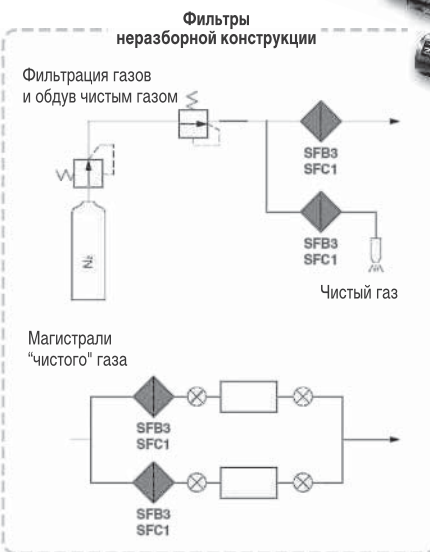


Предназначены для микроочистки газов и их смесей в системах формирования технологических сред

- Совместимы со средами, неагрессивными к SUS316 и PTFE
- Конструкция дискового или патронного типа, неразборные и разборные исполнения
- Номинальная тонкость фильтрации мембранных фильтрующих элементов 0.01 мкм, сетчатых - 120 мкм
- Рабочая температура до 120°C
- Различные варианты соединения с трубопроводом (резьба, соединения типа VCR® или Swagelok®)
- Сборка в чистых зонах класса M3.5, расположенных в чистых комнатах класса M5.5
- Антистатическая герметичная двойная упаковка
- 100% контроль герметичности



Примеры использования фильтра микроочистки газов



Обзор программы поставки

	Тип	Серия	Номинальная тонкость фильтрации (мкм)	Тип фильтрующ. элемента	Пропускная способность (норм.л/мин.)*	Давление (МПа)	Рабочая темп-ра (°C)
Фильтры со сменным элементом	Дисковый	SFA10	0.01	Мембранный	26	0.99	5 ~ 80
		SFA20			70		
		SFA30			140		
	Патронный	SFB10	120 (по запросу: 1, 2, 5, 10, 20, 40, 70 и 100 мкм)	Из спеченного металла, сетчатый	45		
SFB20	400						
Фильтры неразборной конструкции	Патронный	SFB30	0.01	Мембранный	45		5 ~ 120
	Дисковый	SFC10			240		

*Давление на входе 0.7 МПа, перепад давления 0.02 МПа

Фильтры микроочистки газов

SF

Технические характеристики

Модель	SFA100/200/300	SFB100	SFB200	SFB300	SFC100
Среда	Сжатый воздух, азот, среды, неагрессивные к материалам фильтра				
Макс. рабочее давление	0.99 МПа, вакуум: $1.3 \cdot 10^{-6}$ кПа				
Рабочая температура (°C)	5 ~ 80			5 ~ 120	
Испытательный перепад давления (МПа)	0.1	0.5	1	0.5	0.42
Максимальный перепад давления в обратном направлении (МПа)	0.05	0.07	1	0.07	0.07
Номинальная тонкость фильтрации (мкм)	0.01 (задерживающая способность по частицам размером 0,01 мкм не менее 99.99%)		120	0.01 (задерживающая способность по частицам размером 0,01 мкм не менее 99.99%)	
Остаточное содержание твердых частиц размером более 0.1 мкм	0 шт. в 6 л		-	0 шт. в 6 л	
Герметичность - по скорости утечки гелия (Па·м³/с)	-		-	Не более $4 \cdot 10^{-9}$	
Материалы	Корпус	Сталь нержавеющая SUS316, электролитическая полировка наружной и внутренней поверхности*			
	Фильтрующий элемент	Мембрана из PTFE		Спеченный металлический порошок из SUS316	Мембрана из PTFE
	Уплотнения	FKM		Сталь нерж. SUS304	PTFE
Упаковка	Антистатическая герметичная двойная упаковка			-	-

*SFB100 с корпусом из сплава алюминия по запросу

Конструкция

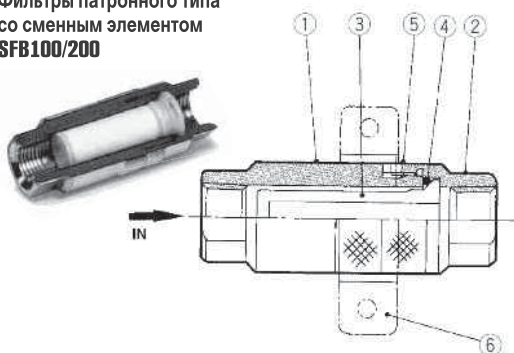
Фильтры дискового типа со сменным элементом SFA100/200/300



Спецификация

Поз.	Наименование	Материал	Примечание
1	Корпус	SUS316	Электролитическая полировка наружной и внутренней поверхности
2	Хомут	SUS304	-
3	Держатель 1	Полиэфирный	Сменный картридж состоит из поз. 3 - 7
4	Держатель 2	пластик	
5	Фильтрующий элемент	PTFE	
6	Уплотнение	FKM	
7	Уплотнение		

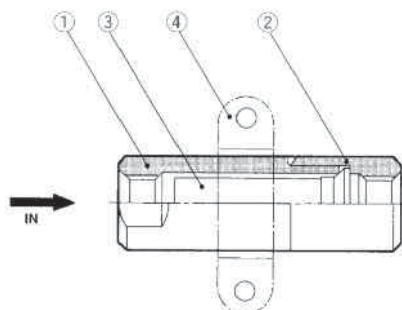
Фильтры патронного типа со сменным элементом SFB100/200



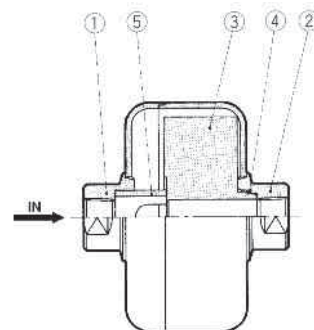
Спецификация

Поз.	Наименование	Материал	Примечание
1	Корпус	SUS316	Электролитическая полировка наружной и внутренней поверхности
2	Крышка		
3	Мембранный	PTFE	Для SFB100
	Сетчатый	Спеченный металлический порошок из SUS316	Для SFB200
4	Уплотнение	FKM	-
5	Винт М3 с внутр. шестигранником	SUS304	-
6	Кронштейн		Входит в комплект поставки

Фильтры патронного типа неразборной конструкции SFB300



Фильтры дискового типа неразборной конструкции SFC100



Спецификация

Поз.	Наименование	Материал	Примечание
1	Корпус	SUS316	Электролитическая полировка наружной и внутренней поверхности
2	Крышка		
3	Фильтрующий элемент	PTFE	Мембранный
4	Кронштейн	SUS316	Входит в комплект поставки

Поз.	Наименование	Материал	Примечание
1	Корпус 1	SUS316	Электролитическая полировка наружной и внутренней поверхности
2	Корпус 2		
3	Фильтрующий элемент	PTFE, PVDF	-
4	Уплотнение	PTFE	-
5	Проставка	PVDF	-

Номер для заказа

Фильтры дискового типа со сменным элементом SFA100/200/300

Номер для заказа	Пропускная способность (норм.л/мин.) ¹⁾	Присоединение	Площадь фильтрующей поверхности (см ²)	Номер для заказа фильтрующего элемента в сборе ²⁾	Вес (кг)
SFA100-02	26	Rc1/4	13.85	ED001S-X10V	0.34
SFA101-02		NPT1/4 (внутр. резьба)			
SFA200-02	70	Rc1/4	33.18	ED101S-X10V	0.44
SFA201-02		NPT1/4 (внутр. резьба)			
SFA300-02	140	Rc1/4	56.75	ED201S-X10V	0.66
SFA301-02		NPT1/4 (внутр. резьба)			
SFA102-02	26	TSJ1/4	13.85	ED001S-X10V	0.38
SFA202-02	70		33.18	ED101S-X10V	0.49
SFA302-02	140		56.75	ED201S-X10V	0.70
SFA103-02	26	UOJ1/4	13.85	ED001S-X10V	0.42
SFA203-02	70		33.18	ED101S-X10V	0.53
SFA303-02	140		56.75	ED201S-X10V	0.75

1) Давление на входе 0.7 МПа, перепад давления 0.02 МПа

2) Состоит из поз. 3 - 7

Фильтры патронного типа со сменным элементом SFB100/200

Номер для заказа	Тип фильтрующего элемента	Пропускная способность (норм.л/мин.) ¹⁾	Присоединение	Площадь фильтрующей поверхности (см ²)	Номер для заказа фильтрующего элемента в сборе ²⁾	Вес (кг)
SFB100-02	Мембранный	45	Rc1/4	10	ED301S-X10V	0.15
SFB101-02			NPT1/4 (внутр. резьба)			
SFB102-02			TSJ1/4			
SFB103-02			UOJ1/4			
SFB104-M5			M5 (внутр. резьба)			
SFB200-02	Сетчатый	400	Rc1/4	ES001S-120V	0.16	
SFB201-02			NPT1/4 (внутр. резьба)			
SFB202-02			TSJ1/4			
SFB203-02			UOJ1/4			

1) Давление на входе 0.7 МПа, перепад давления 0.02 МПа

2) Уплотнения в комплекте

Фильтры патронного типа неразборной конструкции SFB300

Номер для заказа	Корпус	Пропускная способность (норм.л/мин.) ¹⁾	Присоединение	Площадь фильтрующей поверхности (см ²)	Вес (кг)
SFB300-02	Стандартный	26	Rc 1/4	10	0.14
SFB302-02			TSJ1/4		0.15
SFB305-02			URJ1/4		0.14
SFB315-02	Удлинённый		URJ1/4		0.15

1) Давление на входе 0.7 МПа, перепад давления 0.02 МПа

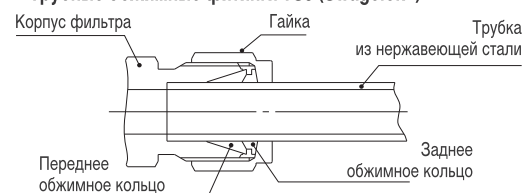
Фильтры дискового типа неразборной конструкции SFC100

Номер для заказа	Пропускная способность (норм.л/мин.) ¹⁾	Присоединение	Площадь фильтрующей поверхности (см ²)	Вес (кг)
SFC100-02	240	Rc 1/4	300	0.35
SFC100-03		Rc 3/8		0.36
SFC102-02		TSJ1/4		0.40
SFC102-03		TSJ3/8		0.41
SFC105-02		URJ1/4		0.44
SFC105-03		URJ3/8		0.49

1) Давление на входе 0.7 МПа, перепад давления 0.02 МПа

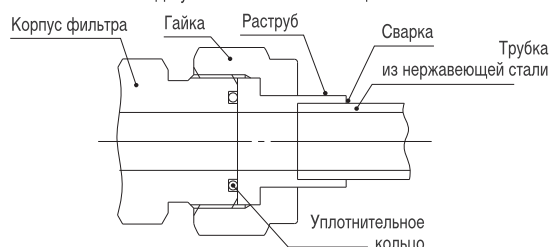
Конструкция фитингов

Трубные обжимные фитинги TSJ (Swagelok®)



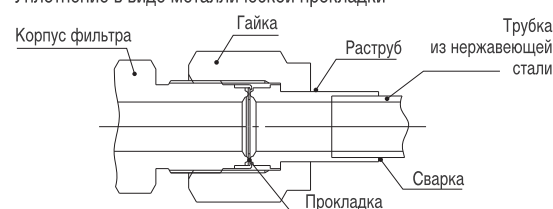
Фитинги с торцевым уплотнением под приварку в раструб UOJ (VCO®)

Уплотнение в виде уплотнительного кольца



Фитинги с торцевым уплотнением под приварку в раструб URJ (VCR®)

Уплотнение в виде металлической прокладки



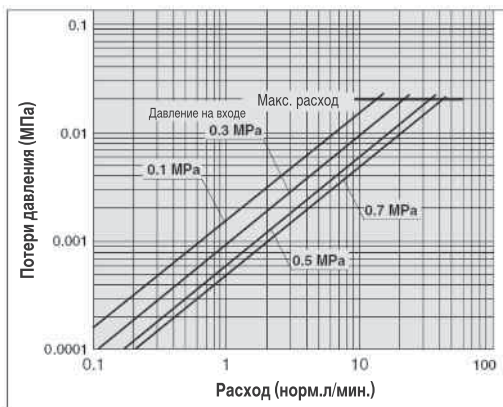
Фильтры микроочистки газов SF

Технические характеристики

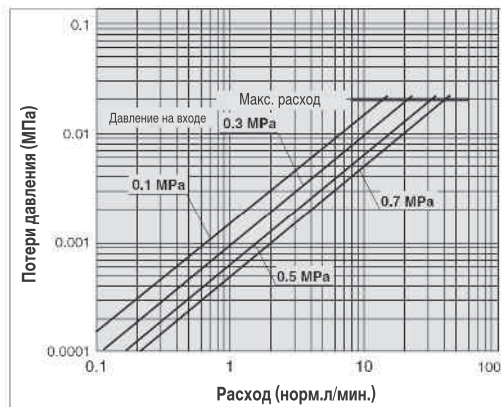
Пропускная способность по сжатому воздуху

Среда: сжатый воздух. Температура на входе 20 °C

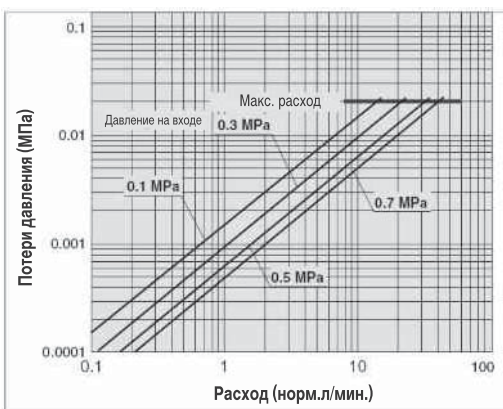
SFA10□



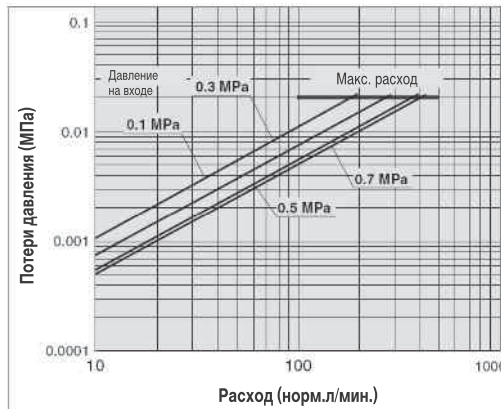
SFB10□-02



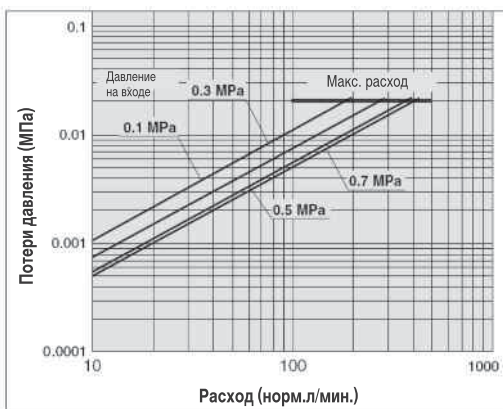
SFA20□



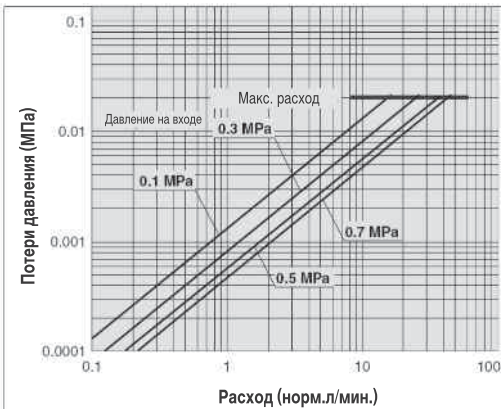
SFB20□-02



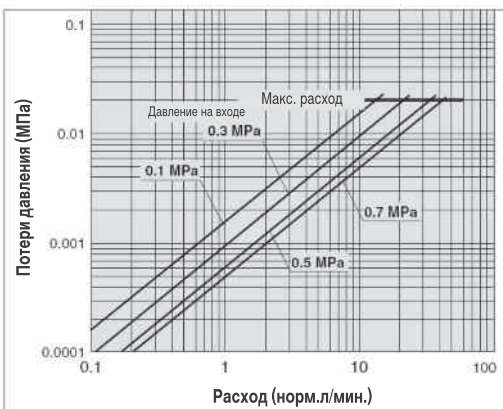
SFA30□



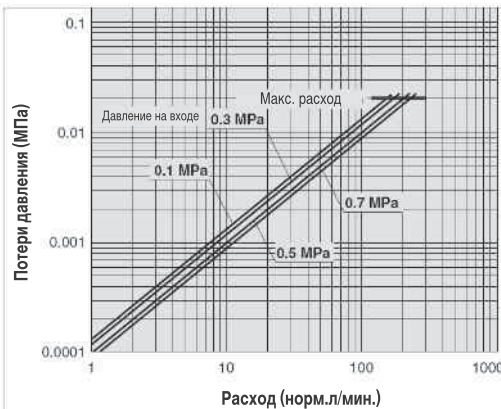
SFB30□-02



SFB104-M5



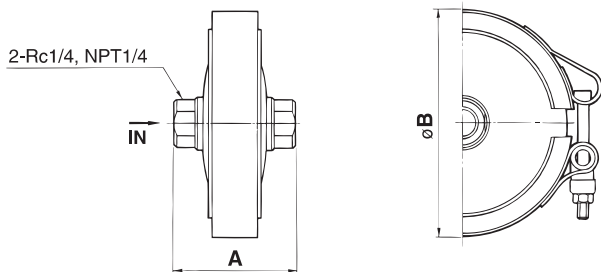
SFC10□



Размеры

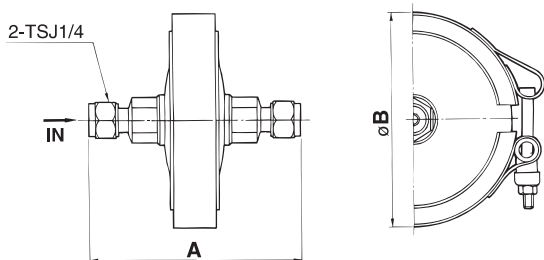
Фильтры дискового типа со сменным элементом
SFA100/200/300

SFA100/101, SFA200/201, SFA300/301



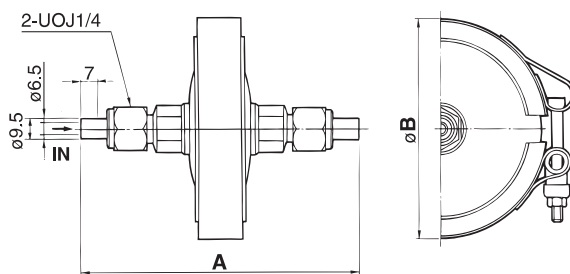
Модель	Присоединение	A	ØB
SFA100-02	Rc 1/4	46	76
SFA101-02	NPT 1/4		
SFA200-02	Rc 1/4	51	96
SFA201-02	NPT 1/4		
SFA300-02	Rc 1/4	59	120
SFA301-02	NPT 1/4		

SFA102, SFA202, SFA302



Модель	Присоединение	A	ØB
SFA102-02	TSJ1/4	89	76
SFA202-02		93	96
SFA302-02		101	120

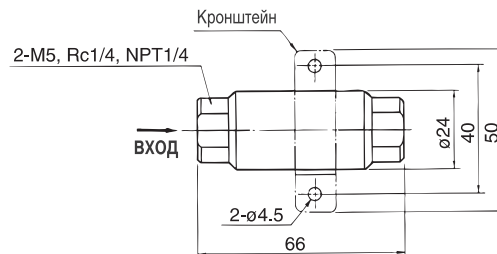
SFA103, SFA203, SFA303



Модель	Присоединение	A	ØB
SFA103-02	UOJ1/4	117	76
SFA203-02		122	96
SFA303-02		130	120

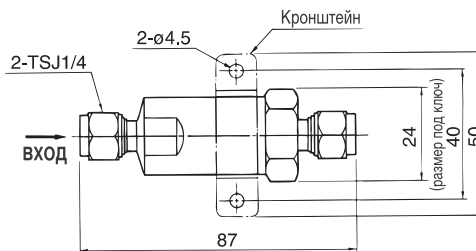
Фильтры патронного типа со сменным элементом
SFB100/200

SFB100/200: Rc1/4
SFB101/201: NPT1/4
SFB104: M5

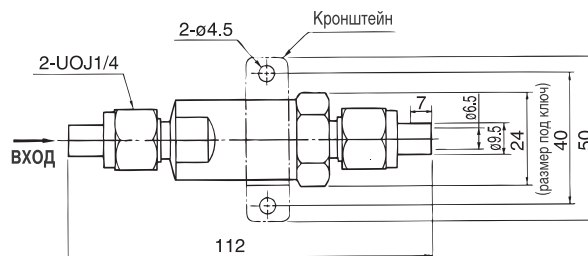


Модель	Присоединение
SFB100-02 / 200-02	Rc 1/4
SFB101-02 / 201-02	NPT 1/4
SFB104-M5	M5

SFB102-02, SFB202-02: TSJ1/4



SFB103-02, SFB203-02: UOJ1/4

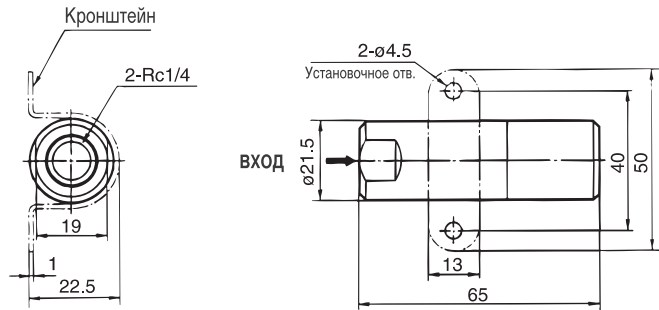


Фильтры микроочистки газов SF

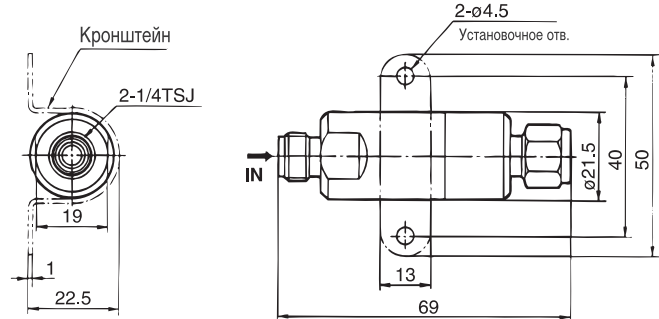
Размеры

Фильтры патронного типа неразборной конструкции
SFB300

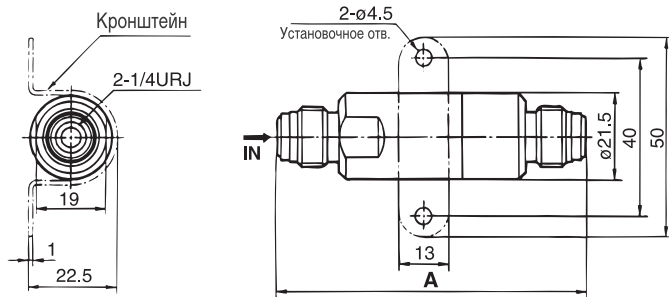
SFB300-02: Rc1/4



SFB302-02: TSJ1/4



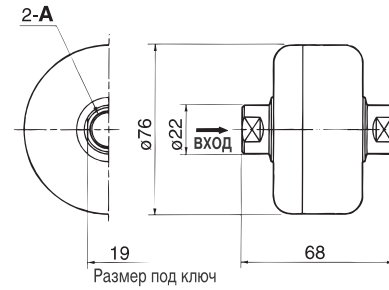
SFB305-02, SFB315-02: URJ1/4



Модель	A
SFB305-02	79
SFB315-02	84

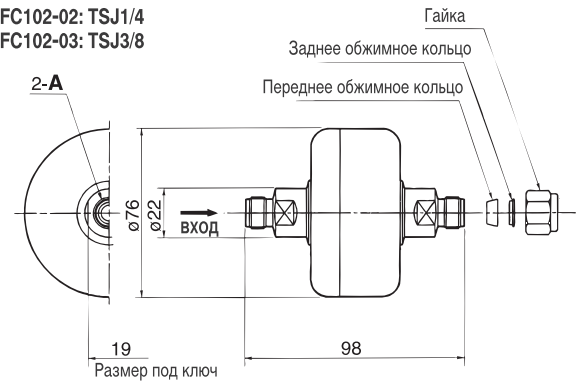
Фильтры дискового типа неразборной конструкции
SFC100

SFC100-02: Rc1/4
SFC100-03: Rc3/8



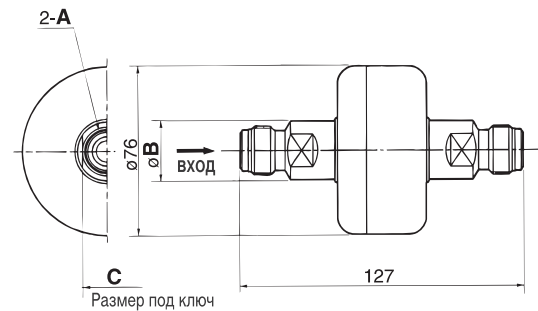
Модель	A
SFC100-02	Rc 1/4
SFC100-03	Rc 3/8

SFC102-02: TSJ1/4
SFC102-03: TSJ3/8



Модель	A
SFC102-02	TSJ1/4
SFC102-03	TSJ3/8

SFC105-02: URJ1/4
SFC105-03: URJ3/8



Модель	A	B	C
SFC105-02	URJ1/4	22	19
SFC105-03	URJ3/8	26.5	22

Предназначен для финишной очистки сжатого воздуха от твердых частиц размером свыше 0.01 мкм. Применяется для защиты прецизионного и измерительного оборудования

- Мембрана из полых волокон
- Высокая эффективность очистки (99.99%)
- Начальный перепад давления 0.03 МПа (при давлении на входе 0.7 МПа, максимальном расходе)
- Максимальное рабочее давление 1.0 МПа (при 20°C)
- Быстроразъемное или резьбовое присоединение
- Исполнение со сменным фильтрующим элементом SFD200
- Модификации с корпусом из алюминия или нержавеющей стали (для применения в агрессивных средах) поставляются по запросу
- 100% контроль качества на момент отгрузки:
 - все компоненты проходят ультразвуковую очистку
 - проводятся тесты на очистку и на воздухопроницаемость
 - производственный цикл осуществляется в чистых помещениях (M 5.5, ISO класс 7), на чистых поверхностях (M 3.5, ISO класс 5)

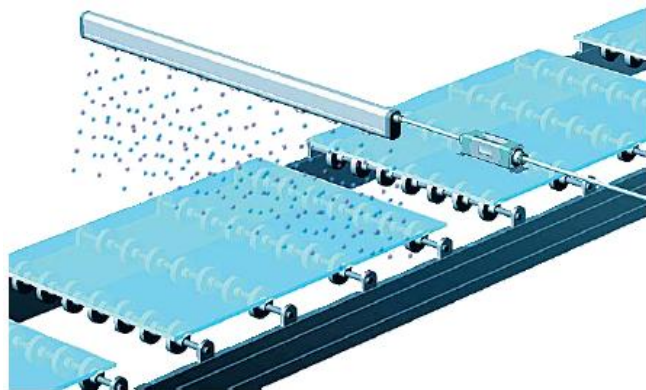


Примеры применения

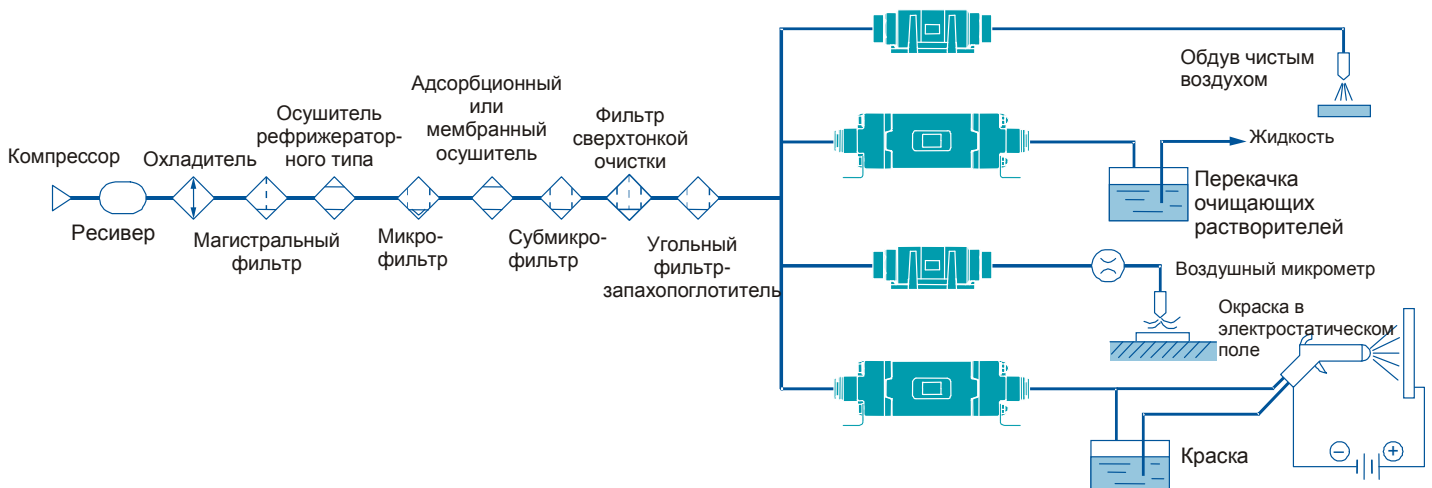
Обдув чистым сжатым воздухом



Защита прецизионного оборудования






Пример схемы подготовки воздуха



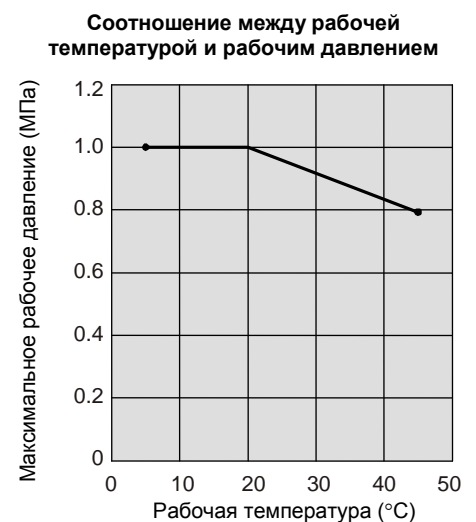
Примечание: Оборудование, установленное после SFD, должно быть очищено и иметь ту же степень чистоты, что и SFD.

Технические характеристики

		SFD100			SFD200			SFD101	SFD102
Типоразмер									
Тип		Одноразовый (несменный фильтроэлемент)			Многоразовый (сменный фильтроэлемент)				
Объемный расход (при входном давлении 0.7 МПа) (норм.л/мин)		≤ 60	≤ 80	≤ 100	≤ 300	≤ 400	≤ 500	≤ 100	
Присоединение	Быстроразъемное соединение для чистых сред	∅4	∅6	∅8	∅8	∅10	∅12	--	
	Резьбовое	-	-	G1/4	-	-	G1/4	G1/4	
Материал корпуса		Полимер			Полимер			Алюминий	Нерж. сталь
Среда		Сжатый воздух (Азот)							
Тонкость фильтрации (мкм)		0.01 (эффективность фильтрации 99.99%) ¹⁾							
Начальный перепад давления (МПа)		0.03 (при давлении на входе 0.7 МПа, максимальном расходе)							
Максимальное рабочее давление (МПа) ²⁾		1.0 (для азота – 0.99)							
Испытательный перепад давления (МПа)		0.5							
Испытательное давление (МПа)		1.5							
Рабочая температура (°C)		5-45							
Срок службы фильт. элемента		1 год, или при достижении перепада давления 0.1 МПа							

1) Фильтр предназначен для фильтрации твердых частиц. Фильтры этой серии непригодны для отделения частиц масла или воды.

2) Максимальное рабочее давление указано для 20°C. Для других температур – см. рисунок справа (соотношение между рабочей температурой и максимумом рабочего давления)



Номер для заказа

Типоразмер	Присоединение	Номинальный расход (норм. л/мин.)	Вес (г)	Материал корпуса	Номер для заказа	
SFD100	Быстроразъемное	Ø4	60	35	Полимер	SFD100-C04
		Ø6	80	35	Полимер	SFD100-C06
		Ø8	100	35	Полимер	SFD100-C08
	Резьбовое	G1/4	100	35	Полимер	SFD100-F02
SFD101	Резьбовое	G1/4	100	60	Алюминий	SFD101-F02
SFD102	Резьбовое	G1/4	100	150	Нерж. сталь	SFD102-F02
SFD200	Быстроразъемное	Ø8	300	190	Полимер	SFD200-C08
		Ø10	400	190	Полимер	SFD200-C10
		Ø12	500	190	Полимер	SFD200-C12
	Резьбовое	G1/4	500	260	Полимер	SFD200-F02

Примечание: фильтры с различными присоединениями на входе и выходе – по запросу.

Принадлежности (заказываются отдельно)

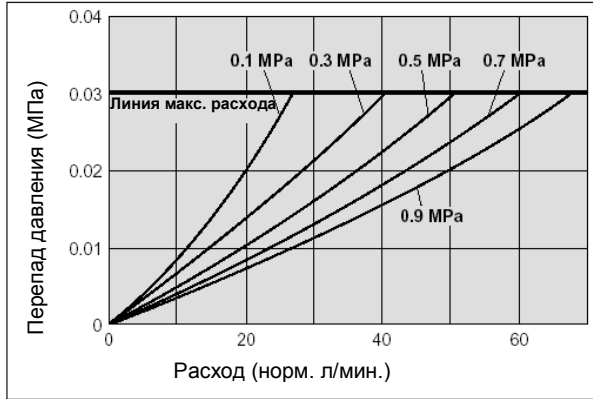
Наименование	Тип фильтра	Примечание	Номер для заказа
Крепление ¹⁾	SFD100	–	SFD-BR100
	SFD101	Входит в стандартный комплект поставки	SFD-BR101
	SFD102	Входит в стандартный комплект поставки	SFD-BR101
	SFD200	Входит в стандартный комплект поставки	–
Сменный фильтроэлемент	SFD101	С кольцевой прокладкой	SFD-EL101
	SFD102	С кольцевой прокладкой	SFD-EL101
	SFD200	С тремя кольцевыми прокладками	SFD-EL200

1) Два винта М3 с потайной головкой в комплекте.

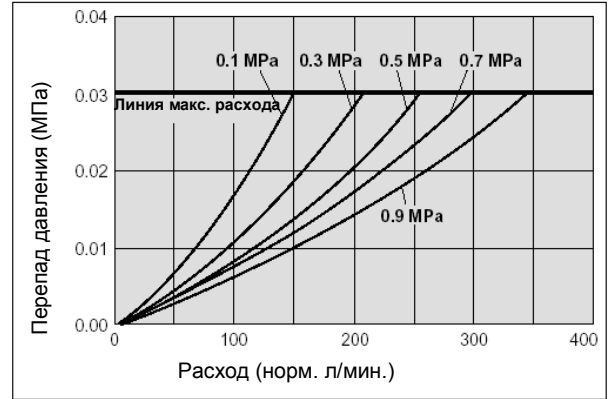
Характеристики расхода

Давление на входе 0.7 МПа

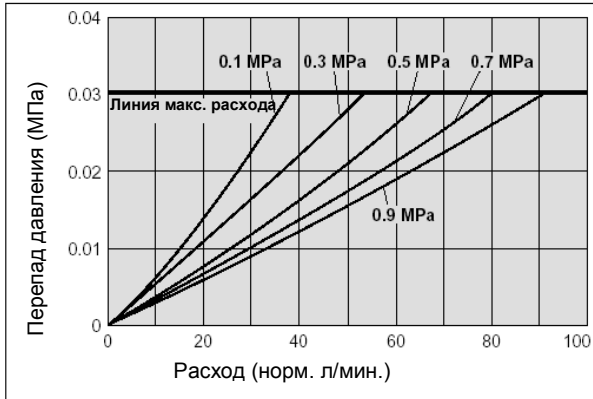
SFD100-C04



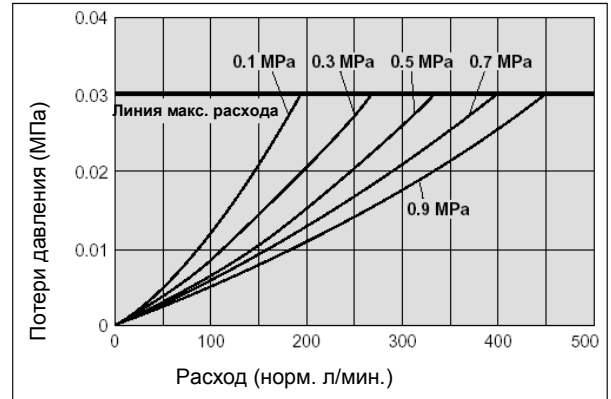
SFD200-C08



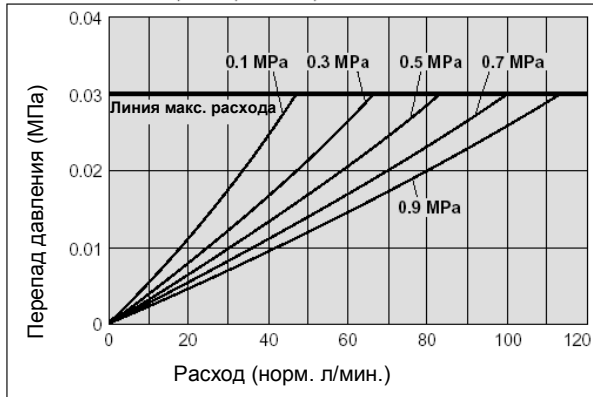
SFD100-C06



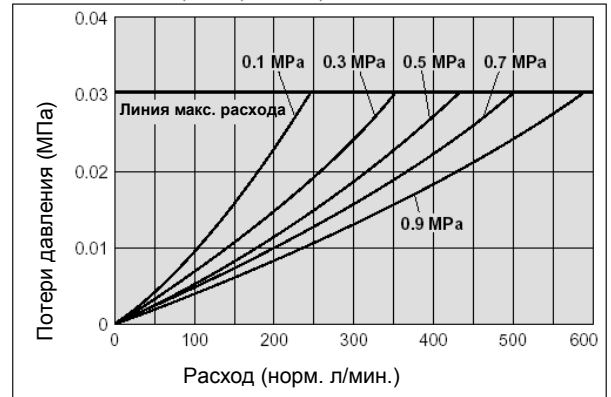
SFD200-C10



SFD100-C08, -02, -N02, -F02



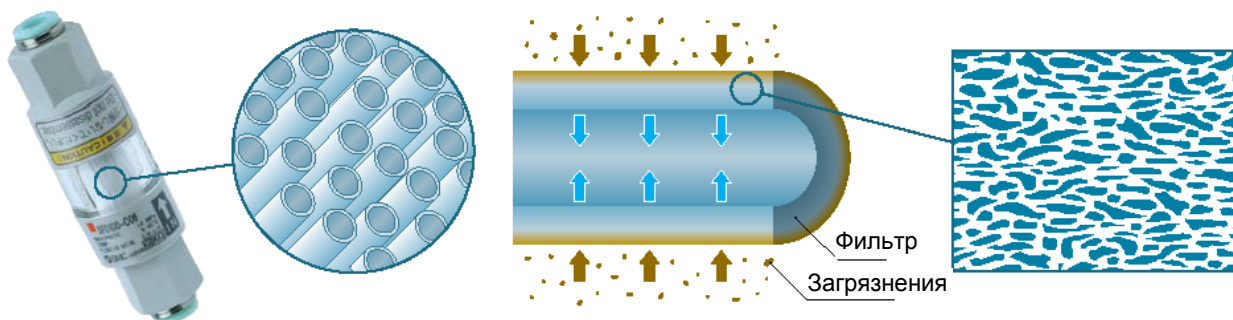
SFD200-C12, -02, -N02, -F02



Принцип действия

Мембрана из полых волокон имеет пористую структуру с многочисленными микропорами на «ворсистом» слое мембраны. Эти микропоры распределены в слоях, накладывающихся друг на друга между внутренней и внешней поверхностью мембраны.

Фильтроэлемент из такой мембраны улавливает и отфильтровывает в микропористых слоях примеси, содержащиеся в сжатом воздухе.



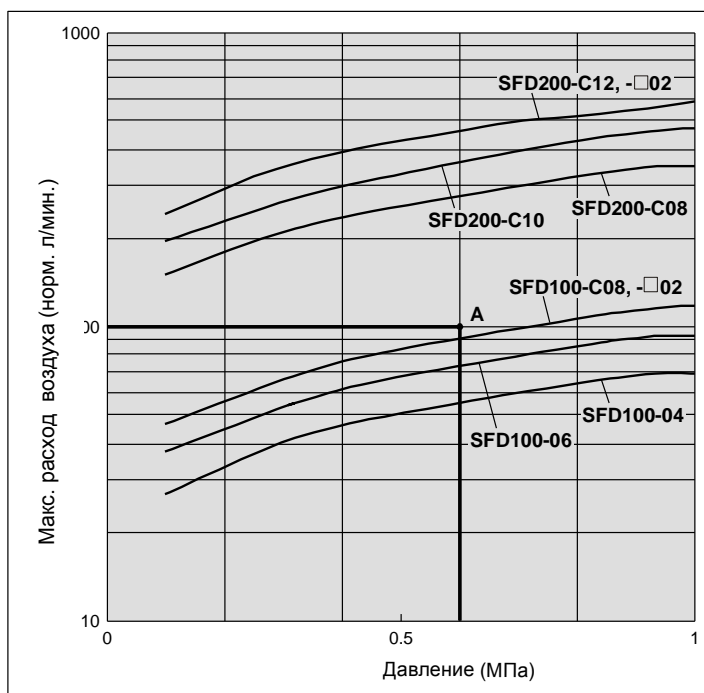
Выбор исполнения

Модель фильтра выбирается по значениям давления на входе и максимального расхода с использованием графика расходной характеристики (см. рис.):

[Пример] давление на входе: 0.6 МПа
максимальный расход: 100 норм.л/мин.

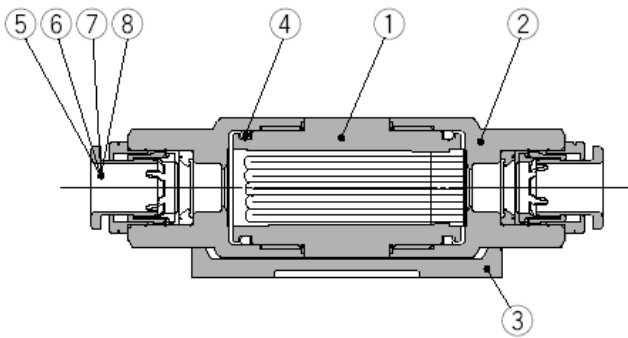
1. На графике расходной характеристики находим точку пересечения А для значений входного давления 0.6 МПа и максимального расхода 100 норм.л/мин.
2. Далее выбирается ближайшая к точке А кривая, расположенная выше. В данном случае это кривая для фильтра SFD200-C08.

Не следует использовать данные фильтры при расходах воздуха, превышающих расходы, указанные в технических характеристиках.



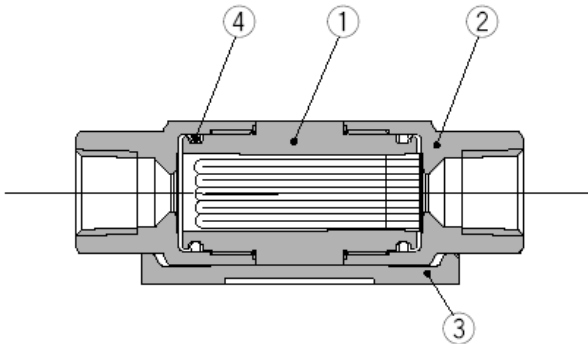
Конструкция

SFD100-C□



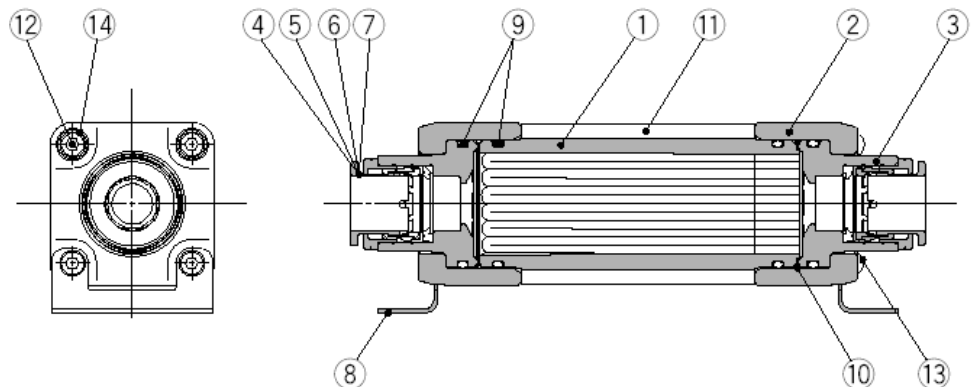
Поз.	Наименование	Материал
1	Фильтроэлемент	Корпус: очищенный полимер
2	Корпус	Полимер
3	Крепление	Полимер
4	Кольцевая прокладка	Резина
5	Уплотнение	Резина
6	Упругая прокладка	Резина
7	Стопор	Нерж. сталь
8	Кассета	Нерж. сталь

SFD100-F02



Поз.	Наименование	Материал
1	Фильтроэлемент	Корпус: очищенный полимер
2	Корпус	Полимер
3	Крепление	Полимер
4	Кольцевая прокладка	Резина

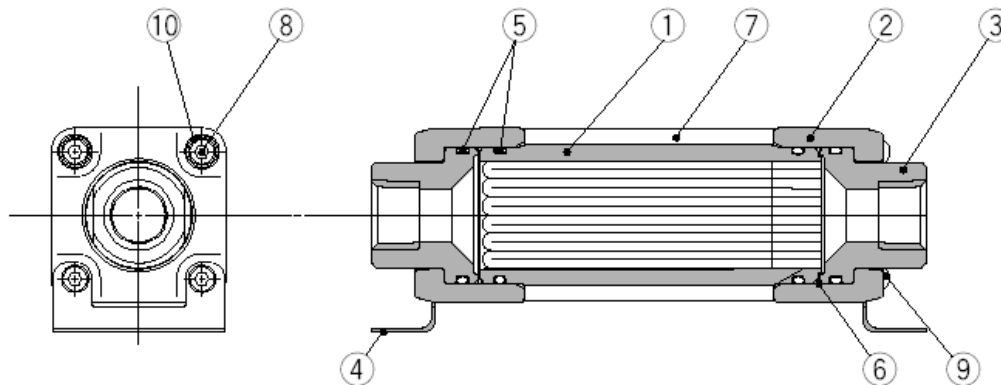
SFD200-C□



Поз.	Наименование	Материал
1	Фильтроэлемент	Корпус: очищенный полимер
2	Корпус	Алюминиевый сплав
3	Корпус быстроразъемного соединения	Полимер
4	Уплотнение	Резина
5	Прокладка	Резина
6	Стопор	Нерж. сталь
7	Кассета	Нерж. сталь
8	Крепление	Нержавеющая сталь
9	Кольцевая прокладка А	Резина
10	Кольцевая прокладка В	Резина
11	Крышка	Нерж. сталь
12	Шпилька	Нерж. сталь
13	Колпачковая гайка	Сталь, никелированная

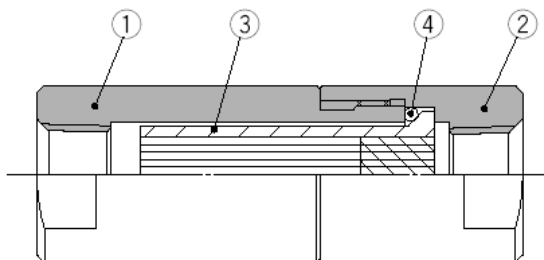
14	Плоская шайба	Сталь, никелированная
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SFD200-F02



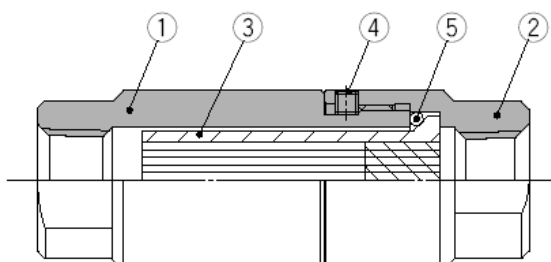
№	Наименование	Материал
1	Фильтроэлемент	Корпус: очищенный полимер
2	Корпус	Алюминиевый сплав
3	Корпус быстроразъемного соединения	Полимер
4	Крепление	Нержавеющая сталь
5	Кольцевая прокладка А	Резина
6	Кольцевая прокладка В	Резина
7	Крышка	Нерж. сталь
8	Шпилька	Нерж. сталь
9	Колпачковая гайка	Сталь, никелированная
10	Плоская шайба	Сталь, никелированная

SFD101-F02



№	Наименование	Материал
1	Корпус	Алюминиевый сплав
2	Крышка	Алюминиевый сплав
3	Фильтроэлемент	Корпус: очищенный полимер
4	Кольцевая прокладка	Резина

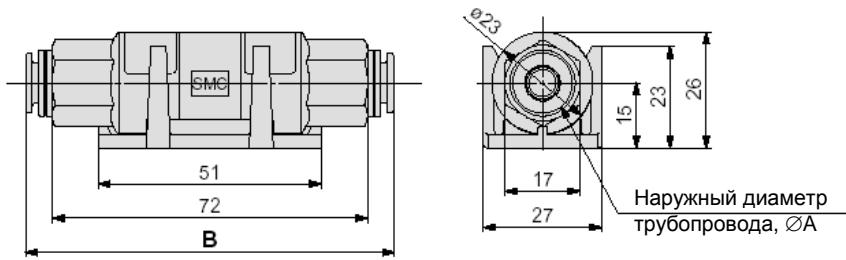
SFD102-F02



№	Наименование	Материал
1	Корпус	Нерж. сталь
2	Крышка	Нерж. сталь
3	Фильтроэлемент	Корпус: очищенный полимер
4	Стопорный винт	Нерж. сталь
5	Кольцевая прокладка	Резина

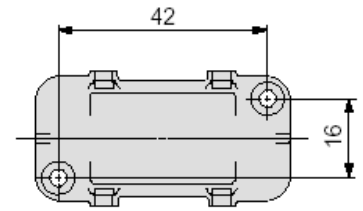
Размеры:

SFD100-C□

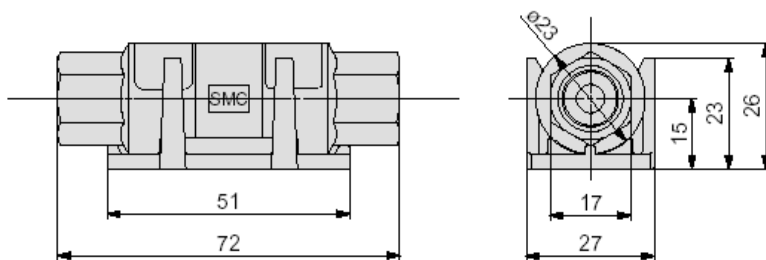


Модель	A	B	
SFD-100	C04	4	83
	C06	6	83
	C08	8	84

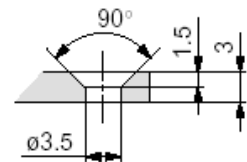
Установочные размеры



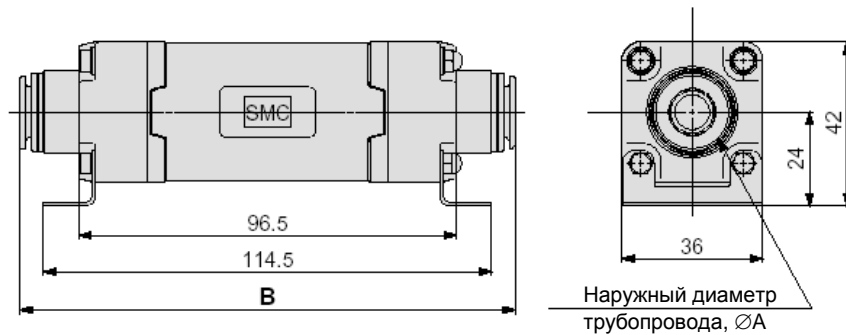
SFD100-F02



Установочное отверстие

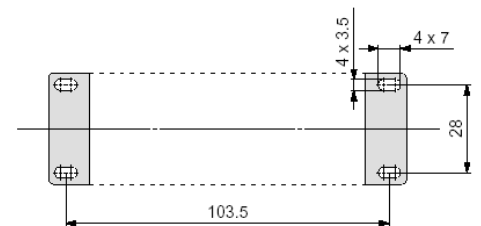


SFD200-C□

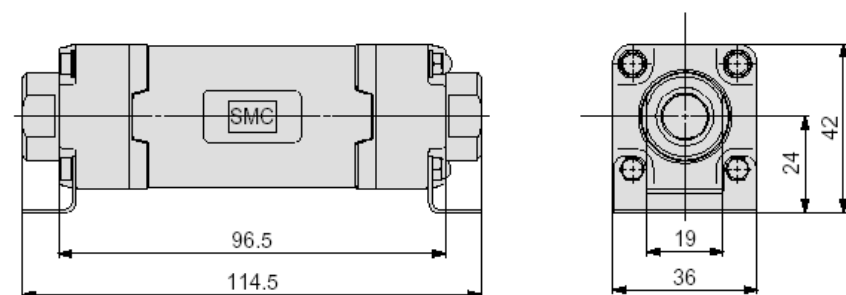


Модель	A	B	
SFD-200	C08	8	127
	C10	10	128
	C12	12	128

Установочные размеры



SFD200-F02



Related Products

<Pre-filters for Series SFD>

Mist Separator *Series AM*

Refer to pages 161 to 168 for details.



Series AM

Model	AM150C	AM250C
Rated flow (ℓ/min (ANR))	300	750
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure ^{Note)}	0.05 MPa
Proof pressure	1.5 MPa
Ambient temperature	5 to 60°C
Nominal filtration rating	0.3 μm (Filtering efficiency 99.9%)

Note) With auto drain: 0.1 MPa (N.O. type), 0.15 MPa (N.C. type)

Micro Mist Separator *Series AMD*

Refer to pages 169 to 177 for details.



Series AMD

Model	AMD150C	AMD250C
Rated flow (ℓ/min (ANR))	200	500
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure ^{Note)}	0.05 MPa
Proof pressure	1.5 MPa
Ambient temperature	5 to 60°C
Nominal filtration rating	0.01 μm (Filtering efficiency 99.9%)

Note) With auto drain: 0.1 MPa (N.O. type), 0.15 MPa (N.C. type)

Super Mist Separator *Series AME*

Refer to pages 187 to 194 for details.



Series AME

Model	AME150C	AME250C
Rated flow (ℓ/min (ANR))	200	500
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Proof pressure	1.5 MPa
Ambient temperature	5 to 60°C
Nominal filtration rating	0.01 μm (Filtering efficiency 99.9%)

Odor Removal Filter *Series AMF*

Refer to pages 195 to 203 for details.



Series AMF

Model	AMF150C	AMF250C
Rated flow (ℓ/min (ANR))	200	500
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Proof pressure	1.5 MPa
Ambient temperature	5 to 60°C
Nominal filtration rating	0.01 μm (Filtering efficiency 99.9%)

HAA
HAW

AT

IDF
IDU

IDFA

IDFB

ID

IDG

AMG

AFF

AM

AMD

AMH

AME

AMF

SF

SFD

LLB

AD□

GD

Related Products

Ionizer *Series IZS31*

Refer to Best Pneumatics No. 6 for details.

- Controlled ion balance by sensor
- Rapid elimination of static electricity by a feedback sensor
 - Ion balance control by an autobalance sensor



Ionizer



Feedback sensor

Autobalance sensor

Ionizer model		IZS31-□□ (NPN spec.)	IZS31-□□P (PNP spec.)
Ion generation method		Corona discharge type	
Method of applying voltage		Sensing DC, Pulse DC, DC	
Output for emitting electricity		±7000 V	
Ion balance <small>Note)</small>		±30 V (in the case of stainless steel electrode needle ±100 V)	
Air purge	Fluid	Air (clean and dry)	
	Operating pressure	0.7 MPa or less	
	Connecting tubing O.D.	ø4	
Electrode needle material		Tungsten, Silicon, Stainless steel	

Note) In case where air purge is performed between a charged object and an ionizer at a distance of 300 mm.

Electrode Cartridge Number, Weight

Bar length (mm)	300	380	620	780	1100	1260	1500	1900	2300
Electrode cartridge number	3	4	7	9	13	15	18	23	28
Mass (g)	470	530	720	850	1100	1220	1410	1730	2040

Clean Regulator *Series SRH/SRP*

Refer to pages 587 to 607 for details.

Stainless steel regulator controlled for contamination

Series SRH



Series SRP



Series SRH

Series	Port size Rc					
	1/8	1/4	3/8	1/2	9/16-18UNF	7/8-14UNF
SRH3000	●	●			●	
SRH4000		●	●	●		●

Series SRP

Series	Port size Rc	
	M5	1/8
SRP1000	●	●

Clean Gas Filter *Series SF*

Refer to pages 221 to 242 for details.

Nominal filtration rating 0.01 μm

Series SFA



Series SFB



Series SFC



Cartridge Type

Series	Type	Main material			Thread type	Port size	
		Element	Housing	Seal		M5	1/4
100 SFA 200 300	Disc	PTFE + Polyester	Stainless steel 316 (Electro-polishing)	Fluorine rubber (FPM)	Rc		●
SFB100	Straight	PTFE + PFA			TSJ		●
					UOJ		

Disposable Type

Series	Type	Main material			Thread type	Port size	
		Element	Housing	Seal		1/4	3/8
SFB300	Straight	PTFE + PFA	Stainless steel 316 (Electro-polishing)	—	Rc	●	
SFC100	Multiple disc	PTFE + PVDF		O-ring PTFE	TSJ	●	
					URJ		●



Series SFD Specific Product Precautions 1

Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions and pages 6 to 8 for Air Preparation Equipment Precautions.

Selection

Warning

1. Thoroughly and carefully confirm the purpose of use, required specifications and operating conditions (fluid, pressure, flow rate, nominal filtration rating and environment) then select a model within the specifications.
2. The product is not certified under the High Pressure Gas Safety law, so for nitrogen, its maximum operating pressure will be 0.99 MPa (gauge pressure).
3. Contact us beforehand if the product will be used in an application such as a caisson shield, breathing, food and/or medical treatment that affects the human body directly or indirectly.
4. If the compressed air includes ozone, do not use it since it may damage the product or cause malfunction. When it includes ozone, use a clean gas filter (SFA/B/C).

Mounting

Warning

1. **Instruction manual**
Mount the product after reading and understanding the instruction manual. Keep it in a location where it can easily be found.
2. **Flushing**
Flush the piping line when the filter is used for the first time or has been replaced. In the event of connecting such as piping, flush (air blow) when using this product for the first time or replacing its elements in order to reduce the affect of the dust generated from the connection, etc. Flushing the line is also required to eliminate contamination resulting from the piping line installation. Therefore, be sure to flush the line before actually running the system. Fix all mounting parts for use.
3. **Use fittings with resin threads for the connection of fittings to the IN and OUT ports.**
Using fittings with metal threads could damage the IN and OUT ports.
4. **Connect tubing to the IN and OUT one-touch fittings in accordance with the precautions**

Caution

1. **Connect the piping in accordance with the flow direction marked on the case.**
If connected in reverse, the element could break.
2. **The mounting orientation does not affect the performance, but if excessive force is applied to the SFD100 series, the body may become disconnected from the bracket.**
Therefore, take particular care about the mounting orientation.

Caution on Installation

Warning

1. **The material of the element is polycarbonate.**
The material is resistant to wiping with alcohol, but is not suitable for atmospheres or places with organic solvents, chemicals, cutting oils, synthetic oils, ester base compressor oils, alkalis or thread locking agents.

Caution

1. **If the pressure difference (pressure drop) between the inlet and the outlet exceeds 0.1 MPa, it can cause damage to the product.**
2. **Do not install the product in a place where it can be affected by a pulsation (including surge pressure) of over 0.1 MPa.**
3. **Use caution regarding the particles that may be emitted from the outlet side of a pneumatic equipment.**

Installation of a pneumatic equipment on the outlet side can deteriorate the cleanliness because a particle will be generated from the equipment.

The mounting position of the pneumatic equipment needs to be considered.

4. **Set the air flow capacity with an initial pressure drop of 0.03 MPa or less. If the initial pressure drop is set to be high, its service life will be shorten due to clogging.**
5. **Determine the product by the maximum consumption flow rate.**

When using compressed air for an air blow application, calculate the maximum volume of air that will be consumed before selecting the SFD series product size.

6. **Generally, the following pollutant particles are contained in compressed air.**

[Pollutant particle substances contained in the compressed air]

- Moisture (drainage)
- Dusts and particles which are in the surrounding air
- Deteriorated oil which is discharged from the compressor
- Solid foreign matter such as rust and/or oil in the piping

- 1) The SFD series is not compatible with compressed air which contains fluids such as water and/or oil.
- 2) Install a dryer (IDF, IDG, ID series), mist separator (AM series), micro mist separator (AMD series), super mist separator (AME series), or odor removal filter (AMF series), etc., for the source of the air for the SFD series.

7. **Using with a flow-rate much higher than its specification could lead to exceeding the differential pressure the product can resist.**

Use the product within its specifications. Also, take care about the replacement period of the product, taking into consideration that the differential pressure of the filter will increase over time.

HAA
HAW

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IDF
IDU

IDFA

IDFB

ID

IDG

AMG

AFF

AM

AMD

AMH

AME

AMF

SF

SFD

LLB

AD□

GD



Series SFD Specific Product Precautions 2

Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions and pages 6 to 8 for Air Preparation Equipment Precautions.

Piping

⚠ Caution

1. Unpacking the sealed package

Since the filter is sealed in an antistatic double bag, the inner package should be unpacked in a clean atmosphere (such as a clean room).

2. Apply a wrench to 2 chamfered flats or hexagon portion on the IN side or the OUT side to prevent the housing from rotating.

3. Always tighten threads with the proper tightening torque.

When attaching fittings to the product, tighten with the proper tightening torque shown below.

Material	Tightening torque (N·m)
Resin	2 to 3
Metal	12 to 14

4. Check the arrow mark on the case which shows the flow direction to connect the IN and OUT ports correctly.

If connected in reverse, the element could break.

Maintenance

⚠ Warning

1. Follow the maintenance procedures in the instruction manual. If handled incorrectly equipment or device can be damaged or cause a malfunction.

2. When removing the product, exhaust the air and ensure the air is released to atmosphere before removing it.

3. When the element comes to the end of its life, immediately replace it with a new filter or replacement element (cartridge type).

Service life of element

The service life of the element ends when either of the following two conditions occurs.

- 1) After 1 year of usage has elapsed.
- 2) When the pressure drop reaches 0.1 MPa even though the operating period has been less than 1 year.

Operating Environment

⚠ Warning

1. Do not operate under the conditions listed below due to a risk of malfunction.

In locations having corrosive gases, organic solvents, and chemical solutions, or in locations in which these elements are likely to adhere to the equipment.

In locations in which salt water, water, or water vapor could come in contact with the equipment.

In locations that are exposed to direct sunlight. (Shield the equipment from sunlight to prevent its resin material from ultraviolet ray degradation or overheating.)

In locations that have a heat source and poor ventilation. (Shield the equipment from heat sources to protect it from softening degradation due to radiated heat.)

In locations that are exposed to shocks and vibrations.

In locations with high humidity or a large amounts of dust.

2. When the product is used for blowing, use caution to prevent the work from being damaged by entrained air from the surrounding area.

When the compressed air is used for air blow, the exhausted air from the blow nozzle may have taken in airborne foreign matter (such as solid particle, fluid particle) from the surround air. The foreign matter will be sprayed on the work, and the airborne foreign matter may adhere to it. Therefore, use caution for the surrounding environment.

Other Tube Brands

⚠ Caution

1. When tubing of brands other than SMC's are used, verify that the tubing O.D. satisfies the following accuracy;

- 1) Polyolefin tube: Within ± 0.1 mm
- 2) Polyurethane tubing: Within $+0.15$ mm, within -0.2 mm
- 3) Nylon tubing: Within ± 0.1 mm
- 4) Soft nylon tubing: Within ± 0.1 mm

Do not use tubing which does not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tube pulling out after connection.

The recommended tube for the clean fitting is polyolefin tube. Other tubes can satisfy the performance in terms of leakage, tensile strength, etc., but impair the cleanliness. Note this point for use.

Clean Exhaust Filter

RoHS

New

This filter enables direct exhaust of air in a clean room!

(Cleanliness class 4*: ISO14644-1) (* Based on SMC's measuring conditions.)

Air can be directly exhausted in a clean room only by mounting this product to the pneumatic equipment in the clean room.



Filtration rating **0.01 μm**

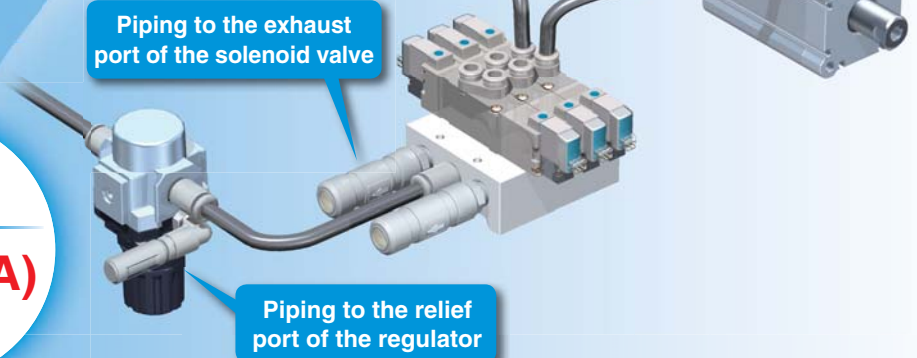
(Trapping efficiency 99.99%)

Maximum flow capacity

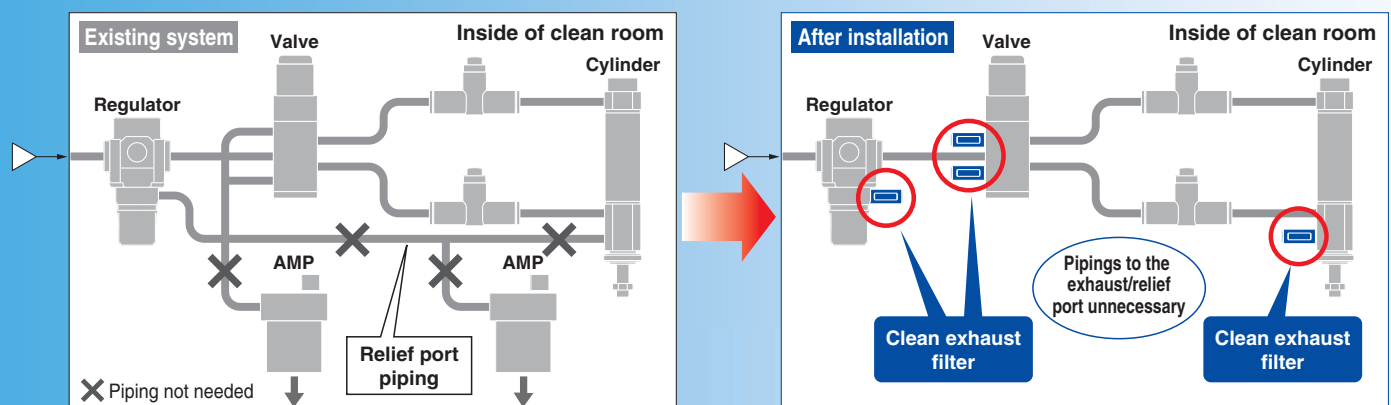
200
L/min (ANR)

Noise reduction

30 dB (A)
or more



No need for piping for exhaust air and relief air. Reduces piping installation work and space.



Series **SFE**

SMC

CAT.ES120-6A

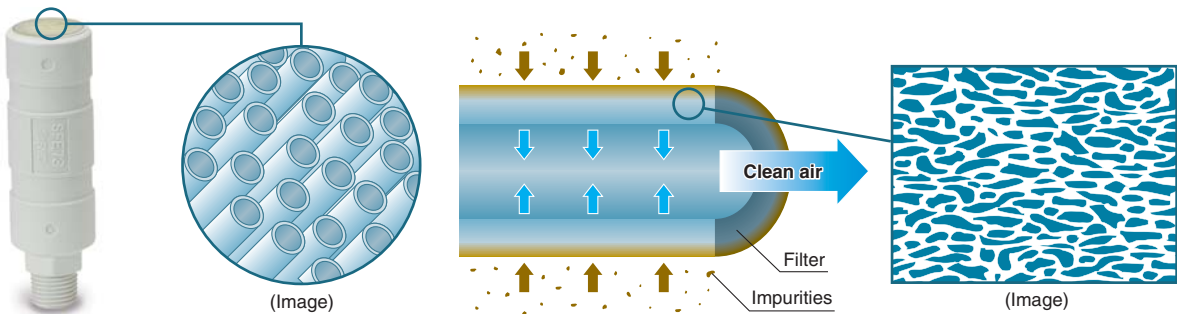


Mounting variations

Series	Maximum flow capacity L/min (ANR)	M5	R1/8	R1/4	ø4	ø6	ø8	ø10
SFE1	3	●						
SFE3	30				●			
SFE4	65		●			●		
SFE5	130		●	●			●	
SFE7	200			●				●

Hollow fiber membrane

The hollow fiber membrane has a porous construction with numerous fine holes on a straw type fiber membrane wall. The hollow fiber membrane filter traps and filtrates the impurities from the compressed air through the overlapping layered fine holes.



Series SFE

Model Selection

Selection Procedure

Model selection for the clean exhaust filters uses the flow characteristic graphs for the corresponding exhaust flow rate from the equipment that the clean exhaust filter is mounted to.

Calculate the flow rate by performing "1. Calculation of Exhaust Flow Rate", and then, select the correct model following the instructions in "2. Model Selection Based on Exhaust Flow Rate". When the exhaust flow rate is already known, start selecting the model from "2. Model Selection Based on Exhaust Flow Rate".

1. Calculation of Exhaust Flow Rate

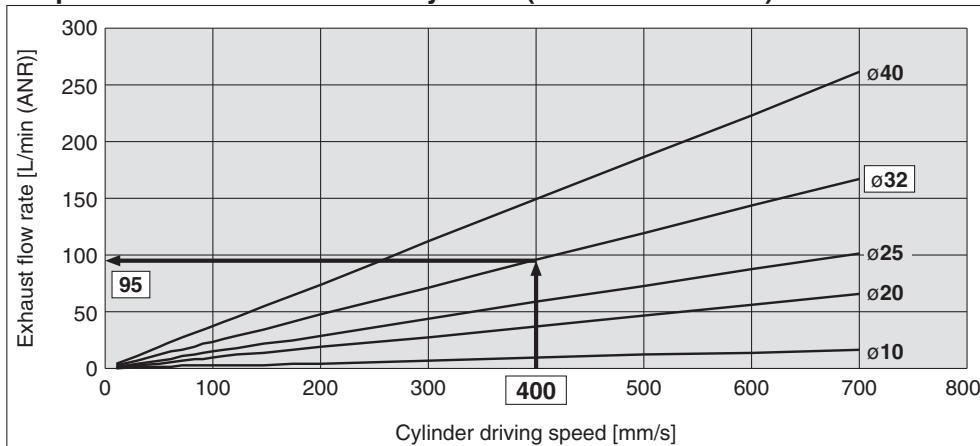
1) Exhaust flow rate from cylinder (from solenoid valve)

1. Find the exhaust flow rate of the cylinder from the cylinder bore size and the actuating speed using the graph shown below.
2. Correct the exhaust flow rate that is found into exhaust flow rate at the operating pressure (supply pressure to the cylinder) by calculation using the conversion formula shown below.

$$\text{Corrected exhaust flow rate} = \text{Exhaust flow rate} \times \frac{\text{Supply pressure to the cylinder (gauge pressure)} + 0.1}{0.5}$$

3. To operate more than one cylinder using collective piping with manifolds, etc, total the exhaust flow of the cylinders to find the maximum flow capacity.

Graph 1 Exhaust flow rate of cylinder (Meter-out control)



Example) Bore size: ø32, Driving speed: 400 mm/s, Supply pressure: 0.5 MPaG

1. From the graph, exhaust flow rate is found to be 95 L/min (ANR).

2. Corrected exhaust flow rate found with the conversion formula: $95 \times \frac{0.5 + 0.1}{0.5} = 114 \text{ L/min (ANR)}$

2) Exhaust from ejectors

In the case of ejectors, the exhaust flow rate is the total of the suction flow rate and the air consumption.

3) Exhaust from other equipment

Use the air consumption specified for each piece of equipment as a standard.

Selection Procedure

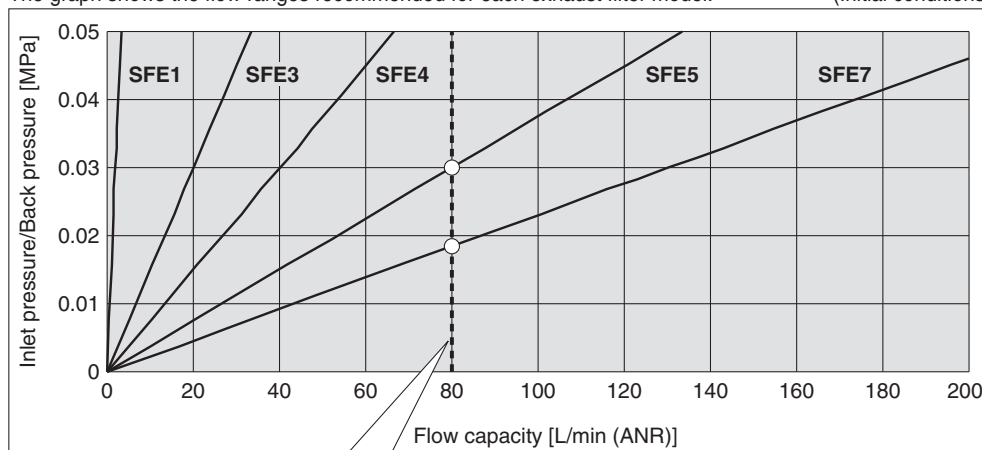
2. Model Selection Based on Exhaust Flow Rate

The exhaust flow rate that is calculated in step "1. Calculation of Exhaust Flow Rate" is the flow capacity shown in Graph 2. Select the model that is shown with a point where the dotted line, for flow capacity, and the solid line, for flow characteristics, intersects.

- Some equipment may have problems with the operation or performance when back pressure is applied. Check the equipment's back pressure range, with the catalog etc, and that the equipment will not be influenced, and select a model within that range.
- Long piping between the cylinder and the exhaust port increases exhaust resistance. Give some margin with the selected model.
- Depending on the equipment that the clean exhaust filter is mounted to, the filter body may interfere with the piping, making it difficult to be mounted. Please confirm the external dimensions so that it may cause no interference.

Graph 2 Flow characteristics

The graph shows the flow ranges recommended for each exhaust filter model. (Initial conditions)



When the flow capacity is 80 L/min (ANR), the graph lines of **SFE5** and **SFE7** reach 80 L/min (ANR), thus either of these two models can be selected.

Clean Exhaust Filter Series *SFE*

RoHS

How to Order



Male thread type



Plug-in type

SFE 11

• Size/Port size
Male thread type

Symbol	Port size	Max. flow capacity L/min (ANR)
11	M5 x 0.8	3
42	R1/8	65
52	R1/8	130
53	R1/4	130
73	R1/4	200

Plug-in type

Symbol	Port size	Max. flow capacity L/min (ANR)
3A	ø4	30
4B	ø6	65
5C	ø8	130
7D	ø10	200

Specifications

Model	SFE11	SFE3□	SFE4□	SFE5□	SFE7□	
Fluid ^{Note 1)}	Air					
Maximum flow capacity ^{Note 2)}	Up to 3 L/min (ANR)	Up to 30 L/min (ANR)	Up to 65 L/min (ANR)	Up to 130 L/min (ANR)	Up to 200 L/min (ANR)	
Filtration rating ^{Note 3)}	0.01 μm (Trapping efficiency 99.99%)					
Noise reduction ^{Note 3)}	30 dB (A)					
Operating temperature	5 to 45°C					
Maximum operating pressure ^{Note 4)}	0.1 MPa					
Material	Body	PBT, Polyolefin, Polyurethane				
	Gasket	NBR, Stainless steel	—			
Weight	Male thread	1 g	—	7 g	12 g	17 g
	Plug-in	—	3 g	6 g	11 g	16 g
Element service life	· 2 years or when back pressure reached 0.1 MPa · When the system fails to operate normally due to clogging					
Packaging	Antistatic double packaging processes					

Note 1) Do not use this product in air containing ozone, since it may break.

Note 2) Model should be selected based on the flow capacity. (Refer to page 2).

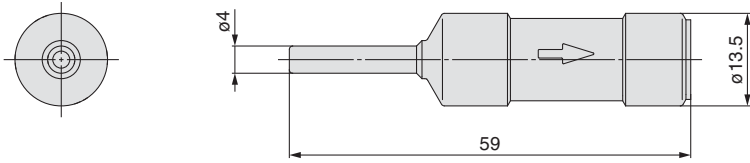
Note 3) Based on SMC's measuring conditions.

Note 4) Pressure applied to SFE, and not supply pressure to the equipment that SFE is mounted to (e.g. solenoid valve, cylinder).

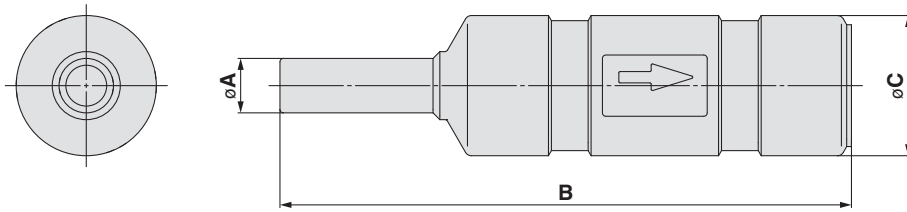
Series SFE

Dimensions

SFE3A



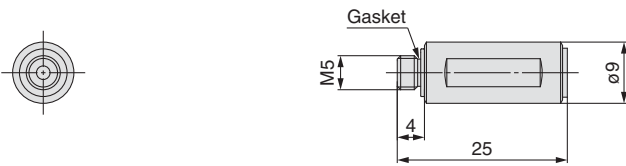
SFE4B/5C/7D



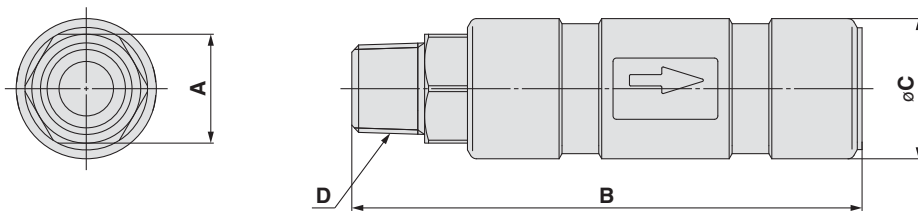
Dimensions (mm)

Model	A	B	C
SFE4B	6	73	16.5
SFE5C	8	84	20.5
SFE7D	10	94	24

SFE11



SFE42/52/53/73



Dimensions (mm)

Model	A	B	C	D
SFE42	10	62	16.5	R1/8
SFE52	10	71	20.5	R1/8
SFE53	17	75	20.5	R1/4
SFE73	17	84	24	R1/4



Series SFE/Specific Product Precautions

Be sure to read before handling. Refer to back cover for Safety Instructions. For Air Preparation Equipment Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smcworld.com>

Selection

⚠ Warning

1. Thoroughly and carefully confirm the purpose of use, required specifications and operating conditions (fluid, pressure, flow rate, filtration rating, and environment), then select a model within the specifications.
2. Do not use this product for any purposes that may adversely influence, directly or indirectly, the human body such as for food or medical applications.
3. Do not use air which contains ozone, as it will cause damage to the product.

Mounting

⚠ Caution

1. Flush and clean the piping before connecting it to the product.
2. Do not apply excessive force to the product.
Install piping so that it does not apply pulling, pressing, bending or other forces on the products.
Tighten the screws by hand, and then apply a spanner to the spanner flats to tighten the screw for additional 1 to 2 rotations. For the model with the M-thread, tighten the tip of the main body securely by hand until it is in contact with the end face, and then retighten it by hand. At this time, note that the retightening amount should be 30° or less.
(Tighten it with 0.2 N·m or less)
3. Do not mount the product in a place where dust will be stirred up by the exhaust air from the product and affect peripheral equipment.
4. Do not mount the product in a location where air from the product will be directly exhausted to the workpiece.
5. If installing the products to valve ports, interference may occur with the fittings. Please confirm the dimensions before installing.

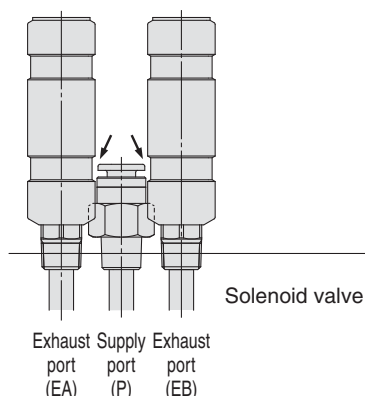


Fig. Example of the interference with fittings

Supply Air

⚠ Caution

1. The product cannot be used with air containing water droplets.
2. Install a mist separator (Series AM), micro mist separator (Series AMD), or micro mist separator with pre-filter (Series AMH) on the air supply side.
3. When using on the ejector etc., do not allow liquids such as water or oil to be drawn in with the air.

Operating Environment

⚠ Warning

1. Do not operate under the conditions listed below due to a risk of malfunction.
 - 1) In locations having ozone, corrosive gases, organic solvents, and chemical solutions, or in locations in which these elements are likely to adhere to the equipment.
 - 2) In locations in which sea water, water, or water steam could come in contact with the equipment.
 - 3) Where the product is exposed to ultraviolet rays or temperature increase.
 - 4) Where the product is exposed to heat sources or in areas that the product is exposed to radiant heat.
 - 5) In locations that are exposed to direct sunlight.
 - 6) In locations that are exposed to shocks and vibrations.


Maintenance


⚠ Warning


1. Replace the product with a new one right away when it reaches its life.
Make sure to verify the operating conditions of the actuator at least once a day.
— Criteria of the product's life —
The service life of the product ends when either of the following two conditions occurs.
 - 1) After 2 years of usage has elapsed.
 - 2) When the back pressure of the SFE reaches 0.1 MPa even though the operating period has been less than 2 years.
 - 3) When the system fails to operate normally due to clogging.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1, and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

 Safety Instructions Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

SMC Corporation

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D-G

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