Dean Pump Division

R Series

High Temperature Pumps

R400/R4000

RMA5000

RWA

RA2000/RA3000
R Series

High Temperature (Hot Oil/Hot Water) Centrifugal Process Pumps

Process Industries

Heat Transfer OEM’s, Chemical, Petrochemical, Power Plants, Plastics, Food Processing, Pharmaceutical and Commercial (hospitals, universities, laboratories)

Quality Design Features for High Temperature Pumps

The Dean Pump R Series pumps, unlike foot-mounted pumps, are designed for high pressure and high temperature applications. They include design features that guard against pipe load and thermal distortions. The following features assure long and trouble free service life of bearings, driver coupling, and shaft sealing devices.

• Centerline mounted pump casing support allows thermal expansion of the casing about the pump centerline without disturbing shaft alignment
• Centerline mounted pump casing supported with yoke or pedestal mounts (water-cooled pedestal mounts also available) holds the pump securely in place resisting thermal expansion piping loads
• Centerline suction and discharge connections equalize pipe loads to prevent off center forces and distortion
• Deep precision rabbeted joints on the casing and bearing housing allow accurate assembly and hold the assembled pump rigidly in line
• Totally confined high temperature casing gasket provides safety during operating service conditions
• Back pull-out construction with spacer coupling allows the entire pump rotating assembly to be removed for servicing without removing the casing from the piping or disturbing the driver
• Fully enclosed Francis vane impeller design is keyed to the shaft and secured by an impeller bolt and washer to remain rigidly in place under all load conditions. The design is hydraulically balanced to extend bearing and seal life. Wearing ring clearances are to API refinery requirements for optimum efficiency
• ASME/ANSI B16.5 Class 300 Raised Face or Ring Type Joint flanges are available for high pressures
• Casing wear rings (R4000/R4000 and RMA Series only) are standard and allow renewable running clearances within the pump for extended performance life
• Heavy duty angular contact thrust bearings provide long bearing life

Interchangeability

• Maximum pump and parts interchangeability for field repairs without special tools
• Hydraulic performance curves are the same for each R Series pump size

Quality Engineering

• Sealed pump designs can be fitted with a wide range of mechanical seals and flush/cooling arrangements, thereby allowing for maximum sealing and installation flexibility
• Air-cooled pump designs requiring no external water cooling for the bearings and mechanical seal
• Water-cooled designs for maximum mechanical seal life
• Sealless, magnetic drive designs for emissions compliance/concerns
• Wide range of hydraulic coverage
• Back pullout design allows for removal of the entire rotating assembly for easy field repair and maintenance
• Various casing foot designs are available – “yoke” (allows for pump to fit on an ASME/ANSI B73.1 baseplate and Dean’s “Economy” baseplate), “pedestal” (allows for pump to mount on an API-type baseplate), and “water-cooled pedestal” for severe service conditions and applications
• Sturdy fabricated steel baseplates help maintain alignment under all service conditions
R400/R4000 SERIES

Heavy Duty, High Temperature Process Pumps

- Capacities to 6,500 GPM (1,476 m³/hr)
- Heads to 800 feet (244 m)
- Pumping Temperatures to 850°F (455°C)
- Working Pressures to 500 PSIG (3,447 kPa)
- Twenty-seven Sizes

R400/R4000 Series Pumps are the single most applied pump for high temperature heat transfer service. These heavy duty, center-line supported, chemical, petrochemical, and refinery style process pumps are available in twenty-seven sizes in steel and 316SS construction.

Head-Capacity Range Charts

Two Pole Motor

Working Pressure vs Pumping Temperature

used to determine the allowable working pressure at any allowable process fluid temperature for the material of construction selected.

Seal Chamber Temperature vs Pumping Temperature

with respect to the GPM of cooling water flowing through the cooling jacket surrounding the seal chamber.
Air-Cooled High Temperature
Thermal Liquid Pumps
• Capacities to 1,100 GPM (250 m³/hr)
• Heads to 425 feet (130 m)
• Pumping Temperatures to 650°F (343°C)
• Working Pressures to 350 PSIG (2,413 kPa)
• Eleven Sizes

RA2000/3000 Series Pumps are cost effective, hot oil, heat transfer pumps. Pumps feature a shaft mounted fan to provide air flow over the cooling fins of the pump. This air-cooled design translates to NO EXTERNAL WATER COOLING REQUIRED for the bearings and mechanical seal. Eleven sizes are available in ductile iron construction.

Head-Capacity Range Charts

Two Pole Motor

Four Pole Motor

No Liquid Cooling Required
The air fan-cooled design of RA Series pumps permits temperature drop in the pump from the casing to seal faces. When pumping at 650°F (343°C), the seal face temperature is 230°F (110°C). The efficient gradient breakdown protects the mechanical seal and bearing.
Air-Cooled Hot Water Pumps

- Capacities to 1,100 GPM (250 m³/hr)
- Heads to 425 feet (130 m)
- Pumping Temperatures to 400°F (205°C)
- Working Pressures to 450 PSIG (3,100 kPa)
- Eight Sizes

RWA Series Pumps are designed specifically for use with hot water, ethylene glycol and propylene glycol in boiler feed, steam condensate, HVAC and heat transfer applications. Pumps feature a shaft mounted fan to provide air flow over the cooling fins of the pump. This air-cooled design translates to **NO EXTERNAL WATER COOLING REQUIRED** for the bearings and mechanical seal. Eight sizes are available in ductile iron construction.

Head-Capacity Range Charts

**Two Pole Motor**

![Capacity U.S. Gallons Per Minute vs Total Head Feet](chart)

**Four Pole Motor**

![Capacity Cubic Meters Per Hour vs Total Head Meters](chart)

**Working Pressure vs Pumping Temperature**

![Working Pressure vs Pumping Temperature Chart](chart)
RMA5000 SERIES

Magnetic Drive Air-Cooled High Temperature Process Pumps

- Capacities to 1,200 GPM (270 m³/hr)
- Heads to 600 feet (180 m)
- Pumping Temperatures to 750°F (400°C)
- Working Pressures to 300 PSIG (2,068 kPa)
- Seventeen Sizes

RMA5000 Series Pumps are sealless, air-cooled (or water-cooled), heavy duty process pumps. Features include centerline supported casing, silicon carbide bearings positively held against rotation, Samarium cobalt rare earth magnets, and a Hastelloy-C containment shell. Air fin cooling reduces heat flow from process fluid to magnets. Seventeen sizes are available in steel.

Head-Capacity Range Charts

Two Pole Motor

Working Pressure vs Pumping Temperature

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<thead>
<tr>
<th>Pumping Temperature - °C</th>
<th>Working Pressure - PSIG</th>
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<tbody>
<tr>
<td>-50</td>
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<table>
<thead>
<tr>
<th>Pumping Temperature - °F</th>
<th>Working Pressure - kPa</th>
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Four Pole Motor

Capacity Cubic Meters Per Hour 1450 RPM - 50 Hertz

Capacity U.S. Gallons Per Minute 1750 RPM - 60 Hertz