\*This **software pack** includes a program and a key. Open **eDUCT** file in CD, click SETUP and follow the steps to finish installation. Then desktop will exist **eDUCT** execution file. (2020/04/15)

# enhanced <u>DUCT</u> Design Software (eDUCT) Manual

★To compute (total) pressure loss, duct size, fan horsepower, etc.
★To verify Moody chart, Darcy equation and Colebrook equation, etc.

#### (A)Symbols:

FN: fitting No.  $\nu$  : kinematic viscosity(m<sup>2</sup>/s)  $P_f$ : fitting pressure loss(Pa, =Cs\*Pv) SN: serial No.  $\varepsilon$  /D: relative roughness (-)  $P_{\rm m}$ : main duct pressure loss(Pa, =  $\Delta P_{\rm L}$ \*L) Q: flowrate(L/s) Re: Revnolds No. (-)  $P_t$ : total pressure loss(Pa, = $P_f$ + $P_m$ ) V:velocity(m/s) f: friction factor(-)  $P_{T}$ : fan total pres. (Pa)  $\varepsilon$  : absolute roughness(mm) Cs: fitting loss coefficient(-) Ps: fan static pres. (Pa)  $T : temperature(^{\circ}Cdb)$ H: given duct height(mm)  $\theta_{f}$ : fan total pres. eff. RH: relative humidity(%RH) W: specified duct width(mm)  $\theta_{\rm fs}$ : fan static pres. eff.  $\rho$ : density (kg/m<sup>3</sup>) L: duct length(m)  $\theta_{\rm m}$ : motor eff. P<sub>v</sub>: velocity pressure(Pa)  $R_{as}$ : aspect ratio( $W/H \leq 5$ )  $\theta_{\rm b}$ : belt eff.  $\Delta P_{L}$ : friction loss(Pa/m)  $A_s$ : duct area(m<sup>2</sup>, =(H+W)xLx2.03)  $\theta$  b=1.0 if no belt is used. De: equivalent diameter of rectangular duct(mm) D: duct diameter(mm)

### (B)Hints for $\rho$ (kg/m<sup>3</sup>) and $\varepsilon$ (mm):

(1)Standard air (20°C & 0%RH or ( $\rho$ )1.204 kg/m<sup>3</sup>) is normally adopted for common HVAC ducts. (2)common  $\varepsilon$  values : PVC(0.04), galvanized steel round(0.09), galvanized steel spiral(0.12), flexible aluminum, 100% extended(2.0)

(3)other  $\rho$  and  $\varepsilon$  values can be found by visiting public websites.

### (C)Duct Diagram Example (**%Refer to eDUCT Software in fig 2.**)

- (1)Number each straight duct, such as  $123\cdots$ . Mark each fitting, such as a b c  $\cdots$ .
- (2)Usually the longest path (path A) has the largest friction loss. However, sometimes the shorter branch path B may have larger loss depending on fitting's shape & quantity..



## (D)Common Use Fitting Loss Coefficients(Cs)(%approximate values)

		1		2		3		4	5
		45°		90°		transition	r	ectangular-	double $45^{\circ}$
		elbow		elbow		11 all \$111011		round	elbow
Symbol						→	2	ZW → SD	*
Cs	0.	05~0.2( <b>≒0.13</b> )	0.	1~0.35( <b>≒0.25</b> )		0.1~0.3 <b>(≒0.2)</b>	0.	.1~0.35( <b>≒0.25</b> )	0.15~0.35 <b>(≒0.2)</b>
		6		7		8		9	10
		wye		double wye	;	2-way		Junction w /	dovetail
		$(\leq 30^{\circ})$		$(\leq 30 \sim 45^{\circ})$	)	junction		2 splitters	uovetan
Symbo	bl		Ϋ́, Ψ		>		-		
Cs(mai	in)	0.1~0.35 <b>(≒0.2</b>	5)	0.1~0.35 <b>(≒0.2</b>	5)	0.1~0.35 <b>(≒0.25</b>	5)	0.1~0.35 <b>(≒0.25)</b>	0.1~0.25( <b>≒0.15)</b>
Cs(bran	ch)	0.2~0.7 <b>(≒0.4</b>	5)	0.2~0.7 <b>(≒0.45</b>	5)	0.2~0.7 <b>(≒0.45</b>	)	0.2~0.7 <mark>(≒0.45)</mark>	0.1~0.25 <b>(≒0.15)</b>

### ★ The Cs values in ASHRAE Duct Fitting Database are preferred.

(=0.00) Cs can be used for general calculation.

### (E)Operating Steps: (Refer to Computer Screen)

- (1) fig 1: Select New Project or Existing file
- (2) fig 2: Select one project and click OK
- (3) fig 3: Input Customer, Project and Date
  - 2 Must Inputs: Input  $Q \cdot V \cdot \varepsilon$  and  $T(^{\circ}C)$ Defaults:  $\varepsilon(0.09)$ , T(20) and RH(0.1%).
  - (3) Option Input: Input %RH(cannot be 0.00%) or  $\rho$ . Defaults 0.01%RH and  $\rho(1.204)$  can be changed.

eDuct Software

- (4) Remarks: Input fitting No. & Straight duct No.
- (5) Click NEXT or EXIT

NO

20180817001

Þ

K



Project

OK

1 ^

20180817001

User's Manual Example

fig1.

fig 2.

eywords	Delete file	BACK
		<u></u>

Customer

(6) If [ Equal Friction Loss ] method is adopted, like this example, suppose target  $\Delta PL$ (column 8) is 1.00Pa/m, try to input V value (Column 2) until (column 8)  $\Delta PL = 1.00Pa/m$ .

⑦Data in Column 11~13 can be used to verify Corebrook Eq(1/√f=-2log[0.27(ε/D)+(2.51/Re/√f)].
(4) fig4: Input Cs, H, W and L; quick double click Cs column and the default values(0.2, 350, 700 and 1.00) will be shown on screen. Default values can be changed. Let H=D if round duct is used. Input duct width (column W) by "trial and error". For example, for SN1(Row 1), input a certain value at W column, such as 800(mm) first and see if De (column De) is equal to D (column D). If it isn't, try another W value (900) until De(597)≒D(592). H value is specified by designer. As(m²) is the required duct surface area. As(m²)=(H+W)\*L\*2.03. 3% is making-loss rate. %Go back to fig 3 if you want to modify any data in Copied from Table 1 and Remarks.

	NO: 201	80817001	Cus	tomer:	eDuct Software 1 Project: User's Manual Example									Date: 2018/08/17	
	Mu	ist Inpu	its (2)		Option	n Input 🕃	$\mathbf{b}$			Outputs	·			(4) Remarks	٦
	1	2	3	4	5	6	7	8	9	10	11 (7	) 12	13	14	
SN	Q L/s	V m/s	ε mm	°C	RH %	ہم kg/m^3	Pv Pa	∆PI(6 Pa/m	) D mm	ν m²/s	ε/D	Re	f	Noted by Designer FN & SN refer to attached duct diagram	
1	2200.0	8.00	0.090	20.0	0.1	1.204	38.5	1.016	592	0.00001508	0.000152	313988.2	0.0156	return grille-1 transition(a)	X
2	2200.0	8.00	0.090	20.0	0.1	1.204	38.5	1.016	592	0.00001508	0.000152	313988.2	0.0156	elbow (b), SN1-2	X
3	2200.0	8.00	0.090	20.0	0.1	1.204	38.5	1.016	592	0.00001508	0.000152	313988.2	0.0156	elbow(c), SN2-3	X
4	4400.0	9.40	0.090	20.0	0.1	1.204	53.2	0.999	772	0.00001508	0.000117	481334.7	0.0145	transition(d), wye main(e), SN3-4	X
5	4400.0	9.40	0.090	20.0	0.1	1.204	53.2	0.999	772	0.00001508	0.000117	481334.7	0.0145	elbow(f), SN4-5	X
6	4400.0	9.40	0.090	20.0	0.1	1.204	53.2	0.999	772	0.00001508	0.000117	481334.74	0.0145	elboe(g), SN5-6	X
7	4400.0	9.40	0.090	20.0	0.1	1.204	53.2	0.999	772	0.00001508	0.000117	481334.7	0.0145	elbow(h), SN6-7, transition(i), SN7-AHU	X
8	5000.0	9.70	0.090	20.0	0.1	1.204	56.6	1.001	810	0.00001508	0.000111	521228.1	0.0143	transition(j), AHU-SN8	X
9	5000.0	9.70	0.090	20.0	0.1	1.204	56.6	1.001	810	0.00001508	0.000111	521228.1	0.0143	elbow(k), SN8-9	X
10	5000.0	9.70	0.090	20.0	0.1	1.204	56.6	1.001	810	0.00001508	0.000111	521228.1	0.0143	elbow(l), SN9-10	X
11	2500.0	8.20	0.090	20.0	0.1	1.204	40.5	1.000	623	0.00001508	0.000144	338870.6	0.0154	wye main(m), transition(n), SN10-11	X
12	2500.0	8.20	0.090	20.0	0.1	1.204	40.5	1.000	623	0.00001508	0.000144	338870.6	0.0154	elbow(o), SN11-12a	X
13	2000.0	7.80	0.090	20.0	0.1	1.204	36.6	1.011	571	0.00001508	0.000158	295610.1	0.0158	wye main(p), transition(q), SN12a-13a	X
14	1500.0	7.30	0.090	20.0	0.1	1.204	32.1	1.021	511	0.00001508	0.000176	247664.6	0.0163	wye main(r), transition(s), SN13a-14a	X
15	1000.0	6.60	0.090	20.0	0.1	1.204	26.2	1.018	439	0.00001508	0.000205	192277.7	0.0170	wye main(t), transition(u), SN14a-15a	X
16	500.0	5.50	0.090	20.0	0.1	1.204	18.2	0.992	340	0.00001508	0.000265	124114.7	0.0185	wye main(v), transition(w), SN15a-16a	X
17	250.0	3.74	2.000	20.0	0.1	1.204	8.4	1.003	292	0.00001508	0.006856	72370.7	0.0347	dovetail(x), rectangular-round(y), SN16a-17a	X
18	0.0	0.00	0.000	0.0	0.0	0.000	0.00000	0.00000	0.00000	0.000000000	0.0000000	0.0000000	0.0000000	flexible duct( © =2.0, D=300), SN17a-diffuser	Tx
19	0.0	0.00	0.000	0.0	0.0	0.000	0.00000	0.00000	0.00000	0.000000000	0.0000000	0.0000000	0.0000000	$\star$ for deleting all inputs	X
20	0.0	0.00	0.000	0.0	0.0	0.000	0.00000	0.00000	0.00000	0.000000000	0.0000000	0.0000000	0.0000000	(A tot detecting un inputs)	X
21	0.0	0.00	0.000	0.0	0.0	0.000	0.00000	0.00000	0.00000	0.000000000	0.0000000	0.0000000	0.0000000		X

<b>P</b> *	
$t_{10}$	-
112	J.

EXIT

fig 4.

									BACK	J											
[		Copied	l From Ta	ible 1			Inj	puts				Outp	outs			Remarks	]				
SN	Q L/S	V m/s	Pv Pa	∆PL Pa/m		Cs	H mm	W mm	L m	Ras W/H	De mm	As m <sup>2</sup>	Pf Pa	Pm Pa	Pt Pa	Noted by Designer FN & SN refer to attached duct diagram					
1	2200.0	8.00	38.5	1.016	592	0.20	350	900	1.00	2.57	597	2.54	7.70	1.00	8.70	return grille-1 transition(a)	X				
2	2200.0	8.00	38.5	1.016	592	0.25	350	900	3.00	2.57	597	7.61	9.60	3.00	12.70	elbow (b), SN1-2	X				
3	2200.0	8.00	38.5	1.016	592	0.25	350	900	12.00	2.57	597	30.45	9.60	12.20	21.80	elbow(c), SN2-3	X				
4	4400.0	9.40	53.2	0.999	772	0.45	400	1400	6.00	3.50	781	21.92	23.90	6.00	29.90	transition(d), wye main(e), SN3-4	X				
5	4400.0	9.40	53.2	0.999	772	0.25	400	1400	24.00	3.50	781	87.70	13.30	24.00	37.30	elbow(f), SN4-5	X				
6	4400.0	9.40	53.2	0.999	772	0.25	400	1400	3.00	3.50	781	10.96	13.30	3.00	16.30	elboe(g), SN5-6	X				
7	4400.0	9.40	53.2	0.999	772	0.45	400	1400	1.00	3.50	781	3.65	23.90	1.00	24.90	elbow(h), SN6-7, transition(i), SN7-AHU	X				
8	5000.0	9.70	56.6	1.001	810	0.20	450	1300	3.00	2.89	808	10.66	11.30	3.00	14.30	transition(j, AHU-SN8	X				
9	5000.0	9.70	56.6	1.001	810	0.25	450	1300	6.00	2.89	808	21.32	14.20	6.00	20.20	elbow(k), SN8-9	X				
10	5000.0	9.70	56.6	1.001	810	0.25	450	1300	12.00	2.89	808	42.63	14.20	12.00	26.20	elbow(l), SN9-10	X				
11	2500.0	8.20	40.5	1.000	623	0.45	350	1000	12.00	2.86	626	32.89	18.20	12.00	30.20	wye main(m), transition(n), SN10-11					
12	2500.0	8.20	40.5	1.000	623	0.25	350	1000	6.00	2.86	626	16.44	10.10	6.00	16.10	elbow(o), SN11-12a	X				
13	2000.0	7.80	36.6	1.011	571	0.45	350	800	6.00	2.29	567	14.01	16.50	6.10	22.50	wye main(p), transition(q), SN12a-13a	X				
14	1500.0	7.30	32.1	1.021	511	0.45	300	800	6.00	2.67	520	13.40	14.40	6.10	20.60	wye main(r), transition(s), SN13a-14a	X				
15	1000.0	6.60	26.2	1.018	439	0.45	300	550	6.00	1.83	439	10.35	11.80	6.10	17.90	wye main(t), transition(u), SN14a-15a	X				
16	500.0	5.50	18.2	0.992	340	0.45	300	550	6.00	1.83	439	10.35	8.20	6.00	14.10	wye main(v), transition(w), SN15a-16a	X				
17	250.0	3.74	8.4	1.003	292	0.50	275	270	3.00	0.98	298	3.32	4.20	3.00	7.20	dovetail(x), rectangular-round(y), SN16a-17a	X				
18	0.0	0.00	0.0	0.000	0	0.00	0	0	0.00	0.00	0	0.00	0.00	0.00	0.00	flexible duct(€=2.0, D=300), SN17a-diffuser	X				
19	0.0	0.00	0.0	0.000	0	0.00	0	0	0.00	0.00	0	0.00	0.00	0.00	0.00	for deleting all inputs	X				
20	0.0	0.00	0.0	0.000	0	0.00	0	0	0.00	0.00	0	0.00	0.00	0.00	0.00		X				
21	0.0	0.00	0.0	0.000	0	0.00	0	0	0.00	0.00	0	0.00	0.00	0.00	0.00		X				
											Total:	340.20	224.4	116.5	340.9	Conjed to fig 5 automatically	-				

- (5) fig5:Complete the inputs in Table 3~Table 5, and SAVE first before PRINT1 or PRINT2.
  - ① The calculated Ptr=644Pa is total pressure loss. If you want to calculate static pressure loss (Ps), then Ps = Ptr - Pv @AHU outlet = 645-57 = 588Pa (see p6/6 Table 2 & 4).
  - (2)Input fan total pressure (PT). Ptr  $\leq$  PT  $\leq$  1.05Ptr is recommended.

- ③Input fan static pressure (PS) value if Ps is used. Psr $\leq$ PS $\leq$ 1.05Psr is recommended.
- (4)Input  $\theta$  fs (static pres. eff.) value if fan static pressure (PS) is used.
- (5)Input concerned information in Table 5.
- (6) Press SAVE first before Print out.

	fig 5													
Table 3 Calculate Fan Total (Static) I	Pressure Required(Ptr) + F4 + F5 + F6	+ F7 + F8	+ FQ +	F10			BACK							
Ptr = 341 + 15 + 0	+ 30 + 0 + 220 +	+ 0 + 15	+ 0 +	23 =	644									
F1: pressure loss, from Table 2			F6: AHU inte	ernal pressure loss(12	20~250Pa)									
F2: outlet diffuser(10~25Pa)			F7: Fan unit	internal loss(SEF,70	~250Pa)									
F3: silencer box(150~500Pa)			F8: other 1	return grille(10~25Pa	)									
F4: volume damper(VD,15~30Pa)			F9: other 2	Fire Damper(FD,20-4	OPa)									
F5: inlet /outlet hood with screen(8	10~200Pa)		F10:other 3	Extra VD(15-30Pa)	Ca	an be change	ed.							
*ASHRAE recommended values & M	laker's data are preferred.													
Table 4 Calculate Fan Motor Power I       kWr = $Q * PT (or PS)$ 1*1000000 * $\theta f * \theta m$	Required(kWr) * θ b 1*1000000 *	2 5000 * 645 0.55 * 0.88 *	1.00 d	6.66 efaults: 0.7*0	k₩( .8*0.9	8.88 HP)								
Ranges of $\theta f \times \theta$ m & $\theta b$ *Maker's data are preferred. $O(I, I_s)$ <1000														
Q(L/s) \$1,000	≥3,000 ≥6,000	≥ 12,000	≤ 18,000	≧20,000	-									
	0.45~0.55 0.5~0.6	0.55~0.7	0.0~0.75	8.0~7.0_07_0.05										
0.70~0	.85 0.75		U.87	CP.U~18.U										
$\theta$ D U. $f > 1.0$ (=1.0 if no belt is used) $\theta$ f : fan total pres. eff., $\theta$ fs if static pres. is used. $\theta$ m : motor eff., $\theta$ b : belt eff., PT : total pres., PS : static pres., PS=PT - Py @fan outlet														
Table 5 Specify Fan's Specifications	al <u>series</u>													
Fan Job (L/s)	total pres. PT (Pa) PS(Pa) S(Pa)	fan eff. moto. $\theta f(\theta fs) = \theta$	reff. belteff. θm θb	motor power kW(HP) phase	e / volt / Hz	fan type	remarks							
5000 (5) 64	IS (Z) (3)	0.55 (4) 0.88	5 1.0 5	7.5(10) (5) 3/220	W/60Hz ()	backward ()	F class Motor(IE3), SF1.15							
Designer / Company: Andy Ho/Temps	sce, Inc.	Email: sales	s.tempace.msa.hinet.net	1			Tel: 886-7-5571755							
				S	AVE 6	PRINT1	PRINT2 EXIT							
						(page5/6)	(page 6/6)							

## **Disclaimer:**

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## **TEMPACE, INC.**

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uston	Der: eDuc	t Softwa	g				3	Project:	Uær's Man	ual Example, HY	AC system		3	Date: 2020/04/06
		Must f	aputs		10	tion Input		3		0ª	tputs			Re
	1	2	3	4	5	9	7	8	6	10	11	12	13	14
N.S	C/s	V m/s	Emm	r <mark>p</mark>	RH %	ρ kg/m3	Pa	APL Pa/m	D	v m/s	ε/D	Re	f	Noted by Designer FN & SN refer to attached
Server Server	2200.0	8.00	0:090	20.0	0.1	1.204	38.5	1.016	592	0.00001508	0.000152	3139882	0.0156	netum grille-1 transition(a)
CN.	2200.0	8.00	0:000	20.0	0.1	1.204	38.5	1.016	592	0.00001508	0.000152	3139882	0.0156	ellow (b), SN 1-2
o L'NO	22000	8.00	06010	20.0	10	1.204	38.5	1.016	592	0.00001508	0.000152	3139882	0.0156	e IIbow (c), SN 2-3
4	4400.0	9.40	0:090	20.0	0.1	1.204	53.2	0.999	772	0.00001508	0.000117	4813347	0.0145	transition(d), wye main(e), SN3-4
	14000	9.40	050.0	20.0	0.1	1.204	53.2	0.999	772	0.00001508	0.000117	481334.7	0.0145	ellbow(¢), SN4-5
4	4400.0	9.40	06010	20.0	0.1	1.204	53.2	0.999	772	0.00001508	0.000117	481334.7	0.0145	ellbow (g), SN 5-6
- <b></b>	4400.0	9.40	06010	20.0	0.1	1.204	53.2	0.999	772	0.00001508	0.000117	4813347	0.0145	ellbow(h), SN 6-7, transition(), SN 7-A.
200	SDODD	9.70	06010	20.0	0.1	1.204	56.6	1.001	810	0.00001508	0.000111	521228.1	0.0143	transition(j), AH U-SNS
- M-1	20000	02.6	06010	20.0	0.1	1.204	56.6	1.001	810	0.00001508	0.000111	521228.1	0.0143	ellbow (k), SN 8-9
0	2000.0	9.70	06010	20.0	01	1.204	56.6	1.001	810	0.00001508	0.000111	521228.1	0.0143	ellbow(), SN9-10
1	2500.0	8.20	0:090	20.0	0.1	1.204	40.5	1.000	623	0.00001508	0.000144	338870.6	0.0154	v ye main(m), transition(n), SN10-11
CN	2500.0	8.20	060.0	20.0	1.0	1.204	40.5	1.000	623	0.00001508	0.000144	338870.6	0.0154	ellbow(o), SN 11-12a
3 2	2000.0	7.80	060.0	20.0	0.1	1.204	36.6	1.011	571	0.00001508	0.000158	295610.1	0.0158	v ye amin(p), transition(q), SN 12a-13a
ন ব	1500.0	7.30	0:090	20.0	01	1.204	32.1	1.021	511	0.00001508	0.000176	247664.6	0.0163	v ye main9t), transition(s), SN1 3a-14a
5	10000	6.60	0000	20.0	01	1.204	26.2	1.018	139	0.00001508	0.000205	192277.7	0.0170	v ye mein(), transition(u), SM14e-15e.
9	500.0	5.50	0:090	20.0	0.1	1.204	18.2	0.992	340	0.00001508	0.000265	124114.7	0.0185	v ye main(v), transition(w), SN 15a-16a
5	250.0	3.74	2.000	20.0	0.1	1.204	84	1.003	292	0.00001508	0.006856	72370.7	0.0347	dovetail(x), rectangular-mund (y), SN 16
00				2-0			2. 10						8.3	flexiable duct( $\varepsilon = 2.0$ , $D = 300$ ), $3N 17a < 0$
Б														
0						2-12							5	-
-														

**PRINT 1** 

RH : mative humidity(%RH) H : known duc theight(mm) As : duct surface area(m<sup>2</sup>=(H+W)\*L\*2.03) Q: specified flow rate (L/s) T : temperature (C) 
 $\alpha$   $\varepsilon$  : absclute roughve sa(run)
 T : temperature (C

 s(Pa/m)
 D : diameter(funn)
 V : kinematic viscosity(n2/s)

  $\alpha$ (·)
 C : section fitting loss codfificient(·)
 H : known dur

  $\alpha$ (·)
 C : section fitting loss codfificient(·)
 H : known dur

  $\alpha$ (·)
 D : equivalent diameter of nc banglar duct
 As : duct

  $\alpha$ (·)
 P1 : fon tohl pressure loss(Pa,=Ft Pm)
 P1 : fon tohl pressure (Pa)

 Ob : belt eff. Note 1: Standard air (20°C & 0%RH or 1.204 kg/m2) is normally adopted for common HVAC ducts. Note 2: common 5 values : PYC(0.04) \* galvanized steel moud(0.09) \* galvanized steel spina(0.12) \* flexible aluminium, 100% extended(2.0) Note 3: Symbols in Table 1 ~ Table 5 : FM : fitting No. SN : serial No. Q : flowrate(L/s) V : veloc ity(m/s) E : absclute rous/hersefinm) 0m : motoreff. SN : serial No. Q : flowrate(L/s) Pv : velocity pressure(Pa) Re : Re ymolds No.() L : ductlength(m) € /D. mlative nughness [-)
 W : specified duct widthform)
 Pf : fitting pressure loss(Pa,=Cs T v)
 PS : fan static pres. (Pa) P : density (kg/m3)

				B		Π																						an.	ł		14	201	_					
		Remarks	16	Noted by Designer FN & SN refer to attached duct dia gra	a tum grille-1 transition(a)	llow (b) SN1-2	ilbow (c), SN2-3	ransition(d), wye main(e), SN 3-4	(Ilbow @), SN 4-5	(Ilbow (g), SN 5-6	(Ibow (h), SN6-7, transition(i), SN7-AHU	ransition(), AHU-SN8	(Ibow (k), SN8-9	(Dow (), SN9-10	vye main(m), transition(n), SN10-11	(Ilbow (o), SN 11-12a	vye amin(p), transition(g), SN12a-13a	vye main9r), transition(s), SN13a-14a	vye main(t), transition(u), SN14a-15a.	vye main(v), transition(w), SN15a-16a	love tail(x), metangular-nound(y), SN 16a-17a	lexiable duct( E =2.0, D=300), SN17a-diffuser					Wr)	00 * 645	0.55 * 0.88 * 1.00	sfened.	= 12,000 = 18,000 = 20,000 0.55.07 0.5.075 0.7.00	5.0.90 0.00000 0.00000	\75~1.0 (=1.0 if no belt is used)	atic pres. is us <u>ed</u> : static mes PS=PT - Pv @fan ontflet	588=645-57	remarks	F class Motor(H3), SF1.15	'el: 886-7-5571755
			15	Ρt	8.7	12.7	21.8	29.9 1	37.3 6	16.3	24.9 6	14.3 1	20.2	26.2	30.2	16.1 6	22.5	20.6	17.9	14.1	7.2 6	-				340.9	Required (k	50(	• 10^6 * 1	data are pre	1000 100	0.7		ff. Θ fs if sto dal mes. PS		fan type	ward	
	DUCT)	0.000	14	Pa Pa	1.0	3.0	12.2	6.0	24.0	3.0	1.0	3.0	6.0	12.0	12.0	6.0	6.1	6.1	6.1	6.0	3.0			0		116.5	tor Power ]		*8b 1*	· *Maker's	13,000	5		tatic pres.e eff.PT:to		/Hz	back	
	Loss (e)	puts	13	报쑵	7.7	96	96	239	13.3	13.3	23.9	11.3	14.2	14.2	18.2	10.1	16.5	14.4	11.8	82	42					224.4	ate Fan Mo	* PT (or PS )	ef*⊖m	0 m & 0 h	000	0.70~08		res. eff., or s A h : helt		phase / volt	/220V /60Hz	
	ressure	Out	12	Ås	2.50	7.60	30.50	21.90	87.70	11.00	3.70	10.70	21.30	42.60	32.90	16.40	14.00	13.40	10.40	10.40	3.30					340.3	le 4: Calcul	×٩	1*10^6 *	gesof 8f	(T/R) = 1040	10 m.B	9 P	: fan total p . : motor eff		r power V(HP)	6	1
	Duct P		11	De mm	597	597	597	781	781	781	781	808	808	808	626	626	567	520	439	439	298					Total:	Tab	It WY	Pa		а Л			<u>بة م</u> م م ا		eff. moto b kV	7.500)	•
	Utmost	Patrical (cox	10	Ras W/H	2.57	2.57	2.57	3.50	3.50	3.50	3.50	2.89	2.89	2.89	2.86	2.86	2.29	2.67	1.83	1.83	96.0					8		F10	23 = 644		1					reff. belt m 0	1.0	a.msa.hinet.ne
	Size &	10 N	6	цщ	1.00	3.00	12.00	6.00	24.00	3.00	1.00	3.00	6.00	12.00	12.00	6.00	6.00	6.00	6.00	6.00	3.00					8		+ ድ	+	(120~250P)	70~250Pa)	()	40Pa)			eff. moto Əfs) Ə	0.5) 0.88	sales. temper
	: Duct	nputs	ω	M mm	006	906	006	1400	1400	1400	1400	1300	1300	1300	1000	1000	800	800	550	550	270					8		+ 22 +	15 +	messine loss	d loss(SEF,	guile(10-ZF	amper(FD,20	Ame-mark		fan Of()	0.55	Email
	able 2	d o	~	Нщ	350	350	350	400	400	400	400	450	450	450	350	350	350	30	ĝ	900	275		2-1	A		(CX		+ F7 -	+	Timtemaln	unit interne	r1: return;	r 2 Hue D	EINT. C TO		static pres. PS (Pa)	8	
	L	- 2	9	ບຶ	020	025	025	0.45	025	0.25	0.45	020	025	025	0.45	025	0.45	0.45	0.45	0.45	0.50		2	A		50 K	wired (Ptr)	원 +	+ 220 +	F6. AHI	F7: Fan	F8: othe	F9: othe	e preferred.			58	
		10 10	4 5	PL D Mm m/m	16 592	16 592	16 592	99 772	99 772	99 772	99 772	01 810	01 810	01 810	00 623	00 623	11 571	21 511	18 439	92 340	03 292		2.5			8	essure Req	+ 55	+				(value)	cer's data ar		otal pres. P T (Pa)		
		om Table 1	8	Pv Pa Pa	5 1.0	5 1.0	5 1.0	2 0.9	0.0	0.0	0.9	5 1.0	5 1.0	5 1.0	5 1.0	5 1.0	5 1.0	1.0	2 1.0	2 0.9	1.0					8	(Static) Po	+ F4	R +	le 2	0	a)	~3UPa) ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	dues & Mal	Ications		645	Tempace, Inc.
		Copied Fu	2	V m/s	.00 38.1	.00 38.	.00 38.1	40 53.2	40 53.1	40 53.2	40 53.5	.70 56.6	.70 56.6	.70 56.6	20 40.	20 40.5	.80 36.6	30 32.1	.60 26.1	50 18.2	74 8.4					8	Fan Total	2 + F3	+ 5	s fmm Tah	er(10~25Pe	c(150~500P	per(VD,15	ume nde d va	an's Specif	w rate Q (L/s)		V: Andy Ho/1
VT 2		10 IV	1	రాష	200.0 8	200.0 8	200.0 8	000t	1000	1000 g	1000 g	0000 9	0000	0,000	500.0 8	500.0 8	7 0,000	500.0 7	0000 6	000 5	50.0 3		¢.	5,	200	8	Calculate	1 + F	41 + 1	messime los	outlet diffus	silencer box	/olume dan	RAE recon	Specify F	E E	2000	c / Company
PRIN	8	- 2		NS	1 22	2 22	32	4 44	5 44	6 44	7 44	8	9 50	10 50	11 25	12 25	13 20	14 15	15 10	16 50	17 25	8	19	8	21	8	Table 3:	Ptr = F	3	F1. T	F2: 0	F3: s	F4: \	HSA*	Table 5:	1 12		Designet