



## GAS PURIFICATION



**DL CH14**

### OPERATION OF THE PLANT

The gas circulation through the plant is obtained by operating a blower of 1.1 kW, 900 m<sup>3</sup> maximum flow and 475 mm CH<sub>2</sub>O of pressure; it is possible to change the flow of the circulating air by means of a frequency inverter that acts on the rotational speed of the blower motor.

The contaminant is introduced into the suction of the blower so that at the outlet we have, already mixed, the air and the solid contaminant.

The rest of the circuit as well as the particle separators are made of transparent methacrylate in order to visualize the entire process.

The gas stream can be led in four branches, each one offering a different process for separating the contaminant; each of these branches can be easily removed, independently from the rest, because in each branch there is a valve and a union nut:

- In the first branch the gas stream is not treated, so it acts as a target and we can later compare the concentrations of particles at its outlet with those obtained through the other branches.
- In the second branch the gas stream passes through a static separator (without obstacles) where we have the separation of cleaned gas and particles.
- In the third branch the gas stream passes through a dynamic separator (with obstacles placed in the direction of the gas) where we have the separation of cleaned gas and particles.
- In the fourth branch we have a cyclone separator made in transparent methacrylate.

The gas purification plant allows testing the removal of solid particles from a gas stream, through different methods:

- Static settler
  - Dynamic settler
  - Cyclonic separator,
- and comparing the three processes.

The contaminant, solid, is stored in a hopper, from where it is dosed to the process by means of an Archimedes screw which is directly actuated by a gear motor.

When using the methacrylate, the sand as a contaminant can produce wear or damage to the inside of the pieces, but in any case you will be able to have an idea of what type of flow is being produced; this would not be possible if we used an opaque material.

Finally, the gas is led to a filter with double paper or plastic, easily removable cartridge type, with spares. In the filter all the solid matter that has not been able to retain in the previous devices is then retained. By weighing this filter, it is possible to easily determine the solid matter concentration in the outlet gas.

The purged gas at the filter outlet is led through a rotameter that allows knowing at each time the flow of the circulating air.

### DESCRIPTION OF THE PLANT

All elements of the plant are placed on a frame made of square pipes 40x40x2 mm of stainless steel AISI 304. The four branches of the plant are in the same horizontal plane.

The plant is complete with a control cabinet, integrated into the structure, with all the switches that are necessary for the activation of the different electrical components of the plant, a main switch-off and emergency stop mushroom button.

Inside the cabinet there are also the necessary protections against potential electrical faults, short circuits or drift to earth, according to the electrical regulations governing the protection of people and equipment.