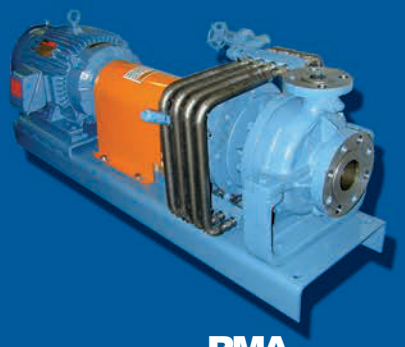
Bulletin C 1.4.45

CECO Dean

Dean Pump® R Series

High Temperature Pumps

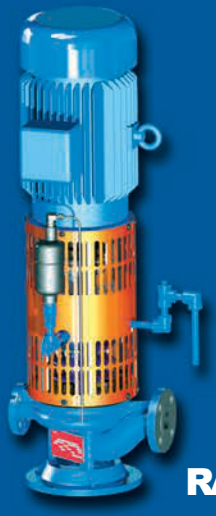


RMA

R

RA

RM



RAV

RWAV

RWA

SERIES

Dean Pump® R Series

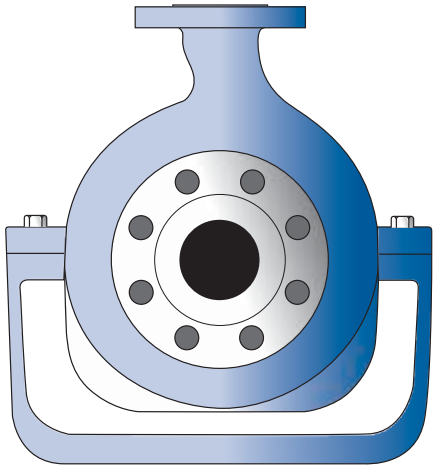
High Temperature (Hot Oil/Hot Water) Centrifugal Process Pumps

Process Industries Heat Transfer OEMs, 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 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 (standard on R4180 and R4240) holds the pump securely in place resisting thermal expansion piping loads (watercooled pedestal mounts also available)
- 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 (R4000, RM and RMA Series only) 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, RM 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

Versatility

- (R4000 only), 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 (RM/RMA)
- 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” (excluding R4180 & 4240) 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

DEAN PUMP® RM5000 SERIES

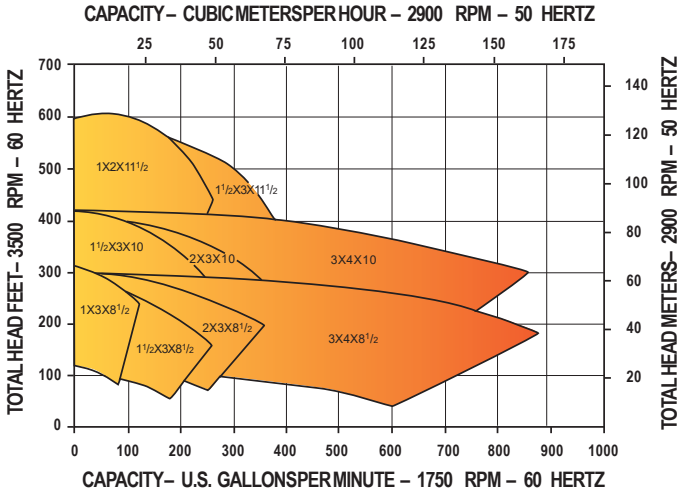
Magnetic Drive High Temperature Process Pumps

- Capacities to 1,200 GPM (270 m^3/hr)
- Heads to 600 feet (180 m)
- Pumping Temperatures to 400°F (204°C)
- Working Pressures to 325 PSIG (2,240 kPa)
- Seventeen Sizes

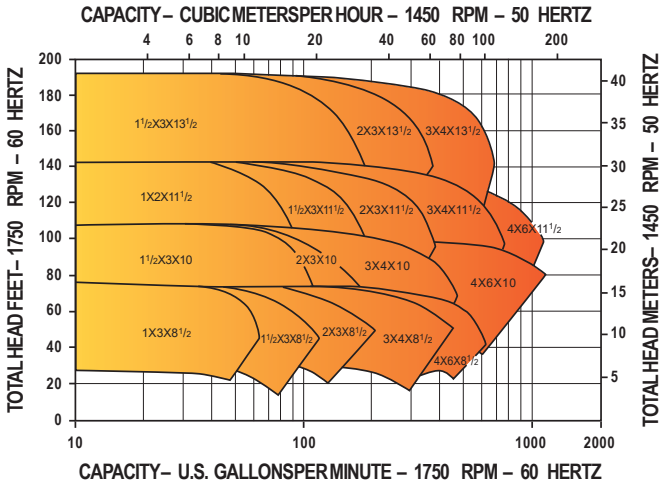
RM5000 Series Pumps are sealless, heavy duty process pumps. Features include centerline supported casing, silicon carbide bearings positively held against rotation, Samarium cobalt rare earth magnets, and a Hastelloy-C containment shell. Seventeen sizes are available in steel and 316SS.

Head-Capacity Range Charts

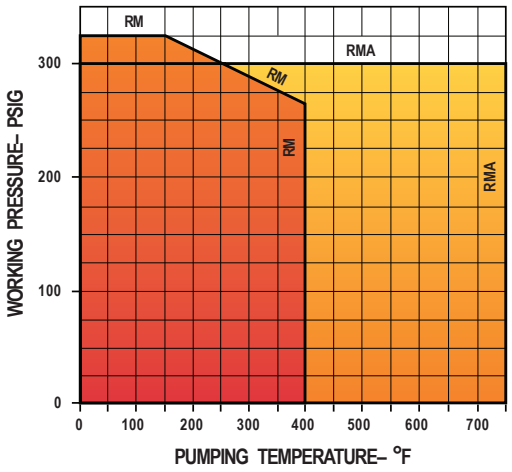
Two Pole Motor



Four Pole Motor



Working Pressure vs. Pumping Temperature



DEAN PUMP® R4000 SERIES

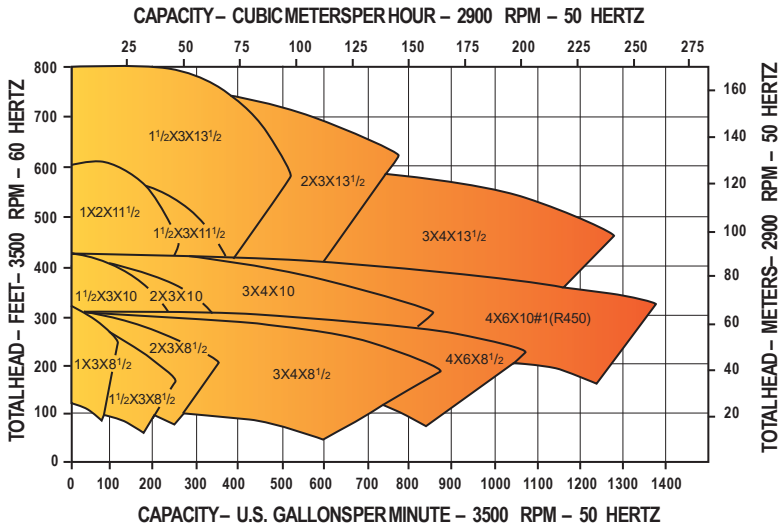
Heavy Duty, High Temperature Process Pumps

- Capacities to 6,500 GPM (1,476 m^3/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

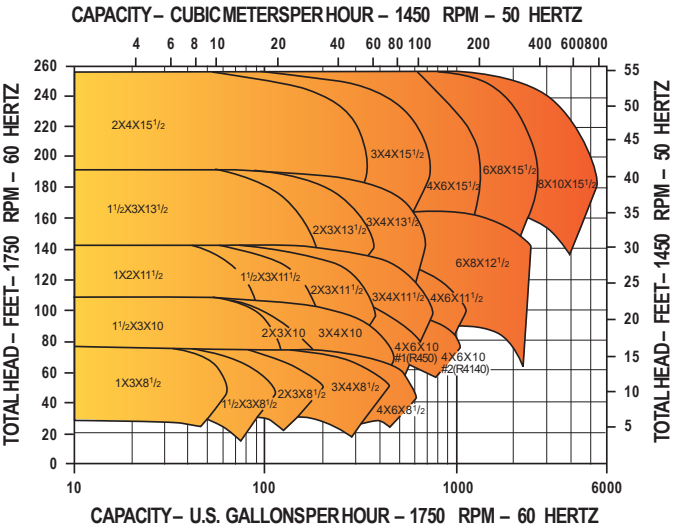
R4000 Series Pumps are the single most applied pump for high temperature heat transfer service. These heavy duty, centerline supported, chemical, petrochemical, and refinery style process pumps are available in twenty-seven sizes in steel and 316SS construction.

Head-Capacity Range Charts

Two Pole Motor

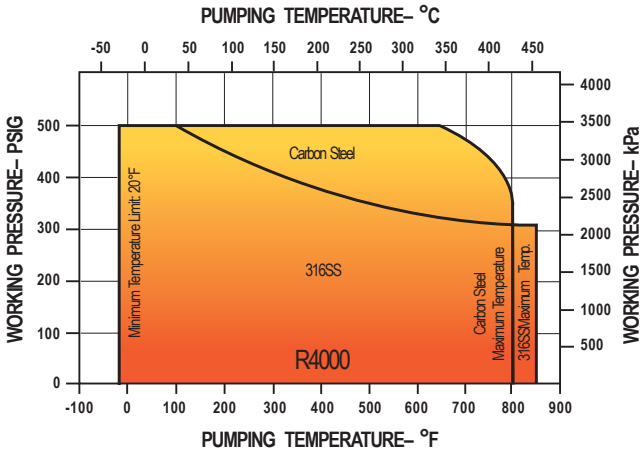


Four Pole Motor



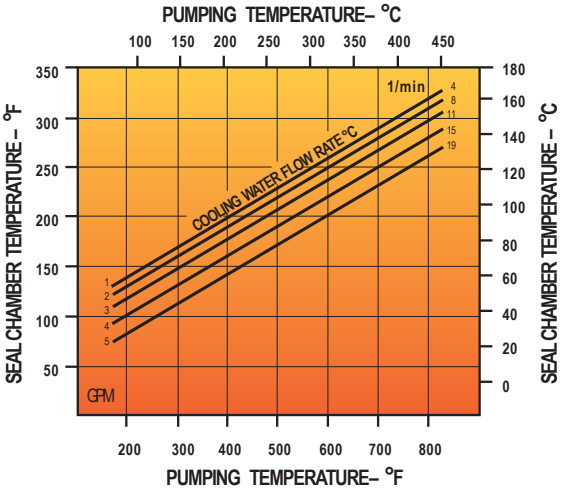
Working Pressure vs. Pumping Temperature

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.



GPM Flow Rate of Cooling Water Based on 70°F (21°C) Inlet Temp

DEAN PUMP® RMA5000 SERIES

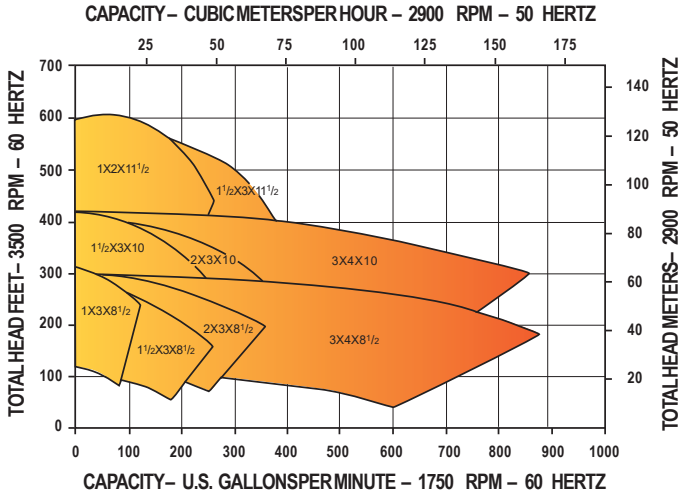
Magnetic Drive Air-Cooled
High Temperature Process Pumps

- Capacities to 1,200 GPM (270 m^3/hr)
- Heads to 600 feet (180 m)
- Pumping Temperatures to 750°F (400°C)
- Working Pressures to 300 PSIG (2,068 kPa)
- Seventeen Sizes

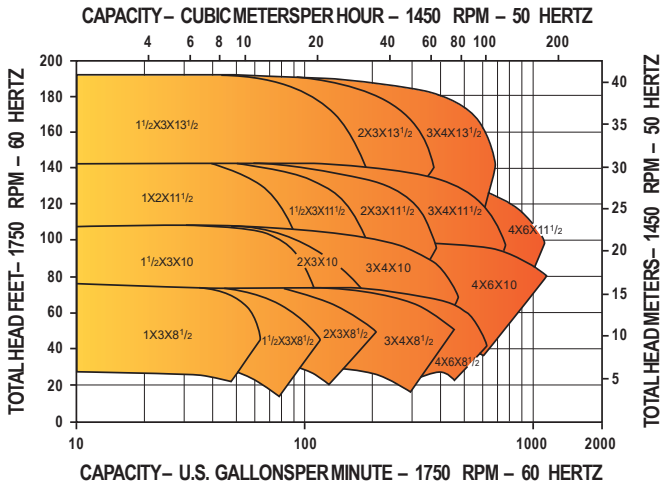
RMA5000 Series Pumps are sealless, air-cooled (or water-cooled), heavy duty process pumps. Features include centerline supported casing, silicon carbide bearings positively held against rotation, Samarium cobalt rare earth magnets, and a Hastelloy-C containment shell. Air fin cooling reduces heat flow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

Head-Capacity Range Charts

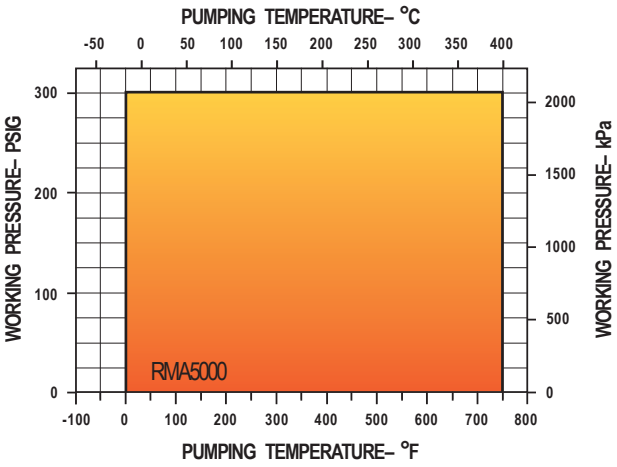
Two Pole Motor



Four Pole Motor



Working Pressure vs. Pumping Temperature



DEAN PUMP® RA SERIES

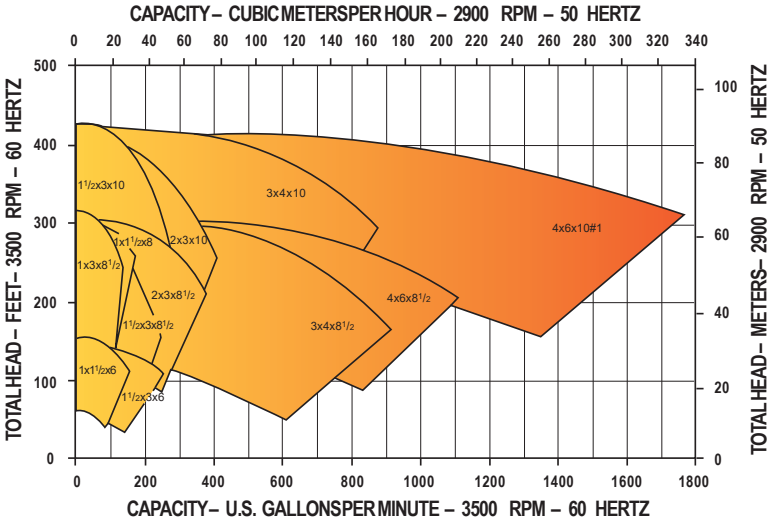
Air-Cooled High Temperature Thermal Liquid Pumps

- Capacities to 1,800 GPM (408 m^3/hr)
- Heads to 425 feet (130 m)
- Pumping Temperatures to 650°F (343°C)
- Working Pressures to 350 PSIG (2,413 kPa)
- Thirteen Sizes

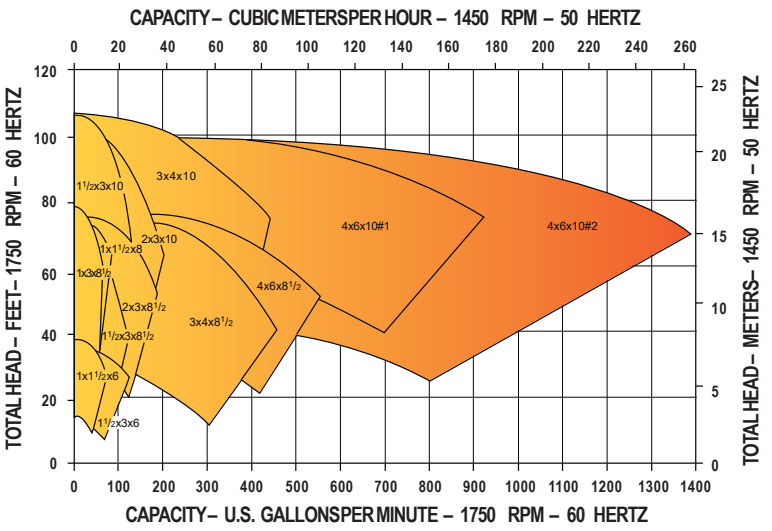
RA Series Pumps are cost effective, hot oil, heat transfer pumps. Pumps feature a shaft mounted fan to provide air flow over the cooling fins of the pump. This air-cooled design translates to **NO EXTERNAL WATER COOLING REQUIRED** for the bearings and mechanical seal. Thirteen sizes are available in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

Head-Capacity Range Charts

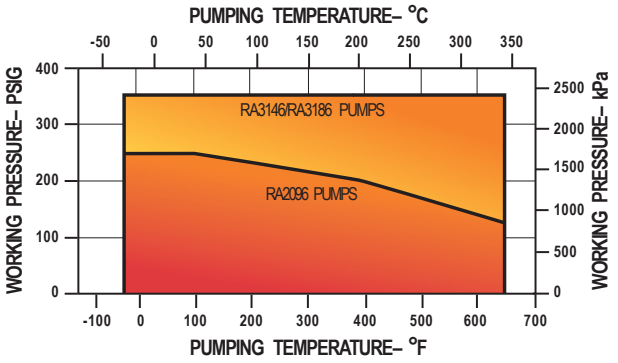
Two Pole Motor



Four Pole Motor

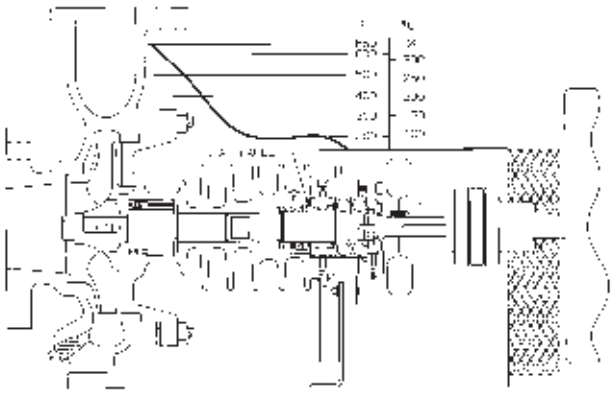


Working Pressure vs. Pumping Temperature



No Liquid Cooling Required

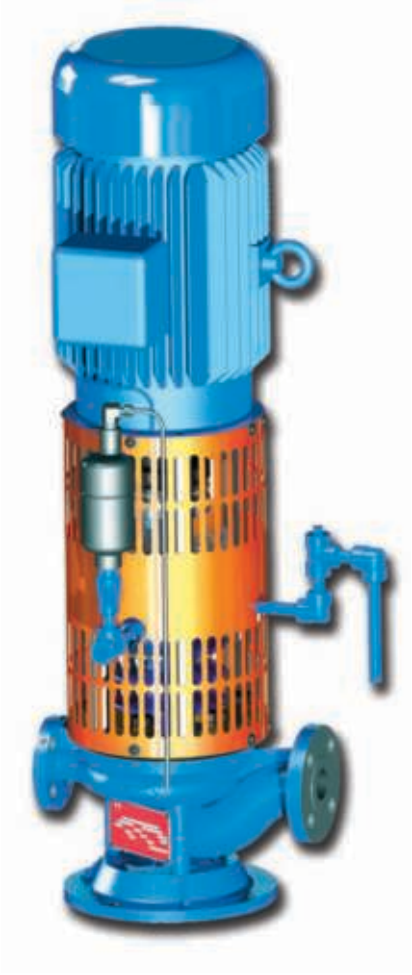
The air fan-cooled design of RA Series pumps permits temperature drop in the pump from the casing to seal faces. When pumping at 650°F (343°C), the seal face temperature is 230°F (110°C). The efficient gradient breakdown protects the mechanical seal and bearing.



Vertical Inline Air Cooled High Temperature Thermal Liquid Pumps

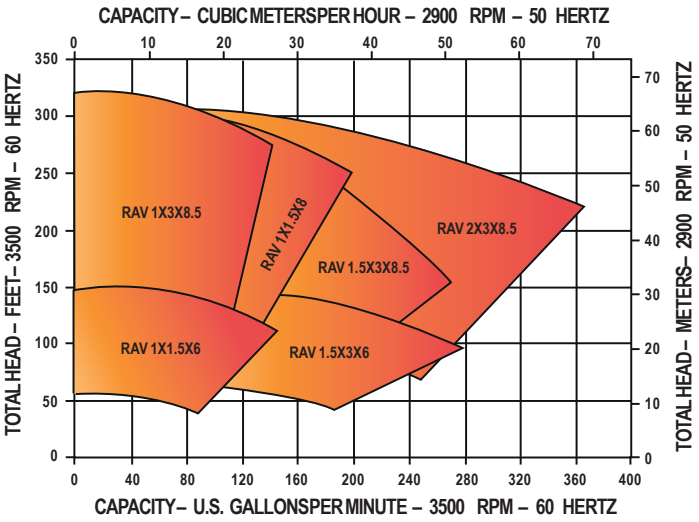
- Capacities to 360 GPM (82 m^3/hr)
- Heads to 320 feet (98 m)
- Pumping Temperatures to 650°F (343°C)
- Working Pressures to 350 PSIG (2,413 kPa)
- Six Sizes

The RAV Series offers the same design benefits as the RA Series but in a vertical configuration. 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. Three sizes are available in ductile iron construction.

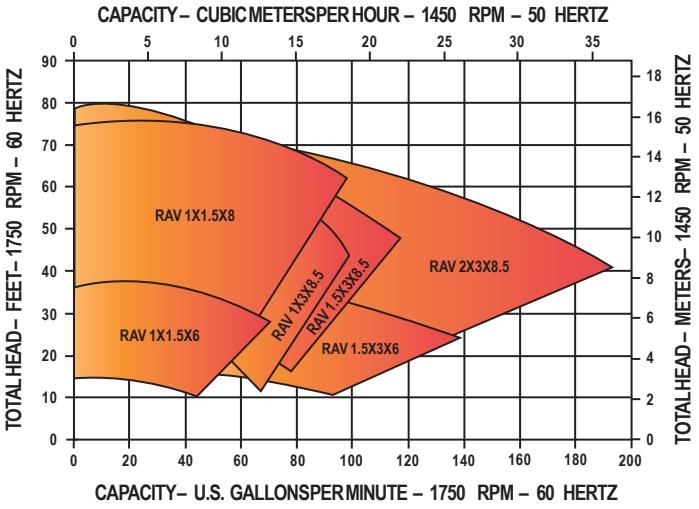


Head-Capacity Range Charts

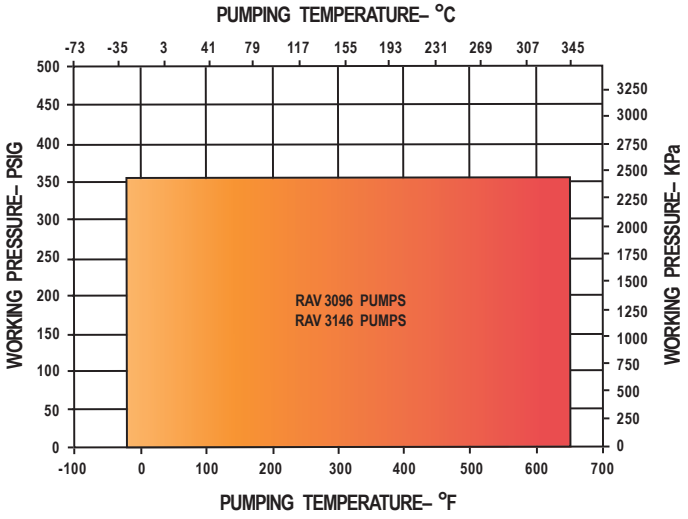
Two Pole Motor



Four Pole Motor



Working Pressure vs. Pumping Temperature



DEAN PUMP® RWA SERIES

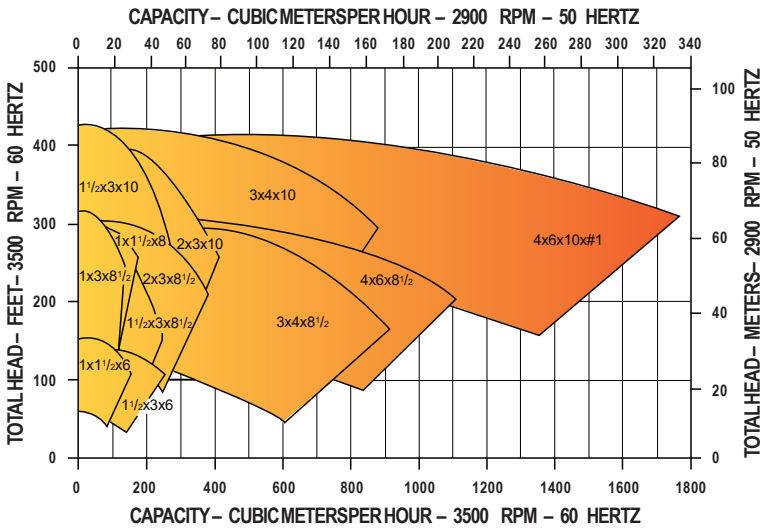
Air-Cooled Hot Water Pumps

- Capacities to 1,800 GPM (408 m^3/hr)
- Heads to 425 feet (130 m)
- Pumping Temperatures to 400°F (205°C)
- Working Pressures to 450 PSIG (3,100 kPa)
- Thirteen Sizes

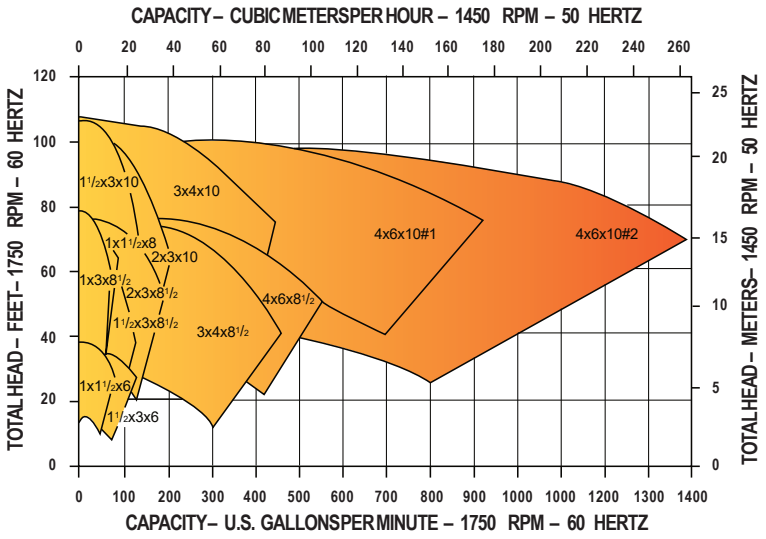
RWA Series Pumps are designed specifically for use with hot water, ethylene glycol and propylene glycol in boiler feed, steam condensate, HVAC and heat transfer applications. Pumps feature a shaft mounted fan to provide air flow over the cooling fins of the pump. This air-cooled design translates to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

Head-Capacity Range Charts

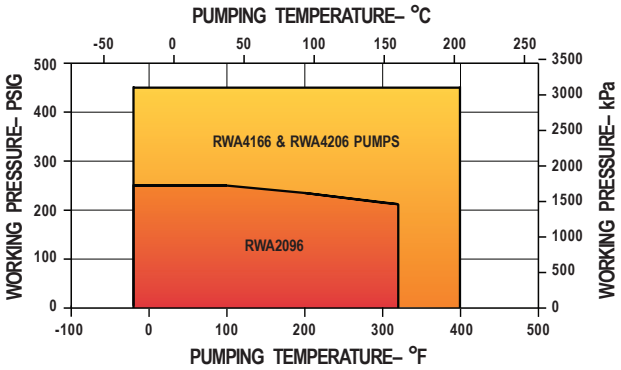
Two Pole Motor



Four Pole Motor



Working Pressure vs Pumping Temperature



DEAN PUMP® RWAV SERIES

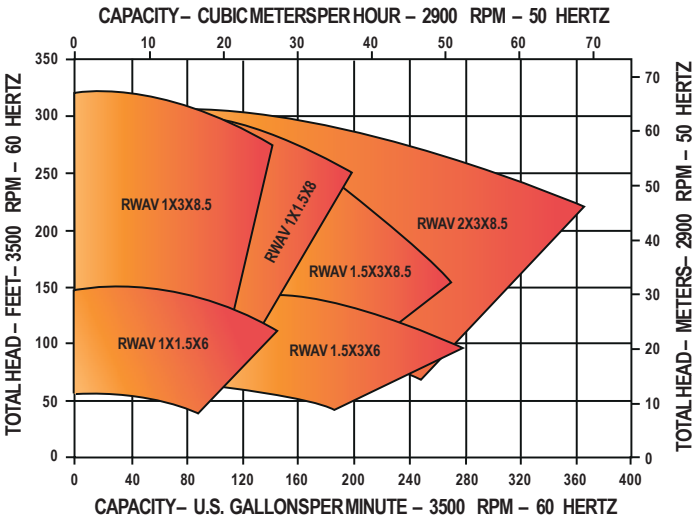
Vertical Inline Air Cooled Hot Water Pumps

- Capacities to 360 GPM (82 m^3/hr)
- Heads to 320 feet (98 m)
- Pumping Temperatures to 400°F (204°C)
- Working Pressures to 450 PSIG (3,103 kPa)
- Six Sizes

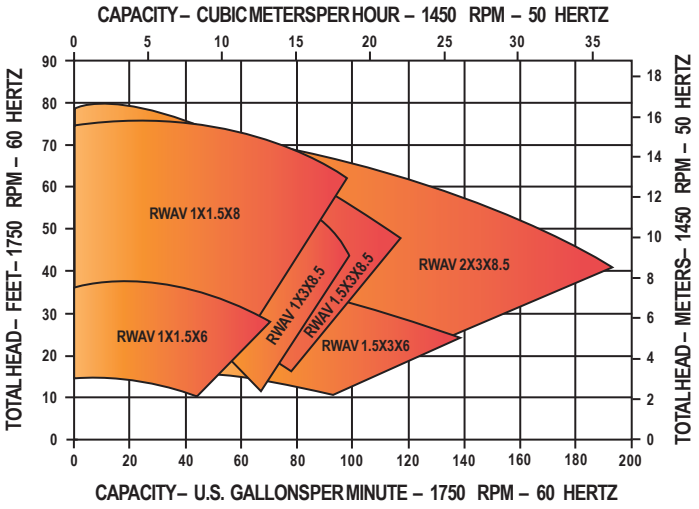
The RWAV Series offers the same design benefits as the RWA Series but in a vertical configuration. Pumps feature a shaft mounted fan to provide air flow over the cooling fins of the pump. This air-cooled design translates to **NO EXTERNAL WATER COOLING REQUIRED** for the bearings and mechanical seal. Three sizes are available in ductile iron construction.

Head-Capacity Range Charts

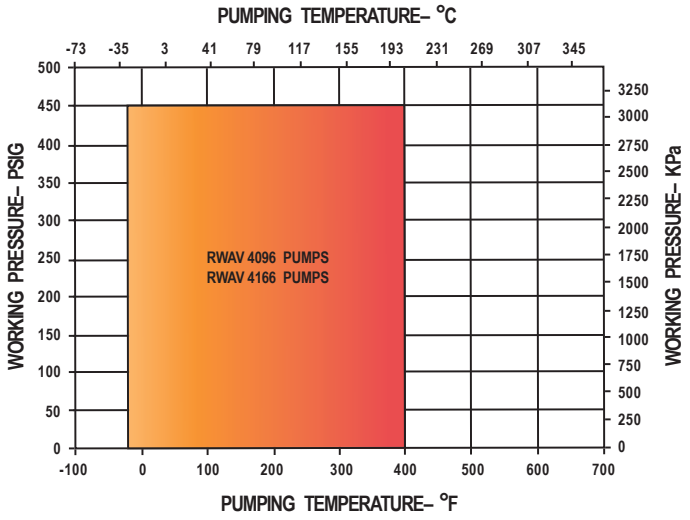
Two Pole Motor



Four Pole Motor



Working Pressure vs. Pumping Temperature



ABOUT CECO ENVIRONMENTAL PUMP SOLUTIONS

CECO Environmental is a global leader in air quality and fluid handling in regions around the world providing innovative technology and application expertise to customers across a variety of industries.

Our Fluid Handling Solutions segment combines the resources of our four internationally-recognized, comprehensive lines of high-quality filters and pumps: Dean Pump, Fybroc, Mefiag and Sethco. Our Dean, Fybroc, and Sethco pumps are designed to handle the niches of corrosive, abrasive, or high temperature liquids. These pumps provide excellent performance for tough applications including pumping of acids, brines, caustics, bleaches, seawater, high temperature liquids and a wide variety of waste liquids for a broad range of applications including the chemical, petrochemical, metal finishing, wastewater treatment, desalination and aquarium/aquaculture markets.

Dean Pump is recognized worldwide for its high-quality chemical process and high temperature metallic centrifugal pumps. These pumps are manufactured in a variety of metals to handle a broad range of high temperature and chemical process applications.

CECO Dean Pump

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