

## Town Sport Hall Püspökladány, Hungary

### Building characteristics

**Purpose:** The construction of the sports hall was dictated by the willingness of providing the local community with the possibility of active leisure and recreation as well as organizing regional sports events. The building, which can seat up to 1000 people, was built on the basis of the modern trends and construction standards.

**Area:** 4 200m<sup>2</sup>

**Cubic measure being handled by VTS units:** 6 400m<sup>3</sup>

### The conception of ventilation system

Providing sportsmen and viewers gathered in the hall with the heat comfort constitutes a necessary and absolute condition for the facility's operation. The implemented system was mainly calculated for the purposes of the best possible air exchange in the court and stand zones as well as proper ventilation of the remaining office and utility rooms. The requirement of intensified channeling of heat and moisture resulting from increased high physical activity of all participants of sports events became the main criterion of calculations. Moreover the designer paid attention to the necessity of 'flexible' control of the system's capacity which was to ensure proper parameters of heat comfort with the lowest possible thermal and electric energy consumption. In addition, heat balance calculations and sanitary standards indicated that the system was capable of performing its tasks even with the use of 50% of the recirculation air. The building's construction forced the necessity of placing the supply and exhaust ductwork under the ceiling which lead to creating a 'top-top' air flow system. With regards to the above, with a relatively high hall (10m), so called 'swirl anemostats' increasing air flow were applied as supply ducts' endings which results in pure air's reaching the working zones. The ventilators generate under pressure and as a result air is sucked in from a room. It is a turbulent flow in which both air streams are mixed



and their parameters are averaged. High level of acoustic volume in the hall during entertainments (the presence of players and the audience) enabled the designer to limit the rigor concerning the noise generated by the ventilation system's devices.

### Solution provided by VTS

Delivered AHUs from the VENTUS typeline are equipped with the mixing box and they work with the capacity from 8 000 m<sup>3</sup>/h for winter time to 10 000m<sup>3</sup>/h for summer period . The possibility of smooth control of the amount of ventilation air met with particular approval. The investor who was demonstrated the savings resulting from the ventilator's rotary speed control fully appreciated the advantages of frequency converter's drives.



General characteristics of used devices			
Number of AHUs	1		
AHUs type	VS		
Configuration	Mixing, Filter, Heater, Fan, Silencer / Filter, Fan, Mixing, Silencer		
Operational parameters			
	Energy recovery	No energy recovery	Economy [%]
Total AHUs heating capacity [kW]	148	75	50
Total supply AHUs electric power consumption [kW]	3		
Total exhaust AHUs electric power consumption [kW]	2		
Total supply Air Flow Rate [m <sup>3</sup> /h]	8 000		
Total exhaust Air Flow Rate [m <sup>3</sup> /h]	8 000		
Average SFP [kW/m <sup>3</sup> /s]/[W/m <sup>3</sup> /h]	2,12	0,59	
Noise parameters for loudest unit at 250 Hz			
	Supply	Exhaust	
Inlet [dB]	83	69	
Outlet [dB]	73	86	
Environment [dB]	74	73	