

Principle of Operation

When the solenoid valve EV is de-energized (Figure n°1 – right picture), the motive gas (**red zone**) doesn't flow to the actuator and therefore both pneumatic gas valve and air stopper are kept closed by means of springs.

After the solenoid valve EV has been energized (Figure n° 1- left picture), the motive gas pressure (**red zone**) opens the pneumatic gas valve by means of its actuator and the gas starts flowing through the valve to the gas nozzle. In the meantime the gas enters the chamber of the pneumatic air actuator, pulling the air stopper down so as to open the air port (orifice). Due to suction created by the gas flowing through the nozzle and the tube section ("venture effect"), the ambient air is drawn into the mixer and blended with the gas inside the tube. The mixture produced is sent to the mixer outlet cone (section) thanks to the motive gas (energy) pressure.

While the gas flow rate is always steady (due to steady gas inlet pressure and fixed nozzle orifice), the amount of air in the mixture can be adjusted by a throttle valve and checked by a differential pressure gauge, both placed on the air suction pipe. In this way is possible, at any time, to set the right Calorific Value of the mixture. Automatic on-off functioning of the Mixer can be obtained through a Pressure switch, installed downstream the Mixer and adjusted at desired operating pressure. As soon as the pressure drops, because of increased consumption, and reaches the set value, the Pressure switch activates (open) the solenoid valve and then the Mixer begins producing mixture till the pressure will be restored.

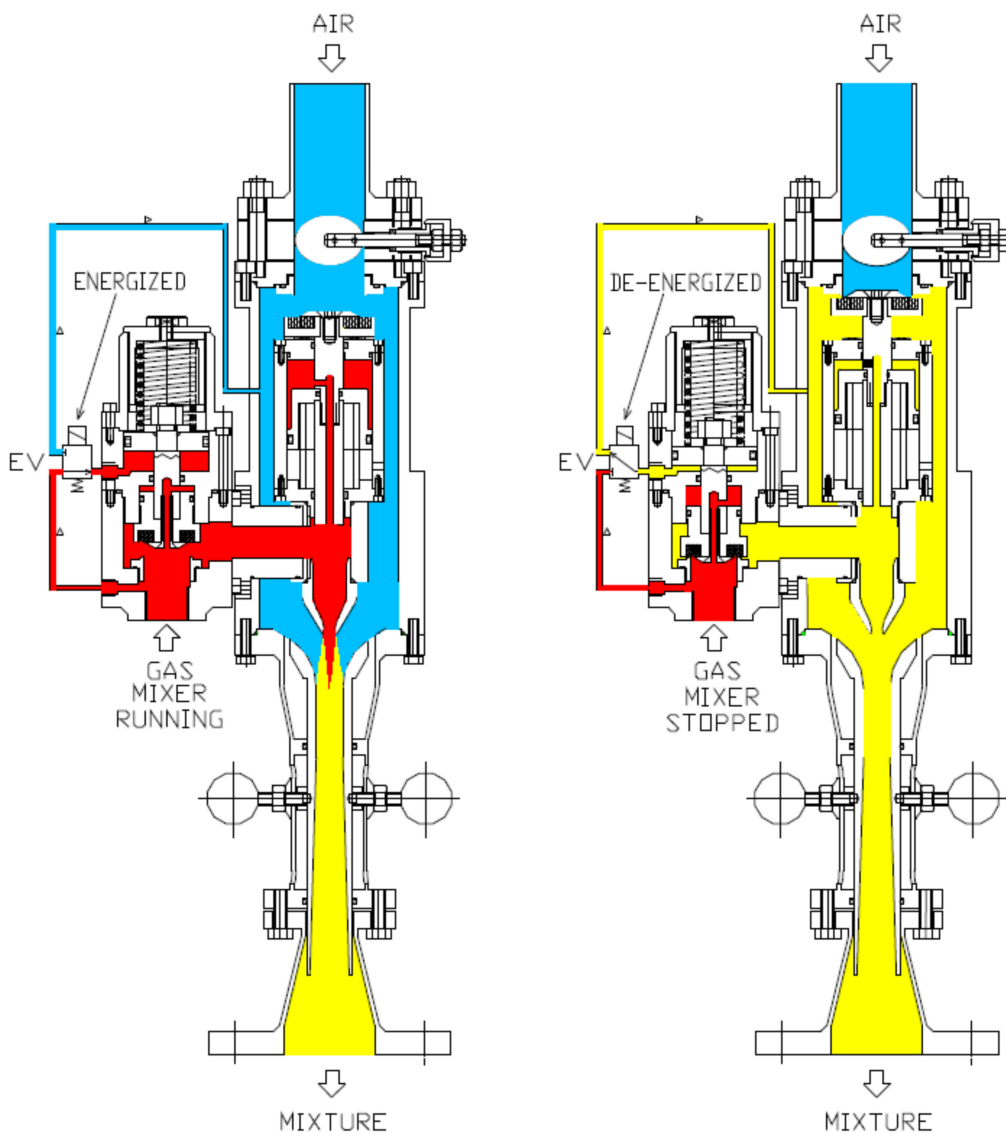


Figure n° 1 – Mixer functioning diagram

Functioning description

The automatic functioning of the unit is managed by the PLC from the Control Panel and has to be selected by placing the Mixers Selectors (SEL-1 / 2 / 3 / 4) on the front Panel in AUTO position.

The mixture outlet pressure is continuously checked from the PLC, through the Pressure Transmitter, and compared with four thresholds (PSLL, PSL, PSH, PSHH) inside the PLC memory. The thresholds are set around the pressure value required from the system. When, due to change in consumption, the pressure drops or rises till to reach the inner thresholds (PSL-PSH), the PLC activates the Mixers, according to a sequence which increases or decreases the mixture flow rate of a same quantity for each step, so as to keep the outlet pressure within the set range.

On reaching the inner thresholds (PSH - PSL), the sequence moves of only one step, while if the pressure reaches even the outer ones (PSLL – PSHH), this means that flow rate variation

of the previous step has not been enough and therefore the sequence speeds up, by carrying

out more steps so as to restore the mixture pressure.

In case of failure of the Pressure Transmitter, the contacts of the Pressure Gauge will take over the unit control, by managing the Mixers instead of the outer thresholds (PSLL-PSHH).