

# ESG

Pool Ventilation

## ESG Energy Saving Systems

ESG combined pool hall and changing rooms ventilation unit

Variable fresh air control

ESG plate heat exchanger heat recovery system

Desiccant dehumidification

Variable rate ventilation control

Loop air distribution

## ESG COMBINED POOL HALL AND CHANGING ROOMS VENTILATION UNIT (UK Patent no 2430486)

The ESG patented system provides the ventilation for both the pool hall and changing rooms from a single ventilation unit, with only one supply fan and one extract fan. This includes directly exhausting to atmosphere, without any recirculation, soiled extract from toilets and showers, while at the same time allowing return air from the pool hall to be recirculated as required by the variable fresh air control system.

Compared to two separate systems, our combined pool hall and changing rooms ventilation system makes a substantial capital cost saving in air handling plant as well as ductwork and silencers.

### VARIABLE FRESH AIR CONTROL

This system uses fresh, recirculation and exhaust air dampers to continuously modulate the proportion of fresh air within the total ventilation to maintain good conditions for bathers and a safe level of relative humidity. This technique, which is the most powerful energy system available in pool hall ventilation, makes it possible to save an average of over 70% of the sensible energy during periods when the pool is in use.

The reason for this high level of saving is the massive variation in demand for fresh air for dehumidification. First, because the level of evaporation at peak, when pool, surrounds and bathers creates a total wetted area that is typically around two and a half times the wetted area of the pool alone when there are few bathers. Second, the capacity for fresh air to provide dehumidification in peak summer conditions is, on average, only around half that available at average outside temperature.

### THE ESG PLATE HEAT EXCHANGER HEAT RECOVERY SYSTEM (UK Patent applied for)

Plate heat exchangers are widely used in ventilation to provide energy saving. However, they have an important drawback, as they nearly double the pressure drop of a typical ventilation system and this increases the fan motor electricity consumption. ESG has developed a new way of using plate heat exchangers that increases the energy saving of a plate heat exchanger in a typical pool ventilation system by around 25%.

There is also a substantial saving in the cost of electrical power supply and building space.

In addition, the cost of changing rooms' ventilation is cut by more than 80% compared to a system without energy conservation. A major part of this extra saving comes because a single air handling unit providing for both does not provide fresh air twice (once, in the pool hall and twice, in the changing rooms) for the same number of bathers who cannot be in both places at the same time.

As a result, in a typical pool, approximately 90% of fresh air required for dehumidification is used when the fresh air damper is less than one third open.

With a pool cover in place, nearly all evaporation stops and the sensible savings level exceeds 95%.

We have installed more than four hundred systems including variable fresh air control and they have an outstanding record of long life, reliability and low energy costs.



The Carnegie Club, Skibo Castle, Dornoch

It achieves this by optimizing fan speed control in conjunction with damper control of the air flows through the plate heat exchanger. This is a proven system and all our controllers include data logging to provide the customer with a record of savings.

## THE ESG DESICCANT DEHUMIDIFICATION SYSTEM

The desiccant system has one important advantage over fresh air in providing dehumidification in a ventilation system. It can provide more than twice the dehumidification from a given quantity of ventilated air in warm outside conditions. This makes it uniquely suited for pool ventilation where there are high evaporation features, such as “buckets” and “volcanoes”, which create high levels of evaporation relative to the total water area.

The ESG desiccant system includes LTHW heating of the desiccant rotor reactivation air. Compared to gas fired reactivation, this reduces corrosion to an insignificant level and provides a highly reliable method of control.



## VARIABLE RATE VENTILATION CONTROL

This provides major fan motor electricity cost savings of more than 50% compared to a pool ventilation system running at a fixed level. It does this in response to lower demand, without any reduction to the quality of the pool hall environment, with the ESG software that continuously modulates the ventilation rate through the fan motor inverter controllers.

During unoccupied periods the ventilation rate is reduced, taking account of outside temperature and the U values of the structure as well as the level of dehumidification demand, to ensure that there is no condensation risk in the pool hall.

When the pool is occupied the ventilation rate is reduced proportionately to the number of bathers in the pool hall.

## LOOP AIR DISTRIBUTION

Although not immediately apparent, efficient air distribution in the pool hall is needed to provide good conditions for bathers and efficient dehumidification. A pool hall with a high efficiency air distribution system will have ventilation costs 20 to 30% lower than a pool hall with an inefficient system.

To achieve efficient air distribution, supply air must be delivered and drawn evenly across the whole area of the pool. Our loop air distribution system will achieve this by delivering supply air over the whole area of the pool, combined with extract at low level. Refurbishment customers repeatedly comment on the major improvement produced by our installation of loop air distribution. Poor air distribution is frequently due to the installation of supply and extract grilles at high level. This generally leads to a substantial part of the dry supply air entering the pool hall, short circuiting and leaving by the extract grilles, considerably above the level of the pool water and bathers, without performing its design dehumidification function.

This substantially reduces the efficiency of the ventilation system in removing moisture or the chemical by-products of pool water dosing. Both are concentrated close to the water surface, particularly the chemical by-products, which are heavier than air. Poor air distribution also increases the cost of ventilation. A substantial proportion of the dry air that has been produced at a cost, continuously leaves the system without providing dehumidification.

Efficient removal of the by-products of pool water dosing is important, as current research suggests that chemical by-products may increase the risk of asthma in children.

# ESG

## Pool Ventilation

### ESG - The Leading Pool Ventilation Specialist

ESG designs and builds pool ventilation systems, completing over 100 in the last 5 years. An independent specialist since 1979, ESG aims to provide all its customers throughout the UK with best conditions, quality products and a complete system.

- Design to meet individual customers requirements
- Provide systems for all types and sizes of pool
- Deliver lowest running cost and long life
- Embrace new technologies, to improve products

Contact us for a free appraisal of your requirements.

