



Refrigeration - Case Study



Case Study Information

Customer	Refrigeration Engineers
Location	United Kingdom
Enquiry Received	14th November
Order Placed	19th March
Order Dispatched	17th April

Equipment Supplied:

2 x Horizontal Close Coupled Centrifugal Pumps w/ Air Priming Ejectors - Azcue SP-MN Range

Application	Refrigeration Cooling
Fluid	Sea Water
Temperature	Ambient
Flow	500 m3/h
Total Head	16.4m
IE2 Motor	30kW / 400v / 3 Phase / 50Hz / 1450 rpm
NPSHr	3.68m, Isol/Prot. F/IP-55
Seal	Mechanical
Pump Casing	Bronze
Impeller	Bronze
S/discharge Ø	200/150
Shaft	Stainless Steel
Impeller Ø	269

Enquiry:

- ✓ A UK based engineering firm was looking to purchase several centrifugal pumps to install on their new gas refrigeration system. The aim of this new system was to demonstrate to their customers how much energy they could potentially save by upgrading their dated refrigeration setup. They were struggling to find a reliable self priming centrifugal pump that could handle the requested 8,300 l/min.
- ✓ A reliable pump was vital for this system as the pump would be working 24 hours a day; its function was to keep the heat exchanger cool as the refrigeration gas was circulating through it.

Solution:

- ✓ We quoted two high flow centrifugal self priming pumps with air priming ejectors. The MN-VP close coupled centrifugal water pumps have a unique feature whereby they have an air operated self-priming pump attached to the main pump which starts intermittently operated via a pressure switch. This ensures a completely automatic system, as they would automatically re-prime the pump should there be any loss of prime, and no need to manually operate the pumps.
- ✓ The additional second pump provides a backup to the main pump to ensure the cooling of the heat exchanger should the main pump require maintaining or worst case fails. This duty / standby arrangement is the safest and most efficient way to ensure the refrigeration system is never down.
- ✓ Typically with a self priming centrifugal water pump only flows of up to 300M³H (5000L/min) are possible which makes the MN SP an excellent choice given its high flow range.



Distillery - Case Study



Case Study Information

Customer	Distillery
Location	United Kingdom
Enquiry Received	9th January
Order Placed	6th March
Order Dispatched	16th May

Equipment Supplied:

2 x Self Priming Centrifugal Pumps - Azcue SP-AN Range

Application	Sea Water Cooling of Heat Exchanger
Fluid	Sea Water
Flow	280 m3/h
Total Head	52m
Power	75Kw
Voltage	415v
Frequency	50Hz
RPM	1450
Execution	Horizontal
Pump Casing	Bronze
Impeller	Bronze
Shaft	Stainless Steel

IE2 Electric Motor

Motor Fitted with Anti-Condensation Heaters

Enquiry:

- ✓ Castle Pumps were approached by an engineering contractor that had been awarded the project of refurbishing a distillery. One of the key components that needed upgrading was the heat exchanger. The previous heat exchanger was using sea water for cooling, which was being fed by a standard end suction centrifugal pump that was being manually primed by the operator.
- ✓ The distillery was experiencing a lot of down time due to the pump constantly losing its prime; an engineer frequently had to travel to the remotely located pump station and manually prime the pump. It was crucial to the distillery that the pump station was fully automatic and did not require an operator to manually prime this sea water pump.

Solution:

- ✓ To ensure the pump station was fully automatic, we quoted for two centrifugal water pumps arranged in a duty/standby operation. This provides a backup pump in the event that one should fail; the distillery therefore should not experience any downtime. We selected long coupled end suction centrifugal pumps in bronze fitted with electric priming pumps.
- ✓ The electric self priming centrifugal pumps are activated by a pressure switch in the event the main pump loses its prime. This automated system ensures that no engineer needs to travel to the pump station to manually prime the pumps. This is a robust engineered solution with many fail safes, the automatic priming and standby centrifugal water pump should ensure that the distillery does not experience any downtime moving forward.



Aerospace - Case Study



Case Study Information

Customer	Aerospace Company
Location	UK
Enquiry Received	19th February
Order Placed	2nd April
Order Dispatched	29th April

Equipment Supplied:

1 x Horizontal Positive Displacement Vane Pump - Bombas Trief BAL Series Range

Application	Very Low Temperature Coolant Circulating Pump
Fluid	Anti-Freeze (Water + Ethylene Glycol)
Concentration	40 / 60%
Temperature	-40°C
Viscosity	100 cPs
SG	1.3 - 1.5
Suction	Flooded
Flow Rate	500 L/min
Discharge Pressures	1 Bar
Geared Motor	4 kW / 220-400v / 3 Phase / 50 Hz / IP55
Output Speed	640 rpm
Body Material	Cast Iron
Shaft	F-114
Sealing	Mechanical w/ EPDM O-Rings

Enquiry:

- ✓ An Aerospace company was having issues sourcing a circulating pump for a test rig that could handle the extremely low fluid temperatures of -40°C. The idea for the test bed was to simulate the operating characteristics of an aircraft's coolant line at high altitudes and therefore low ambient temperatures.

Most pump manufacturers and suppliers could only supply a circulator pump suitable for temperatures down to -5°C.

Solution:

- ✓ Having previously assisted the customer with other special requirements we were happy to take up the challenge. After determining that the fluid was indeed a fluid at the operating temperature and concentration we then examined what type of circulator pump would be required to handle both the specific gravity and extreme temperature of the fluid. We selected a robust positive displacement vane pump with an oversized motor suitable for use with an inverter to enable ultimate control of the pump during their testing programme. The mechanical seal and shaft were selected to suit the arduous fluid temperature.

We subsequently offered and supplied bespoke fittings and connections to facilitate easy installation into the customers test rig therefore facilitating a "Plug and Play" supply.

Castle Pumps understood how important this positive displacement vane pump was to the client's operation, and we had confidence that we could supply them with a solution quickly, for a reasonable price and that was easily integrated into their set-up. The customer was happy with the relative ease that we selected such a bespoke solution within such a small time frame as well as the price!