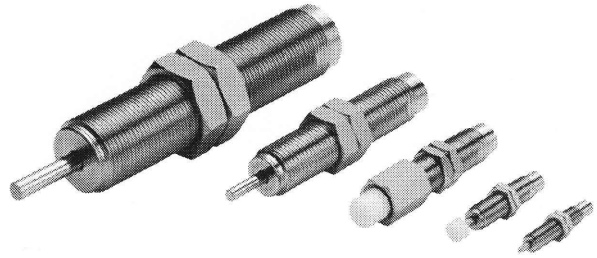


CLEAN ROOM SPECIFICATION
SHOCK ABSORBERS
 LINEAR ORIFICE TYPE

KSHC Series



Specifications

Item	Model	CS-KSHC4×4□-B	CS-KSHC4×4□-BD	CS-KSHC5×5□-D(-11)	CS-KSHC5×5□-DE(-11)
Mounting thread size		M6×0.75		M8×0.75(M8×1) ^{Note2}	
Maximum absorption	J [ft·lbf]	0.3 [0.22]	0.5 [0.37]	1.0 [0.74]	1.5 [1.11]
Absorbing stroke	mm [in.]	4 [0.16]		5 [0.20]	
Maximum impact speed	m/s [ft./sec.]	1.0 [3.28]			
Maximum operating frequency	cycle/min	60			
Maximum absorption per unit of time	J/min [ft·lbf/min.]	15 [11.1]		45 [33.2]	
Spring return force	N [lbf.]	3.0 [0.67]		6.0 [1.35]	
Angle variation		1° or less			
Operating temperature range ^{Note1}	°C [°F]	0~60 [32~140]			

Item	Model	CS-KSHC6×8□-DE	CS-KSHC6×8□-EF	CS-KSHC8×8□-EF	CS-KSHC8×8□-G
Mounting thread size		M10×1		M12×1	
Maximum absorption	J [ft·lbf]	1.5 [1.11]	2.5 [1.84]	2.5 [1.84]	4.0 [2.95]
Absorbing stroke	mm [in.]	8 [0.32]			
Maximum impact speed	m/s [ft./sec.]	1.0 [3.28]			
Maximum operating frequency	cycle/min	60			
Maximum absorption per unit of time	J/min [ft·lbf/min.]	75 [55.3]		120 [89]	
Spring return force	N [lbf.]	8.5 [1.91]			
Angle variation		1° or less			
Operating temperature range ^{Note1}	°C [°F]	0~60 [32~140]			

Item	Model	CS-KSHC9×10□-GK	CS-KSHC9×10□-L	CS-KSHC11×15□-M	CS-KSHC11×15□-P
Mounting thread size		M14×1.5		M16×1.5	
Maximum absorption	J [ft·lbf]	5.0 [3.69]	8.0 [5.90]	10 [7.4]	15 [11.1]
Absorbing stroke	mm [in.]	10 [0.39]			
Maximum impact speed	m/s [ft./sec.]	1.0 [3.28]			
Maximum operating frequency	cycle/min	60		40	
Maximum absorption per unit of time	J/min [ft·lbf/min.]	240 [177]		300 [221]	
Spring return force	N [lbf.]	8.5 [1.91]		18 [4.0]	
Angle variation		1° or less			
Operating temperature range ^{Note1}	°C [°F]	0~60 [32~140]			

Item	Model	CS-KSHC14×16□-R	CS-KSHC14×16□-T	CS-KSHC18×25□-X
Mounting thread size		M20×1.5		M25×1.5
Maximum absorption	J [ft·lbf]	20 [14.8]	30 [22.1]	40 [29.5]
Absorbing stroke	mm [in.]	16 [0.63]		25 [0.98]
Maximum impact speed	m/s [ft./sec.]	1.0 [3.28]		
Maximum operating frequency	cycle/min	40		
Maximum absorption per unit of time	J/min [ft·lbf/min.]	600 [443]		800 [590]
Spring return force	N [lbf.]	18.6 [4.18]		32 [7.2]
Angle variation		1° or less		
Operating temperature range ^{Note1}	°C [°F]	0~60 [32~140]		

Notes: 1. Shock absorption capacity fluctuates depending on ambient temperature or speed.
 2. The value inside () is CS-KSHC5×5□-□-11.

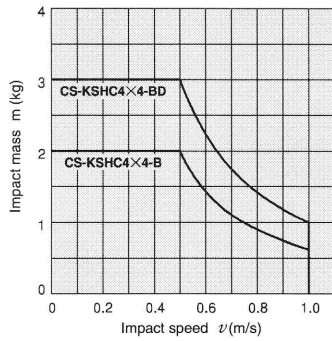
Selection Guideline

Precautions for Use of Selection Graphs

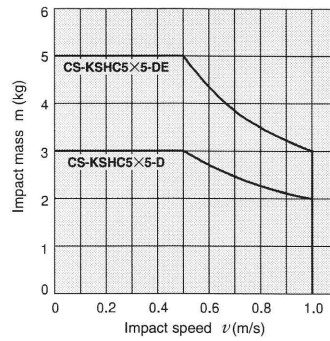
1. The selection graphs show the best conditions for usage of the product with horizontal impacts.
2. The selection graphs are calculated for a cylinder with air pressure of 0.5 MPa [73 psi.].

Selection Graphs

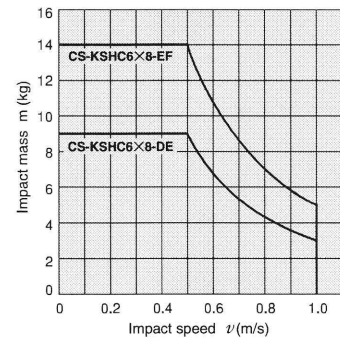
CS-KSHC4 × 4



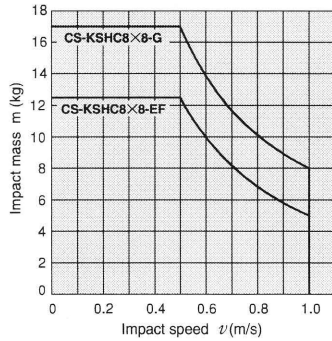
CS-KSHC5 × 5



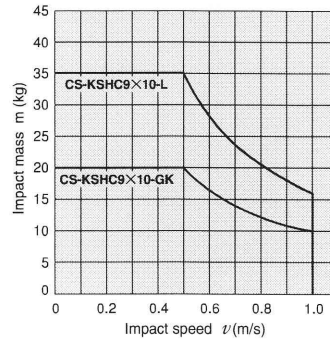
CS-KSHC6 × 8



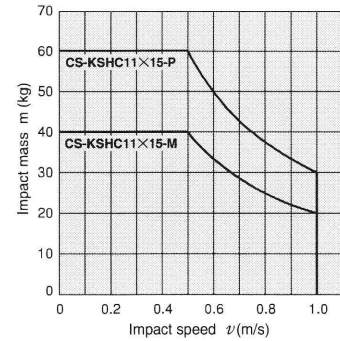
CS-KSHC8 × 8



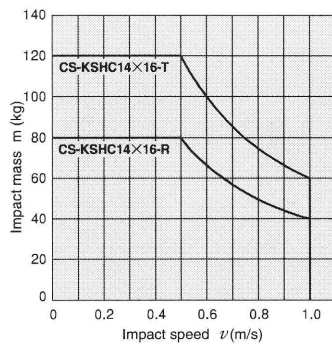
CS-KSHC9 × 10



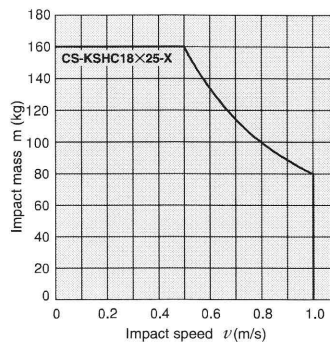
CS-KSHC11 × 15



CS-KSHC14 × 16



CS-KSHC18 × 25



1 kg = 2.20 lb. 1 m/s = 3.28 ft./sec.

SHOCK ABSORBERS

Recommended bore size

Model	Bore size mm [in.]	φ 6 [0.236]	φ 8 [0.315]	φ 10 [0.394]	φ 16 [0.630]	φ 20 [0.787]	φ 25 [0.984]	φ 32 [1.260]	φ 40 [1.575]	φ 50 [1.969]	φ 63 [2.480]	φ 80 [3.150]	φ 100 [3.937]
CS-KSHC4 × 4		○	○	○									
CS-KSHC5 × 5			○	○	○								
CS-KSHC6 × 8				○	○	○							
CS-KSHC8 × 8					○	○	○						
CS-KSHC9 × 10					○	○	○	○					
CS-KSHC11 × 15						○	○	○	○				
CS-KSHC14 × 16								○	○	○	○		
CS-KSHC18 × 25									○	○	○	○	○

Note: The above table shows the recommended sizes. This does not necessarily exclude the use of cylinders in other sizes.

Order Codes

CS — **KSHC**

Clean room specification

Shock Absorbers Linear Orifice Type KSHC Series

Stopper nut
Blank : No stopper nut
S : With stopper nut^{Note}

Rod end type
Blank : No cap
C : With cap

Note: The stopper nut is an option available for models with cap (C) only.

● Order codes for CS-KSHC5×5 thread size M8×1

CS-KSHC5×5 **11**

Body thread size
11 : M8×1

Rod end type
Blank : No cap
C : With cap

Stopper nut
Blank : No stopper nut
S : With stopper nut^{Note}

Note: The stopper nut is an option available for models with cap (C) only.

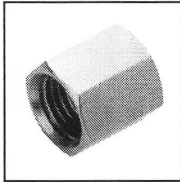
Maximum absorption
D : 1.0 J [0.74 ft·lbf]
DE : 1.5 J [1.11 ft·lbf]

Piston dia. X absorbing stroke	Maximum absorption
4×4	B : 0.3 J [0.22 ft·lbf] BD : 0.5 J [0.37 ft·lbf]
5×5	D : 1.0 J [0.74 ft·lbf] DE : 1.5 J [1.11 ft·lbf]
6×8	DE : 1.5 J [1.11 ft·lbf] EF : 2.5 J [1.84 ft·lbf]
8×8	EF : 2.5 J [1.84 ft·lbf] G : 4.0 J [2.95 ft·lbf]
9×10	GK : 5.0 J [3.69 ft·lbf] L : 8.0 J [5.90 ft·lbf]
11×15	M : 10 J [7.4 ft·lbf] P : 15 J [11.1 ft·lbf]
14×16	R : 20 J [14.8 ft·lbf] T : 30 J [22.1 ft·lbf]
18×25	X : 40 J [29.5 ft·lbf]

Additional Parts

● Stopper nut

S - KSH - M

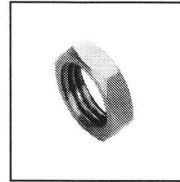


Thread size

6	: M6×0.75 (for CS-KSHC4×4)
8	: M8×0.75 (for CS-KSHC5×5)
8-11	: M8×1 (for CS-KSHC5×5-11)
10	: M10×1 (for CS-KSHC6×8)
12	: M12×1 (for CS-KSHC8×8)
14	: M14×1.5 (for CS-KSHC9×10)
16	: M16×1.5 (for CS-KSHC11×15)
20	: M20×1.5 (for CS-KSHC14×16)
25	: M25×1.5 (for CS-KSHC18×25)

● Hexagon nut (10 nuts in one bag)

N - KSH - M



Thread size

6	: M6×0.75 (for CS-KSHC4×4)
8	: M8×0.75 (for CS-KSHC5×5)
8-11	: M8×1 (for CS-KSHC5×5-11)
10	: M10×1 (for CS-KSHC6×8)
12	: M12×1 (for CS-KSHC8×8)
14	: M14×1.5 (for CS-KSHC9×10)
16	: M16×1.5 (for CS-KSHC11×15)
20	: M20×1.5 (for CS-KSHC14×16)
25	: M25×1.5 (for CS-KSHC18×25)

Mass

Model	Body mass	Additional mass (options)	
		Stopper nut ^{Note}	With cap
CS-KSHC4×4	4.8 [0.169]	2 [0.07]	0.1 [0.004]
CS-KSHC5×5	9.2 [0.325]	4 [0.14]	0.3 [0.011]
CS-KSHC6×8	21 [0.74]	7 [0.25]	1 [0.04]
CS-KSHC8×8	32 [1.13]	8 [0.28]	1 [0.04]
CS-KSHC9×10	58 [2.05]	15 [0.53]	2 [0.07]
CS-KSHC11×15	94 [3.32]	29 [1.02]	2 [0.07]
CS-KSHC14×16	172 [6.07]	50 [1.76]	3 [0.11]
CS-KSHC18×25	350 [12.35]	100 [3.53]	7 [0.25]

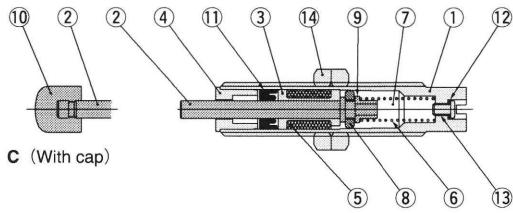
Note: The stopper nut is an option available for models with cap (C) only.

Calculation sample: The mass of CS-KSHC6×8 with cap and stopper nut is 21+1+7=29 g [1.02 oz.]

Inner Construction, Major Parts and Materials

● CS-KSHC4×4

● CS-KSHC5×5



● CS-KSHC6×8

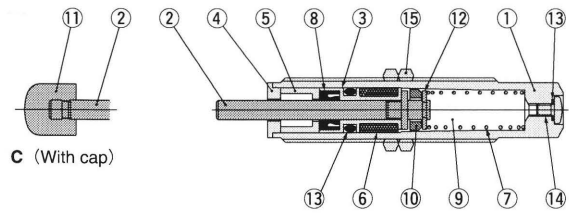
● CS-KSHC8×8

● CS-KSHC9×10

● CS-KSHC11×15

● CS-KSHC14×16

● CS-KSHC18×25



Note : Part shapes vary somewhat between sizes.

● CS-KSHC4×4, 5×5

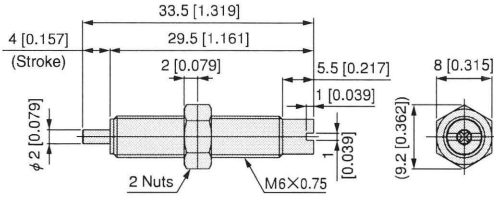
No.	Parts	Materials
①	Body	Copper alloy (nickel plated) (KSHC4: Steel (nickel plated))
②	Piston rod	Steel (nickel plated)
③	Sleeve	Copper alloy
④	Plug	Stainless steel
⑤	Accumulator	Synthetic rubber (CR)
⑥	Spring	Spring steel
⑦	Oil	Special oil
⑧	Piston ring	Copper alloy
⑨	Collar	Copper alloy
⑩	Cap	Plastic (POM)
⑪	Rod seal	Synthetic rubber (NBR)
⑫	O-ring	Synthetic rubber (NBR)
⑬	Screw	Mild steel
⑭	Hexagon nut	Mild steel (nickel plated)

● CS-KSHC6×8, 8×8, 9×10, 11×15, 14×16, 18×25

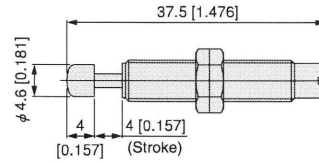
No.	Parts	Materials
①	Body	Copper alloy (nickel plated)
②	Piston rod	Steel (nickel plated)
③	Sleeve	Copper alloy
④	Plug	Stainless steel
⑤	Spacer	Stainless steel
⑥	Accumulator	Synthetic rubber (CR)
⑦	Spring	Spring steel
⑧	Rod seal	Synthetic rubber (NBR)
⑨	Oil	Special oil
⑩	Piston ring	Copper alloy
⑪	Cap	Plastic (POM)
⑫	E-ring	Steel
⑬	O-ring	Synthetic rubber
⑭	Screw	Mild steel
⑮	Hexagon nut	Mild steel (nickel plated)

Dimensions mm [in.]

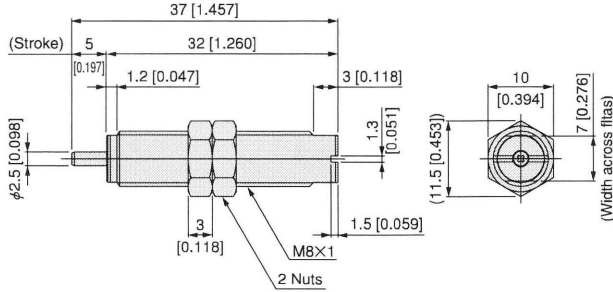
● No rod end cap: CS-KSHC4×4



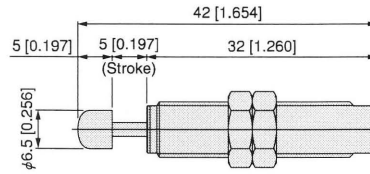
● With rod end cap: CS-KSHC4×4C



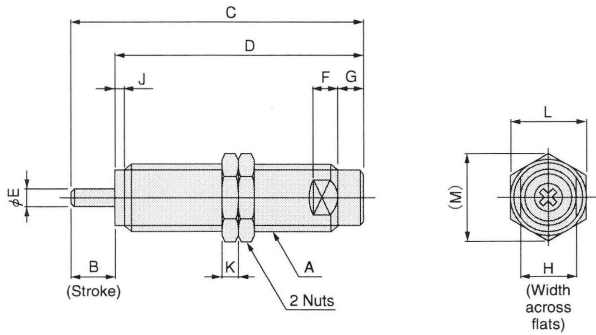
● No rod end cap: CS-KSHC5×5-11



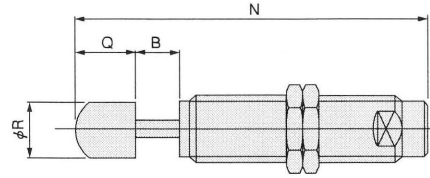
● With rod end cap: CS-KSHC5×5C-11



● No rod end cap: CS-KSHC□×□



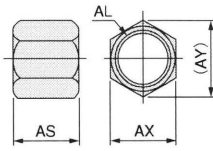
● With rod end cap: CS-KSHC□×□C



Model	Code	A	B	C	D	E	F	G	H	J	K	L	M	N	Q	R
CS-KSHC5×5□	M8×0.75	5	36	31	2.5	3	5	7	1.2	2	10	11.5	41	5	6.5	
		[0.197]	[1.417]	[1.220]	[0.098]	[0.118]	[0.197]	[0.276]	[0.047]	[0.079]	[0.394]	[0.453]	[1.614]	[0.197]	[0.256]	
CS-KSHC6×8□	M10×1	8	53	45	3	4	5	9	2	3	12	13.9	61	8	8	
		[0.315]	[2.087]	[1.772]	[0.118]	[0.157]	[0.197]	[0.354]	[0.079]	[0.118]	[0.472]	[0.547]	[2.402]	[0.315]	[0.315]	
CS-KSHC8×8□	M12×1	8	53	45	3	5	5.5	11	2	4	14	16.2	63	10	10	
		[0.315]	[2.087]	[1.772]	[0.118]	[0.197]	[0.217]	[0.433]	[0.079]	[0.157]	[0.551]	[0.638]	[2.480]	[0.394]	[0.394]	
CS-KSHC9×10□	M14×1.5	10	70	60	4	5	5.5	12	2	5	17	19.6	80	10	11	
		[0.394]	[2.756]	[2.362]	[0.157]	[0.197]	[0.217]	[0.472]	[0.079]	[0.197]	[0.669]	[0.772]	[3.150]	[0.394]	[0.433]	
CS-KSHC11×15□	M16×1.5	15	87	72	4	5	6	14	3	7	19	21.9	97	10	11	
		[0.591]	[3.425]	[2.835]	[0.157]	[0.197]	[0.236]	[0.551]	[0.118]	[0.276]	[0.748]	[0.862]	[3.819]	[0.394]	[0.433]	
CS-KSHC14×16□	M20×1.5	16	98	82	5	6	6	18	3	8	24	27.7	113	15	15	
		[0.630]	[3.858]	[3.228]	[0.197]	[0.236]	[0.236]	[0.709]	[0.118]	[0.315]	[0.945]	[1.091]	[4.449]	[0.591]	[0.591]	
CS-KSHC18×25□	M25×1.5	25	135	110	6	7	6	23	3	10	30	34.6	153	18	18	
		[0.984]	[5.315]	[4.331]	[0.236]	[0.276]	[0.236]	[0.906]	[0.118]	[0.394]	[1.181]	[1.362]	[6.024]	[0.709]	[0.709]	

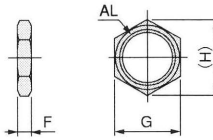
Dimensions of Additional Parts mm [in.]

● Stopper nut: S-KSH-□-□ (-S)



Model	Code	AL	AS	AX	AY
S-KSH-M6	M6×0.75	7 [0.276]	8 [0.315]	9.2 [0.362]	
S-KSH-M8	M8×0.75	11 [0.433]	10 [0.394]	11.5 [0.453]	
S-KSH-M8-11	M8×1	11 [0.433]	10 [0.394]	11.5 [0.453]	
S-KSH-M10	M10×1	17 [0.669]	12 [0.472]	13.9 [0.547]	
S-KSH-M12	M12×1	17 [0.669]	14 [0.551]	16.2 [0.638]	
S-KSH-M14	M14×1.5	18 [0.709]	17 [0.669]	19.6 [0.772]	
S-KSH-M16	M16×1.5	30 [1.181]	19 [0.748]	21.9 [0.862]	
S-KSH-M20	M20×1.5	35 [1.378]	24 [0.945]	27.7 [1.091]	
S-KSH-M25	M25×1.5	40 [1.575]	30 [1.181]	34.6 [1.362]	

● Hexagon nut: N-KSH-□-□



Model	Code	AL	F	G	H
N-KSH-M6	M6×0.75	2 [0.079]	8 [0.315]	9.2 [0.362]	
N-KSH-M8	M8×0.75	2 [0.079]	10 [0.394]	11.5 [0.453]	
N-KSH-M8-11	M8×1	3 [0.118]	10 [0.394]	11.5 [0.453]	
N-KSH-M10	M10×1	3 [0.118]	12 [0.472]	13.9 [0.547]	
N-KSH-M12	M12×1	4 [0.157]	14 [0.551]	16.2 [0.638]	
N-KSH-M14	M14×1.5	5 [0.197]	17 [0.669]	19.6 [0.772]	
N-KSH-M16	M16×1.5	7 [0.276]	19 [0.748]	21.9 [0.862]	
N-KSH-M20	M20×1.5	8 [0.315]	24 [0.945]	27.7 [1.091]	
N-KSH-M25	M25×1.5	10 [0.394]	30 [1.181]	34.6 [1.362]	

Evaluation of Cleanliness (Shock Absorber KSHC Series)

There is currently no standard in JIS or elsewhere for methods of evaluating shock absorber's cleanliness. Koganei has therefore independently established our in-house measurement methods, to conduct the cleanliness evaluations.

● Measurement method

1. Measure particles in the clean bench (Figure 1) without activating the measurement use shock absorber and load driving cylinder in the clean bench (to measure the background valve).^{Note}

Note : Under the background measurement condition, the number of particles measures zero.

2. Drive the load and activate the shock absorber under the measurement condition, to measure the particles.

● Measurement conditions

Load impact speed	: 300 mm/s [11.8 in./sec.]
Shock absorber operating frequency	: 30 cycle/min ^{Note 1}
Particle measurement time	: 1 minute
Suction rate	: 1 cf/min
Measured particles	: 0.1 μ m and larger

For reference, a graph of actual values is shown in Figure 2.

The number of particles is the average value of the test samples. Also, the smaller the angle variation of eccentricity when mounting the shock absorber, the lower the number of particles is likely to be. Mount the shock absorber so that its angle of eccentricity to the workpiece is as small as possible.

- Notes: 1. The number of particles is based on 30 operation cycles. The customer's evaluation should be based on the customer's own operation frequency.
2. Corresponds to FED-STD Class1.
3. The number of particles in the graph are actual values measured under Koganei standards, and are not intended to be guaranteed values.

● Outline of particle measuring device

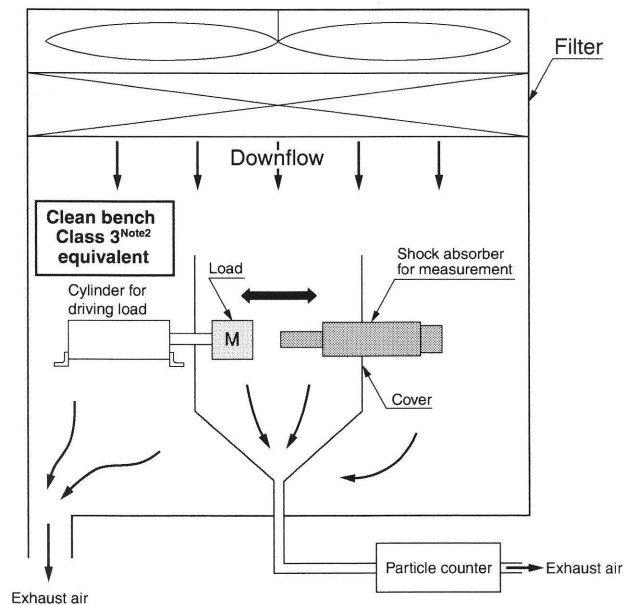


Figure 1

● Number of particles (measured value)^{Note 3}

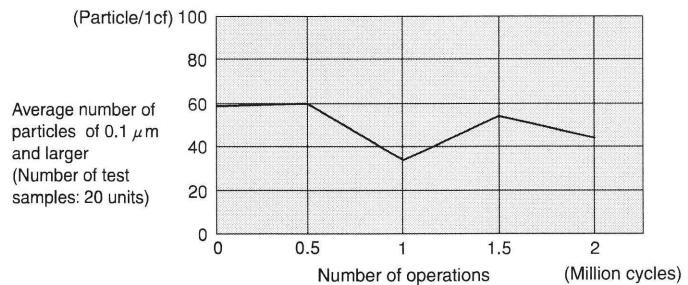


Figure 2