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Case Study – Mangabeira Shopping, Brazil

EDUCATION / HEALTH CARE / LODGING / GOVERNMENT / OFFICE BUILDING / **RETAIL** / SPECIAL

For Reliable, Efficient Cooling in Tropical Conditions, Mangabeira Shopping Selects Carrier AquaEdge® 23XRV Chillers

OBJECTIVES:

Manaíra Shopping has been a popular mall in the city of João Pessoa, Brazil, since 1989. During renovations and expansion in 2005, Midea Carrier — the organization serving Brazil, Argentina and Chile — sales office in nearby Recife demonstrated the superior efficiency of the Carrier AquaEdge® 23XRV screw chiller to the mall owners, who then selected several 23XRV units for the newly refurbished mall. The screw chillers performed as efficiently and reliably as expected. Consequently, when it came time to plan their next shopping center, Mangabeira Shopping, the mall owners turned to Midea Carrier to assist in the selection of the chillers for the cooling plant.

SOLUTION:

The construction of the new shopping mall, Mangabeira Shopping, was completed in 2014. Given the tropical climate, and with more than half a million square feet of retail space, plus entertainment areas including cinemas, bowling, a food court and children's play spaces, it was imperative that the cost of cooling at Mangabeira Shopping be kept as low as possible. The mall owners once again selected Carrier AquaEdge 23XRV water-cooled screw chillers to provide a comfortable atmosphere for shoppers and staff, and to supply appropriate conditions to maintain the quality of the merchandise within the stores. Mangabeira Shopping is served by seven 23XRV chillers of 1,864 kW [530 tons) each, which are maintained by Midea Carrier under a service agreement.

Carrier AquaEdge® 23XRV Chillers Deliver Economic Comfort Cooling for Mall Owners

Full Load kW/Ton: up to 0.53
Integrated Part Load Values (IPLV): up to 0.299

Due to full load performance efficiencies up to 0.53 kW/Ton, and Integrated Part Load Values (IPLV) to 0.299, the Carrier AquaEdge® 23XRV water-cooled screw chiller provides economical comfort cooling for more than a half-million square feet of retail space at tropical Mangabeira Shopping, located in João Pessoa, Brazil.

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Even though we have not fully completed automation of the chilled water system, the Carrier 23XRV chillers are operating very close to factory performance, which we consider highly satisfactory. We anticipate seeing an even better coefficient of performance once automation is complete."

Germano Pordeus Brandão,
Mechanical Engineer
Mangabeira Shopping

SYNOPSIS:

Manaíra Shopping has been a popular mall in the city of João Pessoa, capital of the state of Paraíba in Brazil, since 1989. A city of 770,000 people, João Pessoa enjoys a tropical climate characterized by warm temperatures and high relative humidity all year round. During renovations and expansion of Manaíra Shopping in 2008, the Midea Carrier sales office in nearby Recife was invited to participate in the bidding process for the refurbishment of the central plant. Carrier staff used Carrier's proprietary computer modeling software to demonstrate the superior efficiency of the Carrier AquaEdge® 23XRV screw chiller to the mall owners, who then selected several 23XRV units for the newly refurbished mall. The screw chillers performed as efficiently and reliably as expected. Consequently, when it came time to plan their next shopping center, the owners turned to Midea Carrier once again to assist in the selection of chillers for the new mall's central plant.

The construction of the new shopping mall, Mangabeira Shopping, was completed in 2014. The facility offers more than half a million square feet of retail space, plus entertainment areas including cinemas, bowling, a food court and children's play areas. Given the facility size and tropical climate, it was imperative to the profitability of the mall that the cost of cooling at Mangabeira Shopping be kept as low as possible. Therefore, the mall owners once again selected Carrier AquaEdge 23XRV water-cooled screw chillers to provide a comfortable atmosphere for shoppers and staff, and to provide appropriate conditions to maintain the quality of the merchandise within the stores.

Mangabeira Shopping is served by seven 23XRV chillers of 1,864 kW (530 tons) each, which are maintained by Midea Carrier under a service agreement. The cooling system also comprises several cooling towers and air handling units to serve each store and the common area. The chiller units owe their efficient performance in part to the variable speed drives they use to respond to demand by providing only as much cooling as needed. The units have performed well since installation.

Cristiano Brasil, Applications Coordinator for Building, Systems & Service at Midea Carrier said, "The first two Carrier AquaEdge 23XRV chillers at Manaíra Shopping provided such significant energy savings over the previous chillers that the mall owners purchased five subsequent units, and also selected seven 23XRV chillers for the Mangabeira Shopping complex."

Germano Pordeus Brandão, Mechanical Engineer at Mangabeira Shopping, said, "Even though we have not fully completed automation of the chilled water system, the Carrier 23XRV chillers are operating very close to factory performance, which we consider highly satisfactory. We anticipate seeing an even better coefficient of performance once automation is complete."

Project Summary

Location: João Pessoa, Brazil

Project Type: Applied; new construction

Building Size: 592,015 ft²

Built: 2014

Facility Usage: Retail and entertainment

Objectives: Provide comfort cooling and suitable conditions to maintain merchandise quality in a tropical climate; obtain lowest energy costs through efficient cooling equipment

Equipment: Seven 1,864 kW (530 tons) Carrier AquaEdge® 23XRV water-cooled screw chillers

Cooling tons: 3,710

Service & Maintenance: Carrier Midea

Major Decision Drivers: Mall owners' previous experience with efficiency of Carrier 23XRV chillers at Manaíra Shopping, an older project from the same developer

Installation Date: 2014

For more information, contact your nearest Carrier Representative, call 1.800.CARRIER or visit our web site at **carrier.com/commercial**

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