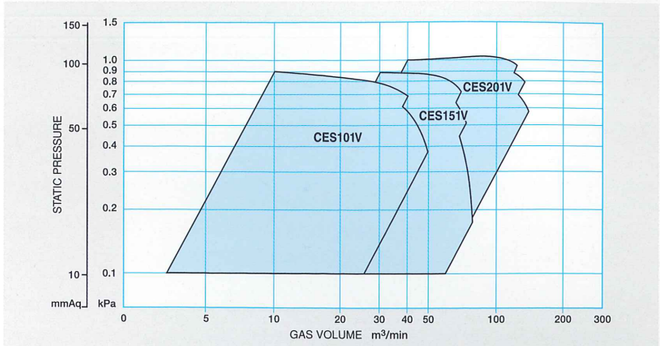
CES-V FRPP Sirocco Fan

Directly driven by built-in inverter-powered motor.

FEATURES

1. The inverter-driven motor can be flexibly set to provide required air capacity and static pressure.
2. Maintenance free due to beltless construction.
3. High-corrosion-resistant and heavy-duty desigh.

Performance curve



SF PVC Sirocco Fan

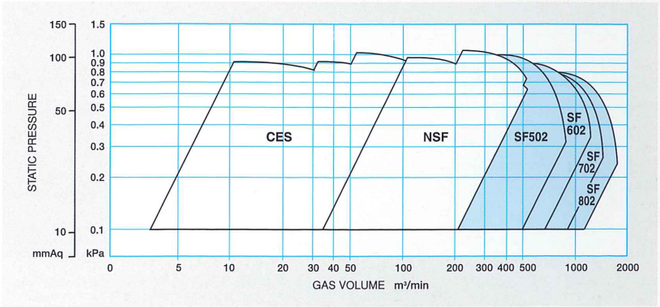
General purpose sirocco fans with FRP-molded impellers for improved mechanical strength.

FEATURES

1. Impellers of models 502~802 are now integral-molded FRP.
2. Lighter weight and mechanically stronger.
3. Excellent corrosion resistance.
4. Higher static pressure and extended performance range.
5. Highly cost-effective.

Applications

1. Corrosive gases in chemical, pharmaceutical and plating plants.
2. Sewage/wastewater treatment plants.
3. Restrooms and bathrooms.
4. For general industrial machines.



Information Necessary for Inquiries and Orders

1. Gas volume : m³/min
2. Static pressure : Pa
3. Handling gas : Concentration (% ppm)
   Specific weight (kg/m³)
   Operating temperature (℃)
4. Dischage and rotational direction
5. Power source : Voltage
   Frequency
   Phase

SEIKOW CHEMICAL ENGINEERING & MACHINERY, LTD.

Head Office 1-31 Mizudo-cho 4-chome, Amagasaki 661-0026 Japan
Export Division Tel : Osaka (06)6438-0841 Fax : (06)6438-3001
URL http://www.seikow.co.jp E-mail : texel@oak.ocn.ne.jp

The contact of this brochure is subject to chage without notice.

ISO 9001
ISO 14001
JQA-2348
JQA-EM4095

Catalogue No.	
CF-46-SFS-E	
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TEXEL®

CORROSION RESISTANT FANS

FRPP SIROCCO FANS
CES
Series

FRP SIROCCO FANS
NSF
Series

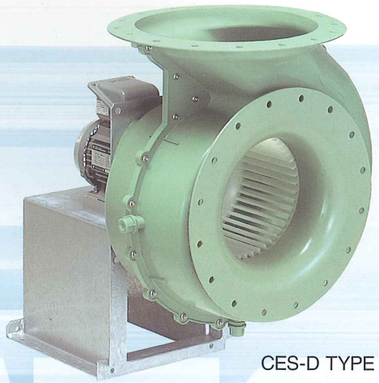
SEIKOW CHEMICAL ENGINEERING & MACHINERY, LTD.

Exceptionally corrosion-resistant, high-performing and highly functional, TEXEL sirocco fans are the dependable choice for exhaust and ventilation Applications in various factories, labs universities, and sewage/raw sewage Treatment plants. Choose from our wide selection of corrosion resistant fans for any application.

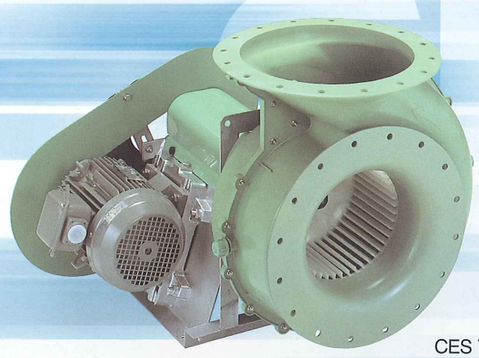
FRPP SIROCCO FANS

CES Series

The conventional model was completely redesigned giving birth to the CES Series Compact Sirocco Fan made of an injected FRP mold with standardized central discharge. The central discharged feature is based on our unique 3-dimensional curved surface design. It has the same capabilities as the conventional models and its rotating discharge direction was reduced by half making selection simple.
Also, its impeller and casing are both made of an injected FRPP mold for enhanced recyclability.

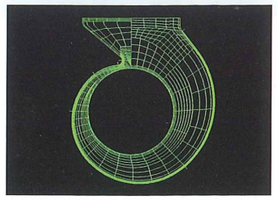


CES-D TYPE



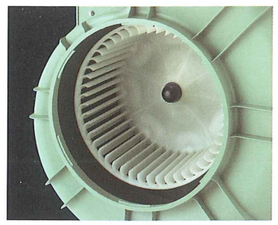
CES TYPE

Features



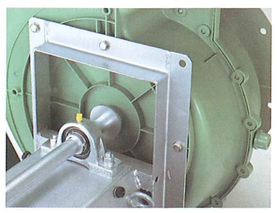
Standardized central discharge

Conventional models featured 6 rotational discharge directions, however, this fan's right rotation only central discharge cuts the number of rotational directions to 3 types. This significantly reduces the complexity of choosing a rotational direction and simplifies duct piping.



Enhanced maintainability

Conventional compact sirocco fans were made with a casing divided into 2 parts. This required the removal of the suction and discharge ducts before being able to remove the impeller. However, by incorporating an easy-to-remove suction cone in the design, only the suction duct needs removal before the impeller can be taken off. Inner-casing inspection is also made easy.



Excellent corrosion resistance

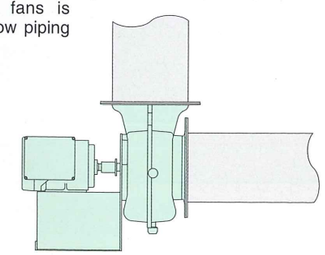
Its casing and impeller have excellent chemical resistance thanks to our standardized FRPP injection mold construction that boasts high dimensional accuracy. Also, its effective ribbed and hemmed design gives it superior strength while keeping it lightweight. We used materials that not only offer great corrosion resistance and maintainability, but also 100% recyclability.

A variety of drive systems

Choose either a belt drive or direct action electric motor drive depending on the application. You can also choose from two types of direct action electric motor drives: a universal electric motor (D-type) or an electric motor with built-in inverter (V-type). Because the only rotating parts in direct action electric motor drives are the motor itself and the impeller, there is no V-belt, shaft or any other mechanical part. This significantly reduces maintenance requirements and labor costs incurred during equipment inspections. In addition, the electric motor with built-in inverter is direct action, however, like a belt driven fan, the required airflow and static pressure can be universally set.

Identical round flange for the suction and discharge ducts

To simplify duct piping, both the suction and discharge flanges were made circular with identical dimensions corresponding to existing regulations. Also, the layout for the CES type fans is close to an elbow piping arrangement.



FRP SIROCCO FANS

NSF Series

NSF Series Sirocco Fan is made of thick FRP sheets offering great safe and Mechanical strength. The indentical round shape of the suction and discharge opening facilitates connection of the fan to a duct. NSF models made of FRP that excel in safety and mechanical strength have been newly introduced.

NSF TYPE

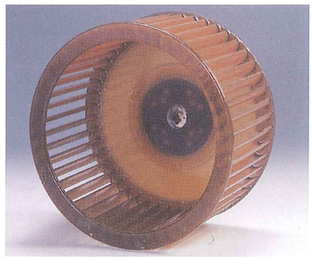
Features

Round Suction and Discharge Flange of Identical Size

The adoption of round flanges of identical dimension on both the suction and discharge openings has greatly enhanced piping in comparison with the conventional square flanges.
Moreover, easy sleeve piping is now possible due to the fact that a duct flange can be employed as a companion flange on fans with a flange size of 500A or less.

Excellent Corrosion Resistance

- **Casing**
  FRP material having outstanding chemical resistance has been employed.
  Besides being rigid against external impact, it has a higher working temperature range than PVC,and has the added advantage of being lighter than metal casings.
- **Impeller**
  Whilie, Integral models have been employed in the fabrication of the impellers of NSF302~402 models which have superb chemical resistance and enhanced mechanical strength.



NSF302-402 impeller (FRP)

Wider Capacity Range

In comparison with our comventional models, higher static pressure and extended gas volume range achieved with the new NSF series make them more economical.

Applications

The CES and NSF series can be used:

- To handle corrosive gases at chemical and pharmaceutical plants
- As a draft-chamber fan for chemical laboratories handling various types of gases
- As a ventilation fan in biotech research facilities or IC labs
- As a ventilation fan in cookery establishments
- As an exhaust fan for offensive odors in purifying facilities
- As a ventilation fan in areas exposed to the damaging effect of salt near the sea coasts.

SPECIFICATIONS

Standard specifications

Model		CES	CES-D	NSF
Gas temperature		−10 to 50℃		
Structure	Impeller	Multi-blade type		
	Shaft seal	Free gland		
	Bearing	Pillow unit	———	Pillow unit
	Drain plug	Plug type PF1/2" screw		Plug type PF3/4" screw
Materials	Impeller	FRPP (fiberglass reinforced polypropylene resin)		FRP (fiberglass reinforced unsaturated polyester resin)
	Casing	FRPP (fiberglass reinforced polypropylene resin)		FRP (fiberglass reinforced unsaturated polyester resin)
	Main shaft	S45C		S35C
Discharge directions		Three directions		Six directions
Standard colors	Casing	Japan Paint Manufacturers Association Paint No.S31-513 (1993 edition) (fiberglass reinforced polypropylene resin)		
	Belt guard		Not attached	
	Base plate	Melted zinc plating color		

Standard accessories

Standard accessories	Materials	Quantity	CES	CES-D	NSF
V-pulley	FC200	1 set	○	——	○
V-belt	Rubber	1 set	○	——	○
Belt cover	FRP	1	○	——	○
Shaft guard	FRP	1	○	○	○
Foundation bolt	SS400	1 set	○		

Special Options

The item given in tha table below are included upon request.

Vibration Rubber Isolator	Suction safety Net (material : PVC)
Vibration Spring Isolator	Discharge Gallery (material : PVC)
Ceiling suspension Base	Ventilator (material : PVC)
Vibration-proof Joints (material : PVC)	Damper (material : PVC)
Companion Flange (material : PVC)	Sound-proof Box

Motor weight

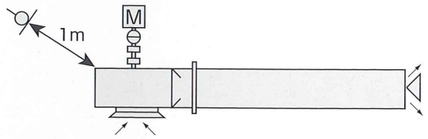
(unit : kg)

Pole \ Output (kw)	0.2	0.4	0.75	1.5	2.2	3.7
2P	5.7	8.3	11	21.5	23.5	37
4P	5.5	8.5	12	22	31.5	39
6P	–	11.5	22	32	39	61
Weight base	–	2	2.2	2.4	3.7	4

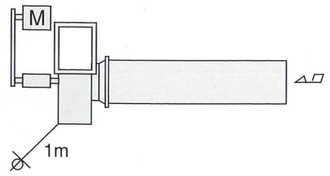
Position of measuring fan peripheral noise

Sound levels recorded at one meter away from fan casing.

CES-101~201
CES-101D~201D

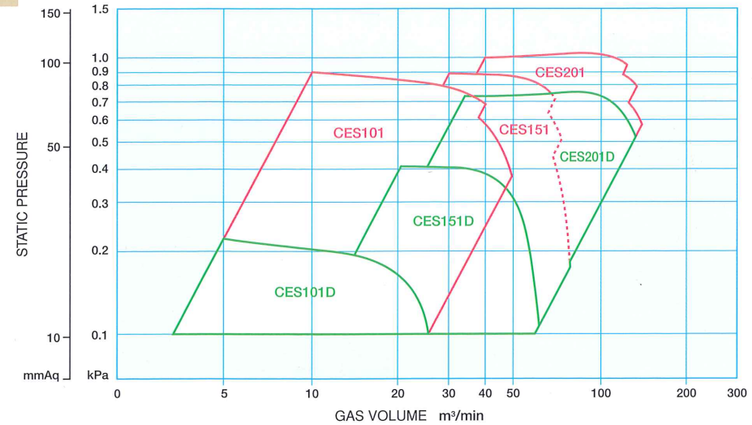


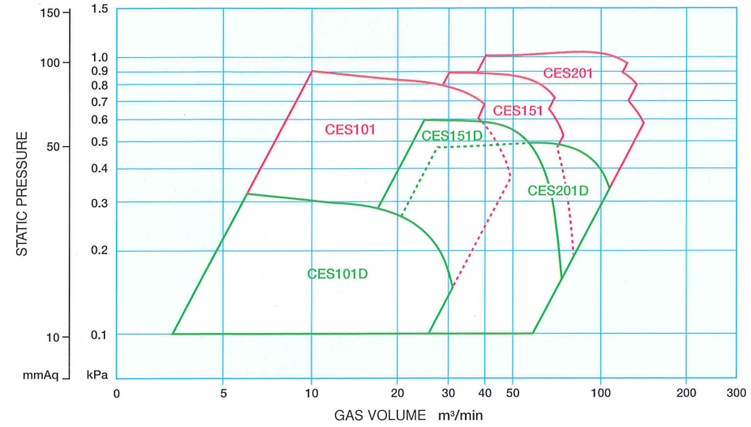
NSF302~402



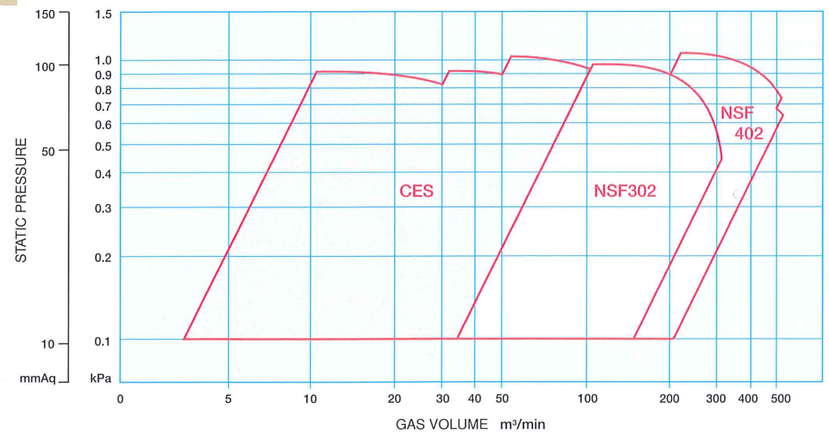
CAPACITY RANGE CHART

CES TYPE



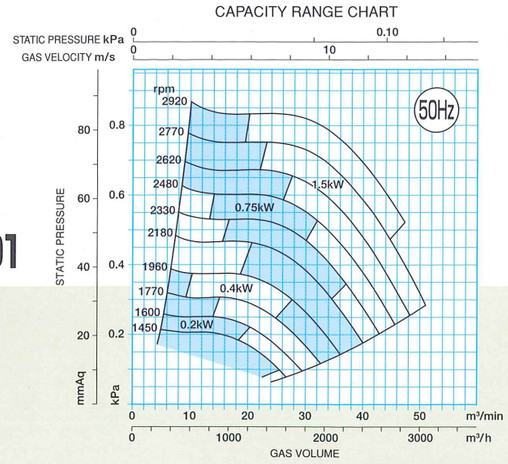


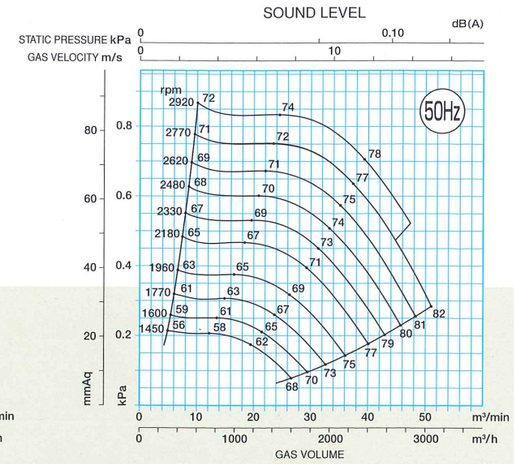
NSF TYPE



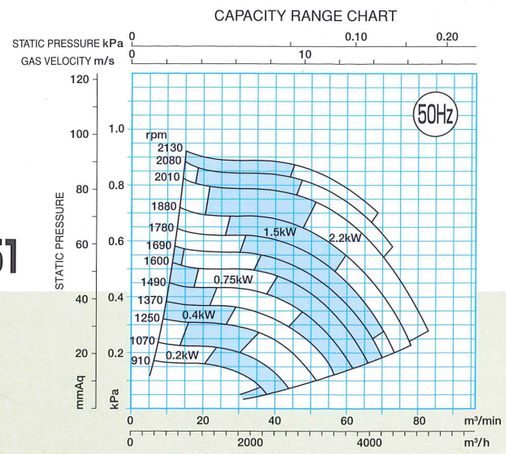
CAPACITY RANGE CHART

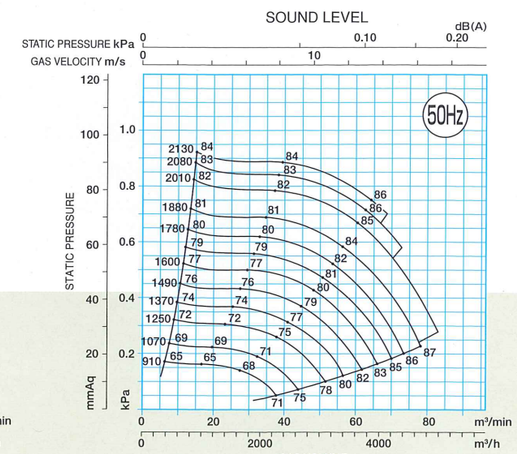
CES 101





CES 151





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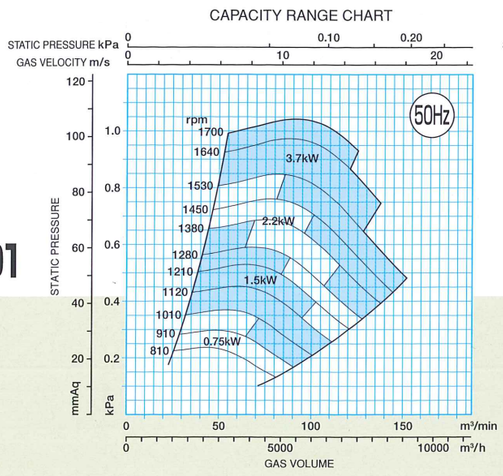

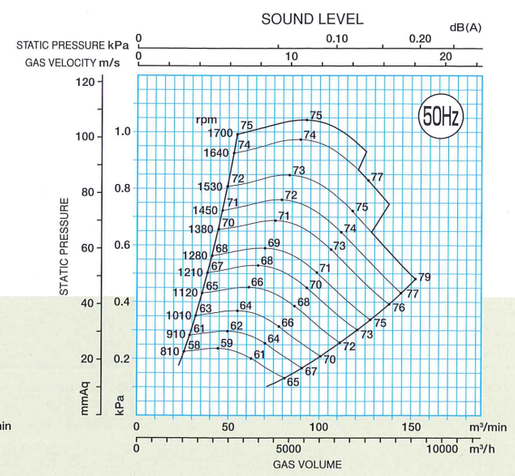

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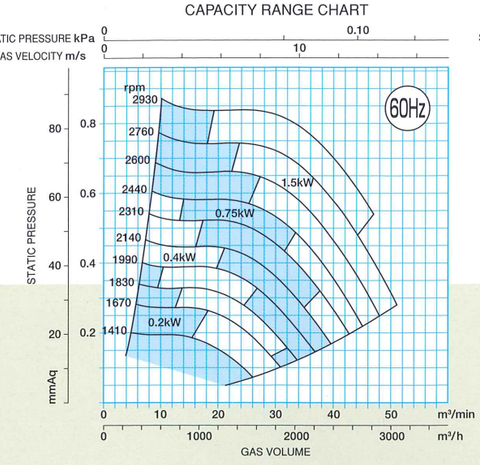

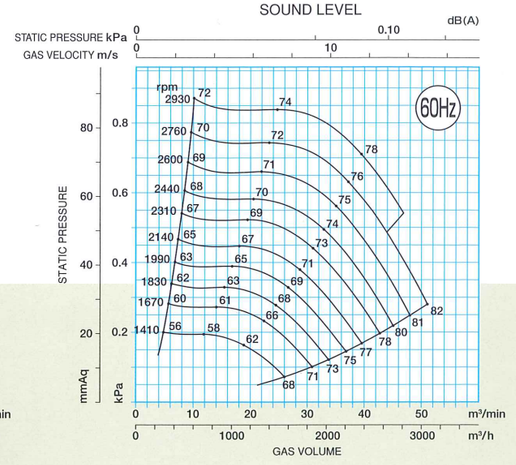

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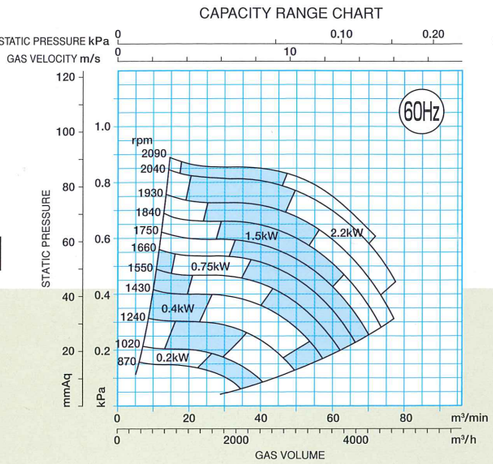

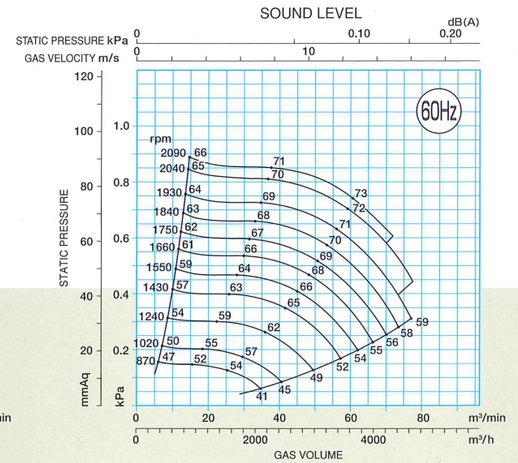

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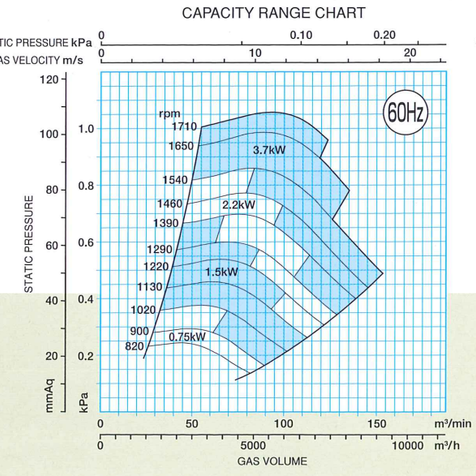
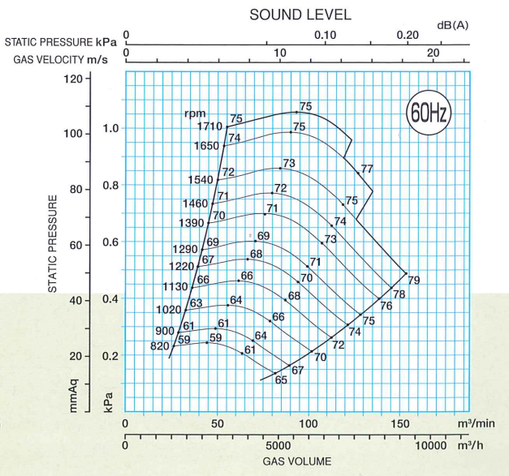
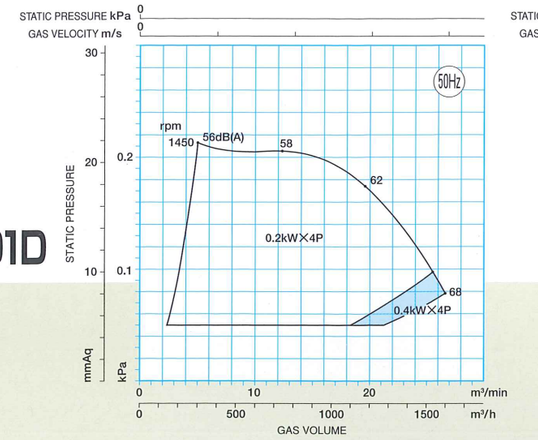
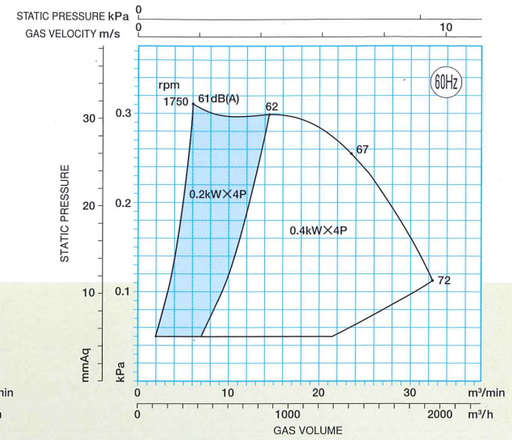




CAPACITY RANGE CHART

CES101D





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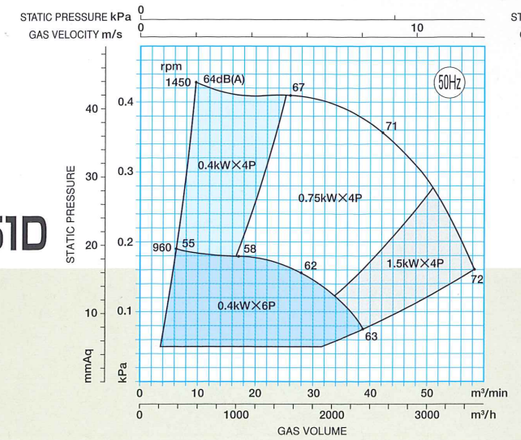

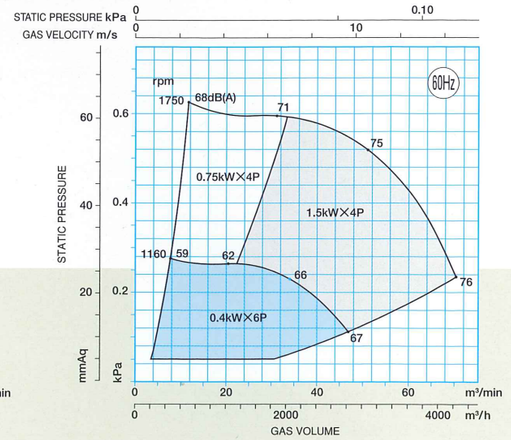

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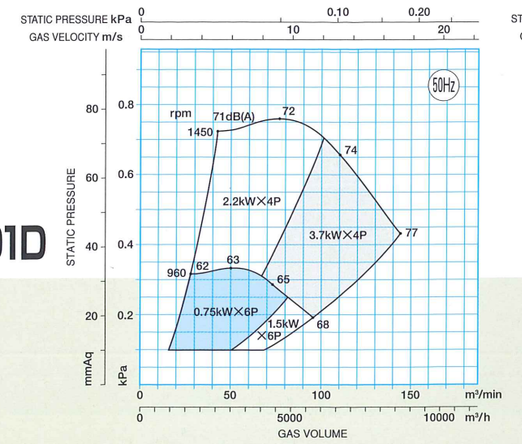
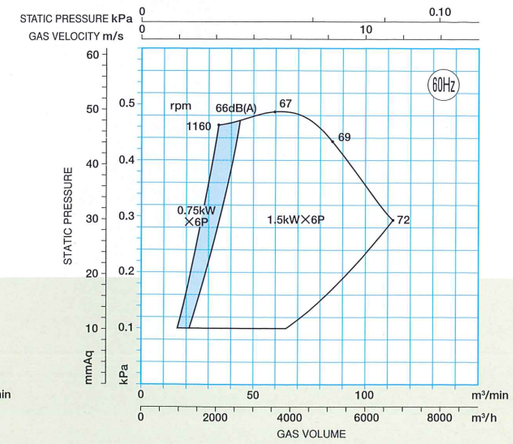
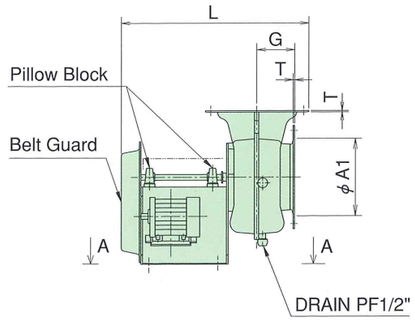
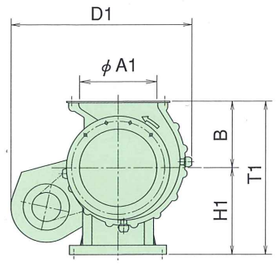




DIMENSION

CES101 • 151 • 201





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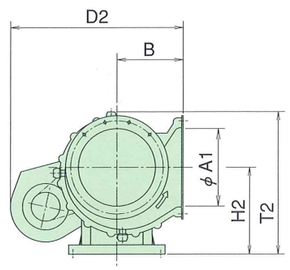

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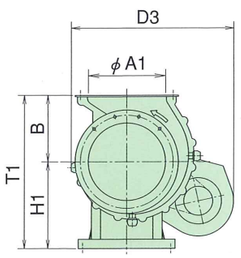

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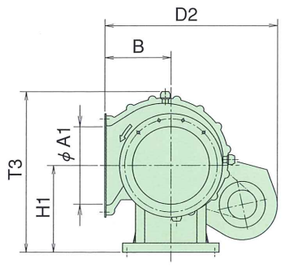

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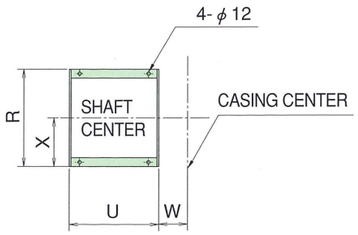
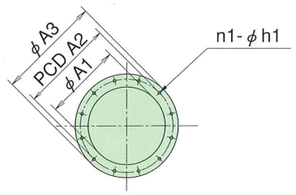


A-A view Basic drawing



DISCHAGE

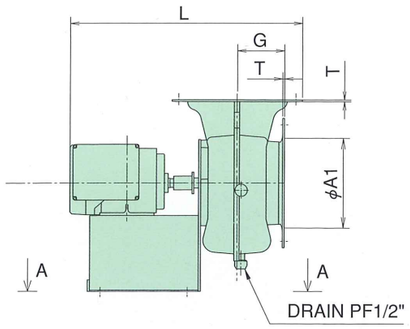
MODEL	BODY											FLANGE						Bearing
	L	H1	H2	B	D1	D2	D3	T1	T2	T3	G	A1	A2	A3	n1	h1	T	
CES101	658	300	300	230	625	600	562	530	492	555	130	268	322	358	12	10	3	UCP204
CES151	812	320	380	300	755	735	675	620	620	640	160	320	382	421	16	12	3	UCP205
CES201	913	400	500	400	867	860	758	800	798	807	200	422	482	520	20	14	3.5	UCP205

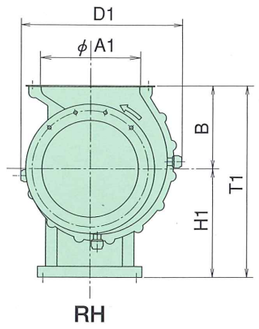
MODEL	BASE				BODY WEIGHT (kg)		
	R	U	W	X	Standard	Vibration Isolator	SpringVibration Isolator
CES101	336	312	100	168	18	28	37
CES151	430	406	128	215	25	37	48
CES201	580	406	160	290	42	58	67

Note : The weight of body is an approximate weight not including the weight of motor

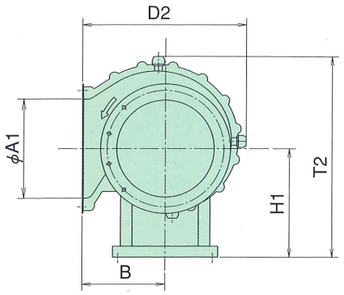
DIMENSION

CES 101D • 151D • 201D

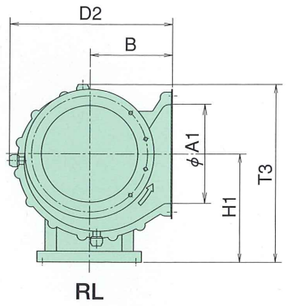




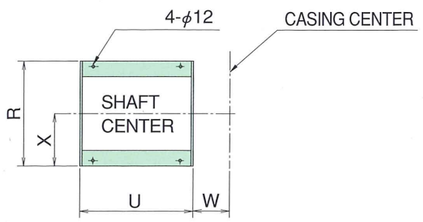
RH



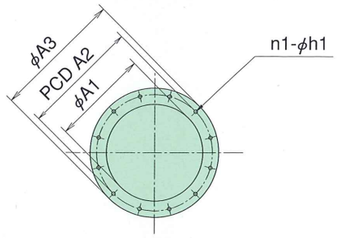
RR



RL



A-A view Basic drawing



DISCHAGE

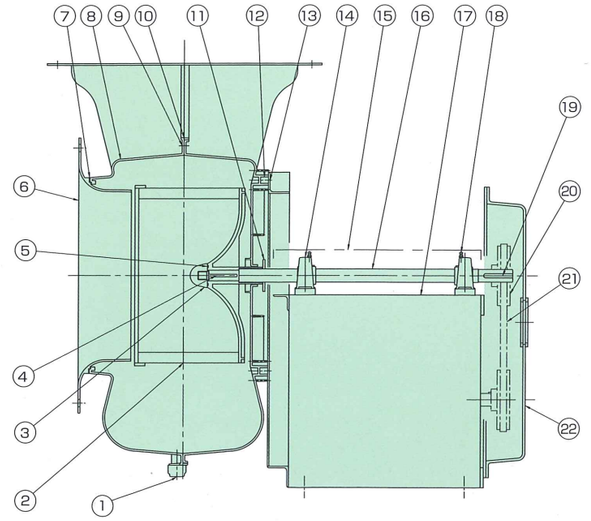
MODEL	BODY									FLANGE					
	L	H1	B	D1	D2	T1	T2	T3	G	A1	A2	A3	n1	h1	T
CES101D	642	300	230	447	452	530	556	492	130	268	322	358	12	10	3
CES151D	750	380	300	560	578	680	700	620	160	320	382	421	16	12	3
CES201D	852	500	400	705	753	900	907	798	200	422	482	520	20	14	3.5

MODEL	BASE				BODY WEIGHT (kg)		
	R	U	W	X	Standard	Vibration Isolator	SpringVibration Isolator
CES101D	290	312	100	145	16	24	42
CES151D	290	346	128	145	19	28	46
CES201D	370	366	160	185	36	46	67

Note : The weight of body is an approximate weight not including the weight of motor

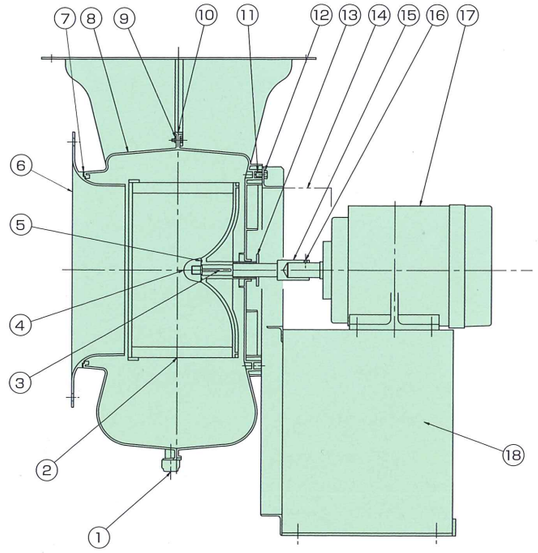
STRUCTURE

CES 101 • 151 • 201



No.	NAME OF PART	MATERIALS	QTY	REMARKS
1	Drain Plug	PE	3	PF1/2"
2	Impeller	FRPP	1	
3	Nut Cover	PP	1	
4	Impeller Key	S45C	1	
5	Nut Cover O-Ring	CR	1	
6	Suction Cone	FRPP	1	
7	Gasket	PE	1	
8	Casing	FRPP	1	
9	Casing Bolt	SUS304	1set	
10	Casing Gasket	PE	1	
11	Seal Ring	PE	1	
12	Insert Nut	Bs BM	1set	
13	Casing Set Bolt	SUS304	1set	
14	Bearing Unit	SUJ2	2	Pillow Block
15	Shaft Guard	FRP	1	
16	Shaft	S45C	1	
17	Bracket	SS400	1	
18	Grease Nipple	Bs BM	2	
19	V-Pulley Key	S45C	1	
20	V-Pulley	FC200	2	
21	V-Belt	Rubber	1set	
22	Belt Guard	FRP	1	

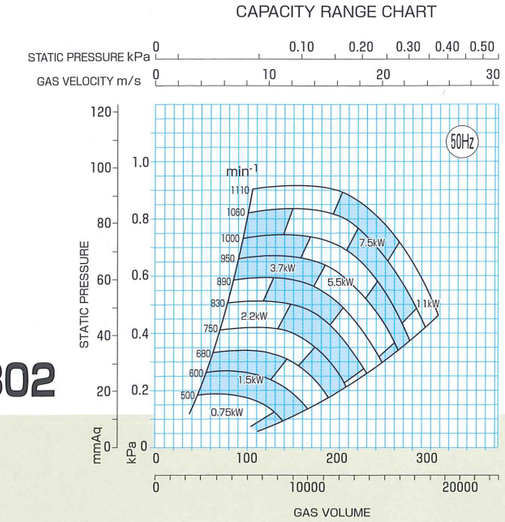
CES 101D • 151D • 201D

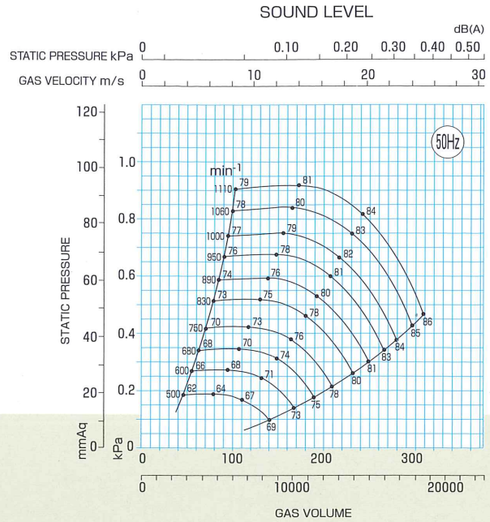


No.	NAME OF PART	MATERIALS	QTY	REMARKS
1	Drain Plug	PE	3	PF1/2"
2	Impeller	FRPP	1	
3	Impeller Key	S45C	1	
4	Nut Cover	PP	1	
5	Nut Cover O-Ring	CR	1	
6	Suction Cone	FRPP	1	
7	Gasket	PE	1	
8	Casing	FRPP	1	
9	Casing Bolt	SUS304	1set	
10	Casing Gasket	PE	1	
11	Insert Nut	Bs BM	1set	
12	Casing Set Bolt	SUS304	1set	
13	Seal Ring	PE	1	
14	Shaft Guard	FRP	1	
15	Shaft	S45C	1	
16	Shaft Set Screw	SUS304	1set	
17	Motor	—	1	
18	Bracket	SS400	1	

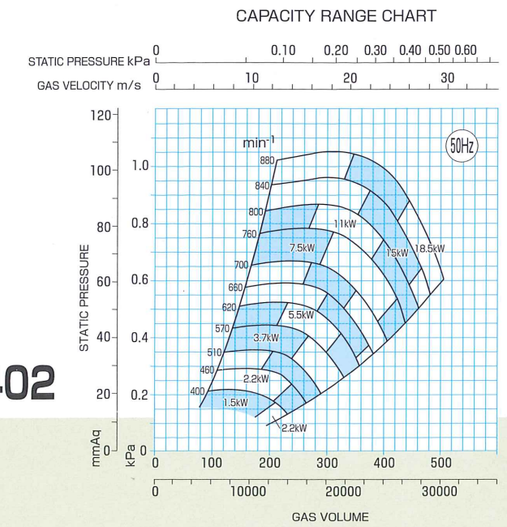
CAPACITY RANGE CHART

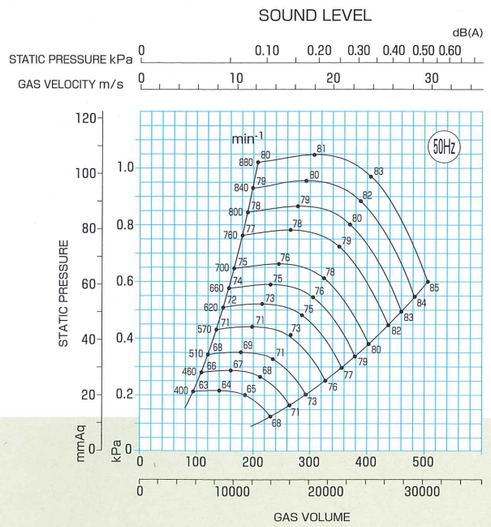
NSF302



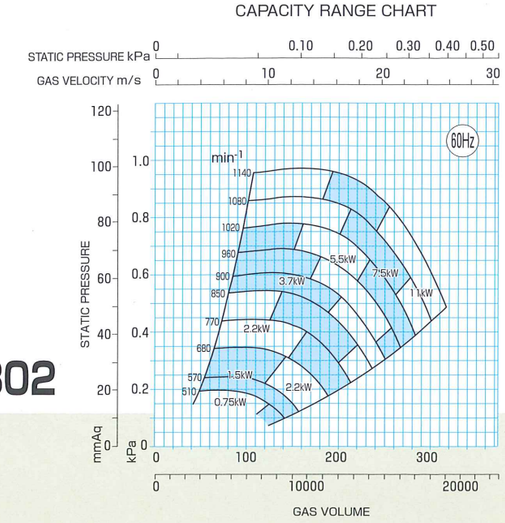


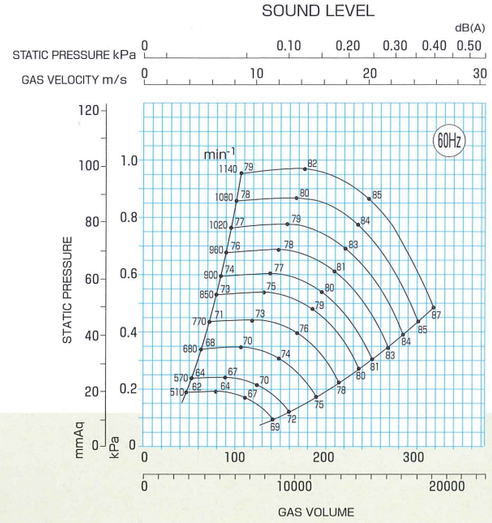
NSF402



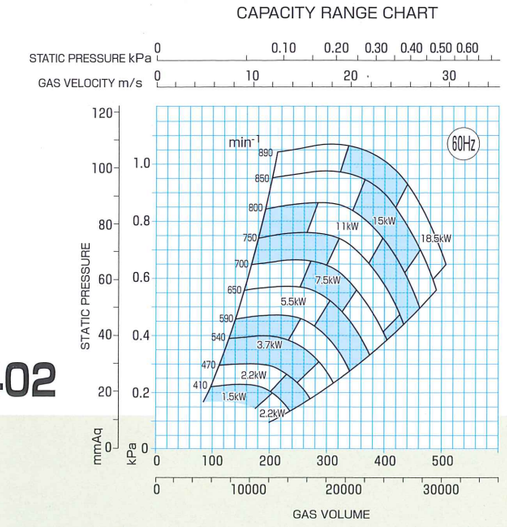


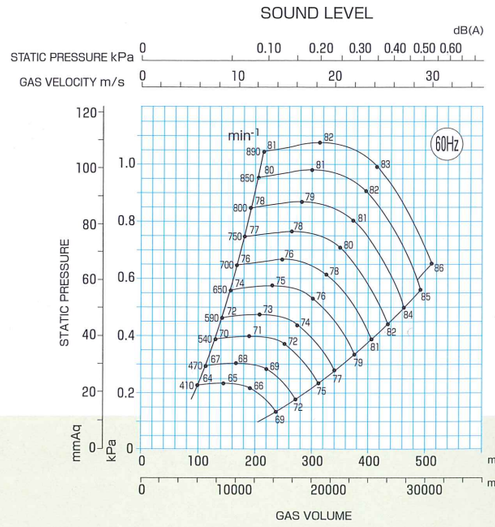
NSF302





NSF402





DIMENSION

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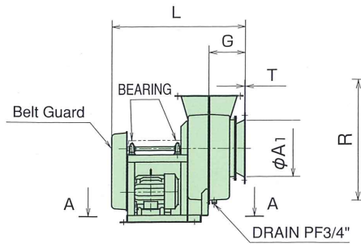
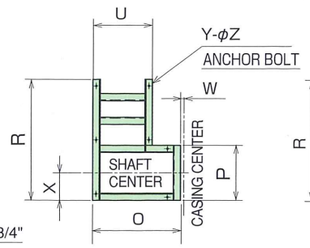
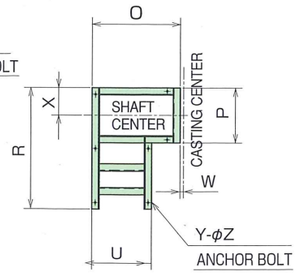
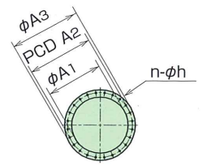




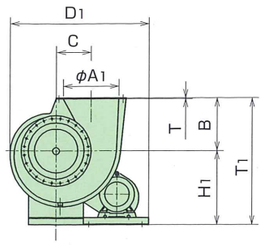
A-A view
RH, RR, LH, LL, LR TYPE



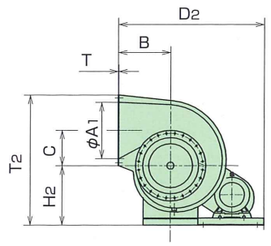
A-A view
RL TYPE



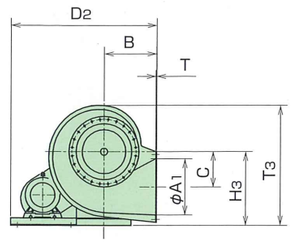
DISCHAGE



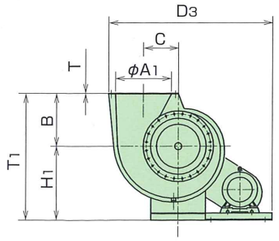
RH1



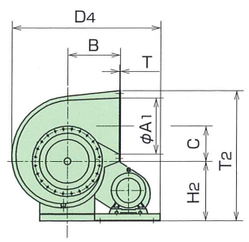
RR1



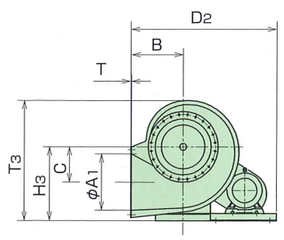
RL2



LH1



LL1



LR1

MODEL	BODY														FLANGE					
	L	H1	H2	H3	B	C	D1	D2	D3	D4	T1	T2	T3	G	φA1	PCDA2	φA3	n	h	T
NSF302	1220	670	540	670	480	320	1270	1330	1490	1357	1150	1180	1090	330	510	590	640	24	14	6
NSF402	1400	870	750	870	580	450	1443	1470	1690	1557	1450	1550	1423	400	600	660	700	28	14	6

MODEL	BASE								BODY WEIGHT (kg)			BEARING
	R	U	O	P	W	X	Y	Z	Standard	Vibration Isolator	SpringVibration Isolator	
NSF302	1100	540	800	500	10	250	7	14	115	170	177	UCP207
NSF402	1200	580	890	620	15	310	7	18	180	237	244	UCP309

Note : The weight of body is an approximate weight not including the weight of motor

STRUCTURE

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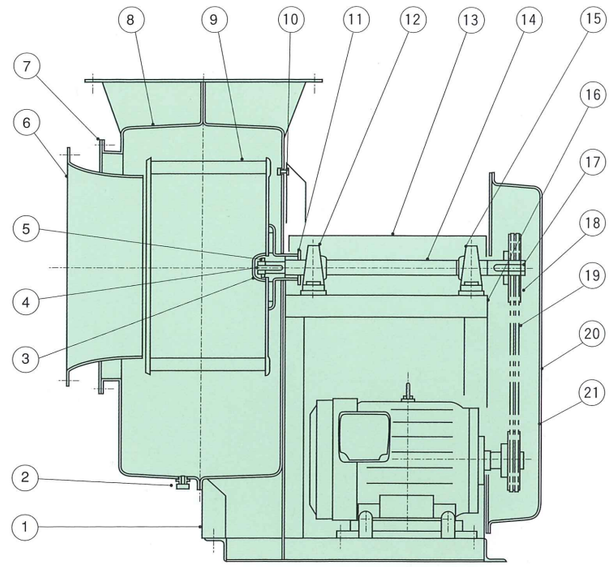


No.	NAME OF PART	MATERIALS	QTY	REMARKS
1	Casing Support	FRP	1	PF3/4"
2	Drain Plug	FRPP	1	
3	Nut Cover	FRP	1	
4	Impeller Key	S45C	1	
5	Impeller Nut & Washer	SS400	1	
6	Suction Cone	FRP	1	
7	Suction Cone Bolt	SUS304	1set	
8	Casing	FRP	1	
9	Impeller	FRP	1	
10	Casing Set Bolt	SUS304	1set	
11	Seal Ring	HTPVC	1	
12	Bearing Unit	SUJ2	2	
13	Shaft Guard	FRP	1	
14	Shaft	S35C	1	
15	Grease Nipple		2	
16	Bracket	SS400	1	
17	V-Pulley Key	S45C	1	
18	V-Pulley	FC200	2	
19	V-Belt	Rubber	1set	
20	V-Belt Window	Acryli plastics	1	
21	Belt Guard	FRP	1	

Calculation of Pressure Loss

The pressure loss in a obtained using equation given below:

$$P = \zeta \cdot \gamma \frac{V^2}{2g}$$

where,
P : Pressure loss (1mmAq=9.8Pa)
γ : Gas specific gravity (air : 1.2kg/m³)
ζ : Pressure loss coefficient of duct
v : Wind velocity inside duct (m/s)
g : gravitational force (9.8m/s²)

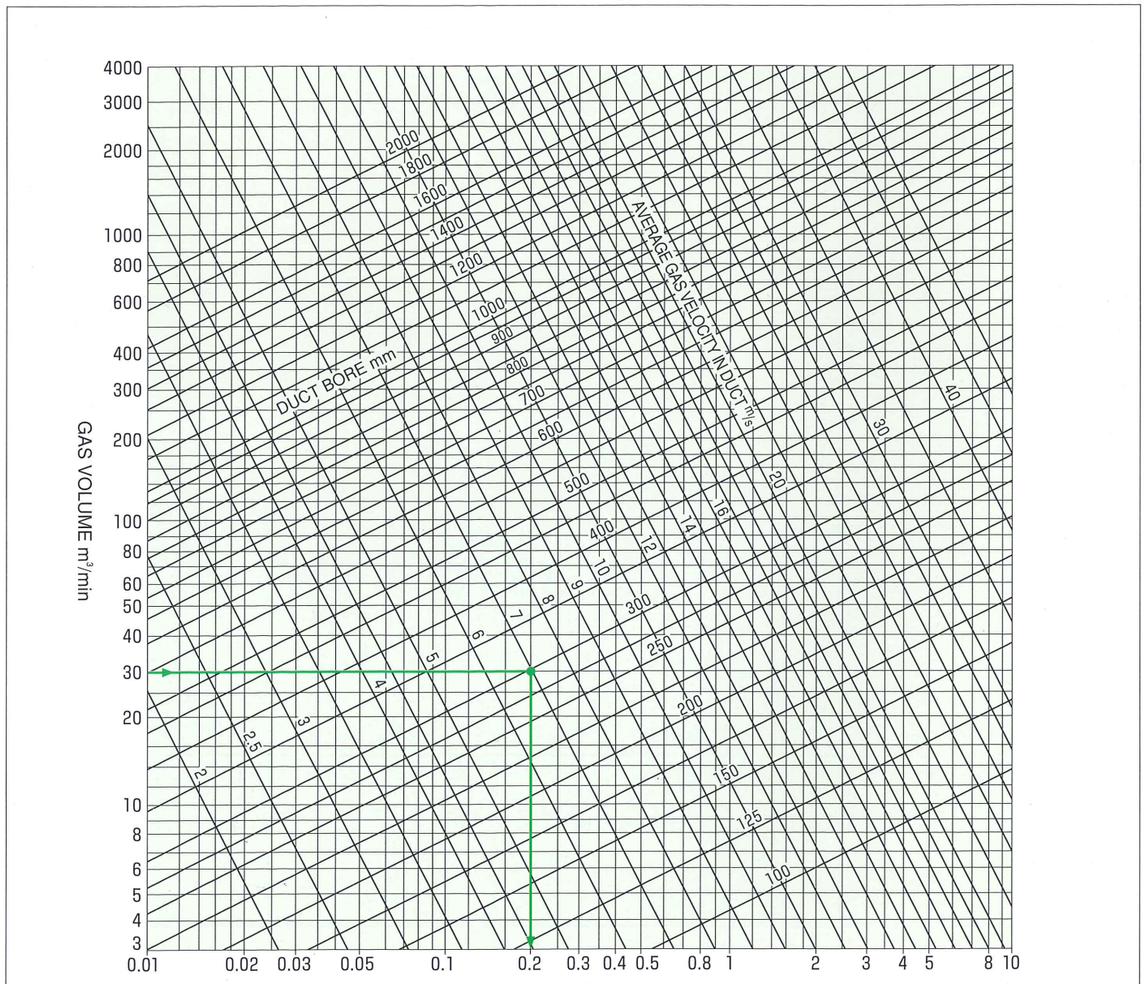
The pressure loss in the straight section of a rectangular duct is obtained by converting the resistance coefficient of the straight portion to a corresponding cylindrical duct using the equation given below.

$$P = 1.3 \times \left\{ \frac{(a \times b)^5}{(a \times b)^2} \right\}^{0.125}$$

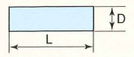
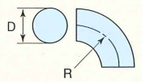
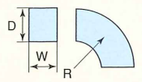
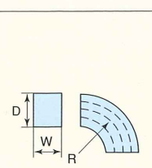
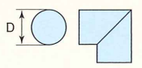
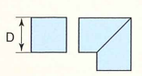
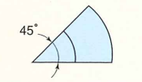
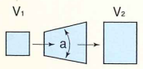
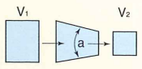
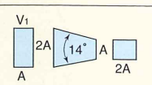
where,
D : Dia meter of equivalent cylindrical duct
a : width of rectangular duct
b : height of rectangular duct

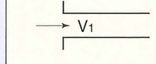
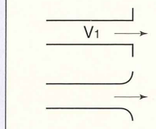
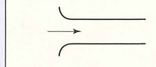
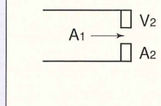
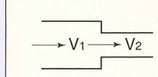
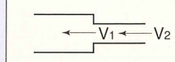
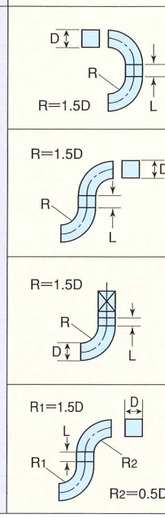
Pressure Loss Graph of Round Duct

Example
When the duct bore is 300mm and the gas volume is 30m³/min, the gas velocity in the duct is 7 m/sec and the pressure loss per meter is 0.2 mmAq.



Duct coefficient of resistance

No. Duct type	Shape	Condition	Value of ζ
1) Straight duct			$0.02 \times \frac{L}{D}$
2) Cylindrical duct bend		R/D = 0.5 = 0.75 = 1.0 = 1.5 = 2.0	0.75 0.38 0.26 0.17 0.15
3) Cylindrical duct with tangular bend plus guide vane		W/D: 0.5; R/D: 0.5 / 0.75 / 1.0 / 1.5	1.30 / 0.47 / 0.28 / 0.18
		W/D: 1~3; R/D: 0.5 / 0.75 / 1.0 / 1.5	0.95 / 0.33 / 0.20 / 0.13
4) Cylindrical duct with Rectangular bend plus guide vane		No.of vanes: 1; R/D: 0.5 / 0.75 / 1.0 / 1.5	0.70 / 0.16 / 0.13 / 0.12
		No.of vanes: 2; R/D: 0.5 / 0.75 / 1.0 / 1.5	0.45 / 0.12 / 0.10 / 0.15
5) Right-angled cylindrical duct		Guide vane	0.87
6) Right-angled rectangular duct			1.25
7) 45° Cylindrical duct		With or without cylindrical shaped vene	1/2 of 90° cylindrical duct
8) Expanding duct		a = 5 10 20 30 40	0.17 0.28 0.45 0.59 0.73
		ζ is a pressure loss coefficient to $\gamma \frac{(V_1^2 - V_2^2)}{2g}$	
9) Contructing duct		a = 30 45 60	0.02 0.04 0.07
		ζ is a pressure loss coefficient to $\gamma \frac{V_2^2}{2g}$	
10) Deformed duct			0.15

No. Duct type	Shape	Condition	Value of ζ
11) Sharp contracted inlet			0.50
12) Sharp outlet			1.0
13) bellmouth inlet			0.03
14) Round shaped orifice		A_2/A_1 = 0 0.25 0.50 0.75 1.0	2.8 2.4 1.9 1.5 1.0
		ζ is a pressure loss coefficient to $\gamma \frac{V_2^2}{2g}$	
15) sharp contraction		V_2/V_1 = 0 0.25 0.50 0.75	0.5 0.45 0.32 0.18
		ζ is a pressure loss coefficient to $\gamma \frac{V_2^2}{2g}$	
16) sharp enlargement		V_2/V_1 = 0 0.20 0.40 0.60 0.80	1.0 0.64 0.36 0.16 0.04
		ζ is a pressure loss coefficient to $\gamma \frac{V_1^2}{2g}$	
17) Two consecutive bends		L = 0 L = D With guide vane	0.43 0.31 0.15
		L = 0 L = D With guide vane	0.62 0.68 0.19
		L = 0 L = D With guide vane	0.42 0.46 0.21
		Direction of arrow Opposite direction	0.15 1.03

CRROSION RESISTANCE TABLE

Usage permitted of prohibited (Gas temp.:50℃ or lower)
○: Permitted(However, for the chemicals annotated with notes 1 through 4, the NSF302 to 402 models are required to have special specifications.)
×: Prohibited

Chemicals	Chemical Formula	Density Wt%	Models CES101~ CES201	Models NSF302~ NSF402	Special Specifi-cations
Alkalis					
Ammonia(gas)	NH_3	all	○	○	
Ammonium Hydroxide	NH_4OH	20	○	○	
Barium Hydroxide	$Ba(OH)_2$	10	○	○	
Calcium Hydroxide	$Ca(OH)_2$	25	○	○	
Potassium Hydroxide	KOH	10	○	○	
Sodium Hydroxide	NaOH	25	○	○	
Bleaches					
Calcium Hypochlorite	$Ca(ClO)_2$	all	○	○	Note 2
Chlorine Dioxide	ClO_2	15	×	○	
Chlorine Water		sat.	×	×	
Hydrogen Peroxide	H_2O_2	30	×	○	Note 4
Hypochlorous Acid	HClO	10	○	○	Note 2
Sodium Hypochlorite	NaClO	15	○	○	Note 2
Inorganic Acid Gases					
Anhydrous Hydrogen Fluoride	HF		×	×	
Boric Acid	H_3BO_3	all	○	○	
Bromine	Br_2		×	×	
Carbon Dioxide	CO_2	-	○	○	
Carbon Monoxide	CO	-	○	○	
Chromic Acid	H_2CrO_4	20	×	○	Note 3
Sulfuric Acid	H_2SO_4		×	×	
Hydrochloric Acid	HCl	20	○	○	
Hydrofluoric Acid	HF	5	×	○	Note 1
Hydrobromic Acid	HBr	10	○	○	
Hydrofluosilicic Acid	H_2SiF_6	10	×	○	Note 1
Hydrocyanic Acid	HCN	all	○	○	
Hydrogen Sulfide	H_2S	10	○	○	
Nitric Acid	HNO_3	10	○	○	
Nitrogen Oxide	NOx	5	○	○	
Ozone	O_3	(10ppm)	○	○	
Perchloric Acid	$HClO_4$	10	○	○	
Phosphoric Acid	H_3PO_4	30	○	○	
Sulfurdioxide	SO_2	25	○	○	
Sulturic Acid	H_2SO_4	40	○	○	
Sulfuric Anhydride	SO_3		×	×	
Organic Acid Gases					
Acetic Acid	CH_3COOH	25	○	○	
Acetic Anhydride	$(CH_3CO)_2O$		×	×	
Acrylic Acid	CH_2=$CHCOOH$	10	×	○	Note 4
Adipic Acid	$(CH_2)_4(COOH)_2$	23	○	○	
Benzene Sulfonic Acid	$C_6H_5SO_3H$	10	○	○	Note 4
Benzoic Acid	C_6H_5COOH	all	○	○	
Butyric Acid	C_3H_7COOH	5	○	○	
Citric Acid	$C_3H_4(OH)(COOH)_3$	25	○	○	
Formic Acid	HCOOH	10	○	○	
Glycolic Acid	$CH_2OHCOOH$	30	○	○	Note 4
Lactic Acid	$CH_3CH(OH)COOH$	all	○	○	
Levulinic Acid	$CH_3COCH_2CH_2COOH$	all	○	○	
Maleic Acid	$(CHCOOH)_2$	all	○	○	
Monochloroacetic Acid	$CH_2ClCOOH$	25	○	○	Note 4
Oleic Acid	$C_{17}H_{33}COOH$	all	○	○	
Oxalic Acid	$(COOH)_2$	20	○	○	
Picric Acid	$C_6H_2(NO_2)_3OH$	1	○	○	Note 4
Stearic Acid	$C_{17}H_{35}COOH$	all	○	○	
Sulfanilic Acid	$C_6H_4(NH_2)(SO_3H)$	all	○	○	
Thioglyclic Acid	$HSCH_2COOH$		×	×	
Tannic Acid	$C_{76}H_{52}O_{46}$	all	○	○	
Tartaric Acid	$(CHOHCOOH)_2$	all	○	○	

Chemicals	Chemical Formula	Density Wt%	Models CES101~ CES201	Models NSF302~ NSF402	Special Specifi-cations
Salts					
Aluminum Chloride	$AlCl_3$	all	○	○	
Ammonium Chloride	NH_4Cl	all	○	○	
Ammonium Nitrate	NH_4NO_3	all	○	○	
Ammonium Sulfate	$(NH_4)_2SO_4$	20	○	○	
Barium Chloride	$BaCl_2$	all	○	○	
Calcium Chloride	$CaCl_2$	all	○	○	
Copper Sulfate	$CuSO_4$	all	○	○	
Copper Chloride	$CuCl_2$	all	○	○	
Ferric Chloride	$FeCl_3$	50	○	○	
Ferric Sulfate	$Fe_2(SO_4)_3$	all	○	○	
Magnesium Chioride	$MgCl_2$	all	○	○	
Magnesium Sulfate	$MgSO_4$	all	○	○	
Nickel Chloride	$NiCl_2$	all	○	○	
Potassium Bicarbonate	$KHCO_3$	50	○	○	
Potassim Bichromate	$K_2Cr_2O_7$	20	×	○	Note 3
Potassium Sulfate	K_2SO_4	all	○	○	
Potassium Permanganate	$KMnO_4$	10	×	○	Note 4
Silver Nitrate	$AgNO_3$	all	○	○	
Sodium Carbonate	Na_2CO_3	35	○	○	
Sodium Nitrite	$NaNO_2$	all	○	○	
Sodium Sulfide	Na_2S	all	○	○	
Sodium Sulfite	Na_2SO_3	all	○	○	
Zinc Sulfate	$ZnSO_4$	all	○	○	
Solvents & Organic Compounds					
Acetaldehyde	CH_3CHO		×	×	
Acetophenone	$C_6H_5COCH_3$		×	×	
Acetone	CH_3COCH_3		×	×	
Acetonitrile	CH_3CN		×	×	
Acrylonitrile	CH_2=$CHCN$		×	×	
Aniline	$C_6H_5NH_2$		×	×	
Benzaldehyde	C_6H_5CHO		×	×	
Chloroform	$CHCl_3$		×	×	
Cresol	$CH_3C_6H_4OH$	5	○	○	
Diethylamine	$(CH_3)_2NH$		×	×	
Diethyl Ketone	$C_2H_5COC_2H_5$		×	×	
Ethyl Acetate	$CH_3COOC_2H_5$		×	×	
Ethyl Alcohol	C_2H_5OH	50	○	○	Note 4
Ethyl Bromide	C_2H_5Br		×	×	
Ethylene Chloride	$ClCH_2CH_2Cl$		×	×	
Ethylene Glycol	$HOCH_2OH_2OH$	all	○	○	
Ethyl Ether	$C_2H_5OC_2H_5$		×	×	
Ethylene Oxide	CH_2CH_2O		×	×	
Formaldehyde	HCHO	10	○	○	Note 4
Gasoline		all	×	○	Note 4
Glycerine	$C_3H_5(OH)_3$	5	○	○	
Heptane	$CH_3(CH_2)_5CH_3$	10	○	×	
Isopropyl Alcohol	$(CH_3)_2CHOH$	all	○	○	Note 4
Isopropyiamine	$(CH_3)CHNH_2$	all	×	○	Note 4
Methyl Acetate	CH_3COOCH_3		×	×	
Methyl Alcohol	CH_3OH	50	○	○	Note 4
Methylene Chloride	CH_2Cl_2		×	×	
Naphtha		all	×	○	Note 4
Phenol Sulfonic Acid	$C_6H_4(OH)(SO_3H)$		×	×	
Pyridine	C_5H_5N		×	×	
Sulfurdichloride	SCl_2		×	×	
Trichlorobenzene	$C_6H_3Cl_3$		×	×	

Note 1 : Spacifications against hydrofluoric acid
Note 2 : Spacifications against hypochlorous acid-based substances
Note 3 : Spacifications against chromic acid (Prohibited to use for alkalis)
Note 4 : Spacifications against solvents (Ptohibited to use for alkalis)

Special Spacifications (Target models : NSF302 to 402)

INSTALLATION PLAN

Precautions for Installation

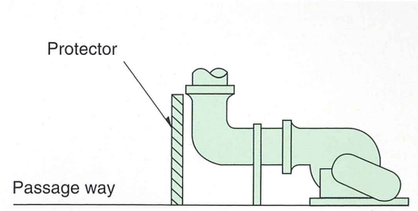
1. Installation and Piping

1) Ensure that the fan is installed where it can easily be accessed for routine checks and maintenance. (Free space of about 600mm is recommended)

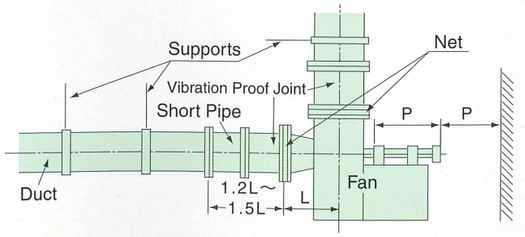
2) When connecting the fan to a duct, make sure a vibration proof joint is attached to the fan and piping supports installed to free the fan from effects of piping load.(We are always at your service with standard vibration proof joints for each model)

3) The risk of foreign matter being sucked into the fan while it is running, resulting in unanticipated damage to the impeller should be averted by taking steps to ensure that foreign matter is not sucked in through the suction opening or allowed to drop in through the dischage opening.
(We are always at your service with standard nettings for each model)

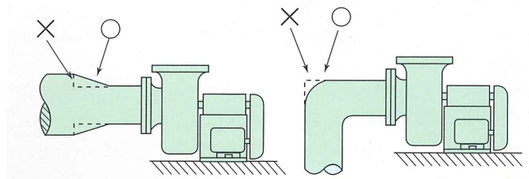
4) Safety has been fully considered in the design and manufacture of impellers. However,the suction of foreign matter, adherance of dust (debris), suction of high tempeature gases may lead to unanticipated damage to the fan. A protector should be installed or other adequate measures taken to avert accidents in unavoidable situations where the discharge opening stretches out into a passage way.



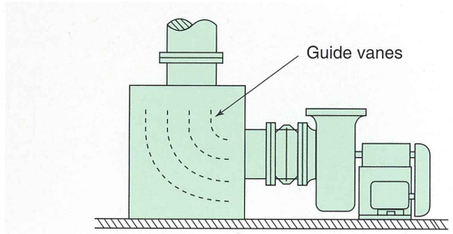
5) For proper running of the fan, the piping and installation method given in the diagram below is recommended.



6) To ensure smooth flow of air, ducts should be designed to have the profile shown by the solid lines in the drawings displayed below. Ducts having the profile denoted by the dotted lines not only lead to increased vibration especially at the suction side but may also cause a decline in fan performance.



7) The use of a right-angle elbow or chamber as piping is also a cause for excessive vibration and decline in fan performance. Utilize guide vanes if use of a right-angle elbow or chamber is unavoidable.



8) Fluid would accumulate inside the casing if the gas being handled contains water vapor or mist, therefore, a casing-drainage pipe should be installed and drainage performed regularly to get rid of the accumulated fluid.

9) The fan has been designed to handle gases that are free of dust or crystallize particles. To avert the risk of impeller unbalance, a filter or similar device should be attached to the suction opening if the gas is not devoid of dust etc.

2. Working temperature and Corrosion resistance

A list of the various gases that can be handled and the permissible maximum gas temperature under which the fan can be used is shown in the CORROSION RESISTANCE TABLE.
Corrosion resistance is attainable at the temperatures up to 50℃ temperatures above this value may likely result in impeller damage. The specified working temperature range must be strictly maintained. Consult with us, if the gas temperature should exceed the maximum.