

Sauter gets the wind up in the *EIG Laboratoire d'aérotechnique* in Geneva.

The EIG engineering college in Geneva operates an aerodynamics research laboratory and, not surprisingly, a wind tunnel is its centrepiece. Sporting aerodynamics is one of the main areas of research at the laboratory, along with investigations into the airflow characteristics of aeroplanes and automobiles, parachutes and fabrics, as well as the effects of wind on buildings and erosion.

Skiers and bobsleigh teams can perfect their stances in the wind tunnel, while their outfits, bindings and helmets are simultaneously tested for optimum aerodynamics. The test results are instantly available as printout and video at the end of each run.

Sauter control for precision settings and results

Airflow testing involves producing air speeds from 5 to 50 m/s (18 to 180 km/h). This calls for dynamic, highly responsive control with no sudden jumps or large

overshoots, an integral control characteristic, and a reset time of the order of 0.5 to 3 seconds. Such a rapid reset can only be achieved using analogue regulators.

This was the reason for using Sauter RUP 140 and RUP 105 differential-pressure controllers. One or the other is active, depending on the desired airspeed.

The flow chamber is built according to the Venturi tube principle. Pressure measurement is at the 'pitot tube' inlet and outlet, where the differential pressure can reach 3000 Pa. A novaFlex DDC station responds to commands from the control console. The setpoint signal for the flow speed is transformed via a free curve and approaches the desired value by means of a ramp function. An XEP 301 e/p converter

converts the electrical setpoint signal into a pneumatic variable and the controller's pneumatic controller output into an electrical variable, which controls the fan speed. The pneumatic controller maintains the specified flow speed with great exactitude, immediately compensating for any disturbance. There is an emergency stop button to shut down the installation and reset the DDC control system.

simon.burri@ch.sauter-bc.com

