard Material is Polyphenylene Sulfide composite material. Recommend using metal idler above 10,000 SSU.
② MD-A canisters are 316 stainless steel.
MODEL NUMBER KEY

A K 8 9 7

Displacement:
GG AS
HJ AK
HL AL

Basic Series Configuration
Shaft Seal:
8 = Sealless Mag Drive

Material of Construction
7 = Stainless Steel

CUTAWAY VIEW & PUMP FEATURES

Balance Plate. Standard material is PPS composite with an optional iron balance plate for high temperature applications.

Casing Bushings

Optional Temperature Probe Connection

Casing

Canister

Optional Temperature Probe Connection

Canister O-Ring. Along with the canister, this static seal replaces traditional dynamic seals like packing and mechanical seals. This provides the highest assurance against leakage on difficult to seal liquids.

Rotor

Idler

(Pump shown with optional raised face flanges)

Internal pressure relief valve standard. Return-to-tank valve and plain head optional.

Bracket. Designed to mount directly to a c-flange NEMA motor (MD-A or MD-B coupling sizes) or to a bearing carrier assembly for a shafted version of this pump (not shown).

The outer magnet is the drive magnet, driven directly by the motor.

Inner Magnet Assembly. The inner magnet is the driven magnet, aligned by magnetic force passing through the canister. The inner magnet assembly is shielded in a laser welded 316SS housing to prevent exposure of the magnets to the liquid.
## MOTOR SPEED PRODUCT LINE:
STAINLESS STEEL — MAG DRIVE PUMPS
SERIES 897

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Port Size</th>
<th>Nominal Pump Rating (100 SSU &amp; below)</th>
<th>Magnetic Coupling Availability</th>
<th>Maximum Temperature</th>
<th>Maximum Hydrostatic Pressure</th>
<th>Approximate Pump Shipping Weight with Valve (less power)</th>
<th>Approximate Coupling Only Shipping Weight (ready to accept but less power)</th>
</tr>
</thead>
</table>
| GG897        | 1         | 10 7 1800 2.3 1.6 1200               | MD-A 4 9 5.4 12.2             | 225 105 400 28 22 10   | 31 14                        | *See Performance Curves, which can be electronically generated with the Viking Pump Curve Generator, located on www.vikingpump.com, for specific coupling recommendation on other pressures and viscosities.*
| HJ897        | 1½        | 20 13 1800 4.5 3 1200                | MD-A 4 9 5.4 12.2 MD-B 40 5.4 12.2 | 225 105 400 28 30 14 31 14  | *Higher temperatures can be handled with Samarium Cobalt magnets. See page 12 for torque and temperature limits.*
| HL897        | 1½        | 30 20 1800 6.8 4.5 1200              | MD-A 4 9 5.4 12.2 MD-B 40 5.4 12.2 | 225 105 400 28 30 14 71 32  | *For bearing carrier weights add 8 Lbs (2 Kg) for “MD-A” size, add 17 Lbs (4 Kg) for “MD-B” size.*
| AS897        | 3         | 35 8 1200 | MD-B MD-C 40 80 54 108 MD-C 40 80 54 108 | 225 105 400 28 78 35 71 32  | *
| AK897        | 3         | 50 11 1200 | MD-B MD-C 40 80 54 108 MD-C 40 80 54 108 | 225 105 400 28 78 35 71 32  | *
| AL897        | 3         | 75 17 1200 | MD-B MD-C 40 80 54 108 MD-C 40 80 54 108 | 225 105 400 28 78 35 95 43  | *

### DIMENSIONS – GG, HJ, HL SIZES (UNMOUNTED)

![Diagram](image)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>A (in)</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>GG-897</td>
<td>1</td>
<td>4.00</td>
<td>4.29</td>
<td>1.12</td>
<td>0.62</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>102</td>
<td>108</td>
<td>29</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>HJ-897</td>
<td>1½</td>
<td>4.00</td>
<td>5.44</td>
<td>1.50</td>
<td>0.62</td>
<td>0.50</td>
</tr>
<tr>
<td>HL-897</td>
<td>1½</td>
<td>4.00</td>
<td>5.44</td>
<td>1.50</td>
<td>0.62</td>
<td>0.50</td>
</tr>
</tbody>
</table>

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

©2018 VIKING PUMP • A Unit of IDEX Corporation • Cedar Falls, IA
PORTS: 2X 1" FLANGES
SUITABLE FOR USE WITH CLASS 150 ANSI FLANGES

19 X .09 KEYWAY
DIMENSIONS – HJ, HL SIZES – MD-A4 & MD-A9 (B DRIVE)

PORTS: 2X 1-1/2" FLANGES
SUITABLE FOR USE WITH
CLASS 150 ANSI FLANGES

DIMENSIONS – HJ, HL SIZES – MD-B15 & MD-B40 (M DRIVE)

PORTS: 2X 1-1/2" FLANGES
SUITABLE FOR USE WITH
CLASS 300 ANSI FLANGES

These dimensions are average and not for construction purposes. Certified prints on request.
## DIMENSIONS – AS, AK, AL SIZES (UNMOUNTED)

A - PIPE SIZE (MATE WITH 150 LB. ANSI FLANGES)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>A (in)</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS-897</td>
<td>3</td>
<td>6.00</td>
<td>7.50</td>
<td>2.00</td>
<td>7.00</td>
<td>1.12</td>
<td>0.75</td>
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<tr>
<td>AK-897</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>152</td>
<td>190</td>
<td>51</td>
<td>178</td>
<td>29</td>
<td>19</td>
</tr>
<tr>
<td>AL-897</td>
<td>3</td>
<td>6.00</td>
<td>7.25</td>
<td>2.50</td>
<td>7.00</td>
<td>1.12</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>152</td>
<td>184</td>
<td>63</td>
<td>178</td>
<td>29</td>
<td>19</td>
</tr>
</tbody>
</table>

These dimensions are average and not for construction purposes. Certified prints on request.
DIMENSIONS – AS, AK, AL SIZES – MD-B15 & MD-B40 (B DRIVE)

PORTS: 2X 3” FLANGES
SUITABLE FOR USE WITH
CLASS 150 ANSI FLANGES

These dimensions are average and not for construction purposes. Certified prints on request.
MOTOR SPEED PRODUCT LINE:
STAINLESS STEEL — MAG DRIVE PUMPS
SERIES 897

DIMENSIONS – AS, AK, AL SIZES – MD-C80 (B DRIVE)

These dimensions are average and not for construction purposes. Certified prints on request.
DIMENSIONS – AS, AK SIZES – MD-B15 & B40 (M DRIVE)

DIMENSIONS – AL SIZES – MD-B15 & B40 (M DRIVE)

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

Printed performance curves are not available.
Performance curves can be electronically generated with the Viking Pump Curve Generator on vikingpump.com.
NPSH\textsubscript{R} data is not available on the Curve Generator.

NPSH (Net Positive Suction Head): The NPSH\textsubscript{R} (Net Positive Suction Head Required by the pump) is given in the table below and applies for viscosities through 750 SSU. NPSH\textsubscript{A} (Net Positive Suction Head – Available in the system) must be greater than the NPSH\textsubscript{R}. For a complete explanation of NPSH, see Application Data Sheet AD-19.

FOR VISCOSITIES UP TO 750 SSU – See NPSH\textsubscript{R} table below.

NPSH\textsubscript{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\textsubscript{R} value in the chart below.

NPSH\textsubscript{R} – FEET OF LIQUID (Specific Gravity 1.0), Viscosities up to 750 SSU

<table>
<thead>
<tr>
<th>PUMP SIZE</th>
<th>PUMPS SPEED, RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>840</td>
</tr>
<tr>
<td>GG</td>
<td>2.2</td>
</tr>
<tr>
<td>HJ, HL</td>
<td>2.8</td>
</tr>
<tr>
<td>AS, AK, AL</td>
<td>3.9</td>
</tr>
</tbody>
</table>
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 Selector Program, 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.

### Table 1: Temperature Correction Factors

<table>
<thead>
<tr>
<th>Application Temp. (°F)</th>
<th>AMB</th>
<th>100</th>
<th>125</th>
<th>150</th>
<th>175</th>
<th>200</th>
<th>225</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCF</td>
<td>1.0</td>
<td>.94</td>
<td>.88</td>
<td>.82</td>
<td>.76</td>
<td>.70</td>
<td>.64</td>
</tr>
</tbody>
</table>

### Table 2: Temperature Correction Factors

<table>
<thead>
<tr>
<th>Application Temp. (°F)</th>
<th>175</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCF</td>
<td>.74</td>
<td>.73</td>
<td>.69</td>
<td>.63</td>
<td>.59</td>
</tr>
</tbody>
</table>

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.

### Table 3: Magnetic Coupling Torque Rating Table

<table>
<thead>
<tr>
<th>Coupling Size</th>
<th>Torque (FT-LBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD-A4</td>
<td>4</td>
</tr>
<tr>
<td>MD-A9</td>
<td>9</td>
</tr>
<tr>
<td>MD-B40</td>
<td>40</td>
</tr>
<tr>
<td>MD-C80</td>
<td>80</td>
</tr>
</tbody>
</table>

EXAMPLE 1

1. A GG897 is required to pump 100 SSU liquid at 1750 RPM, 50 PSI differential pressure.
   Temperature is 100°F.
   From the pump selector, required HP is 0.85.
2. Calculate torque (T).
   \[ \text{TORQUE} (T) = \frac{0.85}{1750} \times 5252 = 2.6 \, \text{FT-LB} \]
3. From the temperature correction factor table, the correction factor (TCF) = 0.94.
4. Calculate adjusted application torque.
   \[ \text{ADJUSTED APPLICATION TORQUE} = \frac{2.6}{0.94} = 2.8 \, \text{FT-LB} \]
5. Select coupling.
   A STANDARD NEOYDIUM MD-A4 COUPLING IS THE PROPER SELECTION

EXAMPLE 2

1. An AL897 is required to pump 38 SSU liquid at 1150 RPM, 50 PSI differential pressure.
   Temperature is 300°F.
   From the pump selector, required HP is 3.7.
2. Calculate torque (T).
   \[ \text{TORQUE} (T) = \frac{3.7}{1150} \times 5252 = 16.9 \, \text{FT-LB} \]
3. From the temperature correction factor table, the correction factor (TCF) = 0.69.
4. Calculate adjusted application torque.
   \[ \text{ADJUSTED APPLICATION TORQUE} = \frac{16.9}{0.69} = 24.5 \, \text{FT-LB} \]
5. Select coupling.
   An MD-B40 WITH OPTIONAL SAMARIUM COBALT MAGNETS IS THE PROPER SELECTION