

V Key and Windchest Actions

A) Key actions - The system or conveyance between the keys and the windchest to activate the valves.

1) Tracker or mechanical action - Tracker or mechanical action pipe organs use a mechanical or physical link between the keys or pedals and the valve in the windchest. The organist can control the valve as it is opened for the pipe to play. Tracker action windchests may be a slider windchest if there are multiple stops on a given manual or pedal division or it may be a unit chest if there is only one stop or rank of pipes for a given manual or pedal division.

2) Electric action - When the key is pressed, an electric signal is sent to the windchest to open an electric valve to play the pipe.

B) Windchest actions - The pipe organ uses wind to blow the pipes and create sound. One of the key components to a pipe organ is the windchests. The windchests provide the physical support for the pipes and contain the valve actions that open and close to permit wind into the pipe. For purposes of consideration there are several different types of windchest actions.

1) Electro-mechanical windchests - Electro-mechanical action is the use of an individual valve beneath each pipe that is activated by an electric magnet. The electro-mechanical valve design is manufactured by a several different suppliers and used by various organ builders. It is an inexpensive, simple way to build pipe organ windchests. Unfortunately this simple system comes with drawbacks. The valve design using electro-magnets consumes far more electrical current than other designs. Relying strictly on electro-magnets, the actual size of the valves are limited to approximately 1-1/2" in diameter, thus requiring multiple valves for some large pipes. The action is prone to inducing issues with pipe speech, thus creating additional obstacles with pipe voicing and tonal finishing. Serious thought should be given before using this action if there are high artistic expectations on the final instrument.

2) Slider windchests - The term slider here refers to a slide valve for each rank of pipes on the windchest. On a slider windchest there is one wind or pallet valve per note of the keyboard or pedalboard compass. This valve can be operated via tracker action, electro-mechanical pull-downs, or electro-pneumatic actions and is mounted on the bottom of a chest channel. The slider valve is mounted to the top of the chest channel and beneath the pipe. When the pallet valve opens, it permits pressurized wind to enter a channel beneath the pipes of that given note for each rank. Once the channel is pressurized, the appropriate notes in a rank will play if the slide valve between the channel and the pipe is open. Slider chests were one of the earliest forms of pipe organ windchest construction and remain in use to this day. A well-designed slider chest offers the greatest number of benefits for the pipe voicer and tonal finisher. The tuning is improved as well and the organist usually notes a cleaner response in the action. It remains the preferred chest for many top organ builders in the world.

3) Electro-pneumatic windchests - Electro-pneumatic windchests have been used successfully for more than 100 years. In an electro-pneumatic windchest there are two valves required to complete the action of opening the pipe valve. A small electric valve is utilized to exhaust a pneumatic action, which in turn opens the pipe valve permitting wind to the pipe. The

action is efficient and fast, but not so fast that it disturbs the natural flow of the wind. Since the pneumatic action relies on wind pressure, the pneumatic valves are not limited in size and very large valves can be utilized when necessary. Yet, each of the pneumatic actions is activated by the same type of small electric valve, with great success.

Summary - Our firm prefers the use of slider windchests with electro-pneumatic pallet valves. They allow us to follow our standards for tonal achievements in our organs. When slider windchests are not feasible, we use electro-pneumatic windchests. Electro-mechanical action windchests are not used due to negative impacts on pipe speech.