



The new patent pending powder intake valve system for the Flex-Mix Instant vacuum mixer

Background

Powder material intake devices are key elements in vacuum mixing technology.

Typically the powder intake device comprises of a single seat valve. This single seat valve opens and closes a passage through which a powder/air mixture is sucked into the liquid in a process tank.

The single seat valve has a wet side where the valve seat part faces the outlet of the powder device, and a dry side where the valve seat part faces the inlet of the powder device.

The existing powder valves on the market suffers from high risk of back flush of liquid into the powder section and very limited life time of the seals due to wet powder materials sticking to the seals especially when the valve is opening and closing.

Invention

The new APV invented powder intake valve system is based on three valves, which open and close in special sequence with individual delay set points.

The valve seats and seals are kept dry and clean during long operations. This ensures an extended life time of the valve seals and provides a reliable production with less number of failures caused by blocking of the powder valve.

Furthermore the valve system can be dismantled for inspection and, if necessary, for cleaning without needing to empty the process tank .

The powder valve has an on/off function which is intended to open and close for a mixture of powder /air flow created by the vacuum in the process tank.

The key functionality related to the valve system can be split into two phases; when it opens, and when it closes. When the valve opens, the lower pressure in the process tank will facilitate the air/powder flow. As a basis, a certain mass flow of air is present in the powder/air mixture to ensure that the pressure at the "dry" side of the valve system is kept at a higher level than the pressure in the process tank (to prevent back flush)

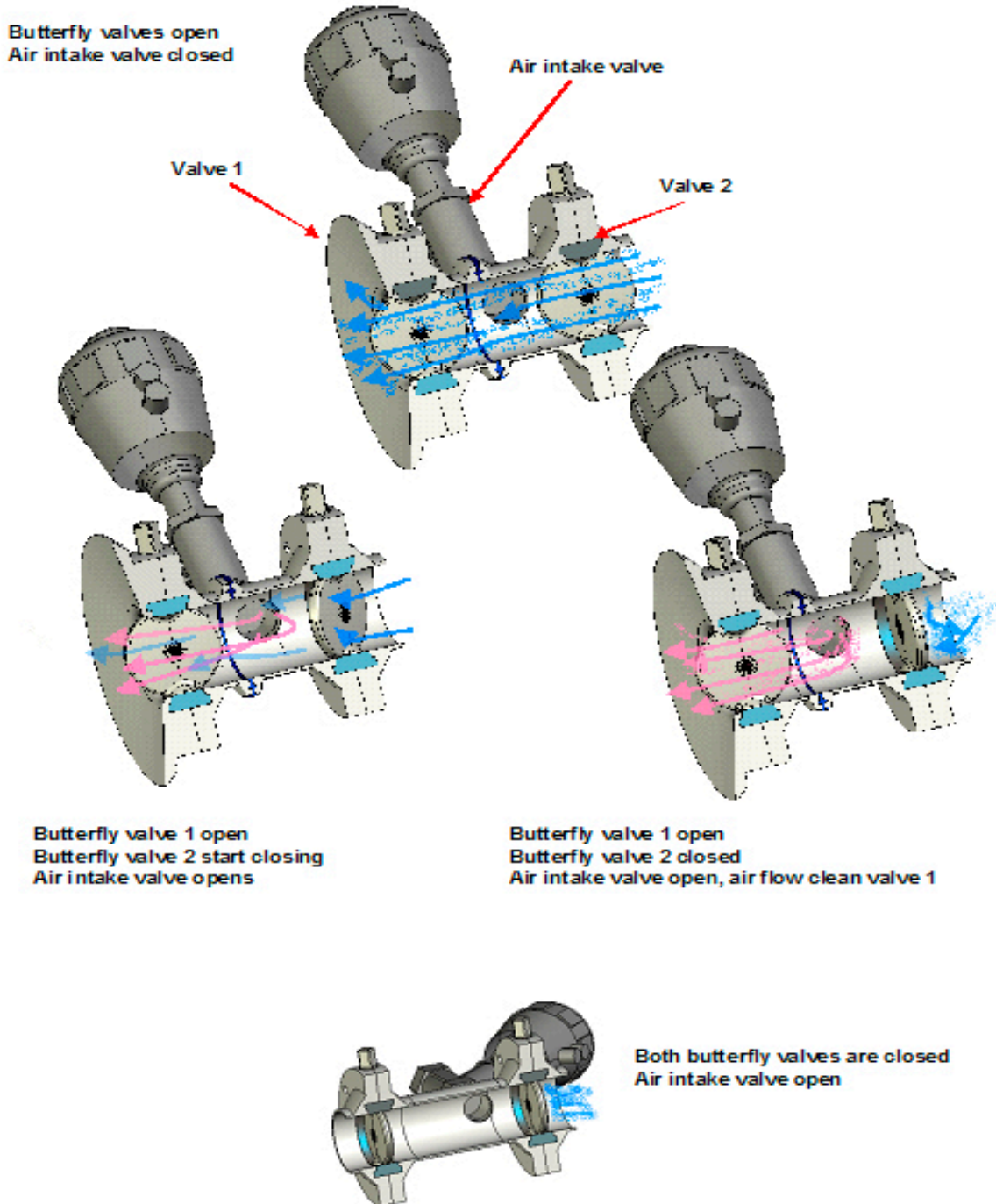
The valves opening and closing sequences are set according to the powder's physical characteristic.

The air intake valve secures a total cleaning of the valves housing.

The steps in the closing sequence are shown in the figure below:

The unique benefits of APV's new powder valve system are:

- Total separation of dry and wet phases
- No blocking of powder inlet valve
- High powder capacity
- Easy to adjust capacity to powder specification
- Extended shelflife of seals
- Dismantling and inspection allowed during production



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