

## Medical Vacuum Filters



## Medical center suction system filtration



Medical vacuum systems are widely used in medical and surgical procedures, providing timely and reliable suction power. In the environment, increasing sensitivity to contamination and protection against infection make filtration a necessity for these systems.

### The necessity of vacuum filtration

The necessity of vacuum system filtration has been widely popularized. Insufficient inlet filtration can damage vacuum pumps, compromise vacuum levels, cause contamination, and lead to equipment shutdown. Contaminants in the inlet line include particles, dust, water vapor, and other gases. Outlet emissions may also include particles, oil, and harmful gases. Professional inlet and exhaust filters can effectively handle these contaminants.

### Professional sterilization filtration

For any vacuum system pipeline and outlet there is a risk of carrying a large number of bacteria, in order to protect the health of patients, medical staff, other service personnel and the general public, countries around the world many years ago proposed to install and maintain bacterial filters. If the vacuum pump is not installed in front of the filter or the filter is not maintained, it will not only damage the vacuum pump, but also make the vacuum pump a source of bacterial pollution. The appropriate temperature and humidity of the vacuum pump are ideal hotbeds for bacterial growth, which will pose a risk to the vacuum pump itself from a technical point of view, and eventually lead to the replacement of the vacuum pump.

### International regulations

The original protocol HTM22 was issued by the UK Department of Health and Social Safety in 1972 and specified that the smoke test for sodium filtration efficiency should reach 99.95%. It was updated in 1994 with HTM2022 and continued to be upgraded in 1997 and May 2006. The latest protocol document HTM02-01 for Medical Gas Piping systems covers system design and operation. It clarifies the requirements of the bactericidal filter, while increasing the filtration efficiency to 99.995%. Authoritative departments in other countries around the world also follow this regulation, including the Canadian CSA standard, Z7396.1 - 06 - Medical gas pipeline systems - Part 1: Pipelines for medical gases and vacuum, which requires the installation of sterilizing filters at the inlet of vacuum pumps.

### Performance requirements of vacuum sterilizing filter

#### Explanation of Sterilization Filters in UK Health Memos 9.28 to 9.31

According to the test method of BS3928:1969, the filtration efficiency exceeds 99.995% Under the condition of a vacuum degree of 630 mbar, the pressure loss does not exceed 30 mbar

The filter has a condensation collection function and is equipped with a transparent sterilizable collection cup

The sterilizing filter needs to be labeled with "Biohazard"

Instructions for filter replacement and disposal are required

#### AS2896 Medical Gas System describes the inlet filter as follows:

The medical inlet filter should be a bacterial filter, with a suitable size to ensure that the pressure difference does not exceed 3.5KPa. The filter element should meet the ISO8573.1 Level 1 requirement for a filtration efficiency of 0.01  $\mu$  m.

#### The provisions of China GB50751-2012 Medical Gas engineering Technical Specification for sterilization filters:

5.2.16 The filtration accuracy is 0.01-0.2 $\mu$ m, and the filtration efficiency is 99.995%. The sterilizing filter should be maintained and the filter element replaced in time to avoid excessive pressure drop affecting the system flow.



## Medical Vacuum Filters

The filtration of medical vacuum is not limited to particles, oil, and water vapor. Bacterial filtration has become an important means of protecting health and safety, which has been widely recognized. CSA (Canadian Standards Certification) has clearly stated these requirements, and HTM02-01 has also been specifically detailed.

It is also recommended to use an exhaust filter at the vacuum pump outlet to remove smoke and odors.

Our company provides a full range of medical vacuum filtration products, which use the sterilization filter elements from WALKER in the UK. This not only meets the current international standards, but also provides more optimized performance. The Walker sterilization filter has been widely recognized by medical institutions around the world.

SR Medical Vacuum Filters fully meet the guidance of HTM02-01 and GB50751-2012, and are professionally designed to protect equipment from liquid, solid particles and bacterial contamination.

The filter adopts a cast aluminum housing, with anodic protection applied inside and outside the housing, and the outermost layer is coated with 100  $\mu\text{m}$  polyester powder.

The CAMR testing institution independently tests according to BS3928, with an efficiency exceeding 99.9999%, surpassing the stipulated requirement of 99.995%.

The initial dry and clean differential pressure of the filter does not exceed 3 KPa.

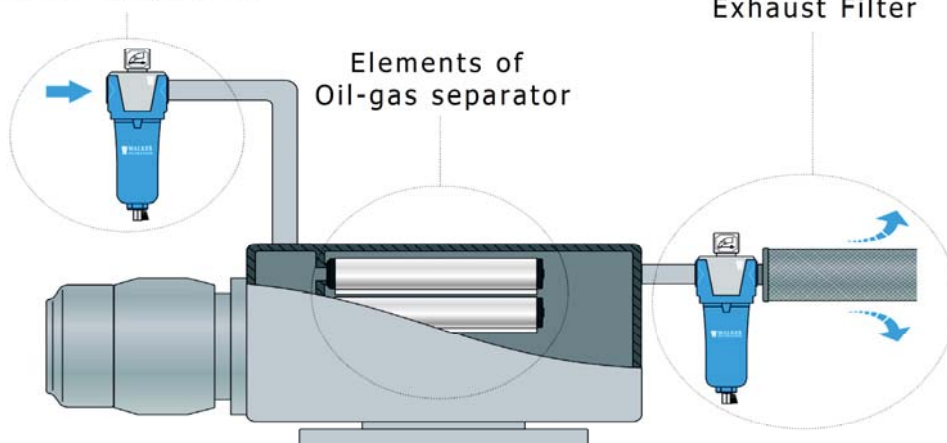
All models are equipped with ball valves and sterilizable collection bottles.

MV filter clearly marked with "Biohazard"

Multilayer folding technology and extremely special filter materials provide ultra-low differential pressure, high efficiency and long service life. The filter element adopts WALKER's specially customized borosilicate ultrafine fibers. Its solid structure can withstand harsh environments and has super corrosion resistance.

Each filter element has a unique serial number and is manufactured according to the ISO9001-2008 procedure. Each filter element comes with a quality certificate.

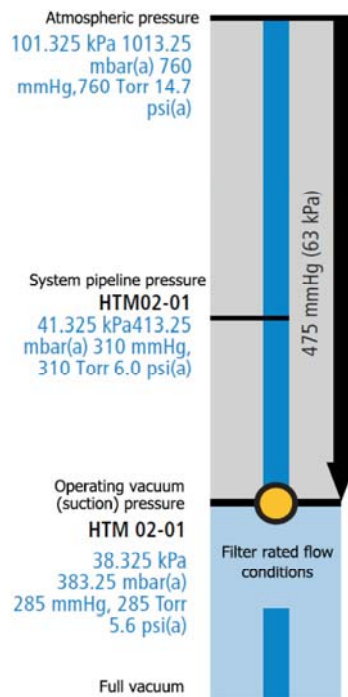
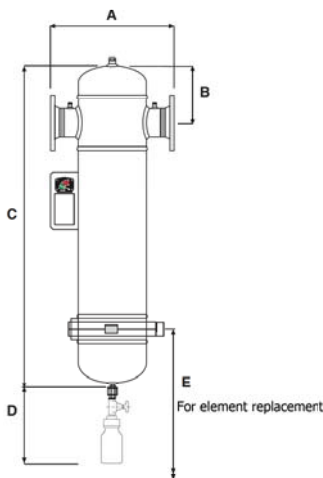
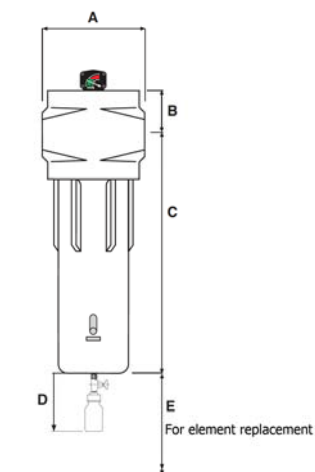
Medical Vacuum Filter



# Technical Specification

Filter Model	Pipe size	Maximum rated flow at atmospheric pressure	Maximum rated flow at an operating vacuum(suction) pressure of 475 mmHg		Dimensions mm					Weight Kg	Element Model	No. of elements
			Free air aspirated	Rarified air flow								
		Nm³/h	Nm³/h	Nm³/h	A	B	C	D	E			
S10MV	Rc1/2	12	7	17	89	42	194	—	130	1.1	D025MV	1
S20MV	Rc3/4	24	13	35	120	58	251	—	172	2.4	D040MV	1
S50MV	Rc1	45	25	66	120	58	351	—	272	2.9	D085MV	1
S100MV	Rc1 1/2	96	54	140	120	58	351	—	272	2.9	D085MV	1
S120MV	Rc2	165	92	240	160	66.5	510	—	272	6.6	D195MV	1
S160MV	Rc2	195	109	284	160	66.5	816	—	320	10.8	D250MV	1
S180MV	Rc2 1/2	205	115	300	160	66.5	816	—	320	10.8	D250MV	1
S250MV	Rc3	252	141	367	202	79	602	—	400	12.5	D400MV	1
S300MV	Rc3	358	200	521	202	79	844	—	625	17.5	D500MV	1
F160MV	DN50	195	109	284	304	115	917	335	350	29	D250MV	1
F250MV	DN80	330	185	480	390	177	1077	335	650	64	D400MV	1
F300MV	DN80	358	200	521	390	177	1077	335	650	65	D500MV	1
F400MV	DN100	585	328	852	450	201	1140	335	650	95	D250MV	3
F500MV	DN100	780	437	1136	500	230	1220	335	650	135	D250MV	4
F600MV	DN150	1170	655	1704	580	273	1294	335	650	177	D250MV	6

Nm³/h is the flow rate at 20 °C under standard atmospheric pressure



	MV
Element end cap colour	● black
Particle removal efficiency According to HTM 02-01, the filtration efficiency of the bacterial filter must exceed 99.995% under the sodium chloride salt spray test conditions as stipulated in BS3928:1969.	>99.9999% ( HTM 02-02 specifies >99.995%)
Maximum temperature	60°C (140°F)
Pressure loss - clean & dry HTM 02 - 01 states that under a vacuum of 475 mmHg (63 kPa), the pressure drop of a clean filter at its rated flow rate does not exceed 25 mmHg (3 kPa).	≤ 3 kPa (30 mbar / 0.44 psig)
Pressure loss - element change The filter element needs to be replaced every six months or 1,000 working hours (whichever comes first), or when the recommended pressure differential is reached.	ΔP = 100 mbar (1.5 psig) or 1000 hours or 6 months (whichever comes first)
Maximum working pressure	0.5 barg (7 psig)
Maximum working vacuum	Full vacuum
Direction of flow	from outside to inside

**SR**  
Gas Purification Solutions

SR Filtration Technology(Dalian) Co.,Ltd.  
Sendfin Technologies(Dalian) Co.,Ltd.

Room 804, Yuetaiwanli No.1 Building, No.454 Gaoerji Road,  
Shahekou District, Dalian, Liaoning, China  
Tel: 0411-84508899 Fax: 0411-84625285  
Web: www.gas-psi.com