We Focus On Indoor Air Quality.
We Focus On Energy Saving In Building.
We Care About The Balance Between The Human Being And Our Earth.

APPLICATION OF VAV/CAV SYSTEM IN LAB

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KST · 开思拓®
KLIMASYSTEMTECHNIK

We focus on indoor air distribution

The clients we served

Cell R&D and Application Laboratory,Peking University Third Hospital
Tianjin Medical University   Animal Center of Chongqing Medical University
Chinese Academy of Biology   Beijing Zhongke Xiyuan Hospital
Zhongsheng Funuojen mRNA vaccine production base
Beijing Luhe Hospital affiliated to Capital Medical University
Tianjin Haihe Hospital   The Second Hospital of Hebei Medical University
Shandong Provincial Hospital   Affiliated Zhongshan Hospital Dalian University
Chongqing Xinqiao Hospital   Fuqu Hospital of Ningxia Medical University
Tongji Medical College, Huazhong University of Science and Technology
Shenzhen People's Hospital   Shenzhen Third People's Hospital
Shenzhen Futian District Second People's Hospital   Changsha Fourth Hospital
Shenzhen Qilin Mountain Sanatorium   Zhangzhou Zhengxing Hospital
The First Affiliated (Nansha) Hospital of Sun Yat-sen University
The Third People's Hospital of Hainan Province   Ezhou Public Health Center
Hong Kong Emergency Hospital   Xiamen University Cardiovascular Hospital
Shenzhen Longhua General Hospital   Shanghai Novartis Pharmaceutical
Western Henan Public Health Center (Wan'anshan Hospital)
Emergency Negative Pressure Consulting Room of Shanghai Chest Hospital
Merck KGaA Pharmaceuticals   Shanghai Novartis Pharmaceutical
Rohm & Haas Shanghai   Shanghai Runuo Biology   East China Medicine
AstraZeneca Pharmaceutical   Zhejiang Haichang Pharmaceutical
Baxter Healthcare   Suzhou Microbiota   Tianjin Tiens Pharmaceutical
Tianjin Sega Pharmaceutical   Northeast Pharmaceutical Factory
Shijiazhuang Yiling Pharmaceutical   Zhengzhou Chuangtai Biology
Shenzhen Center for Disease Control and Prevention   Starry Pharmaceutical
Center for macromolecular biological R & D, shihyao group
Beijing R & D center, shihyao group   Huizhou Capchem Chemicals
Sinophosphina inactivated vaccine workshop of Wuhan Institute of Biology
LUSTRE Pharmaceutical   Sichuan frontier biological pharmaceutical
Chengdu Frontier Medical Center   Sichuan Huiyu Pharmaceutical

（图源网络）

KST VAV-Q/VAV-R is a pressure-independent variable air volume terminal customized for pharmaceutical factories, clean workshops, laboratories and other systems that have control requirements for room pressure . The system realizes the control of air volume and pressure by controlling the air supply volume and exhaust volume, or the room pressure difference control, all need to use the VAV variable air volume unit to achieve. Field debugging can quickly get started, no power, NFC interface and mobile phone connection, background program setting, cloud service efficient data management. The running time is optional, up to 2.5s.

KST VAV-Q/VAV-R variable air volume end valve unit material is forged zinc steel or stainless steel, optional anticorrosive coating, to ensure that the valve unit can be used safely in special occasions. Product design and process using European standards, box and controller integrated unit perfect matched, to achieve high measurement accuracy, fast response and other characteristics. The controller is customized from Europe. If you have customized requirements, you can contact the KST factory.

1.VAV-R-P-F/G Variable air volume valve for room differential pressure/air volume control, full stroke time optional 2.5s fast and standard response speed

2.VAV-R-L-F/A fast response variable air volume regulating valve for fume hood, full travel time 2.5s

3.CAV-R is used to maintain a constant air volume control valve

4.Kst-SDB /Q high comfort swirl air supply port, for details, please consult KST factory

5.Fume hood control display with touch screen

■ Control mode

The core of the air volume control terminal is to control the pressure balance of the room. In order to ensure that the adverse air outside the room does not enter the room, such as in the clean room, operating room, or postoperative ICU, it is necessary to maintain the positive pressure of the room, and the air supply volume is greater than the exhaust volume. In order to ensure that the adverse air in the room does not leave the room, such as biochemical laboratory or isolation ward, it is necessary to maintain the negative pressure of the room, and the supply air volume is less than the exhaust air volume. KST VAV-R/VAV-Q is a variable air volume control terminal for pharmaceutical factories and laboratories to control the indoor pressure and environment. It can quickly and accurately control the air volume/pressure of the room under different requirements.
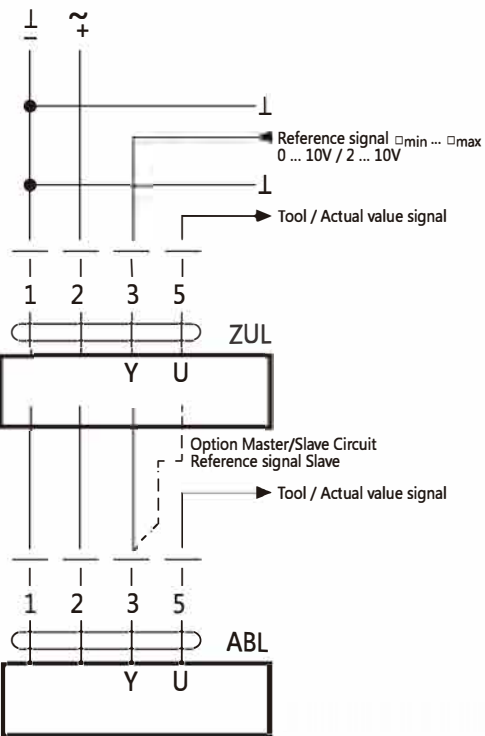
Control mode 1:Duct pressure control

By measuring the difference between the room pressure and the set value, inform the VAV unit of the exhaust and supply air of the required air volume, or cooperate with the CAV constant air volume terminal, and the VAV unit automatically adjusts the supply/exhaust air volume to ensure the room pressure difference.
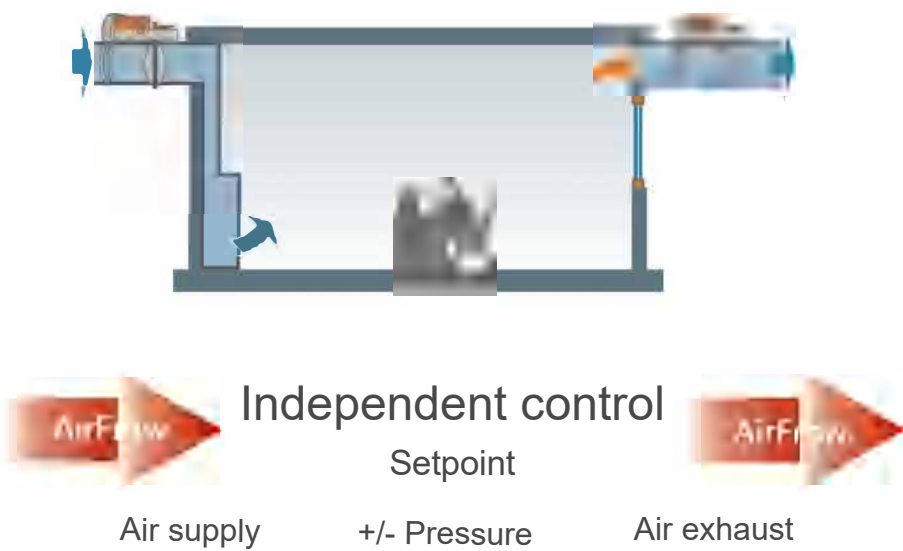
Independent control

Setpoint

Air supply   +/- Pressure   Air exhaust

1.Including differential pressure sensor, controller and damper actuator

2.The protocol supports BACnet MS/TP, ModbusRTU, MP-Bus

3.It can be connected to the mobile phone through NFC interface without power-on to quickly calibrate parameters and debug

4.Built-in standardized control application to get started quickly

5.Pluggable terminal blocks are easy to install

6.Expandable application of integrated IO hardware module

7.Integrated differential pressure sensor, without zero point calibration, accurate measurement and fast response, measuring range - 20Pa -500Pa

8.The maximum travel time of the actuator is 2.5s, and 60s or 120s standard speed actuator can be selected

9.Rated voltage AC/DC 24V, 50/60Hz

10.It can be connected to (0) 2... 10V signal linear adjustment or multi-shift adjustment

Wiring diagram

*Only schematic diagram, please contact KST factory for specific information

Control mode 2:Room pressure control

According to the design requirements of the project, the CAV constant air volume terminal or VAV variable air volume terminal is used to maintain the supply air volume, and the exhaust valve opening is controlled according to the pressure difference. The change of room differential pressure caused by factors such as indoor discharge, room air supplement, window, door switch, etc., can quickly restore the room differential pressure to the set value range through precision sensors, maintain the differential pressure in the best state, and prevent the toxic gas overflow caused by the change of air flow.
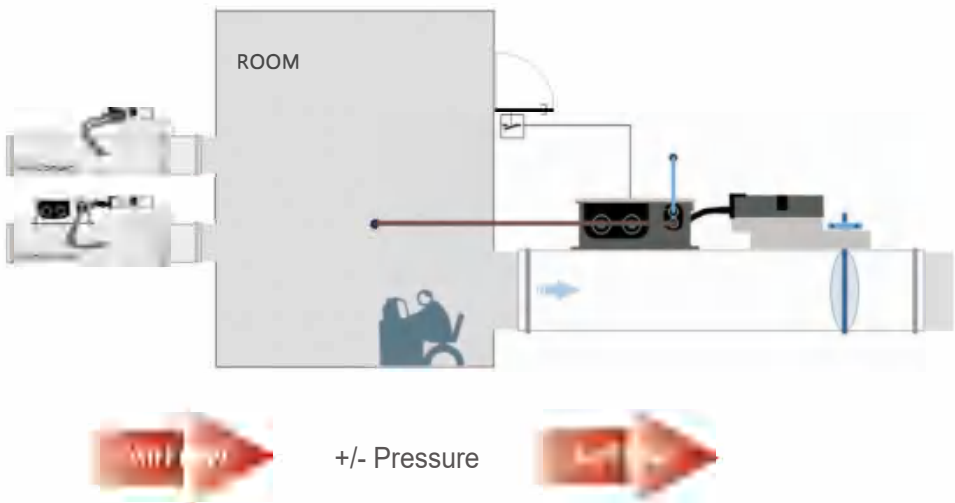
+/- Pressure

1.Including differential pressure sensor, controller and damper actuator

2.The protocol supports BACnet MS/TP,BACnet IP, ModbusRTU, MP-Bus

3.It can be connected to the mobile phone through NFC interface without power-on to quickly calibrate parameters and debug

4.Built-in standardized control application to get started quickly

5.Pluggable terminal blocks are easy to install

6.Expandable application of integrated IO hardware module

7.Integrated differential pressure sensor, without zero point calibration, accurate measurement and fast response, measuring range - 75Pa -75Pa

8.The maximum travel time of the actuator is 2.5s, or 30s - 150s can be selected

9.Rated voltage AC/DC 24V, 50/60Hz

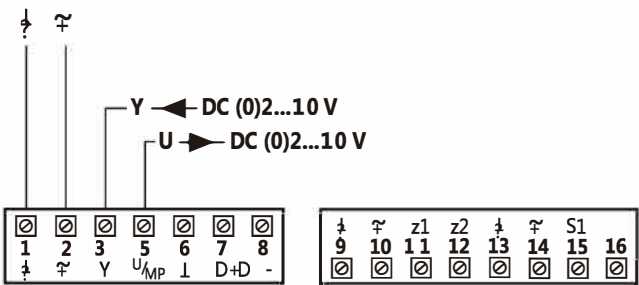10.It can be connected to (0) 2... 10V signal

Wiring diagram

AC/DC 24 V, modulating (▼AV)

Y ◄ DC (0)2...10 V
U ► DC (0)2...10 V

⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	z1	z2	⊘	⊘	S1	⊘
1	2	3	5	6	7	8	9	10	11	12	13	14	15	16	
⏚	∼	Y	U$_{MP}$	⊥	D+	D-									

*Only schematic diagram, please contact KST factory for specific information

## Control mode 3: Fume cupboard control

KST can also provide fast control for laboratory fume hood,control of air supply and exhaust in BSL3 and 4biosafety rooms, and control of high cleanliness level clean environment. The full travel time of the valve of thistype of VAV controller is adjustable for 3~15s. The controller can set all parameters, including the full travel time,various air volume variables,project data, definition of input and output, PID control parameters, etc. through thegraphical interface of the PC.All the above parameters can be saved in EPROM, and have the power-off protectionfunction.All control functions are closed-loop control, and have RS485 network communication interface.The roompressure control at the end of KST variable air volume adopts the control method of residual air volume+roompressure difference, and adjusts the opening of VAV air valve according to the residual air volume difference androom pressure difference. The hardware used may include.

Name	VAV valve	Fast integrated VAV controller	Room pressure sensor	Operation panel
Legend				

Name	Pressure reference device	Wind speed sensor	Displacement sensor
Legend			

The controller of VAV-Q valve combined with of sensor, control module and actuator. The controller is equipped with high-precision air volume sensor. The control module integrates air volume regulation control module, room pressure control module and temperature regulation control module; At the same time, it is equipped with multiple I/O input and output interfaces and communication interfaces. The actuator has fast adjustment function, which is suitable for the environmental control requirements of advanced laboratories.
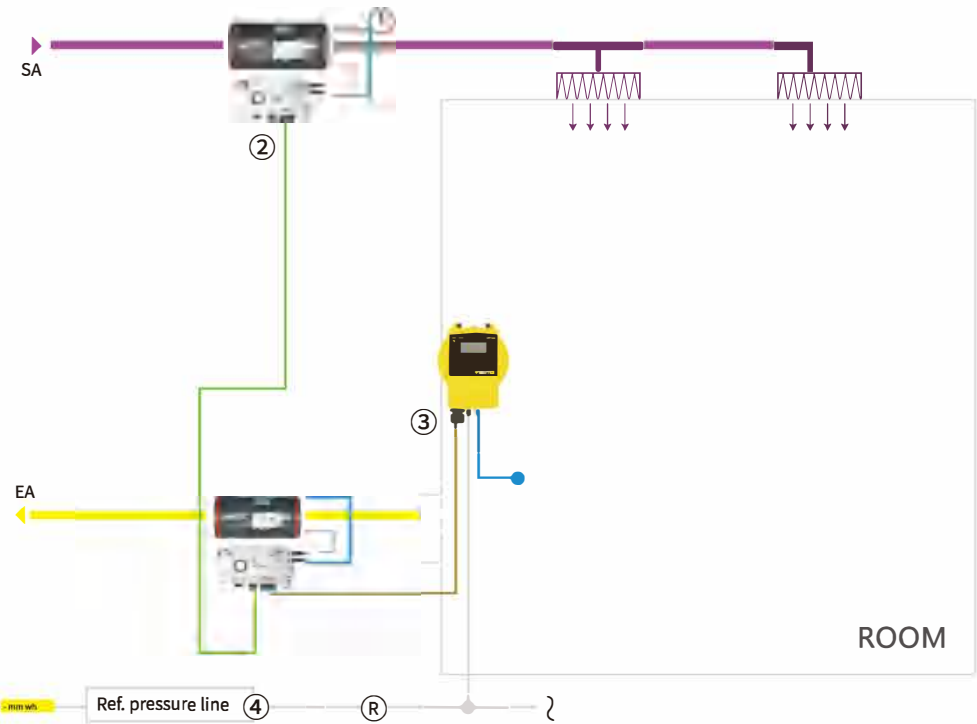
Schematic diagram of cupboard hood laboratory solution

SA

EA

ROOM

Ref. pressure line

Legend:

①Variable air volume

②Controller

③Room pressure sensor and display

④Zero pressure reference point

⑤Displacement sensor

⑥Wind speed sensor

⑦Control panel of cupboard hood
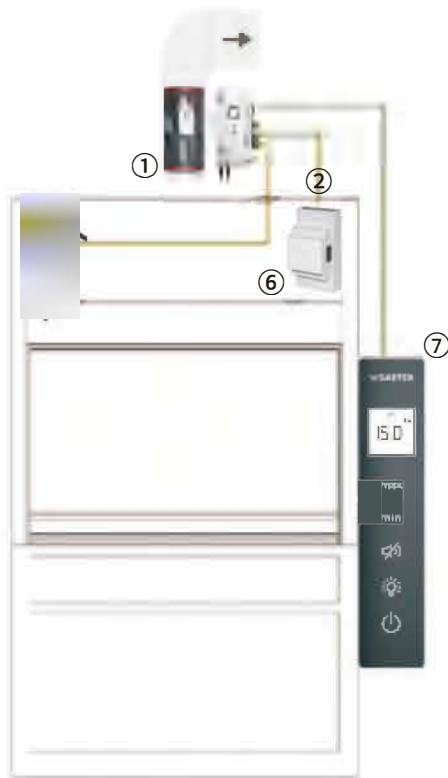
Schematic diagram of cupboard hood solution

Up

Chengdu Advanced

Medical Science Center

Right

Shenzhen Longhua

General Hospital

（Figure source network）

■ Product function description

①It is applicable to the exhaust or air supply system. The air volume range of the valve unit at the end of KST VAV-Q variable air volume is 200-28000m ³/ h. The differential pressure range is 20-1500pa. KST VAV-R variable air volume terminal valve unit air volume range is 30-6786m ³/ h. The differential pressure range is 20-1500pa.

②The air valve can be completely closed. When closed, it meets the air tightness standard DIN EN 1751, the KST VAV-Q VAV terminal valve unit meets grade 3, and the KST VAV-R VAV terminal valve unit meets grade 4.

③Each equipment has been tested for air flow performance on the calibration bench before leaving the factory, and the identification of relevant parameters is pasted on each equipment. After leaving the factory, the air flow can also be measured and set again on the site.

④The total length of valve body is 550mm, the standard specification of KST VAV-Q VAV terminal valve unit is 200x100-600x300, and the standard specification of KST VAV-R VAV terminal valve unit Φ 100- Φ 400。

⑤The valve unit at the end of KST VAV-Q VAV is flanged, and the valve unit at the end of KST VAV-R VAV is plug-in.

⑥The working temperature is 10 ℃ - 50 ℃ .

■ Performance ＆ characteristic

KST VAV terminal valve unit has simple and reliable structure, built-in air volume measuring unit and throttle air valve, and can be quickly connected with the air duct through hanging lugs and flanges.

①T he box use German original equipment and technology, high-precision machine tools and advanced willow pressing technology to ensure that the air leakage rate of the box is ≤ 1%.

②T he square VAV valve plate is made of double-layer high-strength steel plate with high-quality rubber and plastic, and the round VAV valve plate is made of high-quality steel plate with rubber coating process to ensure that the air leakage of the valve unit is ≤ 0.5%, and the valve plate rotates flexibly.

③T he pitot tube has up to 24 air volume measuring holes, which are not easy to block, uniform in measurement, wide in test range, sensitive in response, and accurate in air volume error within ± 5%. The measuring tube is made of aluminum alloy, with good pneumatic performance, tight connection of air pipe, and convenient maintenance and replacement.

④T he surface of the valve unit is smooth, without front and rear diameter change, low resistance and maintenance-free. ⑤T he standard square installation interface is equipped with rubber sealing ring, which can be connected with the air outlet quickly. The air valve can be completely closed. When closed, it meets the air tightness standard DIN EN 1751, and the KST VAV-Q terminal valve unit meets the level 3. Standard round installation interface with rubber sealing ring can be quickly connected with the air outlet. The air valve can be completely closed. When closed, it meets the air tightness standard DIN EN 1751, and the KST VAV-R terminal valve unit meets the level 4.

⑥T he valve unit and internal surface can be made of forged zinc steel plate with special anti-corrosion coating for medical use or stainless steel.

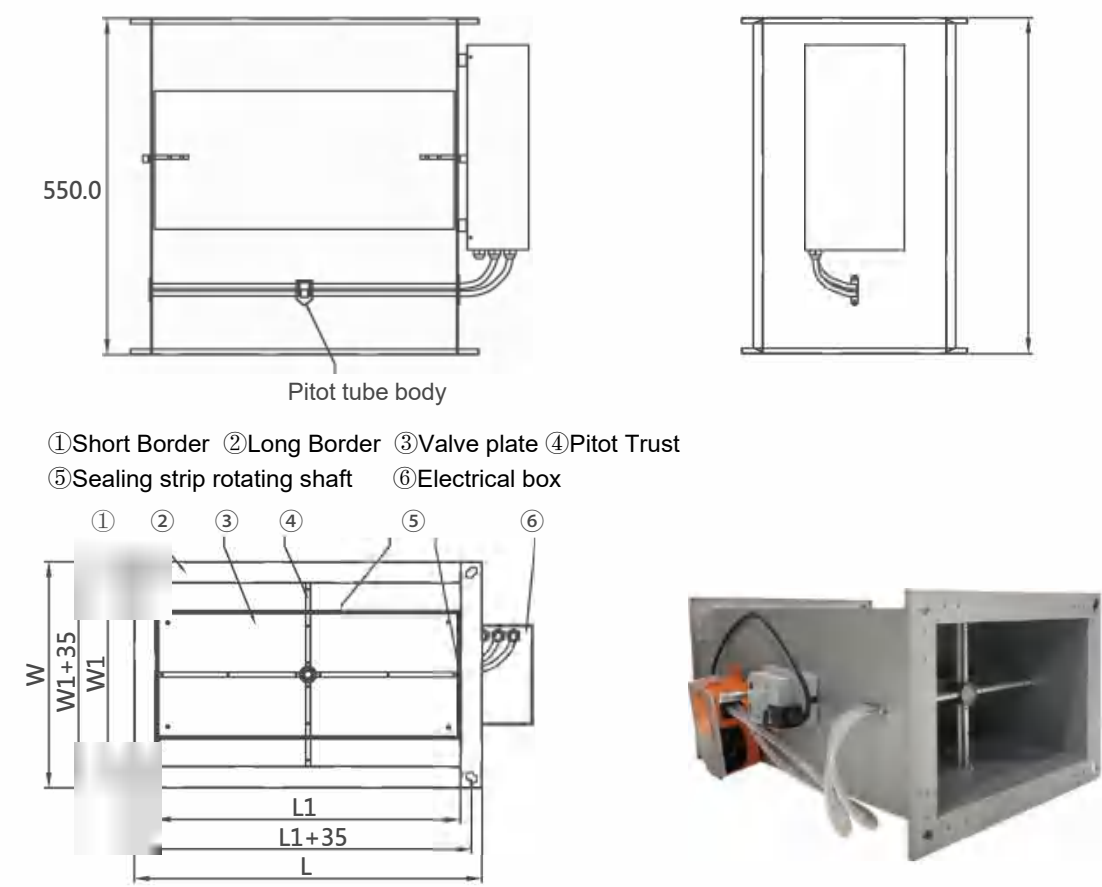⑦T he shell end cover can be disassembled as a whole for easy maintenance.

■ Air volume and specification

VAV-Q

Model	Flow (m^3/h)	Flow (L/s)	W1×H1 mm	W×H mm	Weight (kg)
VAV−Q/200 × 100	216~720	60~200	200 × 100	270 × 170	6.5
VAV−Q/200 × 200	432~1440	120~400	200 × 200	270 × 270	7
VAV−Q/300 × 100	324~1080	90~300	300 × 100	270 × 170	7.3
VAV−Q/300 × 200	648~2160	180~600	300 × 200	370 × 270	9
VAV−Q/300 × 250	810~2700	225~750	300 × 250	370 × 320	9.6
VAV−Q/300 × 300	972~3240	270~900	300 × 300	370 × 370	10.2
VAV−Q/400 × 100	432~1440	120~400	400 × 100	370 × 170	8.8
VAV−Q/400 × 200	864~2880	240~800	400 × 200	470 × 270	10.2
VAV−Q/400 × 250	1080~3600	300~1000	400 × 250	470 × 320	11.2
VAV−Q/400 × 300	1296~4320	360~1200	400 × 300	470 × 370	11.6
VAV−Q/500 × 200	1080~3600	300~1000	500 × 200	570 × 270	11.5
VAV−Q/500 × 250	1350~4500	375~1250	500 × 250	570 × 320	12
VAV−Q/500 × 300	1620~5400	450~1500	500 × 300	570 × 370	13
VAV−Q/600 × 250	1620~5400	450~1500	600 × 250	670 × 320	12.8
VAV−Q/600 × 300	1944~6480	540~1800	600 × 300	670 × 370	13.4
VAV−Q/600 × 400	2592~8640	720~2400	600 × 400	670 × 470	16.5
VAV−Q/600 × 500	3240~10800	900~3000	600 × 500	670 × 570	21
VAV−Q/700 × 300	2268~7560	630~2100	700 × 300	770 × 370	14.7
VAV−Q/700 × 400	3024~10080	840~2800	700 × 400	770 × 470	17.7
VAV−Q/700 × 500	3780~12600	1050~3500	700 × 500	770 × 570	22.5
VAV−Q/700 × 600	4536~15120	1260~4200	700 × 600	770 × 670	21.5
VAV−Q/800 × 300	2592~8640	720~2400	800 × 300	870 × 370	16.2
VAV−Q/800 × 400	3456~11520	960~3200	800 × 400	870 × 470	18.1
VAV−Q/800 × 500	4320~14400	1200~4000	800 × 500	870 × 570	23.2
VAV−Q/800 × 600	5184~17280	1440~4800	800 × 600	870 × 670	25
VAV−Q/900 × 400	3888~12960	1080~3600	900 × 400	970 × 470	20.5
VAV−Q/900 × 500	4860~16200	1350~4500	900 × 500	970 × 570	25.5
VAV−Q/900 × 600	5832~19440	1620~5400	900 × 600	970 × 670	26
VAV−Q/1000 × 600	6480~21600	1800~6000	1000 × 600	1070 × 670	27.7
VAV−Q/1000 × 800	8640~28800	2400~8000	1000 × 800	1070 × 870	33

Pitot tube body

①Short Border ②Long Border ③Valve plate ④Pitot Trust
⑤Sealing strip rotating shaft ⑥Electrical box

① ② ③ ④ ⑤ ⑥

W
W1+35
W1

L1
L1+35
L

550.0

■ Air volume and specification

VAV-R

Model	Flow (m³/h)	Flow (L/s)	Ø D (m×m)	Weight (Kg)
VAV-R/100	29~424	8~117	99	4.9
VAV-R/125	44~663	12~184	124	5.2
VAV-R/160	72~1085	20~301	159	5.8
VAV-R/200	113~1697	31~471	199	6.4
VAV-R/250	176~2650	49~736	249	7.3
VAV-R/315	280~4208	78~1168	314	8.4
VAV-R/400	452~6786	125~1885	399	9.9

550.0

Pitot tube body

①Rotation axis
②Sealing strip
③Pitot tube
④Valve plate
⑤Electrical box

① ② ③ ④ ⑤

45
10

Ø D

550.0
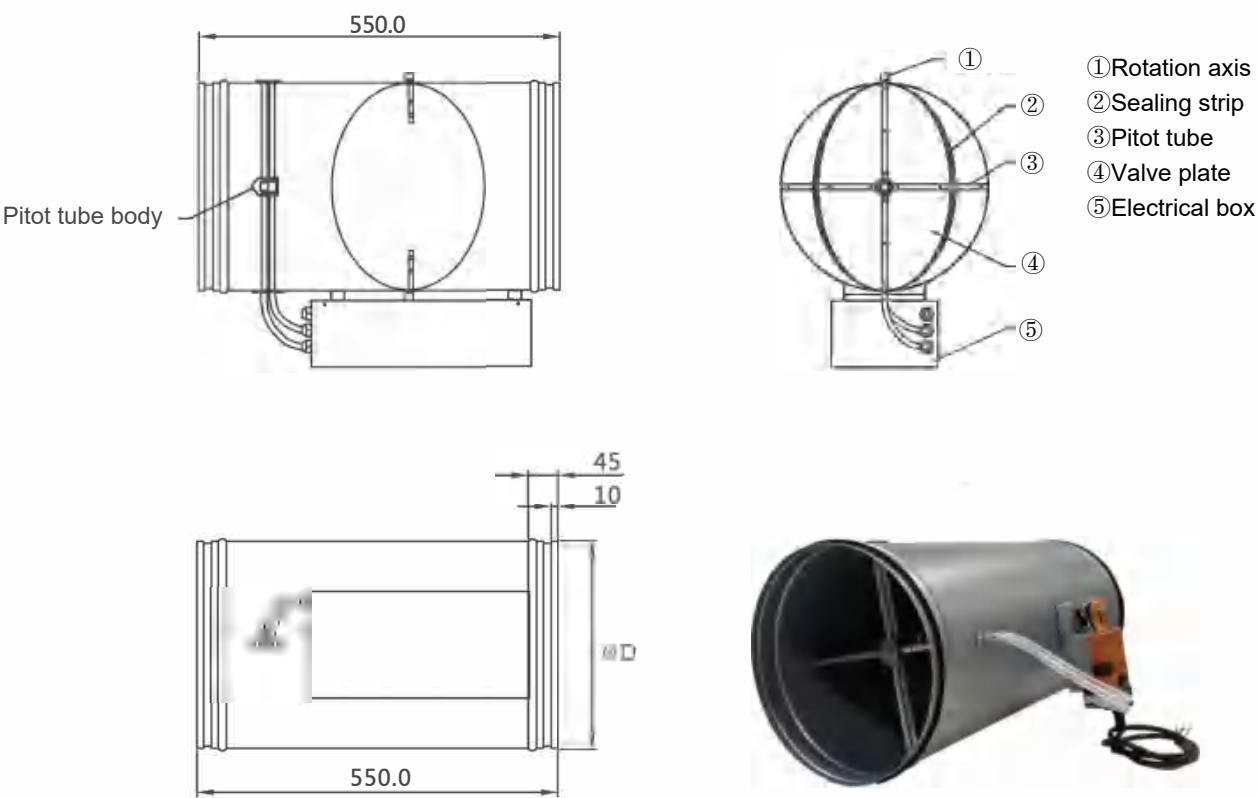
## ■ Install instruction

1. There should be enough space on the operating surface of the electric box of VAV valve (general requirement > 500 mm).
2. Install an overhaul orifice (400 x 400 mm) at the position of 500 mm relative to the operating surface of the electric box for debugging and overhaul.
3. VAV valves shall be installed in the direction of arrow shown at the primary air intake.

4. The VAV valve shall be separately equipped with lifting screw. For the dynamic VAV valve, it is recommended to use spring shock absorption hook and rubber shock absorption pad; If it is directly connected with the screw, spring washer and flat washer shall be added at the contact to reduce vibration; After installation, adjust the screw height to make the variable air volume valve at a thousand level.

5. The conventional VAV valve needs a long installation space. Generally, it needs to reserve a straight pipe section of 3-5 times the pipe diameter in front of the valve. Due to its special process design, KST VAV can still ensure accuracy in a relatively short installation space. Install according to the marked direction, reserve a straight pipe section of 2 times the pipe diameter in front of the valve, and a straight pipe section of 1 times the pipe diameter in the back of the valve, so as to establish a stable air flow.

W

2×W
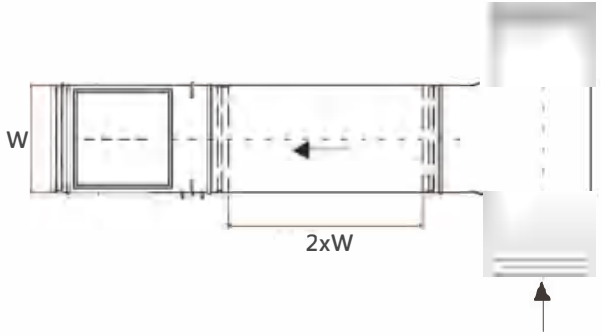
■ Noise sound pressure level

Model	Flow (m³/h)	Static pressure(Pa)	ΔPs=100Pa Radiated noise dB(A)	Airflow noise dB(A)	ΔPs=200Pa Radiated noise dB(A)	Airflow noise dB(A)	ΔPs=600Pa Radiated noise dB(A)	Airflow noise dB(A)
VAV–Q/200×100	216	20	28	39	33	45	44	57
	468	30	34	40	38	47	47	56
	720	40	39	41	42	47	51	56
VAV–Q/200×200	432	20	32	39	37	46	46	56
	936	30	37	40	41	46	50	55
	1440	40	41	40	45	46	54	55
VAV–Q/300×100	324	20	33	40	37	46	46	56
	702	30	37	41	41	45	51	56
	1080	40	42	41	46	46	54	57
VAV–Q/300×200	648	20	34	41	38	47	48	58
	1404	30	39	42	42	47	52	57
	2160	40	43	42	46	47	56	57
VAV–Q/300×250	810	20	33	41	37	47	48	56
	1755	30	38	41	41	47	51	57
	2700	40	42	42	46	47	55	57
VAV–Q/300×300	972	20	34	42	42	48	50	57
	2106	25	41	42	46	48	54	57
	3240	35	45	43	49	49	58	58
VAV–Q/400×100	432	20	34	41	37	46	46	56
	936	30	37	41	42	47	52	57
	1440	40	43	41	46	47	54	57
VAV–Q/400×200	864	20	34	41	39	48	49	59
	1872	30	39	42	43	48	53	58
	2880	40	43	42	47	48	57	58
VAV–Q/400×250	1080	20	35	42	42	48	49	58
	2340	30	42	42	46	48	54	57
	3600	40	45	44	50	49	59	57
VAV–Q/400×300	1296	20	35	42	42	48	50	58
	2808	25	41	41	46	49	54	57
	4320	35	45	43	50	49	59	58
VAV–Q/500×200	1080	20	35	42	40	49	49	59
	2340	30	40	43	44	49	53	58
	3600	40	44	43	48	49	57	58
VAV–Q/500×250	1350	20	35	42	43	48	49	58
	2925	30	43	43	45	48	55	58
	4500	40	46	44	50	49	59	57
VAV–Q/500×300	1620	20	36	42	42	48	51	59
	3510	25	41	42	46	49	55	58
	5400	35	46	43	50	49	60	58
VAV–Q/600×250	1620	20	35	42	43	48	49	58
	3510	30	44	44	46	48	56	58
	5400	40	47	44	50	49	60	57
VAV–Q/600×300	1944	20	36	42	43	48	53	58
	4212	25	42	43	47	49	54	58
	6480	35	45	43	50	48	60	58
VAV–Q/600×400	2592	20	37	43	43	49	50	58
	5616	25	43	43	45	49	57	58
	8640	35	46	44	50	48	63	59
VAV–Q/600×500	3240	20	36	42	44	49	54	60
	7020	30	46	42	47	49	60	59
	10800	40	51	43	51	48	64	59

Model	Flow(m³/h)	Static pressure(Pa)	ΔPs=100Pa Radiated noise dB(A)	Airflow noise dB(A)	ΔPs=200Pa Radiated noise dB(A)	Airflow noise dB(A)	ΔPs=600Pa Radiated noise dB(A)	Airflow noise dB(A)
VAV–Q/700×300	2268	20	37	42	43	48	55	59
	4914	25	42	42	46	48	61	59
	7560	35	49	42	51	49	65	59
VAV–Q/700×400	3024	20	39	42	44	49	55	60
	6552	25	44	42	47	49	62	59
	10080	35	50	43	51	48	66	59
VAV–Q/700×500	3780	20	38	42	44	49	54	60
	8190	30	44	43	49	48	63	59
	12600	40	51	43	51	48	66	59
VAV–Q/700×600	4536	20	38	42	44	48	54	59
	9828	30	44	42	53	49	64	59
	15120	40	52	43	53	49	67	60
VAV–Q/800×300	2592	20	39	42	45	48	55	59
	5616	25	45	42	52	48	64	59
	8640	35	52	43	53	48	68	60
VAV–Q/800×400	3456	20	39	42	45	48	55	60
	7488	25	44	43	52	48	65	59
	11520	35	52	43	54	48	68	60
VAV–Q/800×500	4320	20	40	42	45	48	56	59
	9360	30	45	43	53	48	65	60
	14400	40	52	44	54	49	69	60
VAV–Q/800×600	5184	20	39	42	46	48	55	59
	11232	30	45	43	54	49	66	61
	17280	40	53	44	54	50	69	61
VAV–Q/900×400	3888	20	39	43	45	48	55	59
	8424	25	46	43	54	49	66	61
	12960	35	53	44	54	50	69	61
VAV–Q/900×500	4860	20	39	42	45	48	57	60
	10530	30	48	43	54	49	66	61
	16200	40	53	44	54	49	71	61
VAV–Q/900×600	5832	20	41	42	46	49	56	60
	12636	30	48	42	54	48	66	61
	19440	40	53	44	54	49	72	61
VAV–Q/1000×600	6480	20	41	43	47	50	57	61
	14040	30	49	43	53	50	66	62
	21600	40	54	44	55	50	72	62
VAV–Q/1000×800	8640	20	42	42	47	49	57	60
	18720	30	49	43	54	50	67	62
	28800	40	54	44	55	50	72	62

Note:

1. The minimum static pressure is the inlet static pressure at the end of the variable air volume, which is the required inlet static pressure at the corresponding air volume when the air valve is fully open

2. The radiated noise of the box has been considered as 4dB sound absorption at the top and 5dB(A) indoor attenuation. If equipped with anechoic enclosure, the radiated noise of the box can be reduced by 6-14 dB (A)

3. The system noise attenuation and air volume correction of the air system have been included in the noise value. Please refer to the standard VDI2081 2019-05-31

4. The attenuation of pipe muffler to air noise varies according to the length of muffler, and the attenuation of 500mm muffler can be 8-10 dB (A); 1000mm muffler can attenuate 18-22dB (A); 1500mm muffler can attenuate 23-27 dB (A)

■ Order code

VAV — Q — V — B1 — F / G / 200*200

Shape

Û/ÁQˇadrate
R Circle

Control mode

V   Volume control
P   Pressure control
L   Fume hood
R   Volume control+Pressure
     control

Network interface

B1 Modbus TCP
B2 Modbus RTU
B3 BACnet IP
B4 BACnet MS/TP
B5 Lonworks

Size

200*100	100
200*200	125
300*200	160
400*200	200
500*200	250
500*300	315
	400

Material

G   Ordinary galvanized steel plate
A   Galvanized steel plate+
     anti-corrosion coating
S   Stainless steel

Feedback speed

F   Fast
S   Standard

VAV-Q-P-F/A/300*200   VAV-R-L-R-F/A/200   VAV-R-V-S/S/200

Up
The First Affiliated
(Nansha) Hospital of Sun
Yat-sen University

Right
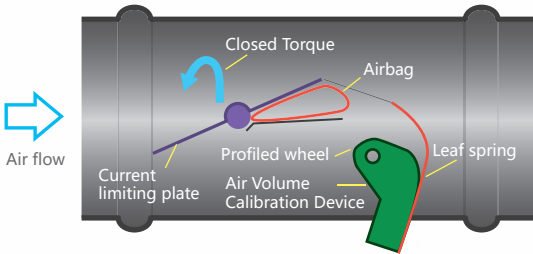Chinese Academy of
Biological Sciences II

（Figure source network）

■Principle

The Constant Air Volume Regulating valve, without external power supply, can make air volume maintain at a constant set value in a certain range, using an aerodynamic flexible damper plate. The power produced by airflow amplifies at automatic inflating airbag, then exerts on the damper plate to close. The airbag can also play in a role of shock absorption. The driving damper plate, composed of spring slice and abnormal wheel, moves in an opposite direction, for ensur-ing tiny deviation of air volume at variable pressures. Due to its constant air volume, we install it at the end of air conditioning system, and set air volume value, for automatic hydraulic-equilibrium regu-lating. Therefore, Designer and engineers don't need to balance air pressure.

Closed Torque
Airbag
Air flow
Current limiting plate
Profiled wheel
Air Volume Calibration Device
Leaf spring

■Characteristic

KST CAVC Constant Air Volume Controller is an automatic mechanic mechanism without external power. It is used to supply air or exhaust air. Its working temperature is 10~50℃ ,and differential pressure is 50-1000Pa. In addition, there are no restrictions in space. A straight inflow distance of at least 1.5D is required. Throttling plate works flexibly, airbag is a resistance component, flow range is 4:1, and precision is high. Flow rate is indicated by needle on the dial. Deviation is 5%.Throttling plate doesn't need to be in maintenance. Actuator is available.

KST Factory is equipped with a standard calibration table of the National Testing Center, which calibrates the air volume of products with constant air volume before leaving the factory as required to ensure the effect of air supply.

■Material

Galvanized steel body, especially anti-aging plastic airbag.
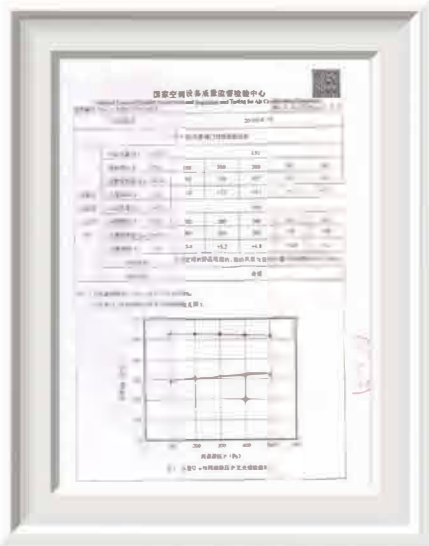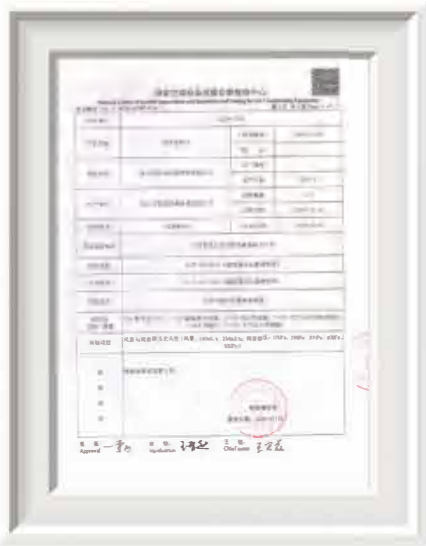
■Parameters

CAVC−R

Type ∅Ra	Flow V		Error △V	Pressure difference	Type ∅Ra	Flow V		Error △V	Pressure difference
mm	(L/S)	(m³/h)	± %	Pa	mm	(L/S)	(m³/h)	± %	Pa
100	27	98	< 10	20	160	69	248	< 10	20
	36	130	< 10	20		91	326	< 10	20
	51	185	< 10	40		125	451	< 10	40
	69	250	< 8	60		153	594	< 8	60
	84	304	< 8	70		205	739	< 8	70
200	105	380	< 10	20	250	191	688	< 10	20
	130	470	< 10	20		226	815	< 10	20
	158	570	< 10	40		309	1111	< 10	30
	202	730	< 8	60		379	1366	< 8	35
	254	915	< 8	75		439	1597	< 8	45
315	254	913	< 10	20	400	448	1612	< 10	20
	351	1263	< 13	20		583	2098	< 10	20
	468	1748	< 8	30		792	2851	< 8	20
	591	2128	< 8	30		955	3437	< 8	25
	810	2915	< 8	35		1295	4663	< 8	25

■Note

KST CAVC constant air volume Regulating valve can produce the designated size duct as required by the customer in order to installment. The CAVC can attach motorized actuator, which is BELIMO import actuator.

■Install instruction

CAVC-Q: The installation of the CAVC-Q is simple; there are flanges at the two end of the damper. It had better use the compressible sealing material (not provided by our company). The cut edges adjacent circular air duct must be cleaned before the installation of the controller. Minimum 1.5W straight upstream and 0.5W straight downstream, "W" refers to the damper width. Please remain enough duct in order to stabilize air volume if require change the diameter.

CAVC-R: extra gas tightness material is needed when the CAVC-R installation. It is recommended that circular duct is fixed to the spigot by means of self tapping screws or air tight blind rivets evenly spaced around the circumference. Minimum 1.5R straight duct upstream, "R" refers to the diameter of the damper. Please remain enough duct in order to stabilize air volume if require change the diameter. The cut edges adjacent circular air duct must be debarred and cleaned prior to the installation of the controller. Retreating the lip seal with lubricant makes it easier to push the seal up to the bead on the spigot connection.

■Structure size

(Other sizes of CAVC valves can be customized according to customer requirements)

CAVC-R：
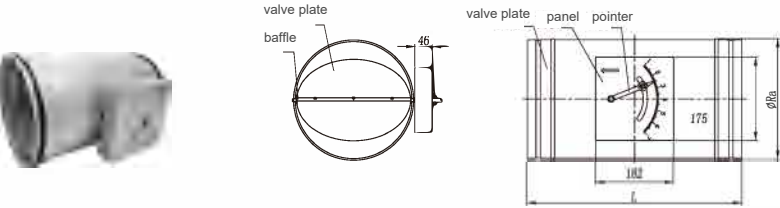
CAVC-Q：

Size	ΦRa	Length
100	99	310
125	124	310
160	159	310
200	199	400
250	249	400
300	299	400
315	314	400
400	399	400
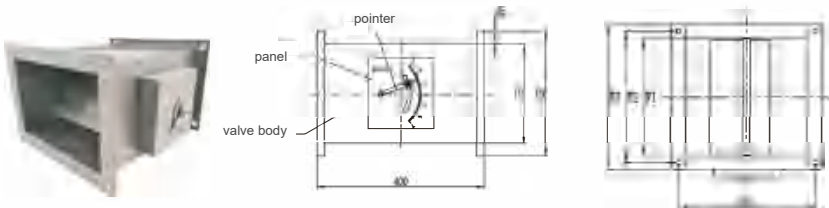
W1XH1	200X100	300X100	300X200	400X200	400X250
H2	135	135	235	235	285
H3	170	170	270	270	320
W2	235	335	335	435	435
W3	270	370	370	470	470

W1XH1	500X250	500X300	500X500	600X400	600X600
H2	285	335	535	435	635
H3	320	370	570	470	670
W2	535	535	535	635	635
W3	570	570	570	670	670

■Order code

Quadrate Q

Size
200×100	500×250
200×200	500×300
250×200	500×400
300×150	500×500
300×200	600×300
400×200	600×400
400×250	600×500
400×300	600×600
400×400	

Circle R

Size
100
160
250
315
400

CAVC ⁻ R/250/M

M1 Electric actuator Switching220V 50Hz

M1 Actuator (2 phrase control) 220V 50Hz

M2 Electric actuator Switching 24V 50Hz

M2 Actuator (2 phrase control) 24V 50Hz

M3 infinite Electric actuator 24V-0-10V

M3 Actuator (proportional control) 24V-0-10V

CAVC-Q

Size W1 × H1	Flow ∨		Error ∆V	Pressure difference	Size W1 × H1	Flow ∨		Error ∆V	Pressure difference
mm	(L/S)	(m³/h)	±%	Pa	mm	(L/S)	(m³/h)	±%	Pa
200×100	44	159	<10	60	500×250	250	900	10	60
	79	286	<10	60		500	1800	10	60
	113	405	<10	60		687	2475	10	60
	156	563	<10	60		937	3375	6	60
	185	677	<8	60		1125	4050	6	60
300×100	60	216	10	60	500×300	300	1080	10	60
	120	432	10	60		600	2160	10	60
	165	594	10	60		825	2970	10	60
	225	810	10	60		1125	4050	6	60
	270	972	8	60		1350	4860	6	60
300×200	127	458	<10	60	500×500	516	1859	<10	60
	238	855	<10	60		946	3405	<10	60
	323	1161	<10	60		1316	4737	<10	60
	438	1578	<8	60		1755	6391	<8	60
	531	1912	<8	60		2170	7811	<8	60
400×200	160	576	10	60	600×400	480	1728	10	60
	320	1152	10	60		960	3456	10	60
	440	1584	10	60		1320	4752	10	60
	600	2160	8	60		1800	6480	5	60
	720	2592	8	60		2160	7776	5	60
400×250	210	756	<10	60	600×600	876	3153	<10	60
	381	1371	<10	60		1311	4720	<10	60
	504	1813	<10	60		1770	6371	<10	60
	723	2601	<8	60		2322	8309	<8	60
	880	3167	<8	60		2990	10763	<5	60

■ Principle

CAVP plastic constant air volume regulating damper is a kind of damper with convenient operation and excellent performance. It provides an economical and simple method to solve the problem of air volume balance in air conditioning and ventilation systems. It does not need complicated hydraulic balance debugging and improves the efficiency of field work. The regulating damper balances the airflow induced by the silica gel balloon flowing through the air duct, and automatically shrinks and expands according to different static pressures to achieve constant air flow. Solve the problems of temperature discomfort and poor air quality caused by static pressure flow at inlet and outlet. The CAVP valve can set the required air volume very easily at the installation site and then insert it into the duct.

fan

VAV valve

■ Characteristic

CAVP constant air regulating damper is made of high quality plastic, used to limit and maintain constant air flow, suitable for air conditioning and ventilation systems. It consists of a control unit with air volume setting and a regulating mechanism with spring blades and low friction without damper. The valve adopts the principle of mechanical automatic control with adjusting valve disc, which has high control accuracy and can achieve error of about 10% in the range of 30-300 Pa pressure difference. The valve installation position is flexible, maintenance-free, and can be easily inserted into the circular duct.
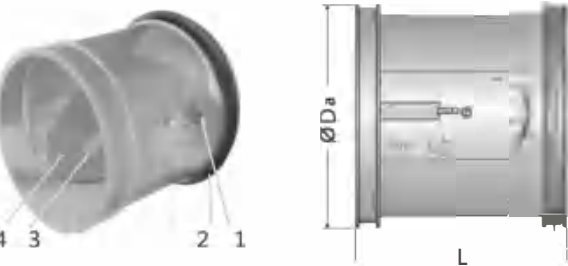
■ Material

Valve disc and shell are made of high quality plastic (UL 94 V1), stainless steel adjusting spring disc and silica gel adjusting airbag.

■ Structure size

1.Air volume setting mechanism   3.Adjusting spring blade

2.Sealing ring   4.Control discs with damped components

ØDa

L

4 3   2 1

Size mm	
Specifications	ΦDa
80	78
100	98
125	122
160	156
200	196
250	246

■ Install instruction

CAVP plastic constant air volume regulating damper can set the required air volume conveniently in the installation site. In order to ensure the best noise performance after installation, the length of intake straight pipe section should be guaranteed to be greater than 1.5D.
When changing diameter, be sure to set aside enough pipe sections for steady flow.

■ Technical specification

Noise sound pressure level Lpa dB(A)							
Specification (Air volume range m³/h)	Air volume m³/h	Δpg=50 Pa dB(A)	Δpg=100 Pa dB(A)	Specification (Air volume range m³/h)	Air volume m³/h	Δpg=50 Pa dB(A)	Δpg=100 Pa dB(A)
80(15~90)	15	24	31	160(50~350)	50	28	36
	25	25	31		100	30	38
	45	28	32		175	32	40
	60	27	33		250	33	40
	90	27	34		350	34	41
100(15~120)	15	29	35	200(60~570)	60	25	33
	30	29	34		185	28	34
	50	31	35		350	29	35
	90	32	36		485	30	37
	120	33	39		570	30	37
125(40~205)	40	34	38	250(125~900)	125	25	33
	70	35	39		285	26	34
	100	35	40		550	28	36
	160	35	40		750	30	37
	205	36	41		900	31	38

■ Order code

CAVP-100 ——— Specification

80
100
type   125
circle plastic   160
CAV damper   200
250

Example
If there is no special requirement, the products are black

■ Characteristic

KST NLD sealed damper is used for the industry place that require sealed strictly. The damper blade move from opposite direction,which is consist of aluminum and is hollow inside, this design can decrease the leakage efficiently, the control damper is manufactured according to DIN EN1751 standard requirement. The damper has gear connection and shaft connection two methods. The normal temperature for gear connection is less than 80 degree.

■ Material

The frame is galvanized steel plate, the valve plate is aluminum hollow airfoil blade, which is pulled by high strength aluminum alloy as a whole. Polyurethane foaming material can be filled in the middle to slow down heat conduction. The regulating mechanism is divided into gear transmission mechanism or connecting rod transmission mechanism. The main transmission material of gear mechanism is engineering plastics, and the main transmission part of connecting rod mecha-nism. It is made of high quality carbon steel with working temperature not exceeding 80℃. Seals are made of specially cus-tomized sealed rubber materials. Conventional electric actuators are imported from Europe to ensure safe operatiα and long-term operation. Switching quantity and continuous quantity can be selected for electric mode, and fast actuator can also be selected for actuator.

■ Installment schematic

Frame

Vane

Hand shank   Panel
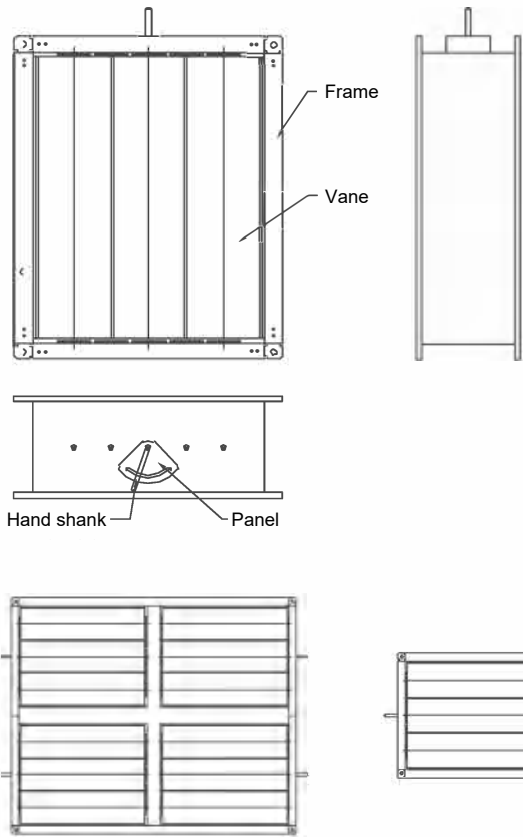
■ Structure size
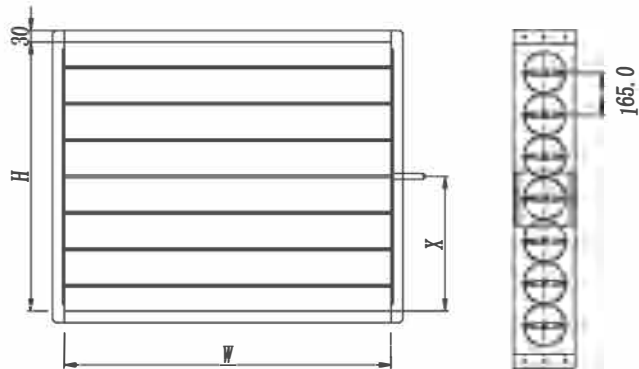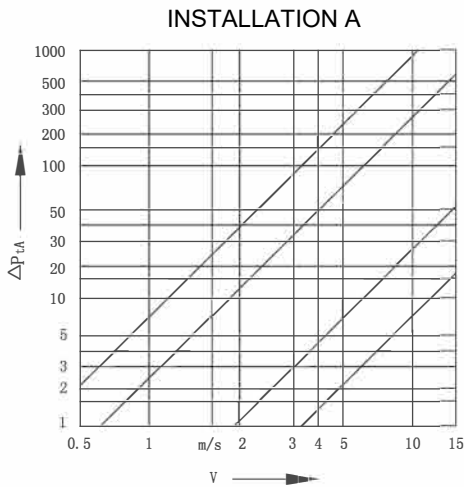
AXIS LOCATION：ODD NUMBERBLADE：H/2   EVEN NUMBER BLADE：H/2-82.5

Large size splicing method

Remarks:When the size is larger than 1000mm(W*H)please contact the manufactures.

■ Pressure drop

INSTALLATION A

Different installation types

C   D

B

A

Remark：V m/s,velocity
When blade opening degreeα=0 °,
means blade open completely
ΔPt(A … … D)unit Pa,total pressure drop（A……D）

Given：
installation D   result：ΔPtD=ΔPTa×6.3
α=15°   =5×6.3
V=4m/s   =31.5Pa

Installation	Opening degree α according correction factor F			
Opening degree	0	15	30	45
B	6	4.3	2	1.4
C	4	2.9	1.7	1.4
D	9	6.3	2.7	1.8

■ Regulating characteristics and resistance characteristics

| Angle	Air speed m/s Vy	Flow m³/h L	Flow ratio m³/h L/L0	Resistance ΔP	Resistance coefficient ξ
90°	10.02	5768	100	30	0.498
75°	7.11	4094	71	30	0.989
60°	5.81	2884	58	30	1.481
45°	3.45	1986	34	30	4.201
30°	2.01	1159	20	30	12.376
15°	1.08	619	11	30	42.867

Remark：1.resistance calculate formula:$\Delta P = \xi \times V^2 \times \rho/2(Pa)$
2.Flow ratio：Flow in different open angle/ flow in 90°open angle

Resistance coefficient ξ
air volume ratio %

Opening angle - resistance coefficient
Air volume ratio curve   open angle
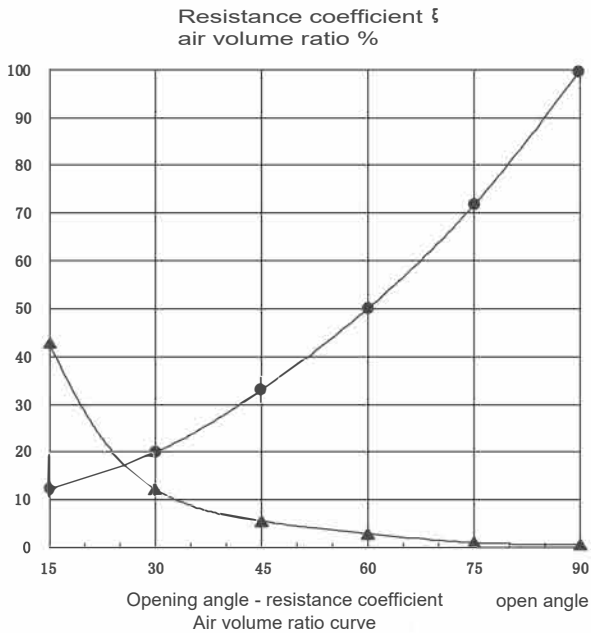
■ Flow test result

Type	Air damper static pressure difference Pa	Leakage air volume m³/h
NLD	750	15.65
	1000	18.35
	1500	23.26
	2000	25.76

■ Leakage test
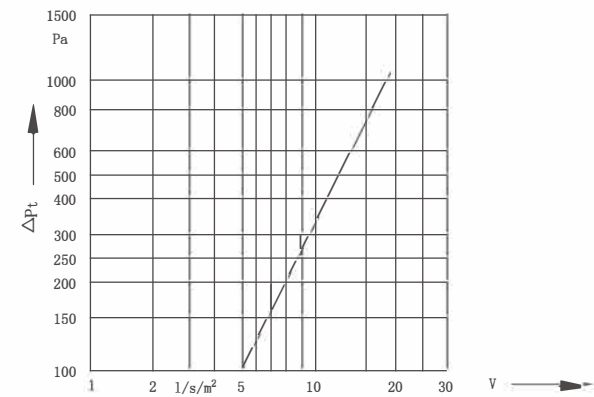
Remark: V: l/s/m2,blade close α=90°
air volume leakage per square

Pipline pressure (Pa)

Leakage of blade ($l \cdot s^{-1} \cdot m^{-2}$)
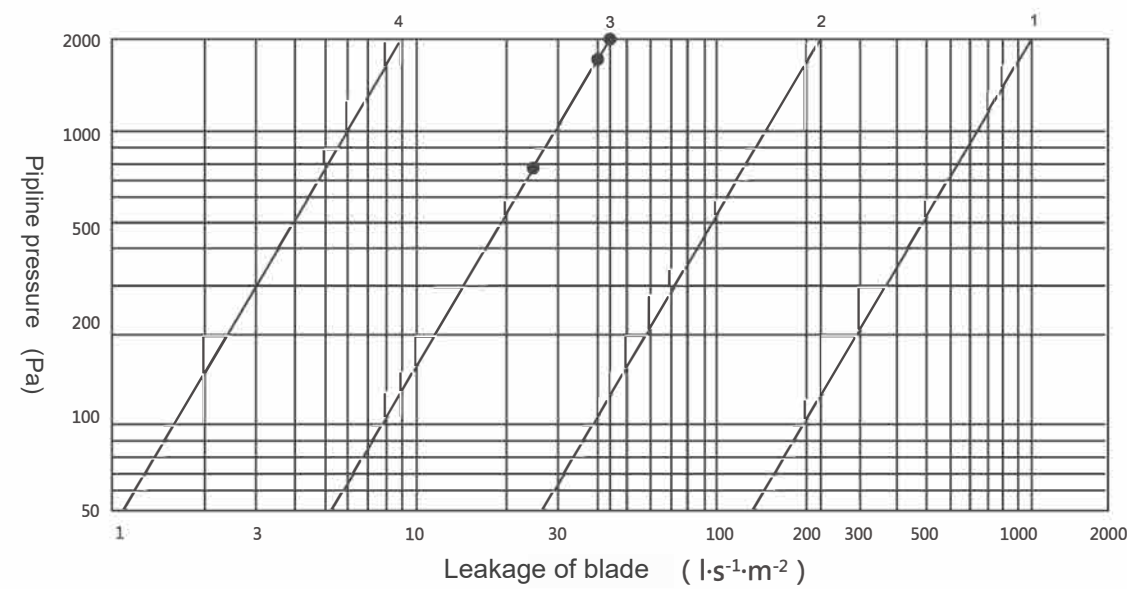
*EN1751 standard, the amount of vane leakage per unit area under different pipeline pressure.
The KST NLD sealed damper meets the class 3 sealing standard.

■ Order code

NLD/W*H/ M

w width
H height

M1	Electric actuator	220V 50Hz
M2	Electric actuator	24V 50Hz
M3	Electrodeless electric regulator actuator	24V-0-10V

Up

Ezhou Public Health Center

Right

Hangzhou Huadong
Pharmaceutical

（Figure source network）

■Characteristic

Used to shut off the air,In line with the DIN1946, airtight standard part iv , electric available (spring reset), or manual operation. Maximum to take over the work pressure is 1500 pa, free maintenance. Working temperature of 10 ℃ to 50 ℃.

■ NTERFACE HAS THE FOLLOWING THREE OPTIONS

1.One end is plug type
2.Accord with DIN24 145, the first part of the stan-dard flange,
3.Fast connection flange,damper shell leakage level II, accord with VDI 3803 or DIN V 24 194, the second part of the standard.
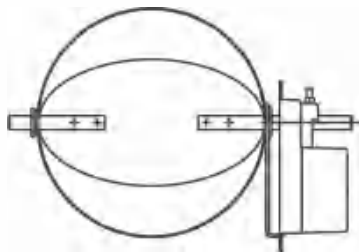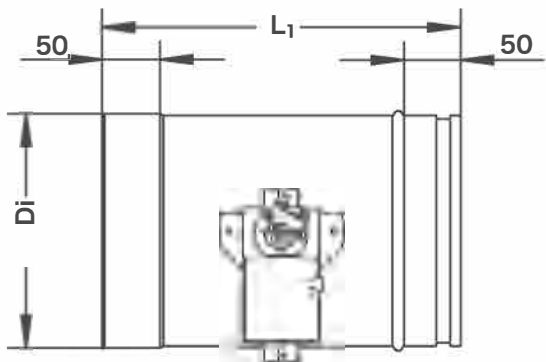
■ DAMPER

There are 7 kinds of circular structure size
Pipe interface for DIN24 145 or DIN24 146 standard
With can install sealing ring grooves (sealing ring can be installed in the factory, can also be used in the construction site installation).

■Material

Body and attachments are made of galvanized steel. Air damper vane is made of galvanized steel plate, with thermoplastic elastic sealing strip. Basic structure of electric actuator (configuration)
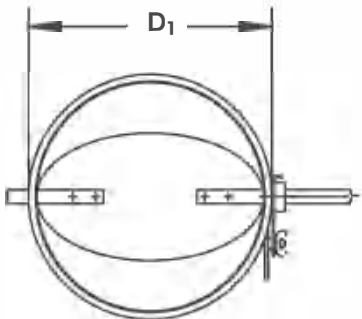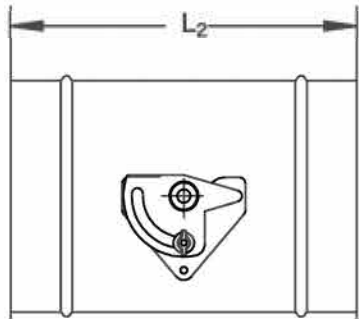
Basic structure
(equipped with electric actuator)

L_1

50

D

Max 100

About 150

Max 105

One end is plug type

50 L_1 50

D_i
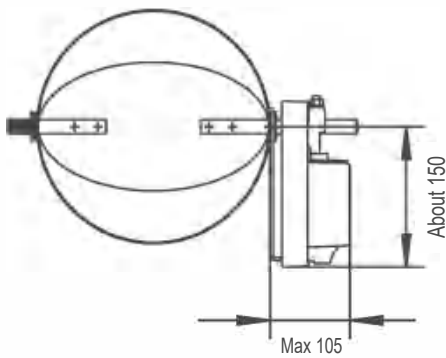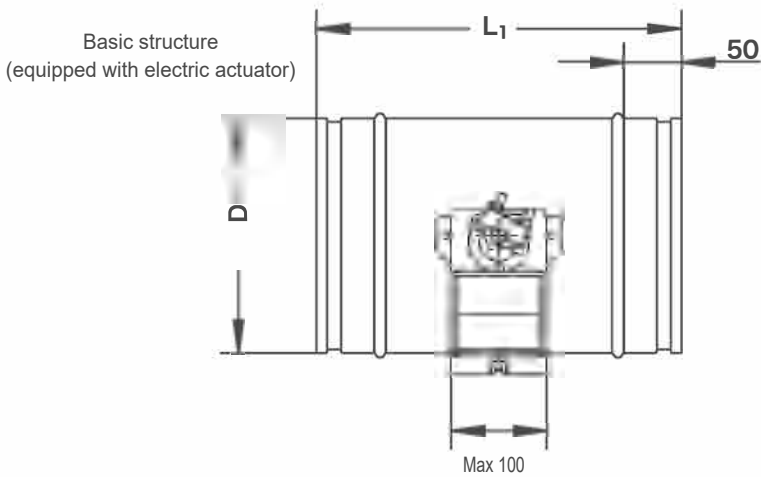
At both sides for flanging

L_2

D_1

■Structure size

Size	$\varnothing D_a$	$\varnothing D_i$	$\varnothing D_1$	$\varnothing D_2$	L_1	L_2	$L_2{}^{2)}$	$L_2{}^{3)}$	B	S	$\varnothing d$	$n^{3)}$
100	99	100	111	132	250	238	230	580	25	3	9.5	4
125	124	125	136	157	250	238	230	580	25	3	9.5	4
160	159	160	171	192	250	238	230	580	25	4	9.5	6
200	199	200	211	233	250	238	230	580	25	4	9.5	6
250	249	250	261	283	250	238	230	580	25	4	9.5	6
315	314	315	326	352	400	388	380	580	30	4	9.5	8
400	399	400	411	438	400	388	380	580	30	4	9.5	8

■Order code

NLR-R1-M1/W*H

R1 Circle with flange
R2 Circle without flange

Effective height and width equipped with air duct

M1 Electric actuator   220V 50HZ
M2 Electric actuator   24V 50HZ
M3 Electrodeless electric
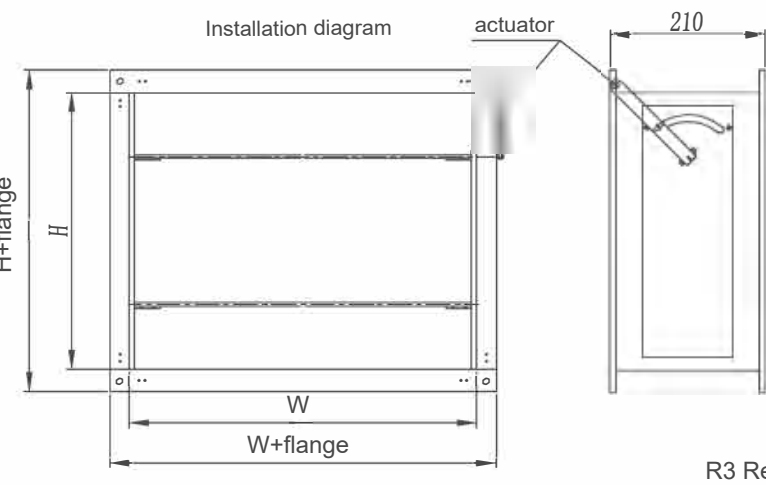   regulator actuator   24V-0-10V

■ 1)MD manually multileaf regulating damper
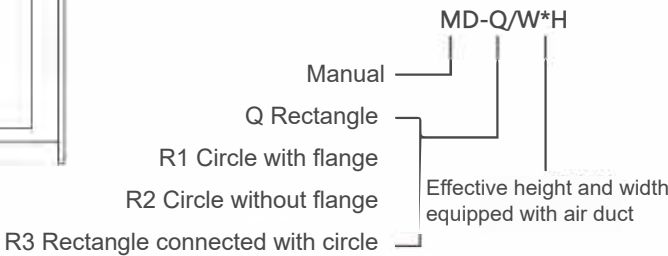
■ Characteristic

KST manually multileaf regulating damper directly installed on duct,connected to duct to adjust the indoor air volume,it is convenience and smart,actuator for handle switch.

MD-R1

MD-R2

■ Material

Galvanized steel sheet

Installation diagram

actuator

210

H+flange

H

W

W+flange

MD-R3

MD-Q

■ Order code

MD-Q/W*H

Manual

Q Rectangle

R1 Circle with flange

R2 Circle without flange

Effective height and width equipped with air duct

R3 Rectangle connected with circle

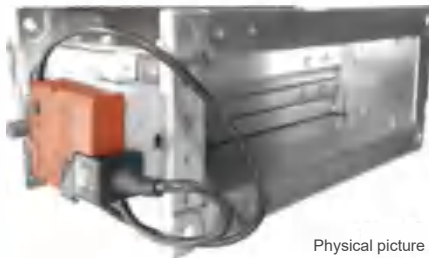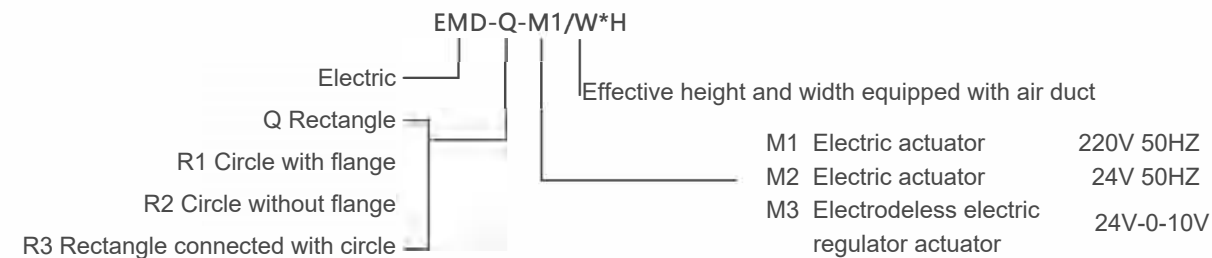## ■ 2) EMD Electric multileaf regulating damper

■ Characteristic

KST motorized multileaf regulating damper directly installed on duct,connected to duct to adjust the indoor air volume,it is convenience and smart,Actuator for electric switch,can choice domestic actuator or imported actuator such as BELIMO, Siemens.
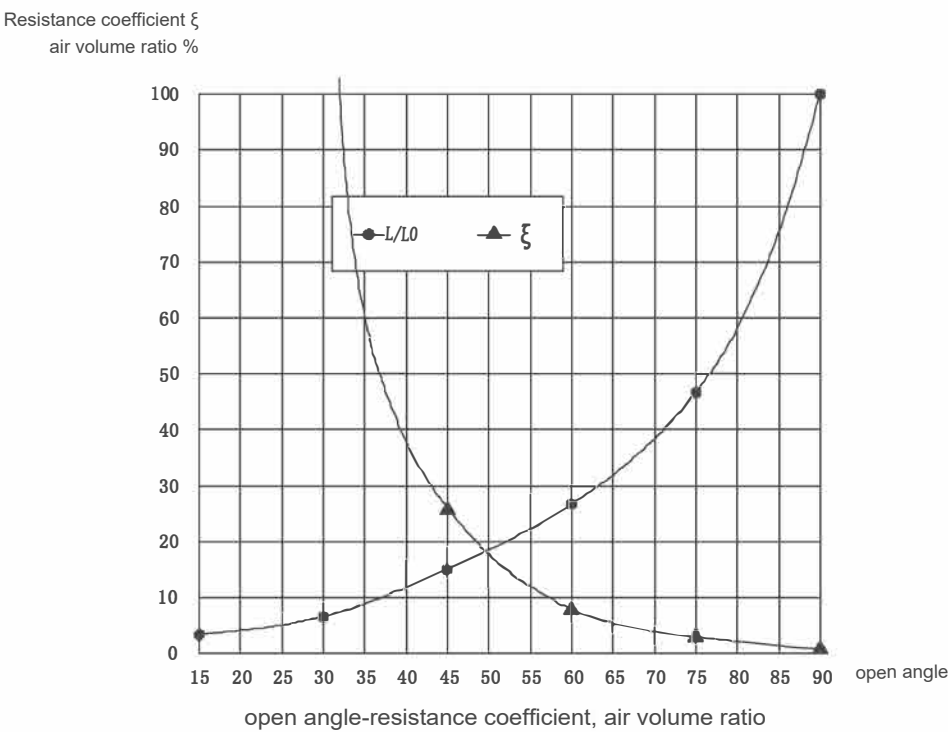
Physical picture

■ Material

Galvanized steel sheet

■ Order code

EMD-Q-M1/W*H

Electric

Q Rectangle

R1 Circle with flange

R2 Circle without flange

R3 Rectangle connected with circle

Effective height and width equipped with air duct

M1 Electric actuator   220V 50HZ

M2 Electric actuator   24V 50HZ

M3 Electrodeless electric
      regulator actuator   24V-0-10V

■ Inherhent adjustment and resistance characteristic

Angle	Air speed m/s Vy	Flow m³/h L	Flow ratio % L/L0	Resistance Pa ΔP	Resistance coefficient ξ
90°	20.0	11520	100.0	148	0.618
75°	9.20	5302	46.0	148	2.911
60°	5.51	3176	27.6	148	8.154
45°	3.11	1792	15.6	148	25.668
30°	1.38	796	6.9	148	129.524
15°	0.60	346	3.0	148	685.18
Remark	1.resistance calculate formula $\Delta P=\zeta \times V^2 \times \rho/2$ (Pa) 2.flow ratio：Air damper under the condition of 20 m/s wind resistance, air volume and air damper fully open under different opening Angle under the 20 m/s wind speed limit when the ratio of air volume 3.environment parameter：atmosphere 101.85kPa,air temperature 26℃				

■ Leakage test example

Type	Damper static pressure Pa	Air Leakage volume m³/h	Leakage ratio %	Distinguish
MD-Q/400*400	2000	219	1.9	＜2%
Remark	Leakage ratio refers to the specimen under the condition of the full closed, air damper on both sides of the differential pressure under the 2000 pa leakage air volume and air damper fully open under the 20 m/s wind speed when the ratio of air volume.			

Resistance coefficient ξ
air volume ratio %

L/L0   ξ

open angle

open angle-resistance coefficient, air volume ratio

■ Characteristic

KST PYF smoke damper consists of frame, blade, blade shaft, bushing, side sealing plate, connecting rod, controller and other supporting components. The opening reliability and corrosion resistance of KST PYF smoke damper are in accordance with the requirements of the corresponding provisions of the Test Method for Fire damper for Building Ventilation and Smoke-venting Systems GB15930-2007.The linear dimensional tolerance of the valve complies with the Level C tolerance class which is specified in GB/T 1804-2000. In 2018, it obtained the 3C certification of Chinese compulsory product certification system.

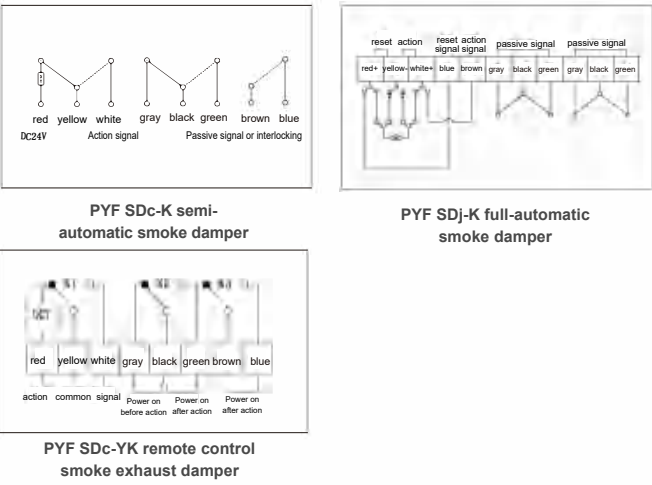**Smoke damper（Remote control）**

Smoke damper（Near control）

■ Material

The smoke damper frame is made of high quality hot-dip galvanized steel sheet of delta=2mm. There are no obvious scratches, indentations, deformations, oil stains and rusts on the surface of the steel sheet. No welding technology is used in the manufacture of the valve frame to avoid damaging the galvanized steel sheet. The smoke damper frame joints firmly, the fastener does not loosen, damage and other phenomena. The blade is a single layer blade. High quality hot-dip galvanized steel sheet of delta=2mm is adopted. There are no obvious scratches, indentations, deformations, oil stains and rusts on the surface of the steel sheet. No welding technology is used in blade making to avoid damaging the galvanized layer of steel plate. The bearing is designed for maintenance-free and has self-lubricating function.
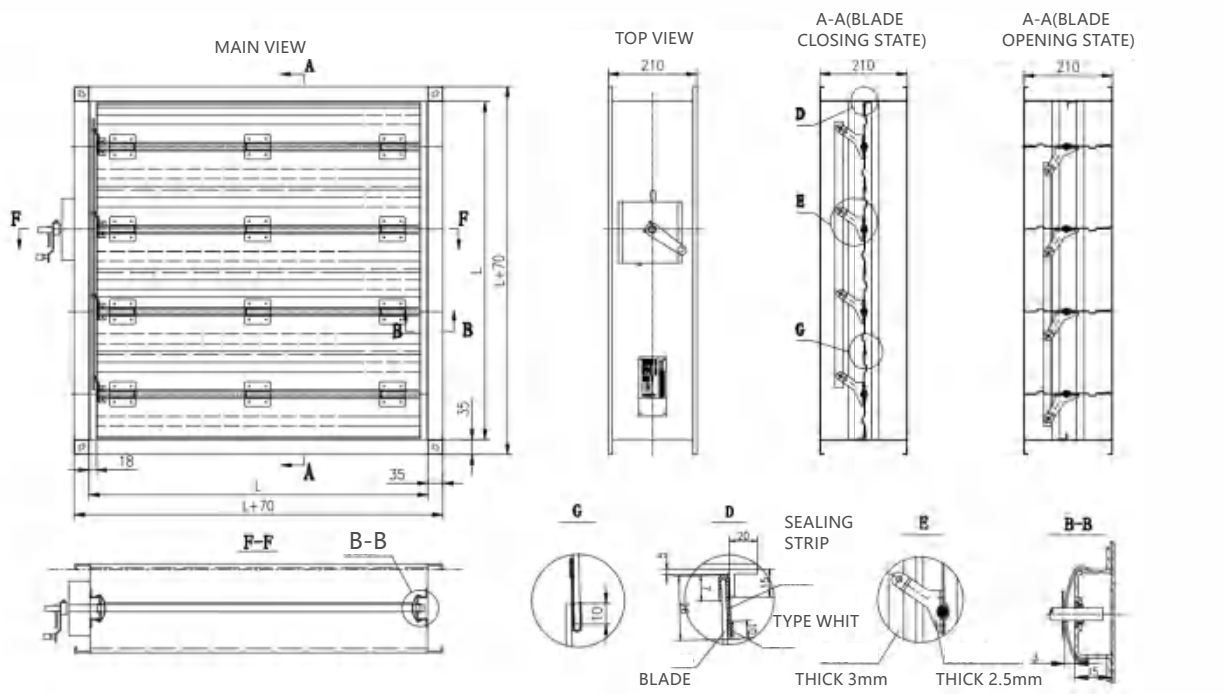
■ Performance

1. PYF SDc-K semi-automatic smoke damper: normally closed, can be manually opened, electrically opened, manually reset, can output closing or opening signal, DC24V rated working voltage.

2. PYF SDj-K full-automatic smoke damper: normally closed,can be manually opened, electrically opened, manually reset, electrically reset, can output closing or opening signal, DC24V rated working voltage.

3. PYF SDc-YK remote control smoke damper: normally closed, remote manual opening, electric opening, remote manual electric reset, output closing or opening signal, DC24V rated working voltage.
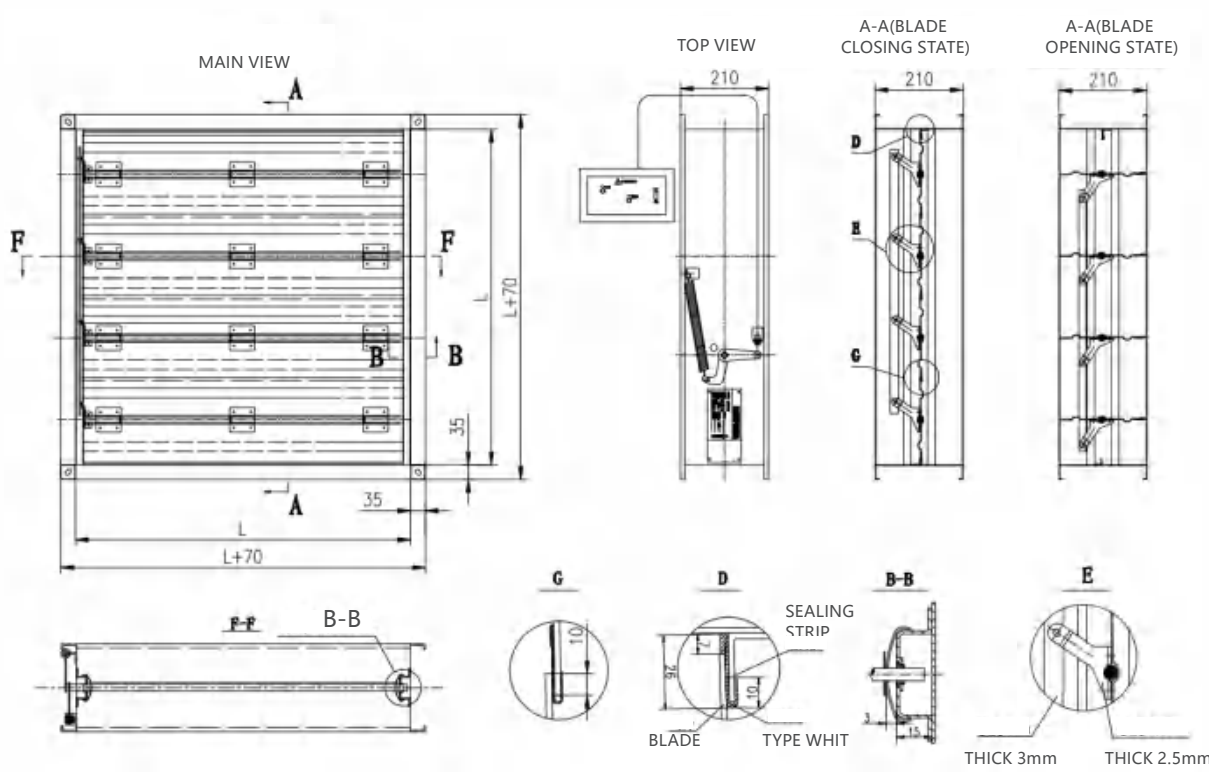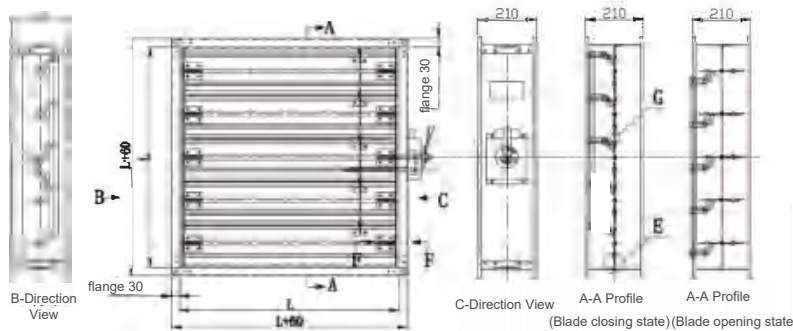
■ Wiring diagram

PYF SDc-K semi-automatic smoke damper

red yellow white | gray black green | brown blue
DC24V | Action signal | Passive signal or interlocking

PYF SDj-K full-automatic smoke damper

reset action | reset action | passive signal | passive signal
signal signal
red+ yellow white- | blue brown | gray black green | gray black green

PYF SDc-YK remote control smoke exhaust damper

red yellow white | gray black | green brown | blue
action common signal | Power on | Power on | Power on
before action | after action | after action

■ Structure size

MAIN VIEW | TOP VIEW | A-A(BLADE CLOSING STATE) | A-A(BLADE OPENING STATE)

SEALING STRIP | TYPE WHIT

BLADE | THICK 3mm | THICK 2.5mm

Smoke damper (Near control)

MAIN VIEW | TOP VIEW | A-A(BLADE CLOSING STATE) | A-A(BLADE OPENING STATE)

SEALING STRIP

BLADE | TYPE WHIT | THICK 3mm | THICK 2.5mm

Smoke damper（remote control）

■Characteristic

KST FHF70 °C fire damper consists of frame, blade, blade shaft, bushing, side sealing plate, connecting rod, 70 ℃ temperature sensor, controller and other supporting components. The test of temperature sensor performance, shutdown reliability, corrosion resistance and fire resistance of KST fire damper are in accordance with the corresponding provisions of the Test Method for Fire Valves for Building Ventilation and Smoke Exhaust Systems GB15930-2007.The linear dimensional tolerance of the valve complies with the Level C tolerance class which is specified in GB/T 1804-2000. In 2018, it obtained the 3C certification of Chinese compulsory product certification system.

■Material

The fire damper frame is composed of 2mm thickness top quality hot-dip galvanized steel plate. The frame is manufactured without any welding technology, so as not to damage the galvanized layer; the frame is firmly connected, the fasteners are not loosened or damaged. The blade is single-layer with 2mm thickness high-quality hotdip galvanized steel plate; the blade shaft is high-quality galvanized steel with 12mm diameter; the bearing is a maintenance-free design and has oil-sintered brass bearing with self-lubricating function. The blade is supported on the bearing firmly. The bearing is flexible; the fuse temperature of the actuator's temperature sensor is 70 °C.
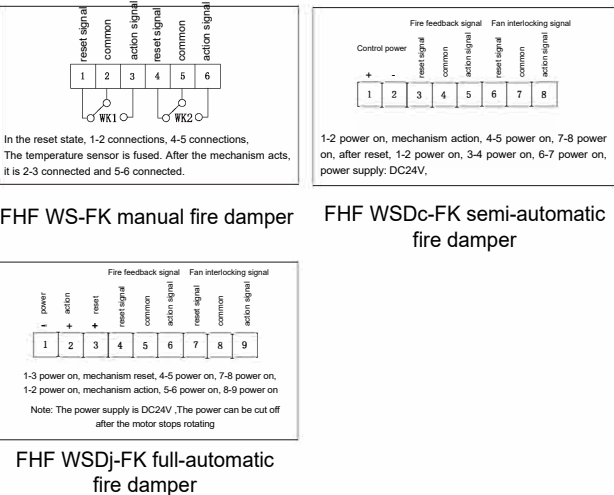
■Performance

1. FHF WS-FK manual fire damper, normally open, 10 ° C fuse closed, manual closed, manual reset, air volume adjustment, output closing or opening signal, DC24V rated working voltage.
2. FHF WSDc-FK semi-automatic fire damper, normally open, 10 ° C fusing close, manual close, electric close, manual reset, air volume adjustment, output closing or opening signal, DC24V rated working voltage.
3. FHF WSDj-FK full-automatic fire damper, normally open, 10 ° C fusing and closing, manual closing/resetting, electric closing/resetting, air volume adjustment, output closing or opening signal, DC24V rated working voltage.

■Structure size

B-Direction View · flange 30 · C-Direction View · A-A Profile (Blade closing state) · A-A Profile (Blade opening state)

■Wiring diagram

In the reset state, 1-2 connections, 4-5 connections, The temperature sensor is fused. After the mechanism acts, it is 2-3 connected and 5-6 connected.

FHF WS-FK manual fire damper

1-2 power on, mechanism action, 4-5 power on, 7-8 power on, after reset, 1-2 power on, 3-4 power on, 6-7 power on, power supply: DC24V,

FHF WSDc-FK semi-automatic fire damper

1-3 power on, mechanism reset, 4-5 power on, 7-8 power on, 1-2 power on, mechanism action, 5-6 power on, 8-9 power on
Note: The power supply is DC24V ,The power can be cut off after the motor stops rotating

FHF WSDj-FK full-automatic fire damper

■Characteristic

KST PHFH fire damper in somke-venting system consists of frame, blade, blade shaft, bushing, side sealing plate, connecting rod, controller and other supporting components. The opening reliability and corrosion resistance of KST PHFH are in accordance with the requirements of the corresponding provisions of the Test Method for Fire Dampers for Building Ventilation and Smoke-venting Systems GB15930-2007.The linear dimensional tolerance of the valve complies with the Level C tolerance class which is specified in GB/T 1804-2000. In 2018, it obtained the 3C certification of Chinese com-pulsory product certification system.

■Material

The valve frame of the fire valve adopts high quality hot-dip galvanized steel sheet of delta=2mm. There are no obvious scratches, indentations, deformations, oil stains and rusts on the surface of the steel sheet. No welding technology is used in the manufacture of the valve frame to avoid damaging the galvanized steel sheet. The valve frame is firmly jointed, the fasteners are not loosened and damaged, the blades are single-layer blades and adopt high-quality hot-dip galvanized steel sheet with a diameter of 12 mm; the blade shaft adopts high-quality galvanized steel with a diameter of 12 mm; the bearings are oil-containing sintered brass bearings designed for maintenance-free and have self-lubricating function, the blades are firmly supported on the bearings, and the bearings rotate flexibly. The actuator is the qualified product tested by the national authorized testing institution. The fuse temperature on the temperature sensor element is 280℃

■Performance

1. PFHF WS-K manual fire damper in somke-venting system: normally open, 280 ° (fuse closed, manual closed, manual reset, can output closing or opening signal, DC 24V rated working voltage.
2. PFHF WSDc-K semi-automatic fire damper in somke-venting system: normally open, 280 ° (fuse close, manual close, electric close, manual reset, can output close or open signal, DC24V rated working voltage.
3. PFHF WSDj-K full-automatic fire damper in somke-venting system: normally open, 280 ° (fuse closed, manual close/reset, electric close/reset, can output close or open signal, DC24V rated working voltage.
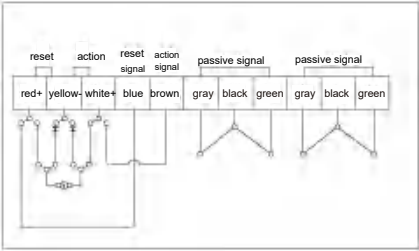
■Structure size

MAIN VIEW · TOP VIEW · A-A(BLADE CLOSING STATE) · A-A(BLADE OPENING STATE)
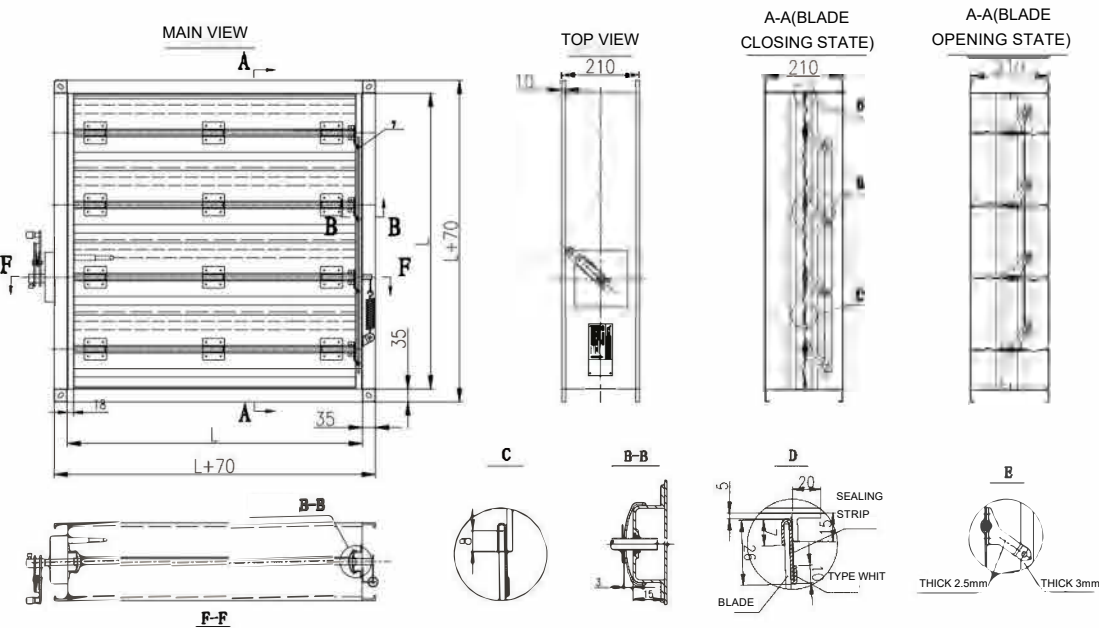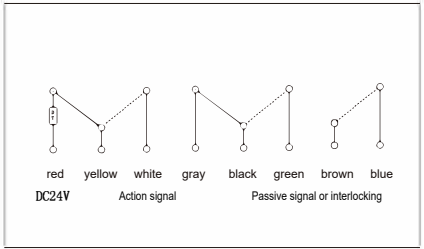
■ Wiring diagram
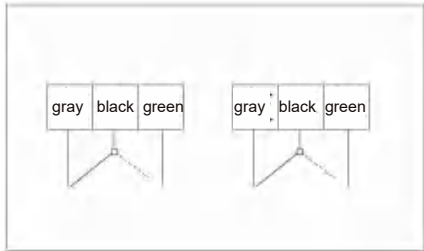
PFHF WS-K manual fire damper in somke-venting system

PFHF WSDj-K full-automatic fire damper in somke-venting system

PFHF WSDc-K semi-automatic fire damper in somke-venting system

■ Oeder code

FHF — WSDc — K — 800x800

FHF　　Fire damper
PFHF　Fire damper in
　　　　somke-venting system
PYF　　Smoke damper

W　Thermostat control automatic switch
S　Manually switch on or off
Dc　Electronic control electromagnet is off or on
Dj　The electric motor is turned off or on

F　Air volume adjustment function
Y　Remote reset function
K　Valve position signal feedback
　　function after valve closing or opening

100x100
:
800x800
750x200
:
1250x800
Φ100
:
Φ600

＊ Remarks:
Minimum size of fire damper is 100x100
Minimum size of fire damper in somke-venting system 120x120
Minimum size of smoke damper 200x200

Up　　　Shenzhen Third People's Hospital

Left　　Shanghai Starry Pharmaceutical

**Right**　　Shanghai Merck Pharmaceutical

（Figure source network）

■ Characteristic

KST PSG purification air return is composed of patented purification materials that can quickly decompose viruses and bacteria and KST SG fine leaf grille. It solves the problems of high wind resistance and poor purification effect of activated carbon and other materials in the purification system. The patented technology of magnetic control catalytic oxygen vacancy is used to decompose harmful substances such as bacteria, viruses and formaldehyde, which are combined with the air return outlet of the air conditioner. It is applied to the return air of the indoor unit of the traditional air conditioner to purify the indoor environment. For the post epidemic era, the installation is simple, the replacement is convenient, and the application range is wide.

■ Purification principle

Through patented technology, the catalytic oxygen vacancy phenomenon at room temperature is realized. Through the catalytic reduction reaction in nano form, the oxygen atoms "O" and "O2" are constantly transformed into each other. Because the oxygen atom "O" is extremely active, it has the characteristics of rapid attachment to other substances, combined with the instantaneous destruction of the molecular chain of other substances, so as to achieve the effect of rapid decomposition of harmful substances. Long service life and only quantitative bonds can not produce secondary pollutants such as ozone and nitrogen oxides.

A two-component structure is designed, which is equipped with slow-release inorganic salts and plant extracts, and forms a gaseous barrier around the two layers of materials driven by gas, which can quickly decompose organic compounds and inactivate bacterial viruses.
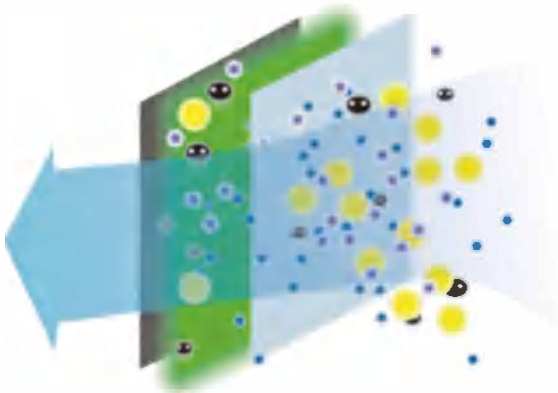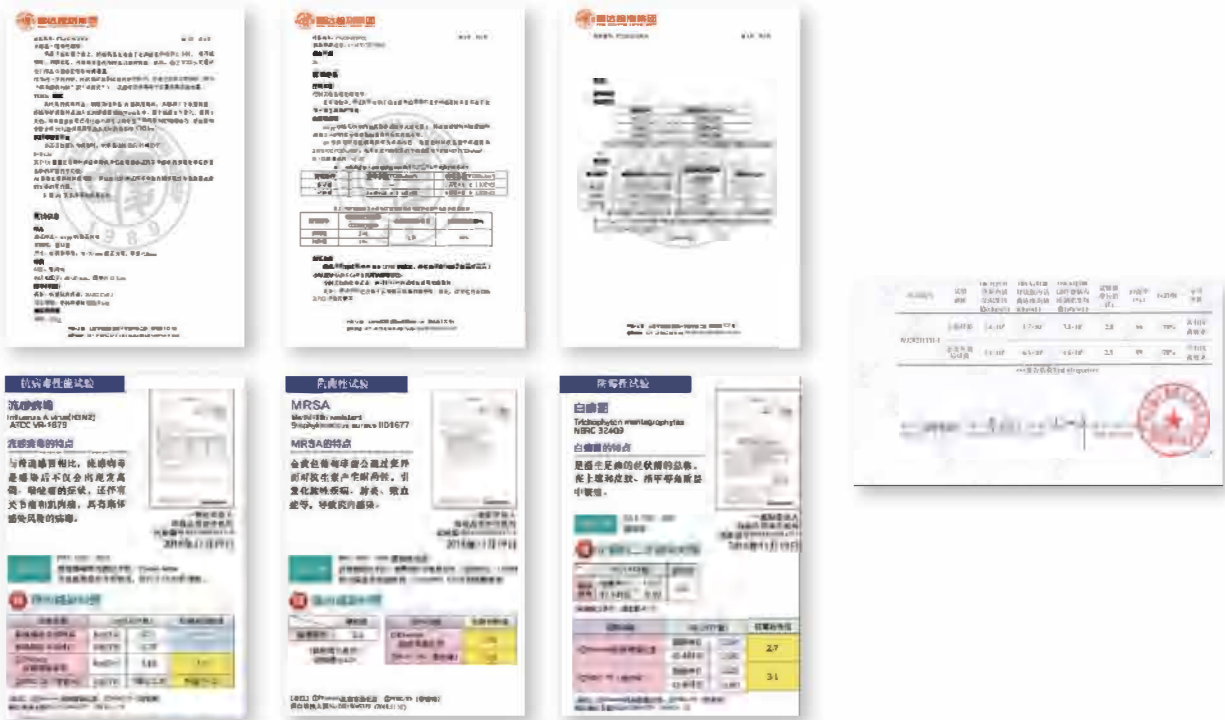
(the two-component intermediate layer forms a protective barrier, and harmful substances are decomposed when passing through)
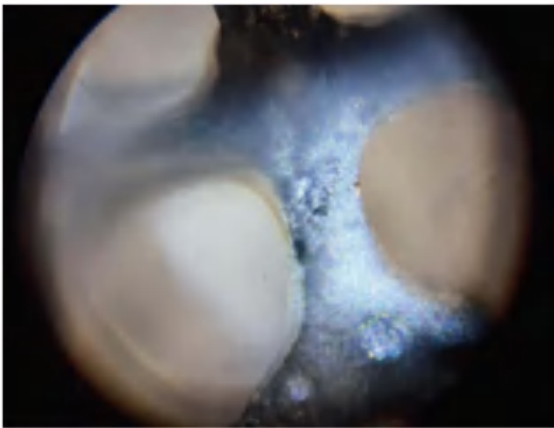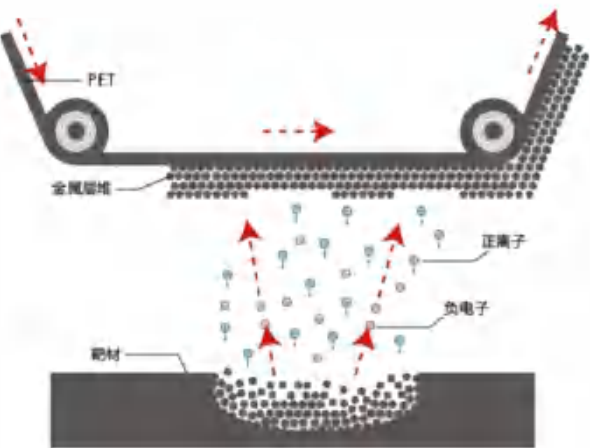
(image of material surface under microscope)
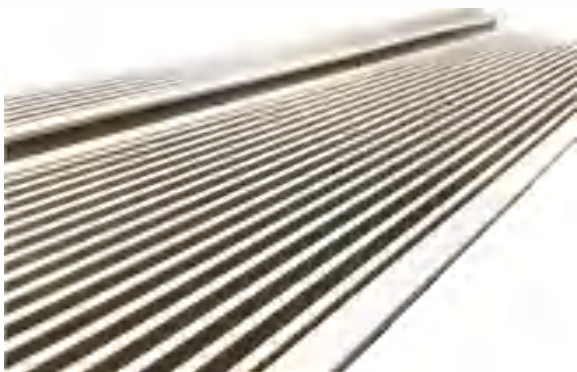
## ■ Test report

■ Order Code

PSG/W*H

W is the width
H is the height

■Characteristic

"Micro electrostatic" purification technology, no consumables, no noise, no ozone,can remove 99% of PM2.5, methanal, influenza virus and other air pollutants,At the same time, the wind resistance is small and energy-saving, so as to protect the surface cooler of fan coil or air-conditioning box, and avoid the dirty and blocked rabbit coil and reduce the heat exchange.

The honeycomb structure of micro electrostatic filter also greatly improves the dust capacity, doubles the absorption area, and the purification effect is more remarkable.KST EF micro electrostatic return air purifier can Concealed in return air inlet of central air-conditioning without destroying decoration and occupying floor space,can be applied to both fluorine and water systems

Air supply

Air Quality Fan Coil purifier

Air outlet

Return air

Air inlet
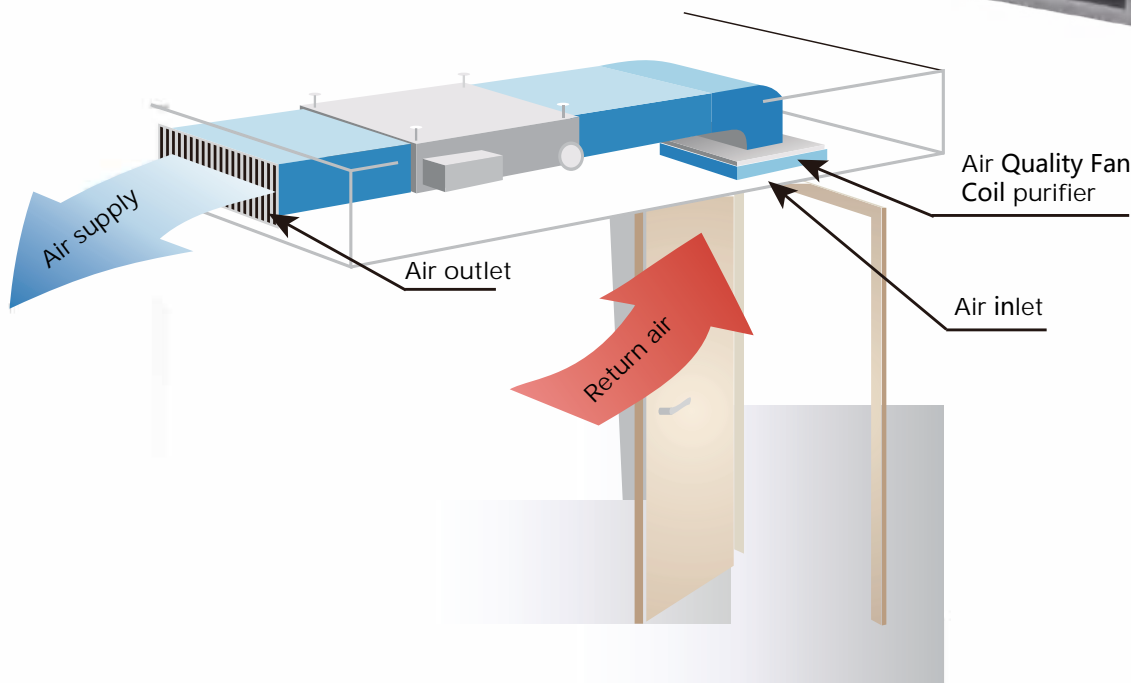
MESP Technology

0 material consumption

low energy consumption
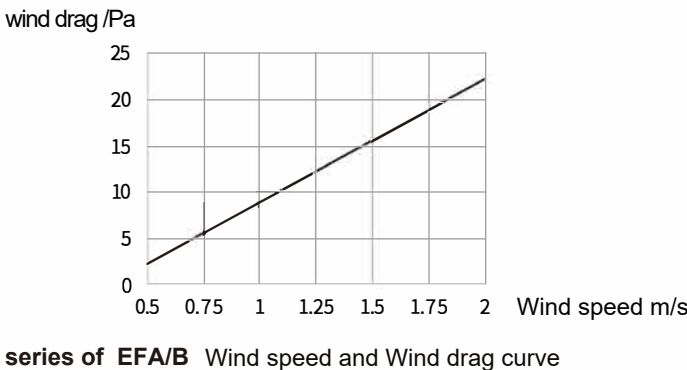
Remove methanal dust and bacteria

Low pressure drop

3-D air circulation

■Product executive standard

GB 15982-2012;
WS/T 648-2019;
《Technical specification for disinfection》（Ministry of Health ,2002）；
Q31/0113000146C002-2021(1);
GB/T 34012-2017;
GB 4706.1-2005;
GB 4706.45-2008(2)。

■Resistance curve

wind drag /Pa

series of EFA/B   Wind speed and Wind drag curve

■Technical Specification

Product Model	EF03A	EF05A	EF06A	EF08A
Overall Dimensions(L*W*T mm)	660*241*90	960*241*90	1170*241*90	1470*241*90
Applicable Air Volume(m³/h)(@0.5-1-1.5m/s)	170～340～510	280～570～850	340～690～1020	460～920～1360
PM2.5 One-time Purification Efficiency (@0.5-1-1.5m/s)	98-93-90%			
Microorganism PurificationEfficiency (@1.25m/s)	≥90%			
Pressure Drop (Pa)(@0.5-1-1.Sm/s)	2.5-9-15			
Disinfection method and certification	Electrostatic sterilization(Sterilizer certification)			
Bactericidal rate(%)	99.93（Staphylococcus albus)			
Viruses killing rate(min)	60			
Power Supply(V/hz)	110-240～/50-60			
Rated power(W)	5	6	7	8
Status indication	Running / Cleaning			
Net Weight(Kg)	4.5	6.5	8	9.5

Product Model	EF03B	EF05B	EF06B	EF08B
Overall Dimensions(L*W*T mm)	700*241*145	1000*241*145	1204*241*145	1504*241*145
Applicable Air Volume(m3/h) (@0.5-1-1.5m/s)	170～340~510	280~570~850	340~690~1020	460~920~1360
PM2.5 One-time Purification Efficiency (@0.5-1-1.5m/s)	98-93-90%			
Microorganism Purification Efficiency (@1.25m/s)	≥90%			
Pressure Drop (Pa)(@0.5-1-1.Sm/s)	2.5-9-15			
Disinfection method and certification	/			
Bactericidal rate(%)	/			
Viruses killing rate(min)	/			
Power Supply(V/hz)	110-240~ / 50-60			
Rated power(W)	5	6	7	8
Status indication	Running / Cleaning			
Net Weight(Kg)	5.5	7	8.5	10

Notes:
1.The overall dimensions, rated power, weight, negative ion content and other data are laboratory measured values, which are only for reference;
2.Standard wind tunnel switch (suitable for fluorine machine / water machine), a series is front extraction, and B series is side extraction.