※本軟體包含一光碟片(CD)及一執行鎖(key),打開 eDUCT 資料夾後,點選 SETUP,並依指示步驟,完成安裝程序,然後在電腦桌面上,會出現 eDUCT 執行檔畫面。 (2020/04/15)

eDUCT 風管軟體使用手冊(中譯本)

- ★供計算風管之直管及配件的全壓/靜壓損失,等速度法及等摩擦損失均適用。
- ★供計算風管尺寸(圓管/矩管),鍍鋅風管表面積(m²)、風機馬力(kW/HP)。
- ★供驗算 Moody chart、 Darcy equation 及 Colebrook equation(學術研究用)。

(A)符號說明:

FN: fitting No. v: kinematic viscosity(m²/s) P_f : fitting pressure loss(Pa,=Cs*P_v) SN: serial No. ε/D : relative roughness (-) P_m : main duct pressure loss(Pa,= ΔP_L*L) Q: flowrate(L/s) Re: Reynolds No.(-) P_t : total pressure loss($Pa = P_f + P_m$) V: velocity(m/s) f: friction factor(-) P_T: fan total pres.(Pa) ε : absolute roughness(mm) Cs: fitting loss coefficient(-) P_S: fan static pres.(Pa) H: given duct height(mm) $T : temperature(^{\circ}C db)$ θ_f : fan total pres. eff.

 $\begin{array}{lll} RH : \mbox{ relative humidity(\%RH)} & W : \mbox{ specified duct width(mm)} & \theta_{fS} : \mbox{ fan static pres. eff.} \\ \rho : \mbox{ density (kg/m^3)} & L : \mbox{ duct length(m)} & \theta_m : \mbox{ motor eff.} \\ P_v : \mbox{ velocity pressure(Pa)} & R_{as} : \mbox{ aspect ratio(W/H $\le 5)} & \theta_b : \mbox{ belt eff.} \end{array}$

 ΔP_L : friction loss(Pa/m) A_s : duct area(m²,=(H+W)×L×2.03) θ_b =1.0 if no belt is used.

D: duct diameter(mm) De: equivalent diameter of rectangular duct(mm)

(B)常用之使用參數:

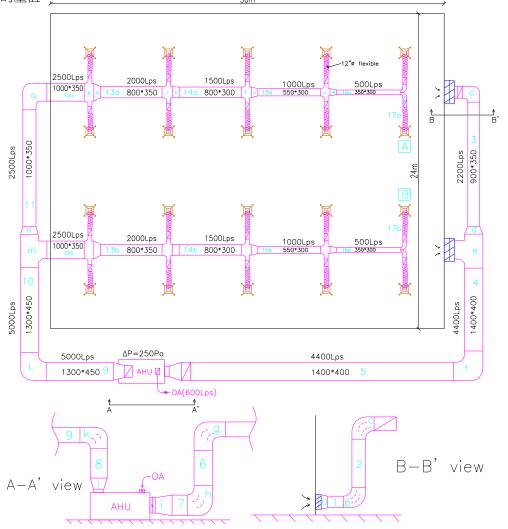
(1)標準空氣(20℃ & 0%RH 或密度 1.204 kg/m³)是預設值,供空調風管設計值,對於不同溫度及火煙密度,可自行更改預設值。

(2)**風管絕對粗度(\epsilon,mm)**: 鍍鋅風管(0.09); 鍍鋅螺旋風管(0.12); 鋁箔軟管直管(2.0); 硬俱 PVC 風管(0.04)。

(3)其他氣體之密度(ρ)及絕對粗度(ε)可上網搜尋。

(C)風管計算圖例:(※參考 fig2,Existing file)

(1)將各段直風管編號,如①②③…;將彎管、分歧管等配件編號,如 abc …。



(D)常用的配件損失(Cs)概略值:

★Cs 值宜取 ASHRAE Duct Fitting Database 中的詳細值。

	1	2	3	4	5
	45°	90°	transition	rectangular-	double 45°
	elbow	elbow	transition	round	elbow
Symbol		(0)M	→ <	ZW >> D	*
Cs	0.05~0.2(\infty 0.13)	0.1~0.35 (≒0.25)	0.1~0.3 (≒0.2)	0.1~0.35 (≒0.25)	0.15~0.35(≒0.2)

	6	7	8	9	10
	wye	double wye	2-way	Junction w /	dovetail
	(≤30°)	$(\leq 30\sim 45^{\circ})$	junction	2 splitters	do (otali
Symbol	1	↑ · · · · · · · · · · · · · · · · · · ·	→ → + -		
Cs(main)	0.1~0.35(\infty 0.25)	0.1~0.35(=0.25)	0.1~0.35(\infty 0.25)	0.1~0.35(\infty 0.25)	0.1~0.25(=0.15)
Cs(branch)	0.2~0.7(\infty 0.45)	0.2~0.7(\infty 0.45)	0.2~0.7(\infty 0.45)	0.2~0.7(=0.45)	0.1~0.25 (≒0.15)

※(約 0.00) Cs 值可供一般性計算用。

(E)操作步驟:(參考電腦畫面)

(1) fig 1:選擇 New Project (新案)或 Existing file(查舊檔案)

(2) **fig 2**: 選擇一既有檔案,如 fig 2 中之 eDUCT Software, 並點選 OK。

(3) **fig 3**:① 在 Customer,、Project 及 Date 欄中,填入自訂(中)文字。

② 在 Must Inputs 欄中,填入風量(Q)Lps、風速(V)m/s、 ϵ (mm)及溫度($^{\circ}$ C),預設值: ϵ (0.09),T(20 $^{\circ}$ C),RH(0.1%,不得填 0.0%)。

③ 在 Option Input 欄中:填入必要時改變更預設的 0.1%RH 及 1.204 值。

④ 在 Remarks 欄中:填入直管編號及配件編號等說明。

⑤ 勾選 NEXT(次頁)或 EXIT(退出)。



fig1.

NO Customer Project 1 Delete file BACK

Customer Project 1 Delete file BACK

Reywords

Project 1 Delete file BACK

- ⑥若採用「**等摩擦損失法**」,如 **fig 3** 中第 8 欄,假設等摩擦損失值 ΔPL 為 1.00Pa/m,則需在 V(m/s)欄中(第 2 欄),數次填入不同風速值(m/s),直到 Δ PL(第 8 欄) ≒ 1.00Pa/m 為止。 ⑦第 11~13 欄之數值,供學術研究驗證 Corebrook 公式(1/√f=2log[0.27(ε/D)+(2.51/Re/√f)]。 (4) **fig4**:輸入 Cs,,H(風管高 mm), W(風管寬 mm)及 L(該段風管長度 m),快點 2 下 Cs 欄,即
- (4) **fig4**: 輸入 Cs,,H(風管高 mm), W(風管寬 mm)及 L(該段風管長度 m),快點 2 下 Cs 欄,即會顯示預設值(0.2,,350, 700 及 1.00),此預設值可更改;若採用圓型風管,H 欄填入風管直徑(mm)。在 W 欄,數次填入風管寬度(mm)(※錯誤嘗試法),例如,在 SN1(第一列)之 W 欄中,填入 800(mm),再看 De 欄之數值是否等於 D 欄之數值,如果不相同,再變更 W 欄之數值,例如,900(mm),直到 De 欄(597)≒D 欄(592)為止。※H(風管高度)是設計者應自行決定。As 欄(m²)是指該段風管所需的風管鐵皮面積(m²),供估價用,As(m²)=(H+W)*L*2.03,3%是製作風管的鐵皮損失率。
- ※如果欲變更 fig4 畫面的任何在"Copied from Table 1"的數值,或是在 Remarks 欄之文字,則需點選 BACK,回到上個畫面(fig 3)中更改。

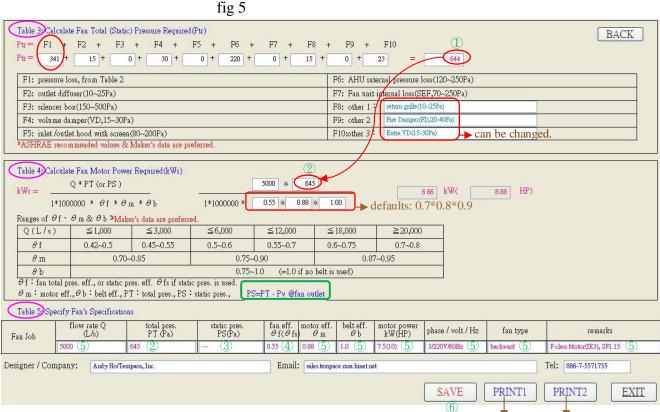
fig 3.

						ng 3).							
	NO: 201	80817001	Cust	tomer:	eDuct So	ftware	1		Pi	oject: User's N	fanual Exampl	e		Date: 2018/08/17 NEXT5
	Mu	st Inpu	ts (2)		Optio	n Input (S	3)			Outputs				(4) Remarks
	1	2	3	4	5	6	7	8	9	10	11 (7) 12	13	14
sn	Q L/s	V m/s	arepsilonmm	$^{ extstyle T}_{ extstyle \mathbb{C}}$	RH %	ρ 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)
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
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
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
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
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
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
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	trensition(j), AHU-SN8
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
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
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
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
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
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
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
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
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
18	0.0	0.00	0.000	0.0	0.0	0.000	0.00000	0.00000	0.00000	0.000000000	0.0000000	0.00000000	0.0000000	flexible duct(€ =2.0, D=300), SN17a-diffuser
19	0.0	0.00	0.000	0.0	0.0	0.000	0.00000	0.00000	0.00000	0.000000000	0.0000000	0.00000000	0.0000000	★ for deleting all inputs
20	0.0	0.00	0.000	0.0	0.0	0.000	0.00000	0.00000	0.00000	0.000000000	0.0000000	0.00000000	0.0000000	Tor deleting an inputs
21	0.0	0.00	0.000	0.0	0.0	0.000	0.00000	0.00000	0.00000	0.000000000	0.0000000	0.00000000	0.0000000	return grille-1 transition(a) elbow (b), SN1-2 elbow(c), SN2-3 transition(d), wye main(e), SN3-4 elbow(f), SN4-5 elboe(g), SN5-6 elbow(h), SN6-7, transition(i), SN7-AHU transition(i), AHU-SN8 elbow(k), SN8-9 elbow(h), SN9-10 wye main(m), transition(n), SN10-11 elbow(o), SN11-12a wye main(p), transition(q), SN12a-13a wye main(r), transition(s), SN13a-14a wye main(t), transition(w), SN14a-15a wye main(t), transition(w), SN15a-16a dovetail(x), rectangular-round(y), SN16a-17a flexible duct(e=2.0, D=300), SN17a-diffuser for deleting all inputs
														EXIT

fig 4.

																BACK NEXT	
		Copied	From Ta	ble 1			Ing	puts	\Box			Outp	outs			Remarks	
SN	Q L/S	V m/s	Pv Pa	△PL Pa/m	D	Cs	H mm	W mm	L m	Ras W/H	De mm	As m²	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 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	12
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	7
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	[2
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	1
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	[2
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	\[\frac{2}{2}\]
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	[
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	Ì
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	Ì
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	[
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	Ì
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	[
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	
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	Ţ
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	7 [2
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	
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		T
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	★for deleting all inputs	Ti
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		Ti
											Total:	340.20	224.4	116.5	340.9	Copied to fig 5 automatically	

- (5) **fig5**:完成在 Table 3~Table 5 中之必要輸入後,點選 SAVE 後,即可點選 PRINT1 或 PRINT2,來列印 Table1或 Table2。
 - ①計算所得的 Ptr=644Pa 是全壓損失(※並非靜壓損失),若要計算靜壓(Ps),計算公式為 Ps = Ptr - Pv @風機出口風速=645-57=588Pa (※Table 2),見 p6/6 之 SN8,@Q=5000Lps 及 V=9.7ms, Pv=56.6Pa 及 Table3, Ptr=644Pa。
 - ②填入風車全壓(PT),建議: Ptr≤PT≤1.05Ptr。
 - ③必要時可填入風車靜壓(PS),建議: $Psr \leq PS \leq 1.05Psr$ 。
 - 4參考廠商資料,填入全壓效率 (θ_f) ,或靜壓效率 (θ_{fs}) 。
 - (5)填寫相關資料,空調風機可採用F級馬達,若為消防排煙風機,官採用H級馬達。
 - ⑥列印前先點選 SAVE。



★免責條款(Disclaimer):

本公司及軟體開發者,已盡最大努力來避免錯誤,然而,我們無法保證,本軟體之數值或計算 結果為百分之百正確,使用者需自行承擔任何"可能錯誤"之風險,我們不承擔任何因引用本軟 體之數據而造成之可能的錯誤或損害之結果。

(page5/6)

(page 6/6)

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PRINT 1

Customer: eDuct Software

Table 1: Duct Basic Analysis Data (eDUCT)
Project: User's Manual Example, HTAC system

Date: 2020,04,06

223	= (3		0 0		0=3		0 0		8 8	- 3		6 E		82 XS		8 3	3		Ø 3		0 10		2 8
Remarks	14	Noted by Designer FN & SN refer to attached duct diagram	setum grille-1 transition(a)	ellow (b), SN 1-2	ellbow(E), SNI-3	transition(d), wye main(e), SN3-4	ellbow(f), SN4-5	elibow(g), SN >-6	ellbowth), SN6-7, transitiont), SN7-AHU	transition(f), AHU-SN8	elibow(k), SN&9	ellbow(t), SN9-10	v ye main(m), transition(a), \$N10-11	ellbow(o), SM11-12a	v ye amin(y), transition(g), SN 12a-13a	v ye main9t), transition(s), SW13a-14a	vye mein(f), transition(u), SN14e-15e.	v ye main(v), temzition(w), SN 15a-16a	dovetail(x), rectangular-round (y), SN 15a-17a	flexiable drot(E = 2.0, D= 300), SN 17a diffuser			
30	13	f	0.0156	0.0156	0.0156	0.0145	0.0145	0.0145	0.0145	0.0143	0.0143	0.0143	0.0154	0.0154	0.0158	0.0163	0.0170	0.0185	0.0347				
	12	Re	3139882	3139882	3139882	481334.7	481334.7	481334.7	481334.7	521228.1	521228.1	521228.1	338870.6	339870.6	295610.1	247664.6	192277.7	124114.7	72370.7				
2	11	s/D	0.000152	0.000152	0.000152	0.000117	0.000117	0.000117	0.000117	0.000111	0.000111	0.000111	0.000144	0.000144	0.000158	0.000176	0.000205	0.000265	0.006856		9X - XS		
Outputs	10	ν m²/s	0.000001508	0.000001508	0.00001508	0.000001508	0.000001508	0.000001508	0.000001508	0.000001508	0.000001508	0.000001508	0.000001508	0.000001509	0.000001508	0.000001508	0.000001508	0.000001508	0.000001508		86-36		2 - 52
	9	D	592 0	592 0.	592 0.	772 0	772 0.	772 0.	772 0.	810 0.8	810 0.	810 0.	623 0.	623 0.	571 0.	511 0	139 0.	340 0.	292 0.		95 <u>-</u> X3		3_3
	8	APL Pa/m	1.016 59	1,016 59	1.016 59	7 666.0	7 666.0	7 666.0	7 666.0	1.00.1	1.00.1	1.00.1	1,000 62	1.000 62	1.011 57	1.021 51	1.018	0.992	1.003 29				
2000	7	Pv Pa	38.5 1.	38.5 1.	38.5 1.	53.2 0.	53.2 0.	53.2 0.	53.2 0.	56.6 1.	56.6 1.	56.6 1.	40.5	40.5	36.6 1.	32.1 1.	26.2 1.	18.2 0.	8.4 1.		ii.		
bput	9	ρ kg/m3	1.204 3	1.204 33	1.204	1.2D4 5.	1.204 S	1.204 5.	1.204 5	1.204 5	1.204 5	1.204 5	1.2D4 4	1.204 4	1.204 3	1.204 3	1.204 2	1.204	1.2D4 8		<u> </u>		
Option Input	5	RH % k	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		57 - No		3_3
3	4	r D	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0		6X X6		
Inputs	3	E mm	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	2,000				
Must In	2	V w	008	8.00	00'8	9.40	9.40	9.40	9.40	026	026	026	820	9.20	7.80	7.30	099	5.50	3.74		0. 0.		0.00
200	1	Q L/s	22000	2200.0	22000	44000	44000	4400.0	44000	50000	50000	50000	25000	2500.0	20000	15000	10000	500.0	250.0				o. 00
	- 3	NS.	1 2	2 2	3	4 4	5 4	6 4	7 4	8	9 5	10 5	11 2	12 2	13 2	14 1	15 1	91	17 2	81	61	20	21

Note 1: Standard sir (20°C & 0%RH or 1.204 kg/m3) is normally adopted for common HVAC ducts.

Note 2: common E values : PYC(0.04) * galvanized steel mount(0.09) * galvanized steel spinal(0.12) * flexible aluminium, 100% extended(2.0)

Note 3: Symbols in Table 1 ~ Table 5 :

FN : fitting No. SN : serial No. Q : flow rate(L/s) V : velocity(m/s) E : absolute roushweesfmm)

P : density (kg/m3)

SN: serial No. Q: flowrate (L/s) V: velocity (m/s)
Pv: velocity pressure (Pa)
Re: Reynolds No. ()
L: drot length (m)
L: drot length (m)
Ras: sepect ratio (W/H \equiv 5)
S\Pi v) Pm: main duct pressure loss(Pa,=\Delta PL*L)
Pt: total p c /D. relative morginess [-)
W : specified duc1 widthfam;
Pf : fitting pressure loss(Fa,=Cs.Fv)
PS : fan static pres. (Fa)

Of : fan total pres. eff.

H: known ductheight(mm) v : kinematic viscosity(m2/s) Cs: section fitting loss codfficient(-)
De: equivalent diameter of nectangular duct E: absolute roughoess(mm)
D: dismeter(mm)

RH : malative humidity(%RH)

I : temperature (C)

angular duct $As: duct surface area(m^2 = (H+W)^4L*2.03)$ PT: fan to in] pressure. (Pa) Pt : total pressure loss(Pa,=Pf+Pm)

Ob : belt eff. Om: motoreff.

8 fs : fan datic pres. eff.

Q: specified flow rate (L/s)

PRINT 2

	Copied	Copied From Table	ble 1			Inputs	Inputs				0	Outputs			Remarks
	2	3	4	5	9	7	8	6	10	11	12	13	14	15	16
05	N N N	Ра	∆PL Pa/m	Da	ప	H	Mm Wm	n a	Ras W/H	m De	Aş M	Ag.	Pm	P.F.	Noted by Designer FN & SN refer to attached duct diagram
2200.0	8.00	38.5	1.016	592	020	350	006	1.00	2.57	597	2.50	7.7	1.0	8.7	ne tum grille-1 transition(a)
2200.0	13500	38.5	1.016	592	025	320	006	3.00	2.57	597	7.60	96	3.0	12.7	ellow (b), SN1-2
22000	8.00	38.5	1.016	592	0.25	350	006	12.00	2.57	297	30.50	96	12.2	21.8	ellbow(c), SN2-3
4400.0	9.40	53.2	666.0	772	0.45	400	1400	00.9	3.50	781	21.90	23.9	0.9	29.9	transition(d), wye main(e), SN 3-4
4400.0	9.40	53.2	666.0	772	0.25	400	1400	24.00	3.50	781	87.70	13.3	24.0	37.3	ellbow (f), SN 4-5
44000	9.40	53.2	666.0	772	0.25	400	1400	3.00	3.50	781	11.00	13.3	3.0	16.3	ellbow (g), SN5-6
44000	9.40	53.2	0.999	772	0.45	400	1400	1.00	3.50	781	3.70	23.9	1.0	24.9	ellbow (h), SN6-7, transition(i), SN7-AHU
20000	9.70	9.99	1.001	810	0.20	450	1300	3.00	2.89	808	10.70	11.3	3.0	14.3	transition(), AHU-SN8
50000	9.70	9.99	1,001	810	0.25	450	1300	9009	2.89	808	21.30	14.2	6.0	20.2	ellbow (k), SN8-9
50000	9.70	9.99	1.001	810	0.25	450	1300	12.00	2.89	808	42.60	14.2	12.0	26.2	ellbow (1), SN9-10
2500.0	8.20	40.5	1,000	623	0.45	350	1000	12.00	2.86	626	32.90	18.2	12.0	30.2	wye main(m), transition(n), SN10-11
2500.0	8.20	40.5	1.000	623	0.25	320	1000	9009	2.86	626	16.40	10.1	0.9	16.1	ellbow(b), SN 11-12a
20000	7.80	36.6	1.011	57.1	0.45	350	008	9009	2.29	267	14.00	16.5	6.1	22.5	wye amin(p), transition(q), SN12a-13a
1500.0	7.30	32.1	1.021	511	0.45	300	008	00'9	2.67	520	13.40	14.4	6.1	20.6	wye main9r), transition(s), SN13a-14a
100001	09'9	26.2	1,018	439	0.45	300	550	00'9	1.83	439	10.40	11.8	6.1	17.9	wye main(t), transition(u), SN14a-15a
500.0	5.50	18.2	0.992	340	0.45	300	550	00.9	1.83	439	10.40	82	0.9	14.1	wye main(v), transition(w), SN 15a-16a
250.0	3.74	8.4	1.003	292	020	202	270	3.00	86.0	298	3.30	42	3.0	7.2	dovetail(x), nectangular-round(y), SN 16a-17a
	3 - 71 2 - 3														flexable duct(ε =2.0, D=300), SN 17a-diffuser
													2 33		
	- 4				g= 104	- 10			- 20	Jan 110	- w		. 10		
	= 33		- 30			- AC						- 2			
										Total:	I: 3403	13 224.4	116.5	340.9	
culs	Table 3: Calculate Fan Total (Static) Pressure Required (Ptr)	ral (Static	c) Pressu	re Requ	ired (Ptr)			1		Ĕ	able 4: Calc	Table 4: Calculate Fan Motor Power Required (kWr)	tor Power	Required	
+	F2 +	F3 +	F4 +	FE .	+ 36 +	F7 +	23	+ 33 +	F10	14	Wr =	Q *PI (orPS)		41	
341 +	15 +	+	+	+	220 +	+	15 +	+	23 = 644	Pa	1*10/6	1*10% * 0f * 0m * 0b	* 0 b 1	1 * 10 4 *	0.88* 1.00
am:	F1: pressure loss, from Table 2	Table 2		-	F6: AHU internal pressure	internal pr		bss(120-250Pa)	Pa)			At the market of the market's data are preferred	5 Maker	sdata ane pn	100001 > 100001
tdif	F2: outlet diffuser(10~25Pa)	5Pa)			F7: Fan unit internal loss(SEE,70~250Pa)	ut internal	loss(SEF,	70~250Pa,			# 0 0 4 0 0 4 0	1,000	45,0.55	0.5.06	0.55.07 06.07
cerl	F3: silencer box(150~500Pa)	00Pa)			F8: other 1 : setum gaile(10-ZFs)	: netum g	nlle(10-2)F	9		ı	100	0.70-08	0.70-0.85	0	75-0.90
med	F4: volume damper(V D,15~30Pa)	,15~30Pa	(00	1	F9: other 2 : Fire Demper(FD, 2040Rs)	7 Fire Da	mper(FD)2	14073		T	9.9			900	0.75~1.0 (=1.0 if no belt is used)
E rec	*A SHRAE recommended values & Maker's data are preferred.	1 values &	Maker's	data are	preferred.		L(1)-ours			<u>ω φ</u>	9 f : fan total 9 m : motor e	I pres. eff., or :	static pres.	off. Ofsif	Θ f : fan total pres. eff., or static pres. eff. Θ fs if static pres. is used. Θ m : motor eff. Θ b : belt eff. P I : total pres. PS : static pres. [PS=P I - Pv @fsn outlet]
edfy	Table 5: Specify Fan's Specifications	ecification					8		2000						588=645-57
100	flow rate Q (L/s)	3	total pres. P I (Pa)	mes. Pa)	sta P	static pres. PS (Pa)	fan Of(fan eff. mot Θ f(Θ fs)	motoreff. beli Om 6	belteff. mo	motor power kW(HP)	phase / volt/Hz	7Hz	fan type	remarks
5000		645		984	588	0.0000000000000000000000000000000000000	0.55 (0.55(0.5) 0.88	1.0	7.5(0)	10)	3/220V /60Hz	0.000	backward	F class Motor(IE3), SFI.15
omp	Designer / Company: Andy Ho/Tempere Inc.	Ho/Termene	Inc				Fmer	1. color town	Two il cales tourses was linet not						Tol: 886 7 45 31 785