

Butterfly Control Valve

控压蝶阀



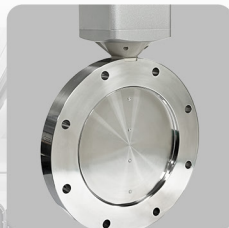
Semiconductor
Manufacturing



Energy(Solar)



FPD

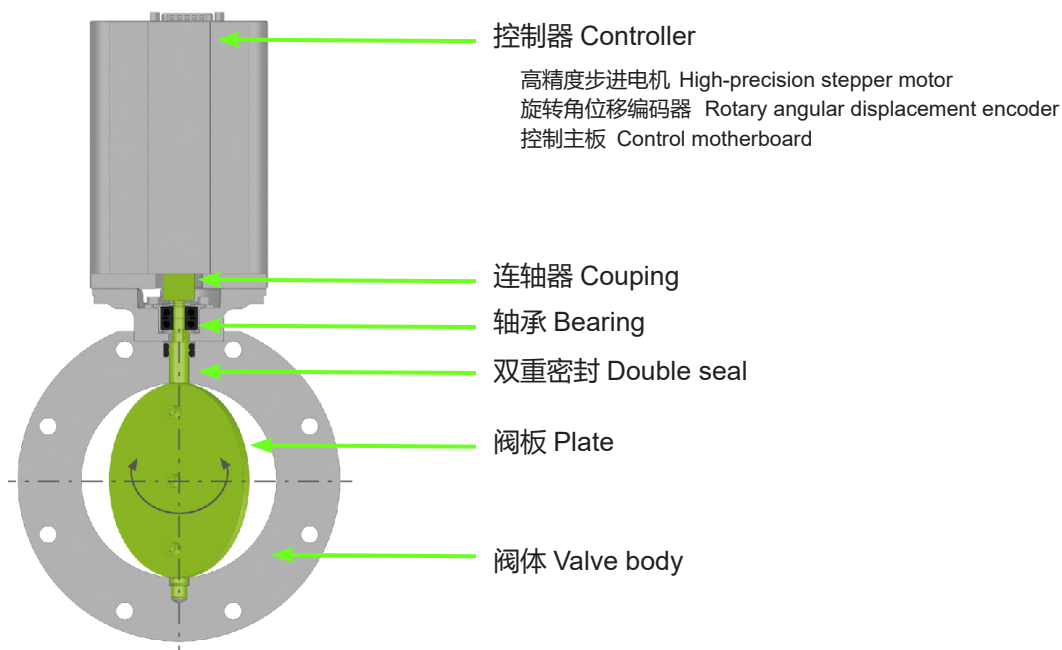


Fast
&
Precise



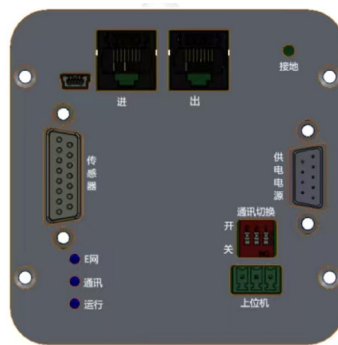
冠客智能蝶形压力控制阀门，利用中间阀板快速和精确动作，阀板在 0~90° 旋转，根据集成在控制单元的两个压力传感器反馈的实测数字信号，通过 PID 算法计算阀板的角速度，起到控制管道内气体流导，从而精准控制系统的压力，稳定在工艺需要的范围。冠客产品位置精准度高，控压稳定好，响应速度快，阀体单元和驱动单元集成安装，结构紧凑，同时也便于拆卸维护，阀门能够抵抗工艺中的腐蚀性、粉尘等严苛制程物的影响，产品能够应用于 CVD、ALD 等严苛工艺中。阀门配置双传感器供电，具有双路数字量输入接收，拥有阀门配置文件的导入和导出功能，内置稳定的压力控制算法，快速学习模式及自适应学习模式。支持各种通讯模式和可以提供客制化服务。

The SCOQ intelligent butterfly pressure control valve utilizes the fast and precise action of the valve plate, which rotates from 0 to 90 degrees. Based on the measured digital signals feedback from two pressure sensors integrated in the controller, the angle of the valve plate is calculated through PID algorithm to control the gas flow in the pipeline, thereby accurately controlling the system pressure and stabilizing it within the required range of the process. SCOQ products have high positional accuracy, stable pressure control, fast response speed, integrated installation of valve body unit and drive unit, compact structure, and easy disassembly and maintenance. The valve can resist the influence of harsh process materials such as corrosiveness and dust in the process, and the product can be applied to harsh processes such as CVD and ALD. The valve is equipped with dual sensor power supply, dual digital input reception, import and export functions of valve configuration files, built-in stable pressure control algorithm, fast learning mode and non adaptive learning mode. Supports various communication modes and can provide customized services.



驱动单元 Driving unit

驱动单元电压 Voltage	输入电压 Voltage : 22VDC~26VDC 驱动功率 Power : 50W
驱动电机类型 Motor type	自主研发高精度步进电机 High precision stepper motor
压力传感器 Pressure sensor	供电电压 Voltage : +24VDC(1A) 或 +15VDC(700mA) 信号输入 Input : 0-10VDC(压力) 输入阻抗 Input impedance : 10KQ 分辨率 Resolution ratio : 0.23mV 采样时间 Collection time : 10ms 传感器接口 Sensor interface : DB15(可连接 2 个传感器)
角位移传感器 Angular sensor	绝对值编码器, 位置分辨率 32767 分之一阀杆位置终端测量。 Absolute value encoder with a position resolution of 1/32767.
控制精度 Control accuracy	压力控制精度 Pressure control : $\leq 0.5\%FS(5mV/10000)$ 或设定点的 0.1%) 位置控制精度 Position control : $\leq 0.1\%FS(1/32767)$
响应时间 Action time	全开到全关时间 Valve opening time : 0.5s 全关到全开时间 Valve closing time : 0.5s 动态响应时间 Dynamic response time : $\leq 2s$
电气接口 Electrical interface	D-Sub
通讯协议 Communication protocol	RS485 DeviceNet®EtherCAT
环境温度 Ambient temperature	驱动工作温度 Ambient temperature : -10~55°C



控压蝶阀的工作原理是：蝶形阀板在 0~90°旋转，阀板与阀体相配合起到控制流量的作用。控制器拥有两个（可选）压力传感器接口。根据实测的压力计算阀板的角，以实现要求的腔室压力。驱动电机为自主研发的步进电机 (FOC) 原理，位于联轴器上的角位移编码器检测位置实现终端测量，即使在工艺气体含有较高污染杂质也能保证快速精确的过程压力控制。

The butterfly valve plate rotates from 0 to 90 degrees, and the valve plate matches the valve body to control the flow rate. The controller has two (optional) pressure transmitter interfaces. Calculate the angle of the valve plate based on the measured pressure to achieve the required chamber pressure. The driving motor is based on the principle of a self-developed stepper motor (FOC). The angular displacement encoder located on the coupling detects the position to achieve terminal measurement, ensuring fast and accurate process pressure control even when the process gas contains high pollution impurities.

压力控制 Pressure control

控制单元能够准确和快速的进行压力控制，在正式运行前，需要打开学习功能，需要学习一次，学习完成后系统会自动计算所需要的参数并保存在控制驱动器的存储器中，控制单元采用了PID综合算法，在不断变化的工况下（气体类型的变更和充气量的变化）也能快速准确的调整，确保在任何时候都能保持用户所要求的腔室压力。

The control unit can accurately and quickly control pressure. Before use, the learning function needs to be turned on, and it needs to be learned once. After learning, the system will automatically calculate the required parameters and save them in the memory of the control driver. The control unit adopts PID comprehensive algorithm, which can quickly and accurately adjust under constantly changing working conditions (changes in gas type and flow rate), ensuring that the chamber pressure required by the user can be maintained at any time.

位置控制 Position control

控制驱动单元能够准确和快速的进行角位移控制，通过高精度步进电机和高精度编码器及PID计算可以准确的将阀板控制在任何位置，理论控制精度约0.003°。

The control drive unit can accurately and quickly control angular displacement, and the valve plate can be accurately controlled at any position through high-precision stepper motors, high-precision encoders, and PID calculations. The theoretical control accuracy is about 0.003°.

显示和状态 Display and Status

控制驱动单元配置LED灯及四位数字显示屏，显示当前真空蝶阀的工作状态及通讯状态。

Configure LED lights and a four digit display screen for the control drive unit to show the current working and communication status of the vacuum butterfly valve.

远程控制 Remote control

控制单元配置多种通讯接口，包括RS485、Devicenet、以太网、EtherCAT等接口，通过这些通讯接口可实现对运行参数的设置与压力及位置指令的输入，同时通过这些通讯接口向用户上位机反馈自身的工作状态。

The control unit is equipped with multiple communication interfaces, including RS485, Devicenet, Ethernet, EtherCAT and other interfaces can be used to set operating parameters, input pressure and position commands, and provide feedback on the user's working status to the upper computer through these communication interfaces.

调试软件 Software

真空蝶阀控制系统配备了专用的调试软件，通过一根RS485通讯线将调试计算机与蝶阀相连接后就可以对真空阀进行参数修改调整及真空阀的实际运行状态的监控。

The vacuum butterfly valve control system is equipped with dedicated debugging software. By connecting the debugging computer to the butterfly valve through an RS485 communication line, the parameters of the vacuum valve can be modified and adjusted, and the actual operating status of the vacuum valve can be monitored.

电气连接类型 Electrical interface

	接口 Interface	类型 Type
驱动电源 Drive power supply	电源输入 Power input	DB-9 公头 Male
传感器 sensor	传感器供电电源，传感器输入 Sensor input, power supply	DB-15 母头 Female
	RS485	DB-15 母头 Female
通讯接口 Communication interface	Devicenet	M12 航空插头 Aviation plug
	定制通讯 Customized communication	DB-25 母头 Female
网络接口 Internet interface	Ethernet	RJ45
总线接口 bus interface	EtherCAT	RJ45

阀体单元 Valve body unit

使用压力范围 Pressure range $1 \times 10^{-6} \text{Pa} \sim 2 \times 10^5 \text{Pa}$ (316L) $1 \times 10^{-4} \text{Pa} \sim 2 \times 10^5 \text{Pa}$ (6065)

漏率 Leakage $\leq 1 \times 10^{-10} \text{Pa} \cdot \text{m}^3/\text{s}$ (316L) $\leq 1 \times 10^{-7} \text{Pa} \cdot \text{m}^3/\text{s}$ (6065)

阀体材料 Valve body material 阀壳 :316L 或铝合金 (6065)
 阀杆 :316L
 阀板 :316L 或铝合金 (6065)

阀杆密封 Valve pole 密封圈 :GB3451.2 氟橡胶密封圈 (FKM)

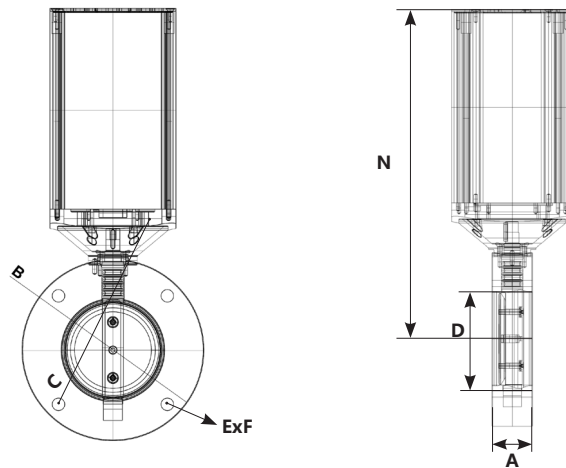
阀体接口 Valve flange 25/40/50 ISO-KF 接口
 63/80/100/160/200 ISO-F 接口

加热模块 Heater 可定制

工作温度 Temperture 阀体工作温度 : $\leq 150^\circ\text{C}$

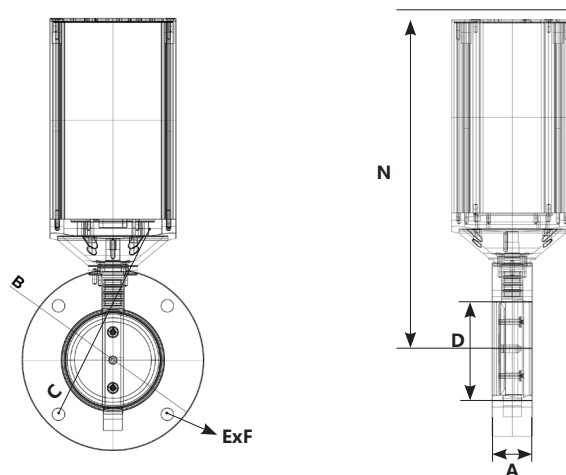
阀门通径 Diameter	流导 (分子流) Maximum molecular flow	最小流导 (分子流) Minimum molecular flow	最大 使用压差 Maximum pressure difference	最快 全行程时间 Fastest action time	重量 Weight	
					铝合金壳体 Aluminum	不锈钢壳体 Stainless steel
mm	l/s	l/s	Pa	s	kg	kg
40	80	0.25	1.2×10^5	0.7	2.3	2.7
50	150	0.3	1.2×10^5	0.7	2.6	3.2
63	360	0.45	1.2×10^5	0.7	2.9	4.5
80	850	0.65	1.2×10^5	0.7	3.1	5.1
100	1400	0.85	1×10^5	0.7	3.9	5.6
160	3800	1.7	1×10^5	0.7	4.7	7.8
200	7800	2.8	0.8×10^5	0.7	5.3	8.9

密封型 Sealed



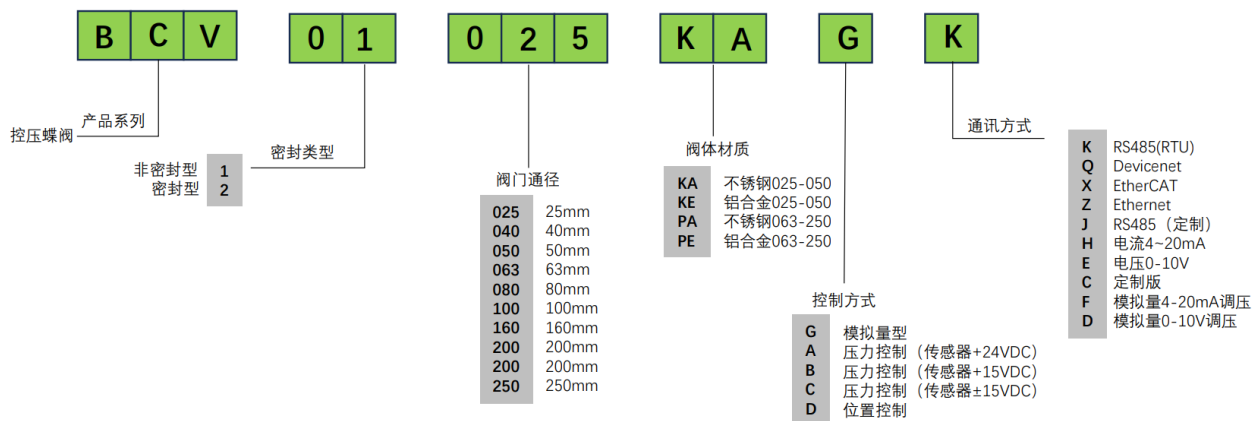
DN	25	40	50	63	80	100
A	57	57	57	40	50	60
B	80	80	100	130	165	175
C				110	125	145
D	25	40	50	64	76	96
ExF				4x9	8x9	8x9
N	206	206	211	233	240	250

非密封型 Unsealed



DN	25	40	50	63	80	100	160	200	250
A	57	57	57	30	30	30	30	30	30
B	80	80	90	130	145	165	225	285	355
C				110	125	145	200	260	310
D	25	40	50	63	80	100	150	200	250
ExF				4x9	8x9	8x9	8x11	12x11	12x11
N	206	206	211	233	240	250	280	310	335

产品选型 Product Selection



选型说明 How to select

项目 Project	选型 Option	说明 Description
产品系列 Product series	BCV	控压蝶阀 Butterfly Control Valve
密封类型 Sealing type	01 非密封型 Unsealed	阀板和阀体之间有间隙，气体可以过。 There is a gap between the valve plate and the valve body, allowing gas to pass through.
	02 密封型 sealed	阀板上完全密封。 The valve plate is completely sealed when closed.
阀门通径 Valve diameter	025 25mm	KF25 法兰
	040 40mm	KF40 法兰
	050 50mm	KF50 法兰
	063 63mm	ISO63 法兰
	080 80mm	ISO80 法兰
	100 100mm	ISO100 法兰
	160 160mm	ISO160 法兰
	200 200mm	ISO200 法兰
阀体材质 Valve material	KA 通径 025-050	铝合金材质 Aluminum
	KE 通径 025-050	不锈钢材质 Stainless steel
	PA 通径 063-250	铝合金材质 Aluminum
	PE 通径 063-250	不锈钢材质 Stainless steel
控制方式 Control mode	G	模拟量型
	A	压力控制 (传感器 +24VDC)
	B	压力控制 (传感器 +15VDC)
	C	压力控制 (传感器 ±15VDC)
通讯方式 Communication mode	D	位置控制
	K	RS485(RTU)
	Q	Devicenet
	X	EtherCAT
	Z	Ethernet
	J	RS485 (定制)
	H	电流 4~20Ma
	E	电压 0-10V
	C	定制版
F	模拟量 4-20mA 调压	
D	模拟量 0-10V 调压	