High Vacuum Poppet Valve
The molecular flow conductance data

● Calculation Method

The molecular flow conductance involved in this data is calculated using the transmission probability method, with the formula as follows:：

$$U = U_0 \times P$$

Where:

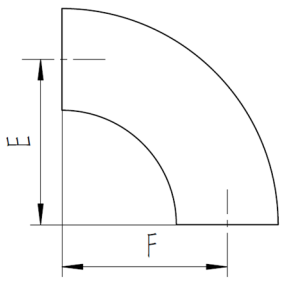
U_0 is the molecular flow conductance at the entrance aperture, which depends on the area of the entrance aperture. The calculation formula can be found in the Vacuum Design Handbook.

P is the molecular transmission probability of the structural element, determined through computer simulations based on the Monte Carlo method.

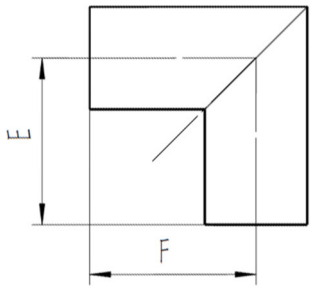
● Molecular Flow Conductance of Elbows with the Same Dimensions

The internationally standardized nominal diameters and dimensions of vacuum angle valves, as well as the relative positions of the inlet and outlet dimensions, are as follows (unit: mm):

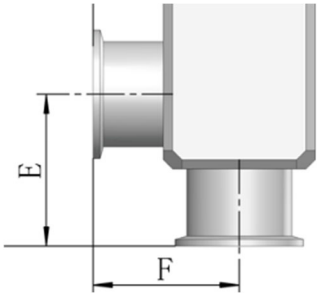
Model	Flange Aperture (mm)	E	F
KF16	16	40	40
KF25	25	50	50
KF40	40	65	65
KF50	50	70	70



Round Elbow



Right-Angle Elbow



Vacuum Valve

Theoretical and Simulated Molecular Flow Conductance for Elbows of the Same Dimensions:

Elbow Diameter (mm)	16	25	40	50
Theoretical Flow Conductance (Round Elbow, L/s)	5	14	45	80
Simulated Flow Conductance (Round Elbow, L/s)	**5.07**	**14.67**	**43.02**	**73.34**
Simulated Flow Conductance (Right-Angle Elbow, L/s)	**4.25**	**12.30**	**36.52**	**63.46**

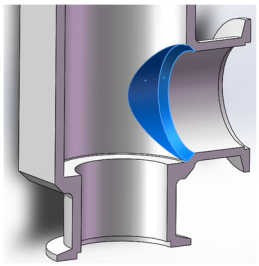
Note: The flow conductance nominally specified for vacuum baffle valves on the market is based on the theoretical flow conductance data of round elbows with the same dimensions. This is a nominal value that does not reflect the

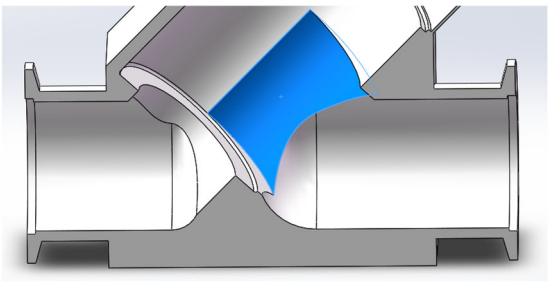
actual performance. In practice, vacuum baffle valves with bellows seals are limited by the stroke range of the bellows. The opening height of the baffle is restricted (in general, the opening height is similar across brands in the market). As a result, the actual flow conductance of bellows-sealed vacuum baffle valves is lower than that of right-angle elbows.

● Molecular Flow Conductance of High Vacuum Baffle Valves

Our company has adopted a design that offers better flow conductance compared to existing valves on the market. As shown in the diagram, both the angle valve and inline valve feature a larger opening at the flow channel on the inner wall.

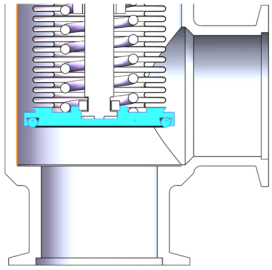
This larger opening enhances the valve's ability to collect gas flow. Through simulation comparisons, the molecular flow conductance of this improved design surpasses that of standard valve designs

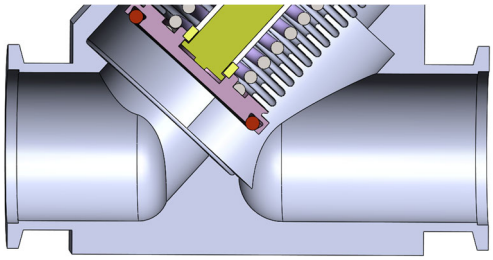




The opening heights of the baffles in our company's angle valves and straight-through valves are approximately the same as those of products on the market. The baffle opening heights for models are as follows:

KF16: 5.8 mm; KF25: 10.0 mm; KF40: 12.8 mm; KF50: 17.0 mm

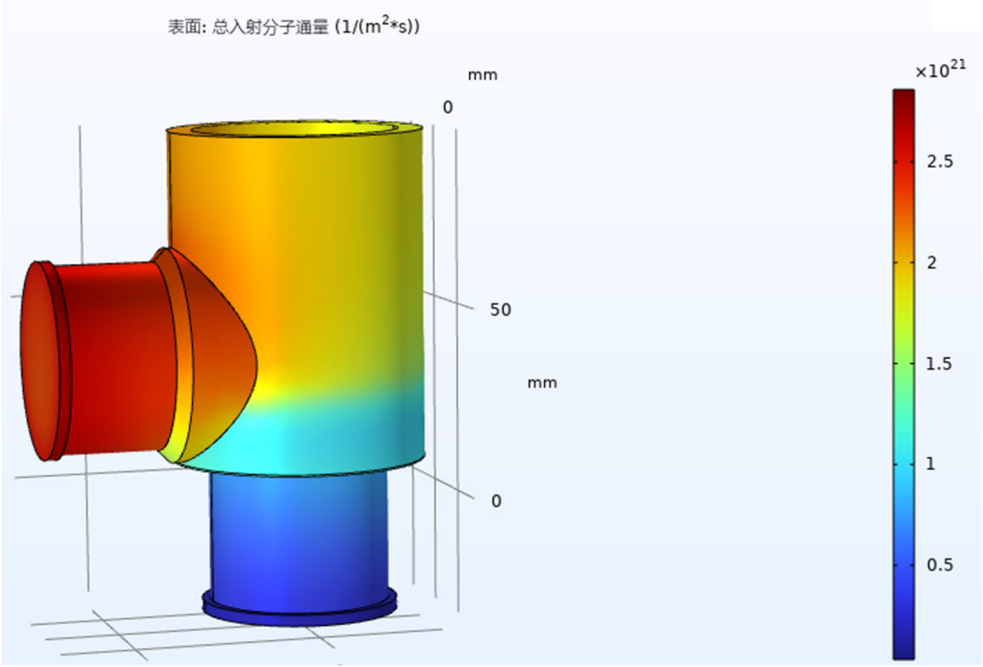




Nominal Diameter	Round Elbow Theoretical (L/s)	Round Elbow Simulated (L/s)	Right-Angle Elbow Simulated (L/s)	Angle Valve Simulated (L/s)	Inline Valve Simulated (L/s)
KF16	5	5.07	4.25	**3.05**	**3**
KF25	14	14.67	12.3	**8.84**	**9.24**
KF40	45	43.02	36.52	**23.01**	**22.71**
KF50	80	73.34	63.46	**37.03**	**34.09**

Notes: Simulation results show that swapping the inlet and outlet flanges in a vacuum baffle valve does not affect its molecular flow conductance.

Notes: For reference, the molecular flow conductance corresponding to different baffle opening heights can be found in the technical manual for two-stage control high vacuum baffle valves (KF40).



Simulation Calculation Diagram for KF50 Model (Reference)

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