

LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

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SERIES DESCRIPTION (34 & 32E)

Viking 34 Series Asphalt Pumps are designed to handle asphalts, bitumens, pitch, tar, bunker oils, residual oils and related materials that solidify at ambient temperatures. The 34 Series are Viking's simplest asphalt pumps, with a hydraulically-balanced rotor that eliminates the need for thrust control, but also limits the pressures to 100 PSI and less. For higher pressure options, see the Viking Heavy Duty Asphalt Pumps beginning on page 430.6, which feature an outboard thrust bearing as well as additional flow rate options.

Viking's 34 & 32E Series Asphalt Pumps offer two means of melting ambient-temperature solids to a liquid state prior to pump startup: Integral jacketing for steam or hot oil (34 Series), or electric cartridge heaters with closed-loop control systems (32E Series, see p.430.2). The 34 and 32E series are available as packed pumps only.

For Heavy Duty Jacketed and Electrically-heated asphalt pumps, which often higher pressures and additional sizes. See section beginning at p.430.7.

JACKETED PUMPS (SERIES 34)

Viking jacketed pumps feature complete jacketing of all external parts and extra clearances on all working parts. In addition, the rotor bearing sleeve jacket prevents these heavy viscous liquids from hardening in the seal box – affording effective shaft sealing.

Individual chambers surround the casing, head, and rotor bearing sleeve, and each is provided with separate openings for connections with heating lines. See illustrations at left showing location of chambers and connections. Casings are furnished in right hand port construction as standard (determined by location of side port when facing shaft end of pump). Left hand port construction on special order only.

Series 34 pumps come equipped with jacketing on casing, head, and rotor bearing sleeve as standard. Pumps are available with any one, or any combination, of the three jackets, but must be so designated when ordering. A complete jacketed pump is recommended for most installations.

Standard Jacketed Rotor Bearing Sleeve

Jacket chamber indicated above accommodates the heating or cooling agent. All chambers are suitable for maximum steam pressures of 150 PSI or 365°F.

Standard Jacketed Head*

Series 34 pumps are equipped with this type of head as standard. Pumps with jacketed heads cannot be furnished with relief valve on head. Some form of pressure relief is recommended in the discharge line.

OPERATING RANGE:

| | | |
|---------------------|------|--|
| ① Nominal Flow | GPM | 20 to 450 |
| | m³/h | 4.5 to 102 |
| ① Maximum Pressure | PSI | to 100 for 100 SSU and above (LQ) to 75 for 100 SSU and above (Q, M, N) |
| | Bar | to 7 for 100 SSU and above (LQ) to 5.2 for 100 SSU and above (Q, M, N) |
| ① Temperature Range | °F | -60 to +450 |
| | °C | -50 to +232 |
| ① Viscosity Range | SSU | 31 to 250,000 |
| | cSt | 1 to 55,000 |

MODEL NUMBER KEY:



Standard Jacketed Casing

Complete jacketed casing section shown above. All pumps are available with right-hand ports as standard. Left-hand on special order only. All jacketed features are furnished as standard on Series 34 pumps.

Optional Jacketed Valve

Jacketed valve on unjacketed head can be furnished on "LQ through "N" pumps. Note the complete jacketing of the valve. Eliminates liquid solidifying in the valve. Maximum steam pressure 150# or 365°F. Maximum heat transfer oil pressure 150#, 450°F.

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SERIES DESCRIPTION (SERIES 32E)

The 32E series pumps are similar to Viking's 34 Series Packed-Gland Jacketed Asphalt pumps, except instead of jacketing, they offer electric heat cartridges to enable heating without the need for piping steam or hot oil to the pump. The electrically heated pump is designed to melt the asphalt within the pump to a liquid state prior to startup. Heat cartridges located on the head, and in some sizes the casing, provide sufficient heat to melt the liquid within the pump and at the stuffing box.

The pump user may provide their own temperature control system, or Viking Pump offers a controller for its electrically heated pumps. It is a closed loop PID control providing fast, yet effective time to temperature with minimal overshoot to prevent overheating. The control system includes a thermocouple and thermowell adapter for mounting to the pump and a controller which powers all the heat cartridges on one pump (N-size requires a separate 40-amp relay). The controller has a user adjustable temperature set point, up to a preset maximum. When the set point is reached, a relay can be wired to alert the operator, or prevent a pump from being started until the asphalt is melted. It can be ordered with pre-set maximum temperature of either 150°F, 250°F, 350°F or 450°F; or 65°C, 120°C, 175°C or 230°C. See specifications below for number of cartridge heaters and wattages by pump size.

SPECIFICATIONS (32E)

Heat cartridges (pre-installed on pump)
All heaters are 240 VAC, 1 phase, 50/60 Hz

| Pump Size | Head Cartridges | Watts/ Cartridge (Head) | Casing Cartridges | Watts/ Cartridge (Casing) | Total Watts |
|-----------|-----------------|-------------------------|-------------------|---------------------------|-------------|
| LQ32E | 2 | 350 | 2 | 250 | 1200 |
| Q32E | 3 | 500 | 0 | - | 1500 |
| M32E | 3 | 450 | 2 | 450 | 2250 |
| N32E | 2 | 900 | 2 | 350 | 2500 |

Materials:

Incoloy® outer sheath, PFA moisture seal, Brass NPT fitting

Leads:

Two - fiberglass-insulated leads rated to 842°F/450°C for temperature resistance (H-QS sizes, 36" lead length) (N size, 72" lead length) in flexible stainless steel hose for abrasion resistance. Two leads extend 12" past end of SS hose. Normal practice is to wire all cartridges to local junction box at pump, with one cable to controller.

Agency Approvals:

UL, CSA, VDE, CE

CONTROL SYSTEM (ACCESSORY NOT INCLUDED WITH PUMP)

Thermocouple:

Type J thermocouple with thermowell in weather-resistant housing with ½" MNPT fitting to mount in pump.

Controller Specifications:

Enclosure:

1/16 DIN, NEMA 4X / IP66 for panel mount

Mains power:

240 VAC, 1 phase

Heater Output:

15A NO-ARC, Form A

Control Algorithm:

PID, with pre-set bandwidths

Set point Achieved Relay Output:

Mechanical relay, 5A, Form A

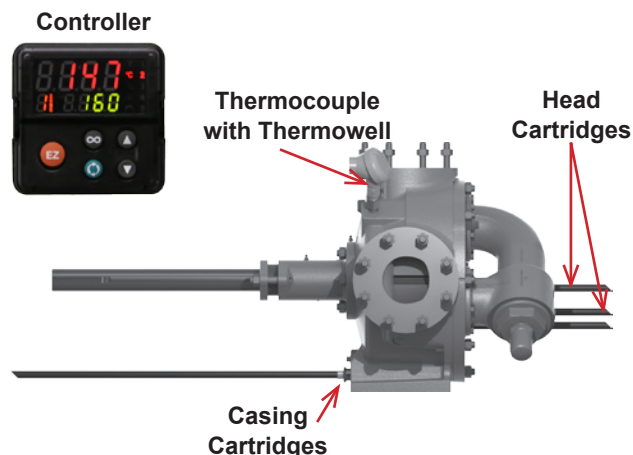
Agency Approvals:

UL, CSA, CE, RoHS, W.E.E.E., FM

N-size pump requires a separate 40-amp relay, available from Viking.

WARNING: Use National Electric Code (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors, heaters or peripheral devices. Failure to do so may result in damage to the equipment and property, and/or injury or loss of life.

Electrically heated pumps should always be insulated, and if possible, use spacers between the pump foot and baseplate to minimize heat loss. Approximate time to temperature is 3 hours for a 300 degree temperature rise.



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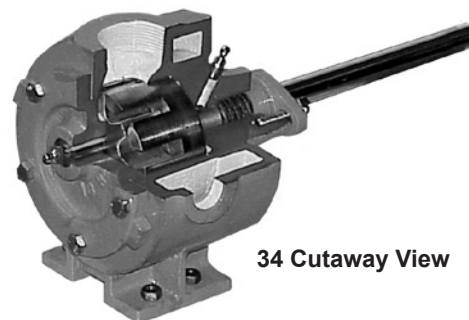
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PRESSURE RELIEF VALVES

Series 34 pumps feature a jacketed head without relief valve standard. A jacketed relief valve can be furnished on a non-jacketed head on LQ through N sizes.

Series 32E pumps feature a non-jacketed relief valve standard. The heat cartridges in the head supply sufficient heat to melt asphalt in the relief valve as long as the pump is insulated. A plain head option is available.

All positive displacement pumps should have some form of pressure relief, whether in the pump or downstream of the pump, to prevent overpressure situations.



34 Cutaway View

MATERIALS OF CONSTRUCTION – SERIES 34 & 32E

| Pump Construction | Casing | Head | Rotor | Idler | Rotor Shaft | Idler Pin | Bushings | Shaft Seal | Internal Relief Valve (optional on 34, standard on 32E) |
|-----------------------|--------|------|-------|--------|-------------|----------------|----------|------------|---|
| | | | | | | | | Packed | |
| Standard Construction | Iron | Iron | Iron | Iron | Steel | Hardened Steel | Bronze | Standard | Iron |
| Steel Fitted | Iron | Iron | Steel | ① Iron | Steel | Hardened Steel | Bronze | Standard | Iron |

SPECIFICATIONS – UNMOUNTED PUMPS

| Jacketed Models | Electric Heat Models | Port Size | Nominal Pump Rating | | | Maximum Recommended Discharge Pressure for 100 SSU and Above | | ③ Maximum Recommended Temperature for Cataloged Pump | | Steel Fitted Construction Recommended Above This Viscosity | | Maximum Hydrostatic Pressure | | Approximate Shipping Weight (Pump Only) | |
|-----------------|----------------------|-----------|---------------------|------|-----|--|-----|--|-----|--|------|------------------------------|------|---|-----|
| | | | | | | | | | | | | | | | |
| Packed | Packed | Inches | GPM | m³/h | RPM | PSI | Bar | °F | °C | SSU | cPs | PSIG | Bar | LBs | KGs |
| ④ LQ34 | LQ32E | ② 2½ | 90 | 20 | 420 | 100 | 6.9 | 450 | 232 | 25,000 | 5500 | 400 | 27.6 | 180 | 82 |
| Q34 | Q32E | ② 3 | 200 | 45 | 350 | 75 | 5.2 | 450 | 232 | 7,500 | 1650 | 400 | 27.6 | 350 | 160 |
| M34 | M32E | ② 4 | 280 | 64 | 280 | 75 | 5.2 | 450 | 232 | 25,000 | 5500 | 400 | 27.6 | 530 | 240 |
| N34 | N32E | ② 5 | 450 | 102 | 280 | 75 | 5.2 | 450 | 232 | 2,500 | 550 | 400 | 27.6 | 750 | 340 |

SPECIFICATIONS – PUMP JACKETING

| Model Number | Maximum Temperature/Pressure Of Fluid in Jackets | | | | | | | |
|--------------|--|-----|----------|------|-------------------|-----|----------|------|
| | Steam (Saturated) | | | | Heat Transfer Oil | | | |
| | Temperature | | Pressure | | Temperature | | Pressure | |
| | °F | °C | PSIG | Bar | °F | °C | PSIG | Bar |
| ④ LQ34 | 365 | 185 | 150 | 10.4 | 450 | 232 | 150 | 10.4 |
| Q34 | 365 | 185 | 150 | 10.4 | 450 | 232 | 150 | 10.4 |
| M34 | 365 | 185 | 150 | 10.4 | 450 | 232 | 150 | 10.4 |
| N34 | 365 | 185 | 150 | 10.4 | 450 | 232 | 150 | 10.4 |

① "Q" Size has steel idler when steel fitted construction is required.

② Ports are suitable for use with 125# ANSI cast or ductile iron or 150# ANSI steel companion flanged fittings. All other tapped for standard pipe (NPT).

③ For use at higher temperatures, consult factory for recommended materials of construction.

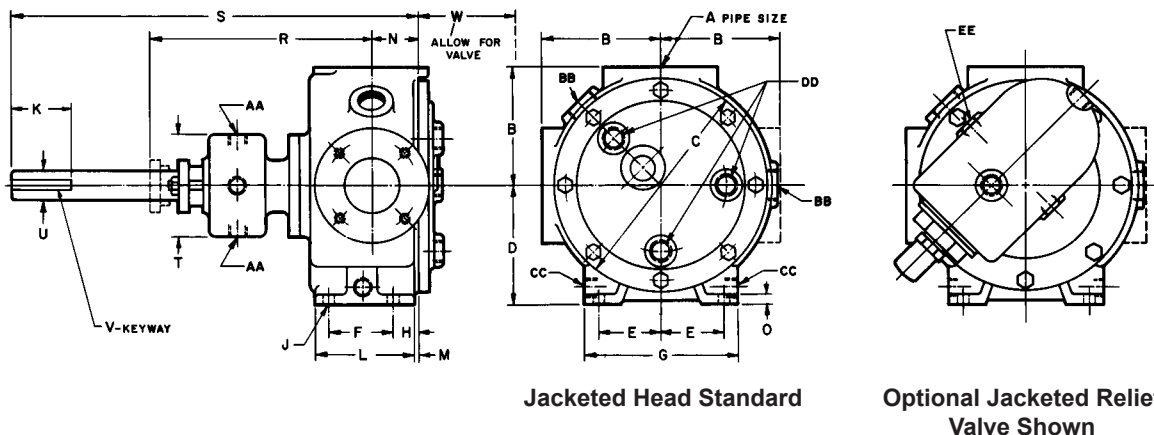
④ "LQ" size has two-piece jacketed head construction

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DIMENSIONS – LQ, Q, M, N SIZE (SERIES 34)



| MODEL NO. | | A | B | C | D | E | F | G | H | J | K | L | M | N | O | ② R | S | T | U | V | W | JACKET CONNECTIONS (N.P.T.) | | | | |
|-----------|----|----|------|-------|------|------|------|-------|------|-----|------|------|-----|------|-----|--------|-------|------|------|-------|-------|--------------------------------|----|----|-----|----|
| | | | | | | | | | | | | | | | | | | | | | | AA | BB | CC | DD | EE |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LQ34 | in | ① | 7.19 | 10.25 | 6.00 | 2.88 | 3.00 | 7.00 | 1.00 | .47 | 3.00 | 4.62 | .12 | 1.75 | .62 | 11.62 | 21.25 | 5.50 | 1.44 | .38 x | 7.88 | ¾ | 1½ | ¾ | ③ 1 | 1 |
| | mm | 2½ | 183 | 260 | 152 | 73 | 76 | 178 | 25 | 12 | 76 | 117 | 3 | 44 | 16 | 295 | 540 | 140 | 37 | .19 | 200 | | | | | |
| Q34 | in | ① | 8.00 | 14.00 | 7.75 | 4.12 | 4.25 | 10.00 | 1.62 | .75 | 5.00 | 6.50 | .25 | 3.00 | .62 | 13.88 | 33.50 | 6.75 | 1.94 | .50 x | 10.62 | ¾ | 1½ | 1 | 1¼ | 1 |
| | mm | 3 | 203 | 356 | 197 | 105 | 108 | 254 | 41 | 19 | 127 | 165 | 6 | 76 | 16 | 353 | 851 | 171 | 49 | .25 | 270 | | | | | |
| M34 | in | ① | 9.50 | 17.25 | 9.50 | 5.00 | 6.25 | 12.00 | 1.44 | .75 | 5.00 | 8.69 | .19 | 4.00 | .75 | 13.38 | 34.00 | 6.75 | 1.94 | .50 x | 10.25 | ¾ | 1½ | 1 | 1½ | 1 |
| | mm | 4 | 241 | 438 | 241 | 127 | 159 | 305 | 37 | 19 | 127 | 221 | 5 | 102 | 19 | 340 | 864 | 171 | 49 | .25 | 260 | | | | | |
| N34 | in | ① | 9.50 | 17.25 | 9.50 | 5.00 | 6.25 | 12.00 | 1.62 | .75 | 5.00 | 8.50 | .19 | 4.50 | .75 | 18.12 | 34.00 | 8.50 | 2.44 | .62 x | 10.25 | ¾ | 2 | 1½ | 1½ | 1 |
| | mm | 5 | 241 | 438 | 241 | 127 | 159 | 305 | 41 | 19 | 127 | 216 | 5 | 114 | 19 | 460 | 864 | 216 | 62 | .31 | 260 | | | | | |

① Ports are suitable for use with 125# ANSI cast iron flanges or 150# steel or ductile iron companion flanges or flanged fittings. All others are tapped for standard pipe (NPT).

② Minimum dimension for repacking.

③ LQ 34 heads have two jacket openings only (near vertical centerline). "Q", "M", and "N" head jacket opening per drawing.

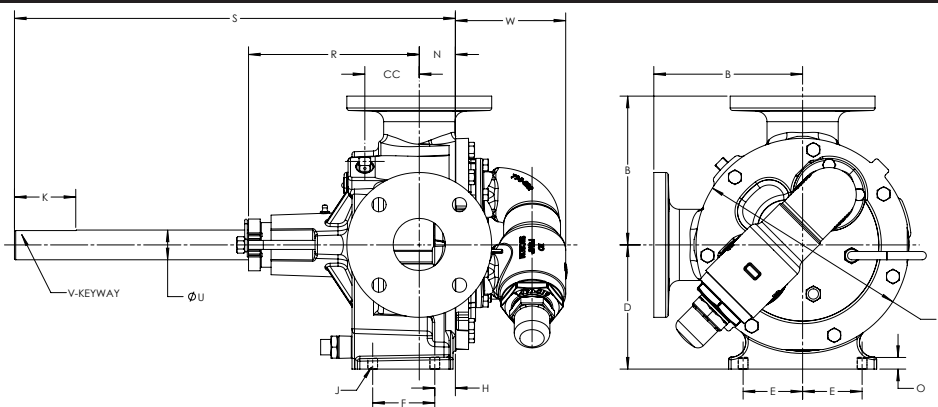
④ "LQ" size has two-piece jacketed head construction

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DIMENSIONS – LQ, Q, M, N SIZE (SERIES 32E)



| MODEL NO. | | ① A | B | C | CC | D | E | F | H | J | K | N | O | ② R | S | U | V | W |
|-----------|----|-----|------|-------|------|------|------|------|------|-----|------|------|-----|-------|-------|------|--------------|------|
| LQ32E | in | 2½ | 7.19 | 10.25 | 2.63 | 6.00 | 2.88 | 3.00 | 1.00 | .47 | 3.00 | 1.75 | .50 | 9.88 | 21.25 | 1.44 | .375 x .19 | 5.38 |
| | mm | | 183 | 260 | 67 | 152 | 73 | 76 | 25 | 12 | 76 | 44 | 13 | 251 | 552 | 37 | | 137 |
| Q32E | in | 3 | 7.75 | 14.00 | 3 | 7.75 | 4.13 | 4.25 | 1.63 | .69 | 5.00 | 3.00 | .63 | 13.88 | 33.50 | 1.94 | .50 x .25 | 8.19 |
| | mm | | 197 | 356 | 76 | 197 | 105 | 108 | 41 | 18 | 127 | 76 | 16 | 353 | 851 | 49 | | 208 |
| M32E | in | 4 | 9.50 | 17.25 | 2.75 | 9.50 | 5.00 | 6.25 | 1.44 | .69 | 5.00 | 4.00 | .75 | 13.38 | 34.00 | 1.94 | .50 x .25 | 8.5 |
| | mm | | 241 | 438 | 70 | 241 | 127 | 159 | 37 | 18 | 127 | 102 | 19 | 340 | 864 | 49 | | 216 |
| N32E | in | 5 | 9.50 | 17.25 | 5.25 | 9.50 | 5.00 | 6.25 | 1.63 | .69 | 5.00 | 4.50 | 1 | 20.88 | 34.00 | 2.44 | .625 x .3125 | 8.25 |
| | mm | | 241 | 438 | 133 | 241 | 127 | 159 | 41 | 18 | 127 | 114 | 25 | 530 | 864 | 62 | | 216 |

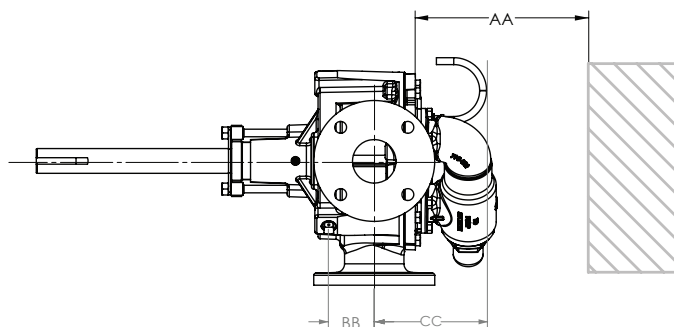
① Ports are suitable for use with 125# ANSI cast iron flanges or 150# steel or ductile iron companion flanges or flanged fittings.

② Minimum dimension for repacking.

③ LQ 34 heads have two jacket openings only, (near vertical centerline). "Q", "M", and "N" head jacket opening per drawing.

DIMENSIONS – LQ, Q, M, N SIZE (SERIES 32E)

HEAT CARTRIDGE LOCATIONS:



| Model | Temp Probe to Port Center Line (BB) | | Head Heater to Port Center Line (CC) | | Required to Remove Heater (AA) | |
|-------|-------------------------------------|-------|--------------------------------------|-------|--------------------------------|--------|
| | Inch | mm | Inch | mm | Inch | mm |
| LQ32E | 2.54 | 64.5 | 5.75 | 146.1 | 7.00 | 177.8 |
| Q32E | 2.85 | 72.4 | 8.25 | 209.6 | 9.25 | 234.95 |
| M32E | 2.64 | 67.1 | 8.25 | 209.6 | 9.25 | 234.95 |
| N32E | 5.05 | 128.2 | 8.25 | 209.6 | 9.25 | 234.95 |

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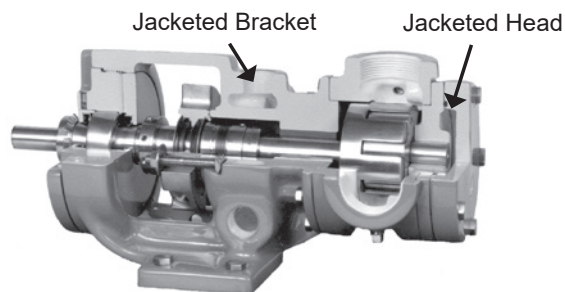
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SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

SERIES DESCRIPTION

The cast iron Universal Product Line pump is commonly used for asphalt applications. It can be heated by utilizing jacketing for steam/hot oil or built-in electric heat cartridges for steam/hot oil or built-in electric heat cartridges.

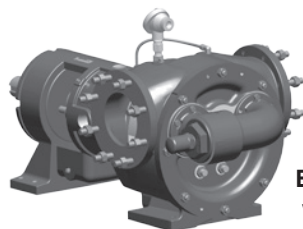
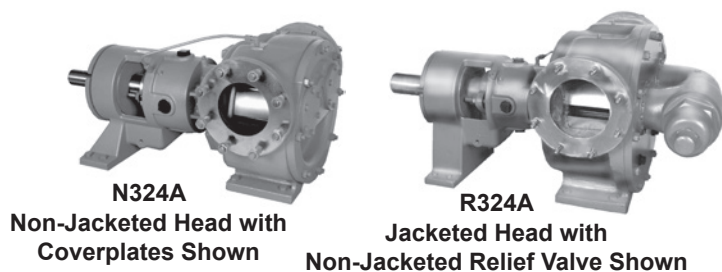
JACKETED PUMPS



Standard-Jacketed Pump Cutaway – H4224A

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. The heat transfer medium flows in a closed loop back to the boiler or heater. Standard jacketed pumps include jacketing on the head and bracket, and are used for melting asphalt prior to startup. This series includes models 224A, 224AE, 4224A, 4224AE, 324A and 4324A.



N324E
Electrically Heated Pump
with Relief Valve Shown

ELECTRICALLY HEATED PUMPS

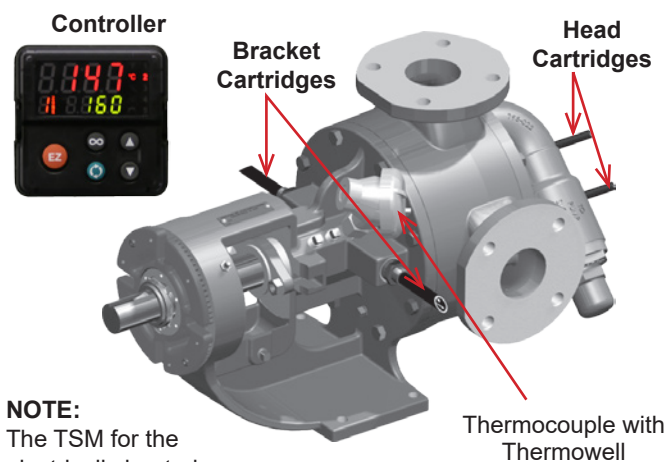
The electrically heated pump is specifically designed to heat the asphalt within the pump, prior to start-up. Heat cartridges located on the bracket or casing heat the area behind the rotor and stuffing box. The design also uses heat cartridges installed in the head to quickly melt asphalt throughout the casing.

| | |
|---------------------|---|
| ① Pressure Range | To 200 PSI (14 Bar) |
| ① Temperature Range | to +450°F (to +232°C) |
| ① Viscosity Range | 31 SSU to 2,000,000 SSU (1 cP to 440,000 cPs.) |
| ① Flow Range | to 1,600 GPM (to 364 m³/h) |

① Values shown represent minimums or maximums. Some special construction or consideration may be required before a cataloged pump can be applied to an application involving maximum pressure or minimum or maximum temperature and/or viscosity. Metric conversions are based on US measurements and rounded to the nearest whole number.

CONTROLLING ELECTRICALLY HEATED PUMPS

Viking Pump offers a controller for its electrically heated pumps. It is a closed loop PID control providing fast, yet effective time to temperature with minimal overshoot to prevent overheating. The control system includes a thermocouple and thermowell adapter for mounting, and a controller which powers all the heat cartridges on one pump (N-size requires a 40-amp relay). The controller has a user-adjustable temperature set point, up to a preset maximum. When the set point is reached, a relay can be wired to alert the operator, or prevent a pump from being started until the asphalt is melted. It can be ordered with present maximum temperature of either 150°F, 250°F, 350°F or 450°F; or 65°C, 120°C, 175°C or 230°C. See specifications on page 2 for number of cartridge heaters and wattages by pump size.



NOTE:
The TSM for the electrically heated pumps is located in the Universal manuals:

TSM 630.1 (H-LL sizes), TSM 630.2 (LS-QS sizes) and TSM 630.3 (N-RS sizes)

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PORTING AND 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.

The Universal Product Line design allows the use of packing, component seals or cartridge seals.

RELIEF VALVE CONFIGURATIONS

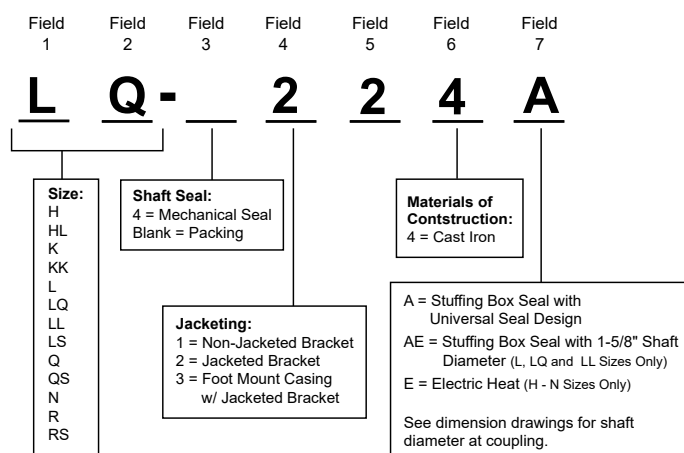
Jacketed pumps are provided with a jacketed head with no relief valve as standard. Integral relief valves in jacketed and non-jacketed configurations are available on the “L” through “N” sizes, but require a non-jacketed valve-type head. Electrically heated pumps are provided with a non-jacketed relief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

The “N” size pump is standard with a jacketed bracket and non-jacketed head and non-jacketed relief valve. A jacketed head, or a jacketed relief valve with a non-jacketed valve-type head, is available as an option.

The “R” size pump is standard with a jacketed bracket, a jacketed head and non-jacketed relief valve. For the “RS” size contact the factory for assistance with jacketing options.

The “RS” size is not available with relief valve.

MODEL NUMBER KEY



Note on Field 4 that only the N, R and RS sizes are the foot mount casing with jacketed bracket (3). All other sizes are available with a jacketed (2) bracket. 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. There are relief valve options available on those pump models designed to accept a relief valve. Options include a jacketed relief valve for the N pump (only available with the non-jacketed head). A non-jacketed relief valve is available for the R pump.

Note that on L, LQ and LL pumps with the “AE” designation at the end of the model number will have 1 5/8" shaft as standard, the L, LQ and LL pumps ending in “A” or “E” will have a 1 7/16" shaft standard. The “AE” designation, i.e., LQ224AE is dimensionally interchangeable with a LQ224A or LQ225 except that the “AE” model has a 1-7/16" shaft at the drive end versus 1-1/8" for the other models. The “AE” version is recommended in severe-duty applications or those where stress corrosion may be encountered. (Dimensional drawings are located on pages 430.9-430.10).

ELECTRIC HEAT SPECS

Heat cartridges (pre-installed on pump)

All heaters are 240 VAC, 1 phase, 50/60 Hz

| Pump Size | Head Cartridges | Watts/ Cartridge (Head) | Bracket/ Casing Cartridges | Watts/ Cartridge (bracket/ casing) | Total Watts |
|-----------|-----------------|-------------------------|----------------------------|------------------------------------|-------------|
| H124E | 1 | 75 | 2 | 100 | 275 |
| HL124E | 1 | 75 | 2 | 100 | 275 |
| K124E | 3 | 130 | 2 | 150 | 690 |
| KK124E | 3 | 130 | 2 | 150 | 690 |
| L124E | 2 | 350 | 2 | 250 | 1200 |
| LQ124E | 2 | 350 | 2 | 250 | 1200 |
| LL124E | 2 | 375 | 2 | 250 | 1250 |
| LS124E | 2 | 375 | 2 | 250 | 1250 |
| Q124E | 3 | 500 | 2 | 350 | 2200 |
| QS124E | 3 | 500 | 2 | 350 | 2200 |
| N324E | 2 | 900 | 2 | 350 | 2500 |

① Heat cartridges are located in the casing.

Materials: Incoloy® outer sheath, PFA moisture seal, Brass NPT fitting

Leads: Two - fiberglass-insulated leads rated to 842°F/450°C for temperature resistance (H-QS sizes, 36" lead length) (N size, 72" lead length) in flexible stainless steel hose for abrasion resistance. Two leads extend 12" past end of SS hose. Normal practice is to wire all cartridges to local junction box at pump, with one cable to controller.

Agency Approvals: UL, CSA, VDE, CE

CONTROL SYSTEM

(accessory not included with pump)

Thermocouple

Type J thermocouple with thermowell in weather-resistant housing with ½" MNPT fitting to mount in pump.

Controller

Enclosure: 1/16 DIN, NEMA 4X / IP66 for panel mount

Mains power: 240 VAC, 1 phase

Heater Output: 15A NO-ARC, Form A

Control Algorithm: PID, with pre-set bandwidths

Set point Achieved Relay Output: Mechanical relay, 5A, Form A

Agency Approvals: UL, CSA, CE, RoHS, W.E.E.E., FM

N-size pump requires a separate 40-amp relay.

WARNING: Use National Electric Code (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors, heaters or peripheral devices. Failure to do so may result in damage to the equipment and property, and/or injury or loss of life.

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LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

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SPECIFICATIONS

Note: Sizes HL, K, KK, L/LQ, LS & N show two different max speed and pressure options. Use higher speed on clean asphalt only.

| Model | | | ① Ports | | Nominal Pump Rating (750 SSU and below) | | | Maximum Hydrostatic Pressure | | ④ Maximum Discharge Pressure | | ⑤⑥ Maximum Recommended Temperature for Standard Pump | | | | Steel Fitted Recommended Above | | Approximate Shipping Weight with Valve | |
|----------------|-------------------------|---------------|---------|-----|---|-------|------|------------------------------|-----|------------------------------|-----|--|-----|-----------------|--|--------------------------------|--------|--|-----|
| Jacketed Pumps | | Electric Heat | | | | | | | | | | Packed | | Mech. Seal | | | | | |
| Packed | Stuffing Box Mech. Seal | Packed | In. | mm | GPM | m³/hr | RPM | PSIG | BAR | PSIG | BAR | °F °C | | °F °C | | SSU | cSt | lbs. | kG |
| | | | | | | | | | | | | | | | | | | | |
| H224A | H4224A | H124E⑦ | ②1.5 | 38 | 15 | 3.4 | 1750 | 400 | 28 | 200 | 14 | 450 | 232 | Consult Factory | | 25,000 | 5,500 | 42 | 19 |
| HL224A | HL4224A | HL124E⑦ | ②1.5 | 38 | 30 | 6.8 | 1750 | 400 | 28 | 200 | 14 | 450 | 232 | | | 7,500 | 1,650 | 45 | 21 |
| HL224A | HL4224A | HL124E⑦ | ②1.5 | 38 | 50 | 11 | 2900 | 400 | 28 | 125 | 9 | 450 | 232 | | | 7,500 | 1,650 | 45 | 21 |
| K224A | K4224A | K124E | ②2 | 50 | 75 | 17 | 780 | 400 | 28 | 200 | 14 | 450 | 232 | | | 25,000 | 5,500 | 110 | 50 |
| K224A | K4224A | K124E | ②2 | 50 | 90 | 20 | 950 | 400 | 28 | 125 | 9 | 450 | 232 | | | 25,000 | 5,500 | 110 | 50 |
| KK224A | KK4224A | KK124E | ②2 | 50 | 100 | 23 | 780 | 400 | 28 | 200 | 14 | 450 | 232 | | | 25,000 | 5,500 | 115 | 52 |
| KK224A | KK4224A | KK124E | ②2 | 50 | 120 | 27 | 950 | 400 | 28 | 125 | 9 | 450 | 232 | | | 25,000 | 5,500 | 115 | 52 |
| L224A/AE | L4224A/AE | L124E | ②2 | 50 | 135 | 30 | 640 | 400 | 28 | 200 | 14 | 450 | 232 | | | 25,000 | 5,500 | 165 | 75 |
| L224A | L4224A | L124E | ②2 | 50 | 210 | 48 | 950 | 400 | 28 | 125 | 9 | 450 | 232 | | | 25,000 | 5,500 | 165 | 75 |
| LQ224A/AE | LQ4224A/AE | LQ124E | ③2.5 | 65 | 135 | 30 | 640 | 400 | 28 | 200 | 14 | 450 | 232 | | | 25,000 | 5,500 | 185 | 84 |
| LQ224A | LQ4224A | LQ124E | ③2.5 | 65 | 210 | 48 | 950 | 400 | 28 | 125 | 9 | 450 | 232 | | | 25,000 | 5,500 | 185 | 84 |
| LL224A/AE | LL4224A/AE | LL124E | ③3 | 75 | 140 | 32 | 520 | 400 | 28 | 200 | 14 | 450 | 232 | | | 2,500 | 550 | 195 | 88 |
| LS224A | LS4224A | LS124E | 43 | 75 | 200 | 45 | 640 | 400 | 28 | 200 | 14 | 450 | 232 | | | 75,000 | 16,500 | 200 | 91 |
| LS224A | LS4224A | LS124E | 43 | 75 | 230 | 52 | 720 | 400 | 28 | 125 | 9 | 450 | 232 | | | 75,000 | 16,500 | 200 | 91 |
| Q224A | Q4224A | Q124E | ③4 | 100 | 300 | 68 | 520 | 400 | 28 | 200 | 14 | 450 | 232 | | | 7,500 | 1,650 | 455 | 206 |
| QS224A | QS4224A | QS124E | ③6 | 150 | 500 | 114 | 520 | 400 | 28 | 200 | 14 | 450 | 232 | | | 75,000 | 16,500 | 555 | 252 |
| N324A | N4324A | N324E | ③6 | 150 | 600 | 136 | 350 | 400 | 28 | 200 | 14 | 450 | 232 | | | 75,000 | 16,500 | 810 | 376 |
| N324A | N4324A | N324E | ③6 | 150 | 685 | 155 | 420 | 400 | 28 | 125 | 9 | 450 | 232 | | | 75,000 | 16,500 | 810 | 376 |
| R324A | R4324A | --- | ③8 | 200 | 1100 | 250 | 280 | 400 | 28 | 200 | 14 | 450 | 232 | | | 25,000 | 5,500 | 1435 | 650 |
| RS324A | RS4324A | --- | ③10 | 254 | 1600 | 364 | 280 | 400 | 28 | 125 | 9 | 450 | 232 | | | 25,000 | 5,500 | 1580 | 718 |

- ① Port sizes are inch standard, not metric design or size. See p. 630.16 for other port size options.
- ② Ports are tapped for standard (NPT) pipe.
- ③ Ports are suitable for use with 125# ANSI cast iron flanges or flanged fittings.
- ④ For maximum recommended discharge pressures when handling other viscosities and/or other speeds, see performance curves, which can be electronically generated with the Viking

Pump Curve Selector, located on www.vikingpump.com. If suction pressure exceeds 50 PSIG, consult factory.

- ⑤ Higher temperatures can be handled with special construction, consult factory.
- ⑥ Consult factory for maximum temperatures for mechanical seals.
- ⑦ H and HL sizes available with tapped ports only due to interference between the bracket heat cartridge and flange.

MATERIALS OF CONSTRUCTION – SERIES 224A, 4224A, 224AE, 4224AE, 124E, 324A, 4324A & 324E (ALL SIZES)

| Pump Construction | Casing | Head & Jacketed Head Plate | Bracket | Rotor | Pressure Relief Valve | Idler | Rotor Shaft | Idler Pin | Shaft Sealing | | Bushings |
|-----------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|-------------------------------|--------------------------------|-----------------------------|---------------------------------------|---------------|-----------------|---------------------------------------|
| | | | | | | | | | Packed | Mech. Seal | |
| Standard Construction | Cast Iron ASTM A48, Class 35B | Cast Iron ASTM A48, Class 35B | Cast Iron ASTM A48, Class 35B | ① Cast Iron ASTM A48, Class 35B | Cast Iron ASTM A48, Class 35B | ③ Cast Iron ASTM A48 Class 35B | Steel ASTM A108, Grade 1045 | Hardened Steel ASTM A108, Grade 10L45 | Standard | Consult Factory | Bronze ASTM B584 (B505), Alloy C93700 |
| Steel Fitted | | | | ④ Steel ASTM A108, Grade 1045 | | ② Iron | | | Standard | | |

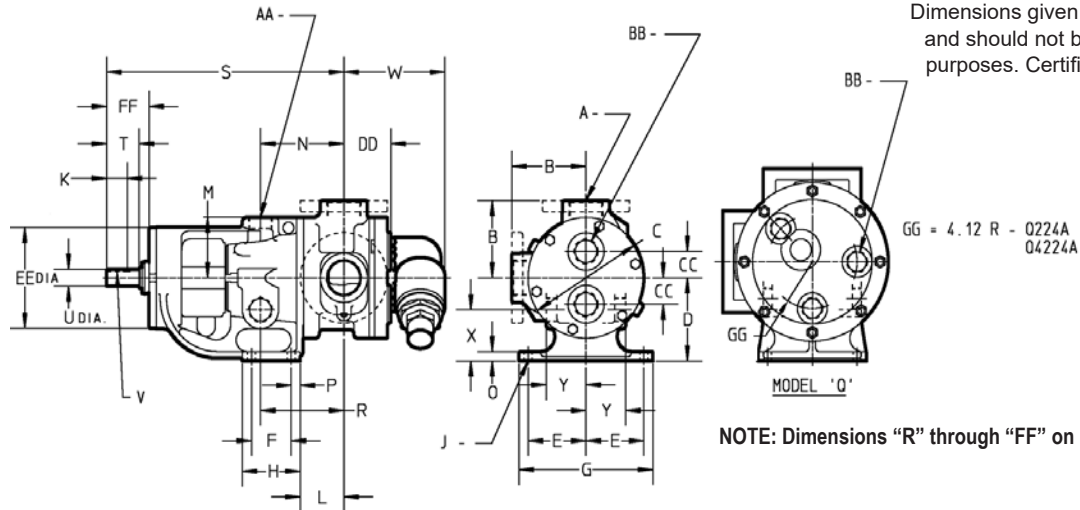
- ① KK, LS, QS, N and RS sizes have ductile iron rotor, ASTM A536 Grade 60-40-18.
- ② Steel fitted Q and QS sizes have steel idler.
- ③ H and HL sizes have powdered metal idler, MPIF Std 35 FC-0208-50.
- ④ Material specification for HL steel rotor is AISI 8620, LS steel rotor is ASTM A148 80-50.

LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

| | |
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DIMENSIONS – H THROUGH Q SIZES – JACKETED PUMPS



| Model Number | | A (in) | | B | C | D | E | F | G | H | J | ㊦ K | L | M | N | O |
|-------------------|----------------------|-----------|----|-------|-------|-------|-------|-------|-------|-------|------|--------|-------|-------|-------|------|
| Jacketed Pumps | | | | | | | | | | | | | | | | |
| Packed | Stuffing Box Seal | | | | | | | | | | | | | | | |
| H224A HL224A | H4224A HL4224A | ㊦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 | 76.2 | 120.6 | 88.9 | 69.8 | 57.1 | 171.4 | 88.9 | 11.9 | 25.1 | 85.8 | 60.5 | 101.6 | 14.2 |
| K224A KK224A | K4224A KK4224A | ㊦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 | 130.0 | 203.2 | 139.7 | 101.6 | 69.8 | 234.9 | 101.6 | 13.5 | 36.1 | 76.2 | 101.6 | 146.0 | 15.7 |
| L224A L224AE | L4224A L4224AE | ㊦2 | in | 6.50 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 2 | 3.38 | 5.12 | 6.56 | 0.62 |
| | | | mm | 165.1 | 260.3 | 177.8 | 111.3 | 101.6 | 254 | 136.7 | 13.5 | 50.8 | 85.9 | 130.0 | 166.6 | 15.7 |
| LQ224A LQ224AE | LQ4224A LQ4224AE | ㊦2.5 | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 2 | 3.38 | 5.12 | 6.56 | 0.62 |
| | | | mm | 182.6 | 260.3 | 177.8 | 111.3 | 101.6 | 254 | 136.7 | 13.5 | 50.8 | 85.9 | 130.0 | 166.6 | 15.7 |
| LL224A LL224AE | LL4224A LL4224AE | ㊦3 | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 2 | 3.38 | 5.12 | 6.56 | 0.62 |
| | | | mm | 182.6 | 260.3 | 177.8 | 111.3 | 101.6 | 254 | 136.7 | 13.5 | 50.8 | 85.9 | 130.0 | 166.6 | 15.7 |
| LS224A | LS4224A | ㊦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 | 182.6 | 260.3 | 177.8 | 111.3 | 101.6 | 254 | 136.7 | 13.5 | 64.8 | 120.6 | 130.0 | 188.0 | 15.7 |
| Q224A | Q4224A | ㊦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 | 209.5 | 355.6 | 222.2 | 104.6 | 101.6 | 254 | 152.4 | 17.5 | 90.9 | 168.1 | 177.8 | 193.5 | 19.0 |

① Port(s) tapped for standard (NPT) pipe.

② Port(s) suitable for use with 125# ANSI cast iron companion flanges or flanged fittings.

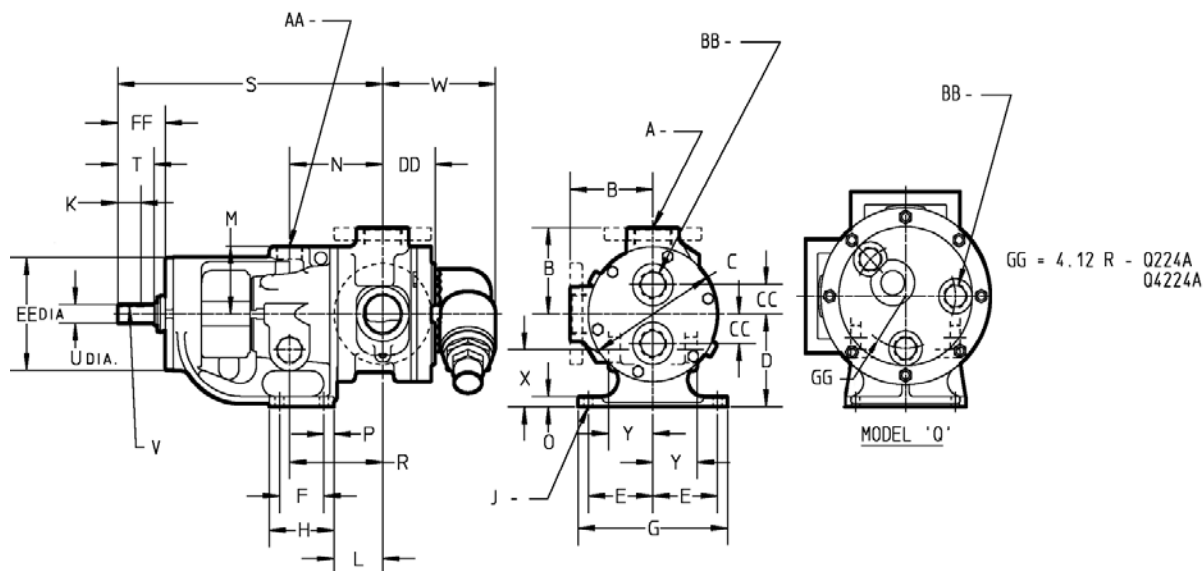
③ "K" dimension for Cast Iron L, LQ and LL sizes is for "A" models. "K" dimension for L, LQ and LL size 224AE and 4224AE pumps is 1.44" (36.6mm).

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LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

DIMENSIONS – H THROUGH Q SIZES – JACKETED PUMPS (CONT'D)



| Model Number | | | P | R | S | ⑥ T | ⑦ U | ⑧ V | W | X | Y | ⑤ AA | ⑤ BB | CC | DD | EE | FF |
|-------------------|--------------------|-----|------|-------|-------|--------|--------|-------------|-------|-------|-------|---------|---------|------|-------|-------|-------|
| Packed | Stuffing Box Seal | | | | | | | | | | | | | | | | |
| H224A HL224A | H4224A HL4224A | 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 |
| | | mm | 15.7 | 101.6 | 306.3 | 41.1 | 19.0 | 4.83 X 2.29 | 102.6 | 45.7 | 46.5 | 19.0 | 12.7 | 23.9 | 61.2 | 146.0 | 58.4 |
| K224A KK224A | K4224A KK4224A | 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 |
| | | mm | 15.7 | 146.0 | 416.0 | 57.1 | 28.4 | 6.35 X .05 | 177.8 | 85.9 | 69.8 | 31.7 | 31.7 | 44.4 | 82.5 | 171.4 | 74.2 |
| L224A L224AE | L4224A L4224AE | in | 0.62 | 6.56 | 17.88 | 2.25 | 1.12 | .38 X .19 | 7.18 | 4.62 | 3.25 | 1.25 | 1 | 3.00 | 3.81 | 6.75 | 2.93 |
| | | mm | 15.7 | 166.6 | 454.2 | 57.1 | 28.4 | 9.65 X .83 | 182.4 | 117.3 | 82.5 | 31.7 | 25.4 | 76.2 | 96.8 | 171.4 | 74.4 |
| LQ224A LQ224AE | LQ4224A LQ4224A | in | 0.62 | 6.56 | 17.88 | 2.25 | 1.12 | .38 X .19 | 7.18 | 4.62 | 3.25 | 1.25 | 1 | 3.00 | 3.81 | 6.75 | 2.93 |
| | | mm | 15.7 | 166.6 | 454.2 | 57.1 | 28.4 | 9.65 X .83 | 182.4 | 117.3 | 82.5 | 31.7 | 25.4 | 76.2 | 96.8 | 171.4 | 74.4 |
| LL224A LL224AE | LL4224A LL224AE | in | 0.62 | 6.56 | 17.88 | 2.25 | 1.12 | .38 X .19 | 7.18 | 4.62 | 3.25 | 1.25 | 1 | 3.00 | 4.31 | 6.75 | 2.93 |
| | | mm | 15.7 | 166.6 | 454.2 | 57.1 | 28.4 | 9.65 X .83 | 182.4 | 117.3 | 82.5 | 31.7 | 25.4 | 76.2 | 109.5 | 171.4 | 74.4 |
| LS224A | LS4224A | in | 0.62 | 7.00 | 19.25 | 3.50 | 1.44 | .38 X .19 | 7.72 | 4.40 | 3.30 | 1.25 | 1 | 3.00 | 4.50 | 7.00 | 4.03 |
| | | mm | 15.7 | 177.8 | 488.9 | 88.9 | 36.58 | 9.65 X .83 | 196.1 | 111.8 | 83.8 | 31.7 | 25.4 | 76.2 | 114.3 | 177.8 | 102.4 |
| Q224A | Q4224A | in. | 1.00 | 6.62 | 23.75 | 4.50 | 1.94 | .50 X .25 | 11.25 | 5.50 | 4.50 | 1.5 | 1.25 | --- | 4.57 | 8.38 | 5.35 |
| | | mm | 25.4 | 168.1 | 603.2 | 114.3 | 49.3 | 12.70 X .35 | 285.7 | 139.7 | 114.3 | 38.1 | 31.7 | --- | 116.1 | 212.8 | 135.9 |

⑤ 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.

⑥ "T" dimension show for Cast Iron sizes L, LQ and LL is for "A" models.
"T" Dimension for L, LQ and LL size 224AE and 4224AE pumps is 2.35" (59.7 mm).

⑦ "U" dimension shown for Cast Iron sizes L, LQ and LL is for "A" models.
"U" dimension for L, LQ and LL size 224AE and 4224AE pumps is 1.44" (36.6 mm).

⑧ "V" dimension shown for Cast Iron sizes L, LQ and LL is for "A" models.
"V" dimension for L, LQ and LL size 224AE and 4224AE pumps is 0.38 X 0.19" (9.65 X 4.83 mm).

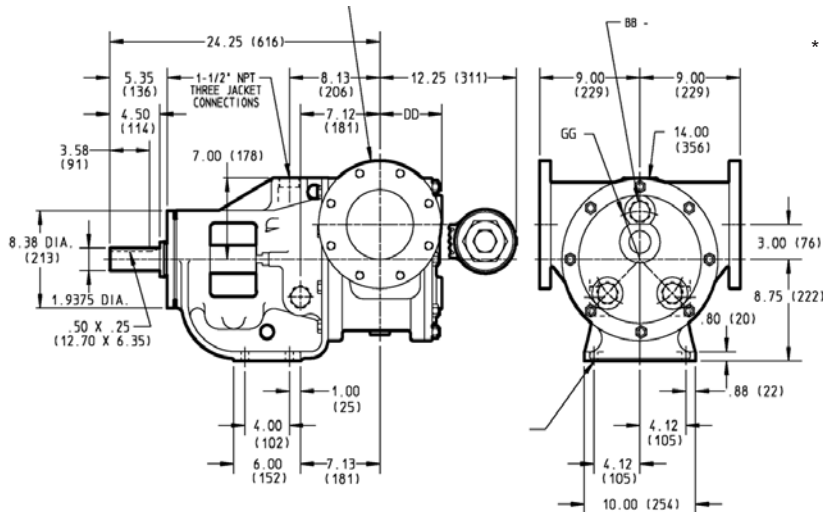
Dimensions given are for guidance only and should not be used for installation purposes. Certified dimensions will be supplied on request.

LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

| | |
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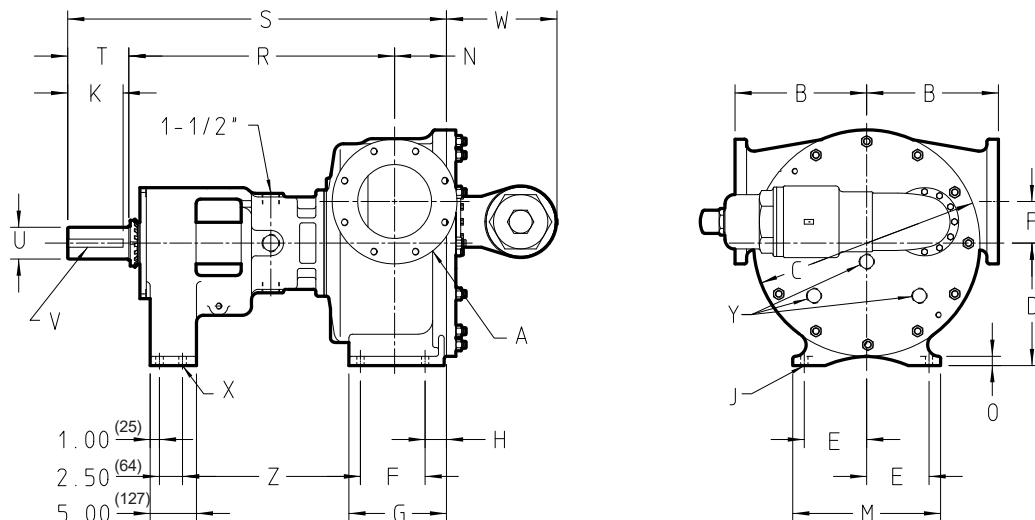
DIMENSIONS – QS SIZE – JACKETED SERIES 224A AND 4224A



* 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.

| Other Dimensions | |
|------------------|---------------|
| BB* | 1.25 (31.75) |
| DD | 5.57 (141.48) |
| GG | 4.12 (105) |

DIMENSIONS – N, R & RS SIZE – JACKETED SERIES 324A AND 4324A



| Model Number | | A (in) | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|----------------------|-----------|----|-------|--------|-------|-------|-------|--------|--------|-------|-------|--------|--------|-------|-------|--------|---------|-------|------|-----------------|-------|-------|------|-------|
| Packed | Stuffing Box Seal | | B | C | D | E | F | G | H | J | K | M | N | O | P | R | S | T | U | V | W | X | Y | Z | |
| N324A | N4324A | ② 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 | 36.50 | 6.00 | 2.44 | .62x.31 | 8.63 | 0.69 | n.a. | 18.94 |
| | | | mm | 24.6 | 438.1 | 241.3 | 127.0 | 158.7 | 220.7 | 41.1 | 17.5 | 114.3 | 304.8 | 114.3 | 25.4 | 76.2 | 660.4 | 927.1 | 152.4 | 62.0 | 15.74 x7.87 | 219.2 | 17.5 | n.a. | 481.0 |
| R324A | R4324A | ② 8 | 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 | .88x.44 | 12.00 | 0.69 | 1.25 | 19.25 |
| | | | mm | 361.9 | 622.3 | 336.5 | 171.4 | 177.8 | 268.2 | 58.7 | 19.8 | 152.4 | 406.4 | 142.7 | 25.4 | 114.3 | 730.2 | 1041 | 168.1 | 87.4 | 22.35 x11.18 | 304.8 | 17.5 | 31.7 | 488.9 |
| RS324A | RS4324A | ② 10 | in | 14.25 | 24.5 | 13.25 | 6.75 | 7.00 | 13.12 | 4.81 | 0.88 | 6.00 | 16.46 | 8.12 | 1.30 | 4.50 | 28.55 | 43.49 | 6.62 | 3.44 | .88x.44 | 12.00 | 0.88 | 1.25 | 19.25 |
| | | | mm | 361.9 | 622.30 | 336.5 | 171.4 | 177.8 | 333.24 | 122.17 | 22.35 | 152.4 | 418.08 | 206.24 | 33.02 | 114.3 | 725.17 | 1104.64 | 168.1 | 87.4 | 22.35 x11.18 | 304.8 | 22.35 | 31.7 | 488.9 |

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

② Ports are suitable for use with 125# ANSI cast iron (324A/4324A)

Dimensions given are for guidance only and should not be used for installation purposes. Certified dimensions will be supplied on request.

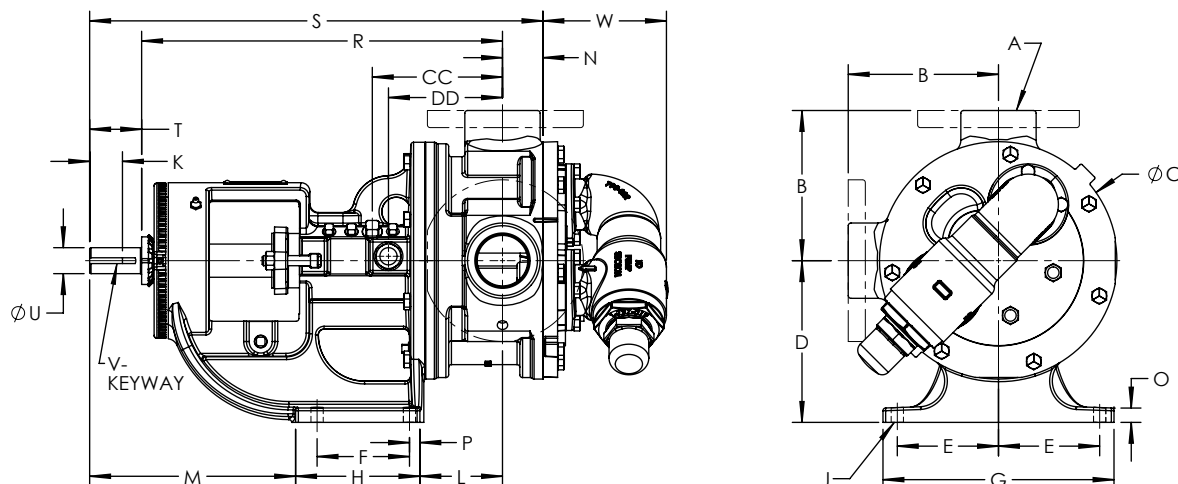
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LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

DIMENSIONS – H THROUGH Q SIZES – ELECTRICALLY HEATED

See drawing on Page 430.15 for cartridge heater and thermocouple port location.



| Model Number | A (in) | | B | C | D | E | F | G | H | J | K | L | M | N | O | P | R | S | T | U | V | W | CC ③ | DD ④ |
|--------------|--------|----|-------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|------|------|------|-------|-------|-------|------|-------------|-------|---------|---------|
| Packed | | | | | | | | | | | | | | | | | | | | | | | | |
| H124E | ① | in | 3.00 | 4.75 | 3.50 | 2.75 | 2.25 | 6.75 | 3.50 | 0.47 | 0.99 | 3.38 | 5.19 | 1.19 | 0.56 | 0.62 | 10.44 | 13.25 | 1.62 | 0.75 | .19 x .09 | 2.85 | 2.84 | 2.40 |
| HL124E | 1.5 | mm | 76.2 | 120.6 | 88.9 | 69.8 | 57.1 | 171.4 | 88.9 | 11.9 | 25.1 | 85.8 | 131.8 | 30.2 | 14.2 | 15.7 | 265.2 | 336.5 | 41.1 | 19.0 | 4.83 x 2.29 | 72.4 | 72.14 | 60.96 |
| K124E | ① | in | 5.12 | 8.00 | 5.50 | 4.00 | 2.75 | 9.25 | 4.0 | 0.53 | 1.42 | 3.00 | 9.38 | 1.75 | 0.62 | 0.62 | 14.12 | 18.12 | 2.25 | 1.12 | .25 x .12 | 6.38 | 4.88 | 4.14 |
| KK124E | 2 | mm | 130.0 | 203.2 | 139.7 | 101.6 | 69.8 | 234.9 | 101.6 | 13.5 | 36.1 | 76.2 | 238.3 | 44.4 | 15.7 | 15.7 | 358.6 | 460.2 | 57.1 | 28.4 | 6.35 x 3.05 | 162.0 | 123.95 | 105.16 |
| L124E | ① | in | 6.50 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 2.00 | 3.38 | 9.12 | 1.75 | 0.62 | 0.62 | 15.62 | 19.62 | 2.25 | 1.12 | .25 x .12 | 5.43 | 5.62 | 4.92 |
| | 2 | mm | 165.1 | 260.3 | 177.8 | 111.3 | 101.6 | 254.0 | 136.7 | 13.5 | 50.8 | 85.9 | 231.6 | 44.4 | 15.7 | 15.7 | 396.7 | 498.3 | 57.1 | 28.7 | 6.35 x 3.05 | 137.9 | 142.75 | 124.97 |
| LQ124E | ② | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 2.00 | 3.38 | 9.12 | 1.75 | 0.62 | 0.62 | 15.62 | 19.62 | 2.25 | 1.12 | .25 x .12 | 5.43 | 5.62 | 4.92 |
| | 2.5 | mm | 182.6 | 260.3 | 177.8 | 111.3 | 101.6 | 254.0 | 136.7 | 13.5 | 50.8 | 85.9 | 231.6 | 44.4 | 15.7 | 15.7 | 396.7 | 498.3 | 57.1 | 28.7 | 6.35 x 3.05 | 137.9 | 142.75 | 124.97 |
| LL124E | ② | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 2.00 | 3.38 | 9.12 | 2.25 | 0.62 | 0.62 | 15.62 | 20.12 | 2.25 | 1.12 | .25 x .12 | 5.43 | 5.62 | 4.92 |
| | 3 | mm | 182.6 | 260.3 | 177.8 | 111.3 | 101.6 | 254.0 | 136.7 | 13.5 | 50.8 | 85.9 | 231.6 | 57.1 | 15.7 | 15.7 | 396.7 | 511.0 | 57.1 | 28.7 | 6.35 x 3.05 | 137.9 | 142.75 | 124.97 |
| LS124E | ② | in | 7.19 | 10.25 | 7.00 | 4.38 | 4.00 | 10.00 | 5.38 | 0.53 | 2.55 | 4.75 | 9.12 | 2.44 | 0.62 | 0.62 | 15.75 | 21.69 | 3.50 | 1.44 | .38 x .19 | 5.43 | 6.25 | 6.09 |
| | 3 | mm | 182.6 | 260.3 | 177.8 | 111.3 | 101.6 | 254.0 | 136.7 | 13.5 | 64.8 | 120.6 | 231.6 | 62.0 | 15.7 | 15.7 | 400.0 | 550.9 | 88.9 | 36.6 | 9.65 x 4.83 | 137.9 | 158.75 | 154.7 |
| Q124E | ② | in | 8.25 | 14.00 | 8.75 | 4.12 | 4.00 | 10.00 | 6.00 | 0.69 | 3.58 | 6.62 | 11.12 | 3.00 | 0.75 | 1.00 | 19.25 | 26.75 | 4.50 | 1.94 | .50 x .25 | 8.25 | 7.33 | 5.83 |
| | 4 | mm | 209.5 | 355.6 | 222.2 | 104.6 | 101.6 | 254.0 | 152.4 | 17.5 | 90.9 | 168.1 | 282.4 | 76.2 | 19.0 | 25.4 | 488.9 | 679.4 | 114.3 | 49.3 | 12.7 x 6.35 | 209.5 | 186.18 | 148.08 |

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

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

③ Port centerline to thermocouple port

④ Port centerline to bracket heat cartridge.

Dimensions given are for guidance only and should not be used for installation purposes. Certified dimensions will be supplied on request.

LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

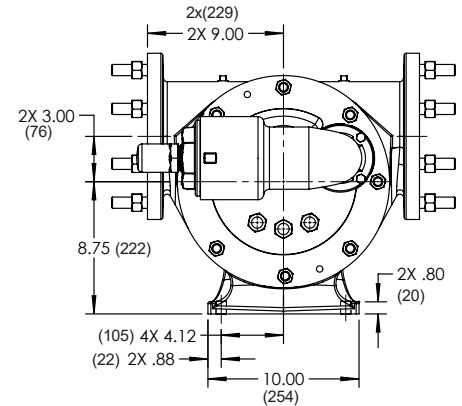
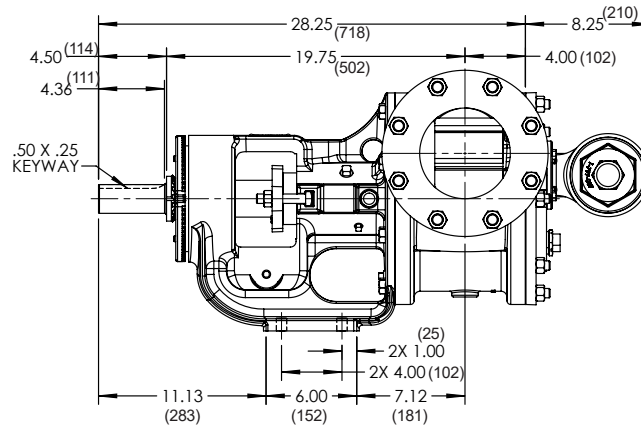
SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

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DIMENSIONS – QS SIZE – ELECTRICALLY HEATED

Series 124E

Dimensions in
inches (mm)

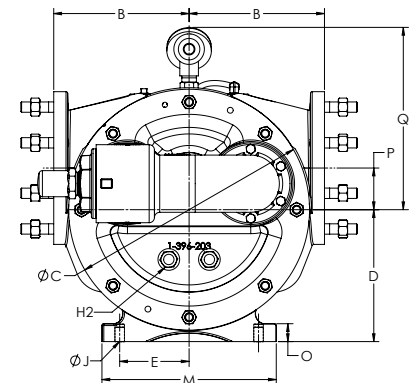
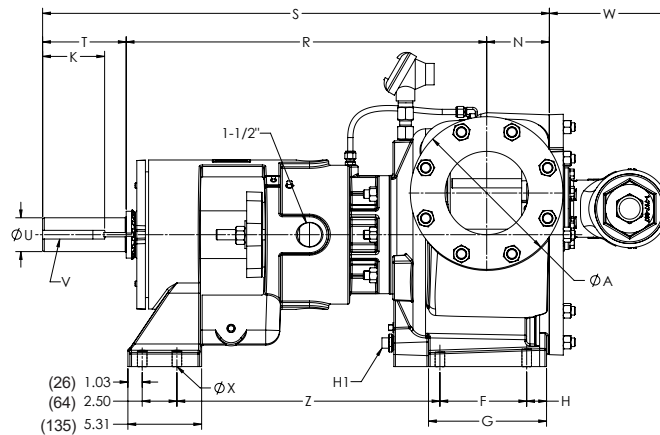


See drawing on Page 430.15 for cartridge heater and thermocouple location.

DIMENSIONS – N SIZE – ELECTRICALLY HEATED

Series 324E

Dimensions in
inches (mm)



| Model Number | A | | B | C | D | E | F | G | H | H1 | H2 | J | K | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
|--------------|--------|----|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|-------|------|------|-------|-------|-------|-------|------|----------------|-------|------|-----|-------|
| Packed | (in) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N324E | ① 6 | in | 9.75 | 17.25 | 9.50 | 5.00 | 6.25 | 8.69 | 1.62 | 0.75 | 0.75 | 0.69 | 4.50 | 12.00 | 4.50 | 1.00 | 3.00 | 13.11 | 26.00 | 36.50 | 6.00 | 2.44 | .62 x.31 | 8.63 | 0.69 | N/A | 18.94 |
| | | mm | 247.7 | 438.1 | 241.3 | 127.0 | 158.7 | 220.7 | 41.1 | 19 | 19 | 17.5 | 114.3 | 304.8 | 114.3 | 25.4 | 76.2 | 333 | 660.4 | 927.1 | 152.4 | 62.0 | 15.74 x7.87 | 219.2 | 17.5 | N/A | 481.0 |

① Ports are suitable for use with 125# ANSI cast iron.

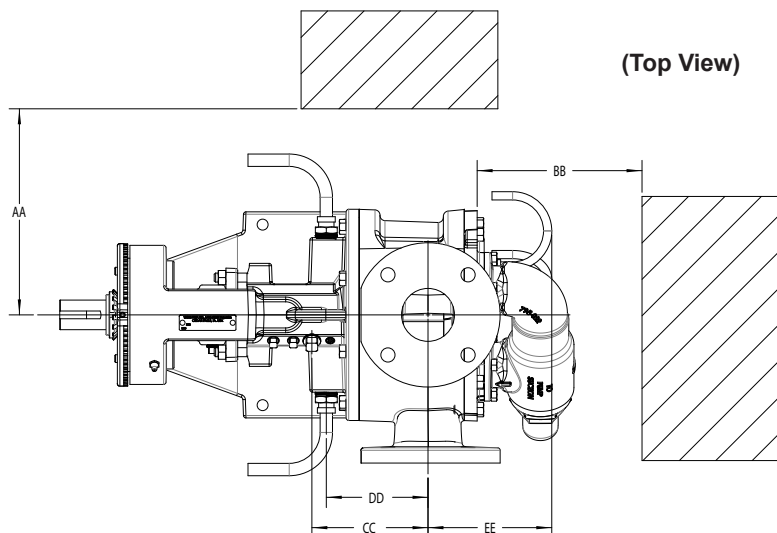
Dimensions given are for guidance only and should not be used for installation purposes. Certified dimensions will be supplied on request.

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LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

DIMENSIONS – H THROUGH QS SIZES – ELECTRICALLY HEATED



| Model | Bracket Heater to Port Center Line (DD) | | Temp Probe to Port Center Line (CC) | | Head Heater to Port Center Line (EE) | | Required to Remove Heater | | | |
|-----------------|---|--------|-------------------------------------|--------|--------------------------------------|--------|---------------------------|--------|------|--------|
| | Inch | mm | Inch | mm | Inch | mm | (AA) | | (BB) | |
| H124E HL124E | 2.40 | 60.96 | 2.84 | 72.14 | 5.66 | 143.76 | 8.13 | 206.50 | 7.75 | 196.85 |
| K124E KK124E | 4.14 | 105.16 | 4.88 | 123.95 | 5.66 | 143.76 | 8.13 | 206.50 | 7.75 | 196.85 |
| L124E | 4.92 | 124.97 | 5.62 | 142.75 | 5.71 | 145.03 | 7.00 | 177.80 | 6.25 | 158.75 |
| LQ124E | | | | | 5.75 | 146.05 | | | 6.75 | 171.45 |
| LL124E | | | | | 6.25 | 158.75 | | | 6.50 | 165.10 |
| LS124E | 6.09 | 154.69 | 6.25 | 158.75 | 6.44 | 163.58 | 9.25 | 234.95 | 7.75 | 196.85 |
| Q124E | 5.83 | 148.08 | 7.33 | 186.18 | 8.25 | 209.55 | | | | |
| QS124E | 6.33 | 160.78 | 7.83 | 198.88 | 9.25 | 234.95 | | | | |

OPTIONAL CASINGS – STANDARD JACKETED* PUMPS

| Model Number | | Standard Jacketed Pumps' Standard Ports† | Standard Jacketed Pumps Optional Ports |
|--------------|-------------------|--|--|
| Packed | Stuffing Box Seal | | |
| H224A | H4224A | 1.5"① | 1.5"②®, 2"②® |
| HL224A | HL4224A | | |
| K224A | K4224A | 2"① | 2"②®, 2.5"②®, 3"②®, 4"②® |
| KK224A | KK4224A | 2"① | 2"②®, 2.5"②®, 3"②®, 4"②® |
| L224A/AE | L4224A/AE | 2"① | ----- |
| LQ224A/AE | LQ4224A/AE | 2.5"② | 3"②®, 4"②®, 6"②® |
| LL224A/AE | LL4224A/AE | 3"② | 4"②®, 5"②® |
| LS224A | LS4224A | 3"② | 4"②® |
| Q224A | Q4224A | 4"② | 3"②®, 5"②®, 6"②® |
| QS224A | QS4224A | 6"②⊙ | 6"②⊙ |
| N324A | N4324A | 6"②⊙ | 5"②⊙ |
| R324A | R4324A | 8"②⊙ | 6"②⊙ |
| RS324A | RS4324A | 10"②⊙ | |

① Port(s) tapped for standard (NPT) pipe.

② Port(s) suitable for use with 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 arrangement 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, and N4324A, are standard with a jacketed bracket and non-jacketed head and relief valve, while the R324A, and R4324A, are standard with a jacketed bracket and jacketed head and non-jacketed relief valve. For the RS324A and RS4324A, contact the factory for jacketing options.

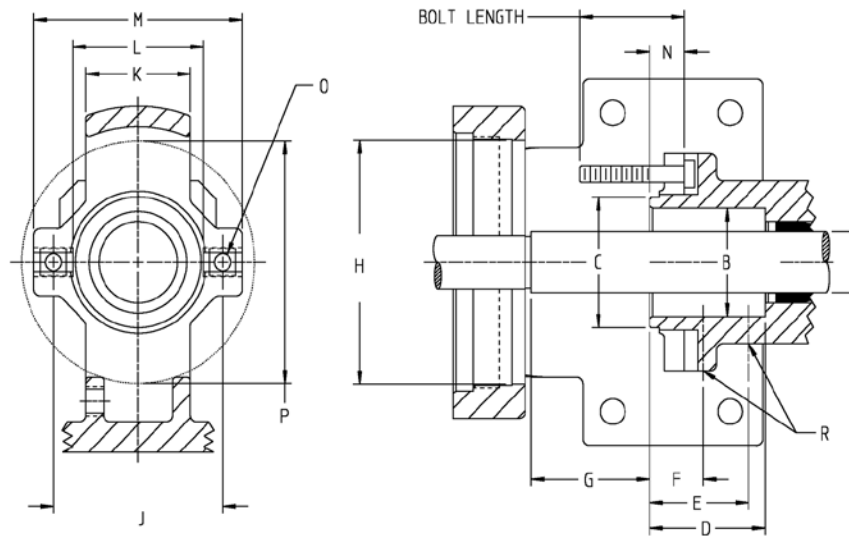
Additional jacketed casings, including fully-jacketed casing, available in steel. See Universal Seal Catalog Section 630.

LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

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STUFFING BOX SEAL CHAMBER DIMENSIONS



| 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 | 28.6 | 50.8 | 61.2 | 56.4 | 48.3 | 26.2 | 57.7 | 114.3 | 76.2 to 88.9 | 50.8 | 63.5 | 101.6 | 16.8 | 7.9 | 113.5 | 3.2 |
| K & KK | In | 1.44 | 2.31① | 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 | 36.5 | 58.7① | 76.2 | 79.5 | 57.1 | 31.7 | 76.2 | 133.3 | 88.9 to 114.3 | 63.5 | 76.2 | 127.0 | 9.7 | 11.1 | 133.3 | 6.3 |
| L, LQ, & LL (A) | In | 1.44 | 2.31① | 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 | 36.5 | 58.7① | 76.2 | 79.5 | 57.1 | 31.7 | 101.6 | 133.3 | 88.9 to 114.3 | 63.5 | 76.2 | 127.0 | 11.2 | 11.1 | 133.3 | 6.3 |
| L, LQ, & LL (AE) | In | 1.62 | 2.375 | 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 | 41.3 | 60.3 | 76.2 | 79.5 | 57.1 | 29.5 | 89.4 | 133.3 | 88.9 to 114.3 | 76.2 | 76.2 | 127.0 | 11.7 | 11.1 | 133.3 | 6.3 |
| LS | In | 1.62 | 2.375 | 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 | 41.3 | 60.3 | 71.1 | 68.6 | 57.1 | 29.5 | 89.4 | 133.3 | 82.5 to 114.3 | 76.2 | 71.1 | 127.0 | 11.7 | 11.1 | 133.3 | 6.3 |
| 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 | 61.9 | 87.0 | 114.3 | 101.6 | 63.5 | 38.9 | 104.1 | 171.4 | 139.7 to 158.7 | 81.3 | 114.3 | 182.9 | 14.2 | 15.9 | 171.4 | 6.3 |
| N | In | 3.44 | 4.69 | - | 5.56 | 1.65 | - | 4.91 | 8.81 | 6.75 | - | - | - | - | 3/4② | 9.00 | 1/4 |
| | mm | 87.3 | 119.3 | - | 141.2 | 41.9 | - | 124.7 | 223.8 | 171.4 | - | - | - | - | 19.0② | 228.6 | 6.3 |
| R | In | 4.50 | 5.75 | - | 5.56 | 1.53 | - | 4.79 | 9.81 | 7.75 | - | - | - | - | 3/4② | 9.81 | 1/4 |
| | mm | 114.3 | 146.1 | - | 141.2 | 38.9 | - | 121.7 | 249.2 | 196.8 | - | - | - | - | 19.0② | 249.2 | 6.3 |
| RS | In | 4.50 | 5.75 | - | 5.56 | 1.53 | - | 4.79 | 9.81 | 7.75 | - | - | - | - | 3/4② | 9.81 | 1/4 |
| | mm | 114.3 | 146.1 | - | 141.2 | 38.9 | - | 121.7 | 249.2 | 196.8 | - | - | - | - | 19.0② | 249.2 | 6.3 |

① Bracket is counter bored to a diameter of 2.687 inches (68.25 mm), 0.12 inches (3.05 mm) deep from stuffing box face.

② Studs are used in place of cap screws.

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LIQUID-SPECIFIC PRODUCT LINE: CAST IRON ASPHALT PUMPS

SERIES 224A, 224AE, 4224A, 4224AE, 324A, 4324A, 124E, 324E, 34, 32E

PERFORMANCE CURVE NOTES

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 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 | PUMP 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, LQ, LL, LS | 1.7 | 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 | 2.5 | 3.5 | 4.5 | 6.3 | 9.5 | 15.0 | | | | | | | | |
| R, RS | 2.7 | 3.2 | 4.2 | 5.8 | 8.2 | 11.9 | | | | | | | | | |