GAS-TO-AIR HEAT EXCHANGERS

Our Gas-to-Air Heat Exchangers decrease the temperature of the gas, allowing efficient air filtration. They also offer initial cost-savings, enhanced plant operation and reduced operating costs. Both of our models, one for dry gases, the other for humid gases, offer excellent performance and leave the tubes perfectly clean.

WHY CHOOSE OUR GAS-TO-AIR HEAT EXCHANGERS?

Enhanced heat exchange

With their unique designs, our Gas-to-Air Heat Exchangers (HEs) minimize losses of pressure and offer a limited footprint.

Reduced equipment costs

Our HEs will reduce the required size of the bag filter, exhaust fans, ducts and stacks.

Perfect seals

Special fasteners provide perfect seals while allowing the internal tubes to expand and contract in differing heat conditions, preventing assembly stress and deformation.

Reduced power consumption

Our HEs' specially designed side panels, perfect seals and customized fans ensure reduced energy use, even when working at high capacity.

Increased pressure stability

Our HEs increase the pressure stability at the outlet connection, resulting in stable conditions at the outlet, particularly important in the cement industry.

Easily transportable for less costly delivery

The design of our Gas-to-Air Heat Exchangers allows us to ship them completely pre-assembled in bundle sizes suitable for common carriers.

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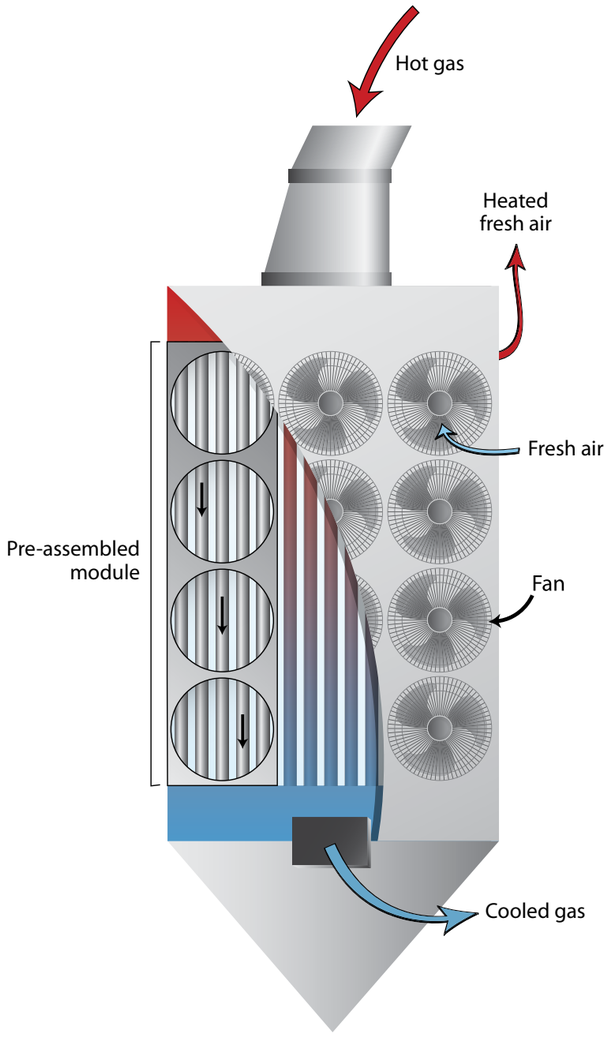
HOW OUR GAS-TO-AIR HEAT EXCHANGERS WORK

Our Gas-to-Air Heat Exchangers have a large structural frame, most often housing several axial fans placed one atop the other to ensure an air flow through the entire length of the tubes (tubes are at times 12 meters or 39 feet high). The vertical tubes are in “bundles” held together by tube sheets. These tube sheets further concentrate the airflow. The fans push ambient air horizontally through the bundles of vertical tubes in order to cool the gas inside the tubes.

Redecam has two models of Heat Exchangers: our RF-Model and our Double-Passage Model. Both can be customized to suit your needs.



OUR RF-MODEL

Our RF-Model is designed for dry gases, when there is no risk of mud inside the tubes. The process flow enters through the hood on top, passes through the tubes and leaves through an opening located on top of the hopper. Dust that drops out from the gas flow settles in the hopper below the tube nest. This HE is important with our Dual-Input Integrated System, in which gas and cooler exhaust air are mixed upstream of the HE.

Advantages of our RF-Model:

1. Unparalleled efficiency
2. No risk of fouling
3. Special side panels ensure the fans’ airflow reaches every row of tubes

OUR DOUBLE-PASSAGE MODEL (DP-RF)

Our Double-Passage Model is engineered for industries in which the gas is humid. Our design avoids local water condensation on the tubes which creates corrosion and mud, which in turn clogs the tubes. The DP-RF Model maintains the temperature of the exterior casing of the tubes above dew point.

In the DP-RF Model, there are two bundles of vertical tubes separated to create a cross flow of gas. The fans blow ambient air through the first bundle of tubes. The warmer air emerging from those tubes is then blown onto the second bundle of tubes, avoiding the formation of condensation.

Advantages of our Double-Passage Model:

1. Excellent performance
2. Tubes remain perfectly clean
3. More compact design than other heat exchangers for similar applications

OUR PERFECT SEALS

We have designed our tube sheets, which hold the vertical tubes and concentrate the air flow, with perfect seals. The tubes are fastened on the tube sheet by means of a special Redecam fiber seal pressed around the tube with a collar allowing the internal tubes to expand and contract in differing heat conditions, preventing assembly stress and deformation. A replaceable insert is installed on each tube inlet to limit abrasion impacts.

OUR OPTIMIZED TEMPERATURE CONTROL SOLUTION

Common Weaknesses in Other Heat Exchange Systems

In most heat exchangers, the axial fans’ speed is regulated by a direct control loop linked to the temperature at the HE outlet. This means the high thermal inertia of the system will generate an outlet fluctuating temperature, causing an adverse effect on the tail fan control. This forces the system to continually hunt and never achieve any equilibrium.

Our Innovative Solution

We have developed a control system based on the inlet temperature only, with variable coefficients depending on gas mass and ambient temperature. The difference between the actual outlet temperature and the set point allows the combined effect of gas mass and ambient temperature. It can therefore be put into the control equation as a variable coefficient, thus ensuring constant equilibrium.

OUR AXIAL FANS

Axial fans are fit onto the front of the HE, blowing ambient air horizontally onto the tubes.

Advantages of our axial fans:

1. All fans are easily accessible for inspection and maintenance from walkways and stairs
2. The number of blades can be customized – usually between five and 10 – depending on the required pressure and maximum noise level
3. The blades are extruded, light alloy metal with an adjustable pitch
4. The blade drivers can be either powered by belt drive, direct drive or with a motor-reducer
5. The fans can operate at fixed speed, two-speeds or variable speeds

DESIGN & MODELLING

DESIGN PARAMETERS

Our engineering team has 30+ years of experience in surveying the output and needs of various plants, and will study your process parameters to find the right Gas-to-Air Heat Exchanger solution to suit your needs.

The shape of your HE will be based on parameters such as the differential temperature and the mass velocity of the gases. To determine the total number of bundles required, we must calculate the process gas flow rate, the maximum temperature of the gases and the ambient conditions. Usually, the difference in temperature that must be achieved affects the height of the bundles, while the gas mass flow regulates the number of tubes required. An appropriate mass velocity inside the tubes is crucial. This ensures the efficiency of the system, limits pressure losses and reduces abrasion.

We customize our products, solutions, installation or technical support & services to suit your needs... including your budget.

MODELLING

We use Ansys's Fluent software to accurately design and study every solution. This allows us to engineer and analyze each system's broad physical capabilities, optimize the fluid dynamics and study the efficiency of pollutants removal. When a computerized simulation is not sufficient, we undertake a physical simulation on a 1:7 scale in our Milan workshop.

Redecam offers a comprehensive portfolio of air filtration, flue gas treatment (FGT), gas conditioning and transportation, handling & storage products. Please contact us to see how we can take care of all your air pollution control needs.

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