

Case Study

HMX cooling solutions boosts employee efficiency

Despite the hot and dry climate of Ahmedabad, the team at TeraSpin’s office at Sari, Ahmedabad, is fresh and energetic throughout the day. Obviously, comfortable people turn out better output and has quickly convinced the TeraSpin management that energetic people are the company’s most valuable asset.

What keeps everyone energetic the whole day? There are many factors; though one that stands out is the comfortable ambience at TeraSpin. No, it’s not just cooling – it’s much more than just cooling; it’s cooling with clean, fresh air, using HMX’s IDEC (Indirect Direct Evaporative Cooling) together with FAAC (hybrid air-conditioner) systems.

Background

TeraSpin is a manufacturer of precision textile spinning machinery components. Its factory and office building incorporate a variety of technologies and features that provide a very comfortable work environment for its employees, and at the same time are eco-friendly.

Challenges

TeraSpin’s office building accounts for about 50% of the total cooling load of its facility. The challenge was to bring down the cooling cost significantly, while maintaining a comfortable ambience with 25°C temperature all year round, and with high indoor air quality.

Solution

Based on a heat load calculations, it was found that approx. 20,000 CFM (cubic feet per minute) of air was required in the office building during summer and approx. 20 TR and 10,000 CFM cooling for monsoon was required in recirculation mode for maintaining a comfortable ambience. Keeping these numbers in mind, the following two systems were installed at TeraSpin’s office:

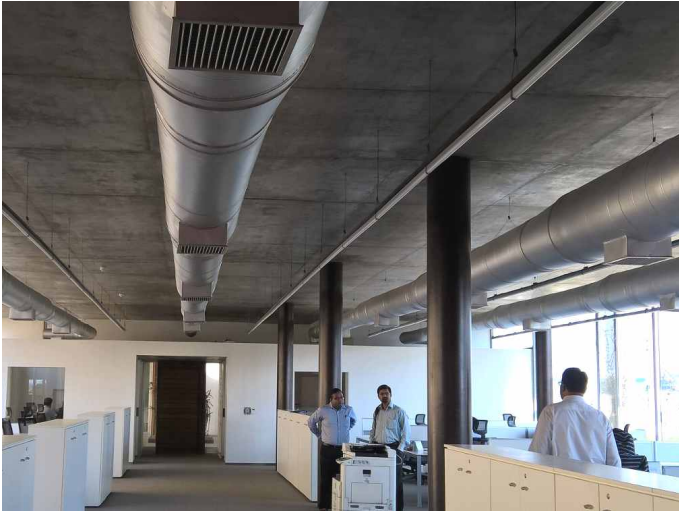
- HMX-IDEC: 10,000 CFM
- HMX-FAAC (hybrid air-conditioner): 10,000 CFM with 20 TR DX coil

IDEC is a two stage evaporative cooler. It is commonly known as Indirect Direct Evaporative Cooling (IDEC) technology. The HMX-FAAC combines indirect direct evaporative cooling and refrigerated air conditioning, and can provide comfort in all seasons.

How does the systems operate?

- During the summer, IDEC alone is sufficient to maintain a comfortable environment. A total of 20,000 CFM of air is pumped in the office with the HMX-IDEC and the HMX-FAAC (the latter is with the cooling coil shut-off) and 70% is exhausted out, maintaining comfortable working conditions through an approximately 9 month long period.
- During the remaining period, the 3 months of the monsoons, the IDEC modes for both these systems along with the exhaust systems in the building are shut down and the cooling coil installed in the FAAC unit comes into play. The 10,000 CFM FAAC unit pumps in exclusively cooled and dehumidified air into the space working purely in recirculation mode for maintaining temperature and RH conditions. Approximately 10% of the total air quantity is supplied as fresh air to maintain the desired oxygen level inside the room and the remaining fresh air is ex-filtrated through door openings.

PRODUCT INSTALLED	MODE OF OPERATION	COOLING CAPACITY	SUMMER / MONSOON	STATUS	ANNUAL RUNNING/ SHUTOFF TIME
HMX-IDEC	IDEC	10,000 CFM	SUMMER	ON	70%
			MONSOON	OFF	30%
HMX-FAAC (hybrid air-conditioner)	IDEC	10,000 CFM	SUMMER	ON	70%
			MONSOON	OFF	30%
	COOLING (DX) COIL	20 TR (10,000 CFM)	SUMMER	OFF	70%
			MONSOON	ON	30%



Inside TeraSpin



HMX-IDEC

The performance of the entire site in terms of energy consumed, water usage, and indoor air quality is monitored through the IoT based remote monitoring solution from EcoAxis (a business unit of A. T.E.)

Result

Tables 2 & 3 below show the ambient and office temperature reading recorded on a typical hot day in April 2015 and on a monsoon day when the RH is high in July 2015. The results show that the HMX systems had maintained comfortable temperature conditions with 100% fresh air with significant saving in energy consumption.

Table 2:

Sr. No.	Date	Time	Ambient (°C)	Room temperature (°C)
1	03-04-2015	2.00 pm	40.2	27.7
2	03-04-2015	4.00 pm	39.6	27.8

Table 3:

Sr. No.	Date	Time	Ambient (°C)	Room temperature (°C)
1	21-07-2015	2.00 pm	35.0	25.6
2	21-07-2015	4.00 pm	37.0	25.2

“ The management is very happy with the HMX systems. “The biggest advantage is that our employees feel energetic throughout the day and this has definitely improved their efficiency and productivity.

– K P Singh, Director