
Valve technology

Vacuum valves are used to control the vacuum and to improve the process safety in vacuum-gripper systems.

A distinction is made between three groups of valves, according to their principle of operation:

- Solenoid valves for vacuum and compressed-air
- Manually actuated vacuum and compressed-air valves
- Check valves and flow resistors

Solenoid valves

Solenoid valves are used to control the flow of vacuum and compressed-air. The valves themselves are controlled with the aid of electrical signals. Solenoid valves are available in various nominal sizes, permitting selection of a valve which precisely matches the customer-specific requirements.

Solenoid valves are available in directly controlled versions (EMV, EMVO) and versions with pneumatic pilot control. The latter are particularly quick-acting valves.



Manually actuated vacuum and compressed-air valves

Valves of this type are used in particular for the manual activation and deactivation of vacuum or compressed-air circuits or of individual suction pads in lifting devices. They are available as 2/2-way or 3/2-way valves.



Check valves, flow resistors and sensing valves

Check valves, flow resistors and sensing valves are used to improve process safety in a vacuum system.

Check valves close automatically when the volume-flow of air through them exceeds a preset value. They can thus be used to deactivate suction pads in a gripper system which are not in contact with the workpiece and to maintain the vacuum in the rest of the system.

Flow resistors reduce the cross-sectional area of the vacuum system and are used primarily in systems used for the handling of porous materials. The reduced cross-sectional area ensures that the system vacuum is maintained even if one or more suction pads are not in contact with the workpiece.

Sensing valves have a spring-loaded plunger which detects whether the suction pad is in contact with the workpiece. If this is the case, the valve opens and applies vacuum to the suction pad.

Important:

Sensing valves provide no protection against vacuum loss caused by suction pads which are only partially in contact with the workpiece!



The following table should help you to select the appropriate components:

Application	Check valves	Flow resistors	Sensing valves
Handling of porous workpieces such as chipboards and MDF panels	● (If type SVN is used)	●	
Handling of air-tight workpieces such as sheets of metal of varying sizes	●		●
Handling of cardboard sheets and boxes of varying sizes		●	
Handling operations with very short cycle times	●		●
Cases where some of the suction pads are not fully in contact with the workpiece	●	●	
Cases where the workpiece is to be blown off for faster release	●	Restricted by the reduced cross-section	

Planning checklist for selection of valves

Which functions are required?	We can supply solenoid valves (3/2-way, 2/2-way), manually actuated vacuum and compressed-air valves, check valves, sensing valves and flow resistors.
Which volume flow rate needs to be controlled?	This determines the nominal flow rate and the size of the valve.
What are the requirements with respect to size, weight and cycle times?	Further information can be found in the design data and/or technical data of the valves.
Which type of energy is available?	See the notes in the design data or the technical data (solenoid valve EMVP also needs a compressed-air supply).
Does the workpiece need to be released very quickly (blown off)?	With type EMV, compressed-air for blowing off can be connected directly. Otherwise, additional valves are needed for this function.