



PROJECT REPORT

ORA ISTANBUL - Three types of BAC cooling towers cool the most prestigious shopping complex in Istanbul



ORA Shopping Mall and Hotel complex, located in the heart of Istanbul, is designed with the objective of receiving 13.5 million visitors per year. The 360.000 m² building will be a world-class centre housing various shopping facilities, hotels, theme park, arena and convention center. ORA Istanbul Real Estate Investment and Development Co. is the investor with his own facility management company. A low total cost of ownership was of key importance. That's why ORA was very interested in BAC's unique selling propositions on performance, quality and reliability.

The prestigious project includes the cooling of a shopping mall, a hotel and a trigeneration system. This results in a diversity of the load profiles. That's why BAC proposed different types of cooling towers for the different heat rejection requirements.



(4) S3-D 501 L + (1) S3-D 985 L; (9) FXV 662 NW; (3) TXV 500

Shopping Mall: Water cooled Heat Pumps and FXV

Water source heat pump systems always require closed loops on the condensation side. The **fouling restrictions** of the system set the opportunity of using a **closed circuit cooling tower**.

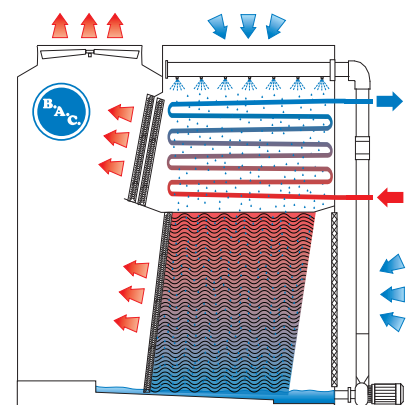
The decision making unit consisted of a design and quality consultant, a contractor for piping and electrical wiring and the investor, who was also responsible for the facility management and purchase of the units.

Easy maintenance and inspection were paramount and mandatory along with a **high quality heavy duty construction**.

The regulation on reaching the required heat rejection set points was an important **energy saving requirement**. BAC considered both FXV and FXV-D units, but finally proposed FXV closed circuit cooling towers, working with 3 fans and applying a step per fan in achieving the required heat rejection set point. The **layout flexibility** of the FXV was an unmatched advantage. BAC was able to reduce the foreseen layout area because of the FXV single air intake.

Customer requirements

- Lowest total cost of ownership :
 - Superior material of construction for long service life
 - Low energy consumption
 - Low maintenance and easy inspection
- Layout flexibility



FXV closed circuit cooling towers are easy to maintain and inspect

Selection Parameters :

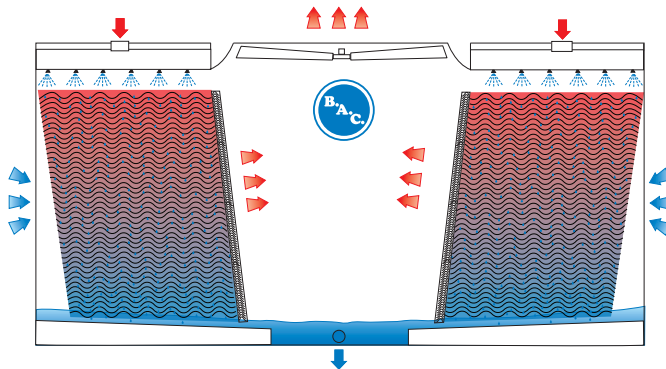
9 x 1163 kW; 46,3 l/s of H₂O, from 34 to 28 °C at 24 °C wet bulb temperature.



Hotel

1. Water cooled centrifugal chillers with S3000D

The centrifugal chillers required two cooling towers per chiller. **Low energy consumption** was a very important customer demand. The S3000D single and low kW axial fan perfectly met the energy saving need. An additional and well appreciated benefit was the **easy maintenance and layout flexibility**.



S3000D guarantee optimal single cell performance with unmatched energy savings.

Selection Parameters :

4 x 2017 kW; 80,3 l/s of H₂O, from 34 to 28 °C at 24 °C wet bulb temperature.

2. Trigeneration system

In a later phase a trigeneration system for the hotel was installed including (4) double stage absorption chillers. Again the customer decide to opt for the high efficient crossflow type cooling towers.

BAC offered (3) TXV and (1) S3000D open cooling towers, exceeding again the customer's expectations in terms of energy saving and ease of maintenance.

Selection Parameters :

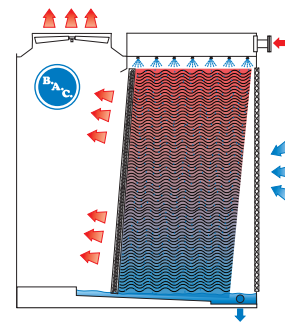
3 x 2388 kW; 81,5 l/s, from 35 to 28 °C at 24 °C wet bulb temperature.

1 x 4454 kW; 154,3 l/s, from 35 to 28 °C at 24 °C wet bulb temperature.

S3000D large access door and internal walkway



S3000D uses one low kW single fan



TXV crossflow, high energy efficient cooling towers

LOW COST, ENERGY EFFICIENCY and LOW / EASY MAINTENANCE were key benefits of all BAC products to satisfy the needs of the customer.