



# KACECO

## Air Handling Unit

Feel the Fresh  
and Pure breathing from nature  
by KACECO present.

KACECO 



HVAC total solution company

# KACECO<sup>®</sup>



**U**

nder the basic attitude of Company lead a life with human, And also Exist for human. With the trust of Benefit of company should be Restored to customer and society Through the development of Excellent technology and products. KACECO will going to Grow and Develop with you.



## History

1986.	04	Eatablised K.A.E
1990.	05	Joined as member of KRAIA
1994.	08	Technical partnership with ACME, USA
1996.	04	Certified ISO 9001
2000.	02	Published Technical institute
	04	GQ certifed
	10	Established World Air condition cop.
2005.	01	Construction license registred
	02	2million us dollars export
2006.	03	Certified CE(AHU, FAN)
2007.	03	Technical Partner-ship and sloe agent ship with WOLTER, Germany
	05	EHP AHU manufacturer designation of SAMSUNG Electric.
	11	Performance certification by SMBA
2008.	07	Certified Energy saving
	10	Resisted as sales shop of SAMSUNG system HAUZEN
2010.	07	Certified ISO 14001
2011.	04	Certified ISO 9001
	12	K-MARK Certified
2012.	06	Q-MARK Certified
	10	Certified as Excellent products of the Supply Admin-istration
	11	Certied INNO-BIZ
2013.	07	ETL Certified



Pyeongtaek Factory



R & D Center





HVAC total solution company

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# KACECO Air Handling Unit

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## Product Feature

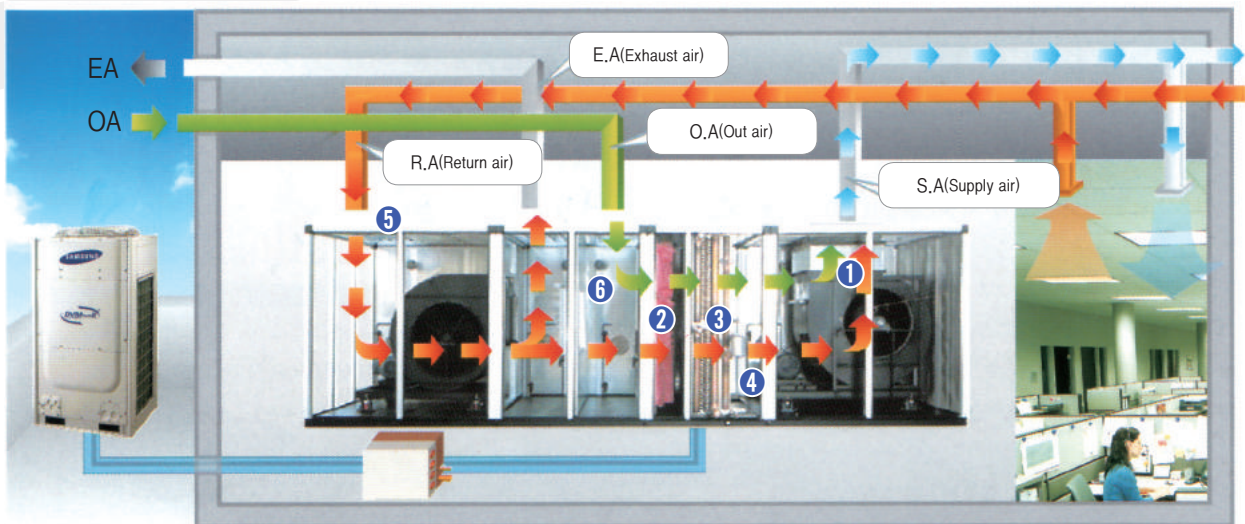
### ■ Combination of DVM and AHU

DVM AHU is heat pump air conditioning system functioning temperature, humidity and purification at the same time in addition to fresh air introduction.



### ■ Internal structure

Comfortable environment is provided through air circulation of internal and external air.



- ❶ FAN & Motor : Full performance guarantee and minimized vibration, noise
- ❷ Filter : Detachable, different specifications can be applied according to the customer needs (Option)
- ❸ D.X Coil : Improved heat exchange performance of coil with complete mechanical tube-expansion
- ❹ Humidifier : Steam injection, evaporation, electric electrode electrode humidifiers available depending on the environment (Option)
- ❺ Damper : Complete confidentiality with less pressure losing Airtight Type for starting and operating
- ❻ Casing : Excellent insulation and prevent condensation through double skin panel structure, excellent sound absorbing effect



## Application Site

### ■ Religious facilities



### ■ Hospitals



### ■ Shopping malls



### ■ Big sized offices







## Product Standard

### ■ KAE8010 / 8020 / 8030

MODEL NO.(CMM)				KAE8010	KAE8020	KAE8030
FAN	air supply	airfoil	DS#	AYZ 315	AYZ 400	AYZ 500
			number	#2.0	#2 3/4	#3.5
		standard air volume	CMM	80	160	240
		static pressure	mmAq	75	80	80
		motor	kW	2.2	5.5	5.5
	ventilation	Siroco	DS#	TYZ 315	TYZ 355	TYZ 450
			number	#2.0	#2.5	#3.0
		standard air volume	CMM	65	130	200
		static pressure	mmAq	30	35	40
		motor	kW(Hp)	0.75	2.2	3.7
coil	cooling	capacity	kW	29	58	87
			Kcal/h	24,940	49,880	74,820
	heatin	capacity	kW	33	65	98
			Kcal/h	28,040	56,080	84,120
		minus 15℃	kW	28	56	84
			Kcal/h	24,080	48,160	72,240
	face area		m²	0.67	1.34	1.95
	air velocity		m/s	1.99	1.99	2.05
	coil row		row	4	4	4
	outdoor unit capacity (HP)			10	20	30
refrigerant		types		R410A		
filter		Pre		AFI 80% <sup>1)</sup>		
		medium		NBS 80% <sup>2)</sup>		
		advanced (option)		Plasma Filter / Hepa Filter		
humidifier		types (option)		electronic electrode humidifier, evaporation and others		
connecting pipe	R410A	gas	Φ, mm	22.23 × 1	22.23 × 2	22.23 × 3
		liquid	Φ, mm	9.52 × 1	9.52 × 3	9.52 × 3
drain			A	40		
weight		horizontal (separate return)	products Kg	730	1,010	1,270
			operating Kg	940	1,310	1,650
		horizontal (internal return)	products Kg	1,110	1,550	1,970
			operating Kg	1,440	2,010	2,560

※ Other specifications out from above can be added additionally.

1) AFI 80% is standard for Pre Filter, AFI 60~80% products can be chosen.

2) NBS 80% is standard for Medium Filter, NBS 60~90% products can be chosen.

3) Humidifier is optional.

4) Cooling operation condition: Indoor 27℃ DB / 19℃ WB, Outdoor 35℃ DB / 24℃ W

Heating operation condition: Indoor 20℃ DB / 15℃ WB, Outdoor 7℃ DB / 6℃ WB

direct expansion type heat exchanger standard is 4~6ROW.

5) Other than above model, outdoor unit until 200HP can be used in combination and inquire to business team for details(Standard to DVM PLUS III).

## ■ KAE8040 / 8050 / 8060

MODEL NO.(CMM)				KAE8040	KAE8050	KAE8060
FAN	air supply	airfoil	DS#	AYZ 560	AYZ 630	AYZ 710
			number	#4.0	#4.5	#5.0
		standard air volume	CMM	320	400	480
		static pressure	mmAq	90	90	90
		motor	kW	11	11	15
	ventilation	Siroco	DS#	TYZ 500	TYZ 560	TYZ 630
			number	#3.5	#4.0	#4.5
		standard air volume	CMM	260	320	390
		static pressure	mmAq	40	40	40
		motor	kW(Hp)	3.7	5.5	5.5
coil	cooling	capacity	kW	116	145	174
			Kcal/h	99,760	124,700	149,640
	heatin	capacity	kW	130	163	196
			Kcal/h	112,160	140,200	168,240
		minus 15℃	kW	112	140	168
			Kcal/h	96,320	120,400	144,480
	face area		m²	2.63	3.28	3.93
	air velocity		m/s	2.03	2.03	2.03
	coil row		row	4	4	4
	outdoor unit capacity (HP)				40	50
refrigerant		types		R410A		
filter		Pre		AFI 80% <sup>1)</sup>		
		medium		NBS 80% <sup>2)</sup>		
		advanced (option)		Plasma Filter / Hepa Filter		
humidifier		types (option)		electronic electrode humidifier, evaporation and others		
connecting pipe	R410A	gas	Φ, mm	28.58 × 2	28.58 × 2	31.75 × 2
		liquid	Φ, mm	15.88 × 2	15.88 × 2	19.06 × 2
drain			A	40		
weight		horizontal (separate return)	products Kg	1,580	1,810	2,190
			operating Kg	2,050	2,350	2,840
		horizontal (internal return)	products Kg	2,390	2,790	3,300
			operating Kg	3,100	3,620	4,290

※ Other specifications out from above can be added additionally.

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2) NBS 80% is standard for Medium Filter, NBS 60~90% products can be chosen.

3) Humidifier is optional.

4) Cooling operation condition: Indoor 27℃ DB / 19℃ WB, Outdoor 35℃ DB / 24℃ W

Heating operation condition: Indoor 20℃ DB / 15℃ WB, Outdoor 7℃ DB / 6℃ WB

direct expansion type heat exchanger standard is 4~6ROW.

5) Other than above model, outdoor unit until 200HP can be used in combination and inquire to business team for details(Standard to DVM PLUS III).





## ■ KAE8070 / 8080 / 8090

MODEL NO.(CMM)				KAE8070	KAE8080	KAE8090
FAN	air supply	airfoil	DS#	AYZ 800	AYZ 800	AYZ 800
			number	#5.5	#5.5	#5.5
		standard air volume	CMM	560	460	720
		static pressure	mmAq	100	100	100
		motor	kW	18.5	18.5	22
	ventilation	siroco	DS#	TYZ 630	TYZ 710	TYZ 710
			number	#4.5	#5.0	#5.0
		standard air volume	CMM	450	520	580
		static pressure	mmAq	40	45	45
		motor	kW(Hp)	7.5	11	11
coil	cooling	capacity	kW	203	232	261
			Kcal/h	174,580	199,520	224,460
	heatin	capacity	kW	228	261	293
			Kcal/h	196,280	224,320	252,360
		minus 15℃	kW	196	224	252
			Kcal/h	168,560	192,640	216,720
	face area		m²	4.57	5.28	5.94
	air velocity		m/s	2.04	2.02	2.02
	coil row		row	4	4	4
	outdoor unit capacity (HP)				70	80
refrigerant		types		R410A		
filter		Pre		AFI 80% <sup>1)</sup>		
		medium		NBS 80% <sup>2)</sup>		
		advanced (option)		Plasma Filter / Hepa Filter		
humidifier		types (option)		electronic electrode humidifier, evaporation and others		
connecting pipe	R410A	gas	Φ, mm	31.75 × 2	38.1 × 2	31.75 × 3
		liquid	Φ, mm	19.05 × 2	19.05 × 2	19.05 × 3
drain			A	40		
weight		horizontal (separate return)	products Kg	2,450	2,690	2,830
			operating Kg	3,180	3,490	3,670
		horizontal (internal return)	products Kg	3,640	4,200	4,400
			operating Kg	4,730	5,460	5,720

※ Other specifications out from above can be added additionally.

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2) NBS 80% is standard for Medium Filter, NBS 60~90% products can be chosen.

3) Humidifier is optional.

4) Cooling operation condition: Indoor 27℃ DB / 19℃ WB, Outdoor 35℃ DB / 24℃ WB

Heating operation condition: Indoor 20℃ DB / 15℃ WB, Outdoor 7℃ DB / 6℃ WB

direct expansion type heat exchanger standard is 4~6ROW.

5) Other than above model, outdoor unit until 200HP can be used in combination and inquire to business team for details(Standard to DVM PLUS III).

## ■ KAE8100 / 8120

MODEL NO.(CMM)				KAE8100	KAE8120
FAN	air supply	airfoil	DS#	AYZ 800	AYZ 900
			number	#5.5	#6.0
		standard air volume	CMM	800	960
		static pressure	mmAq	100	100
		motor	kW	30	30
	ventilation	siroco	DS#	TYZ 800	TYZ 800
			number	#5.5	#5.5
		standard air volume	CMM	640	770
		static pressure	mmAq	45	45
		motor	kW(Hp)	11	15
Coil	cooling	capacity	kW	290	348
			Kcal/h	249,400	299,280
	heatin	capacity	kW	326	391
			Kcal/h	280,400	336,480
		minus 15℃	kW	280	336
			Kcal/h	240,800	288,960
	face area		m²	6.58	7.92
	air velocity		m/s	2.03	2.02
	coil row		row	4	4
	outdoor unit capacity (HP)			100	120
refrigerant		types		R410A	
filter		pre		AFI 80% <sup>①</sup>	
		medium		NBS 80% <sup>②</sup>	
		advanced (option)		Plasma Filter / Hepa Filter	
humidifier		types (option)		electronic electrode humidifier, evaporation and others	
connecting pipe	R410A	gas	Φ, mm	31.75 × 3	38.1 × 3
		liquid	Φ, mm	19.05 × 3	19.05 × 3
drain			A	40	
weight		horizontal (separate return)	products Kg	3,040	3,330
			operating Kg	3,950	4,320
		horizontal (internal return)	products Kg	4,780	5,230
			operating Kg	6,210	6,790

※ Other specifications out from above can be added additionally.

1) AFI 80% is standard for Pre Filter, AFI 60~80% products can be chosen.

2) NBS 80% is standard for Medium Filter, NBS 60~90% products can be chosen.

3) Humidifier is optional.

4) Cooling operation condition: Indoor 27℃ DB / 19℃ WB, Outdoor 35℃ DB / 24℃ W

Heating operation condition: Indoor 20℃ DB / 15℃ WB, Outdoor 7℃ DB / 6℃ WB

direct expansion type heat exchanger standard is 4~6ROW.

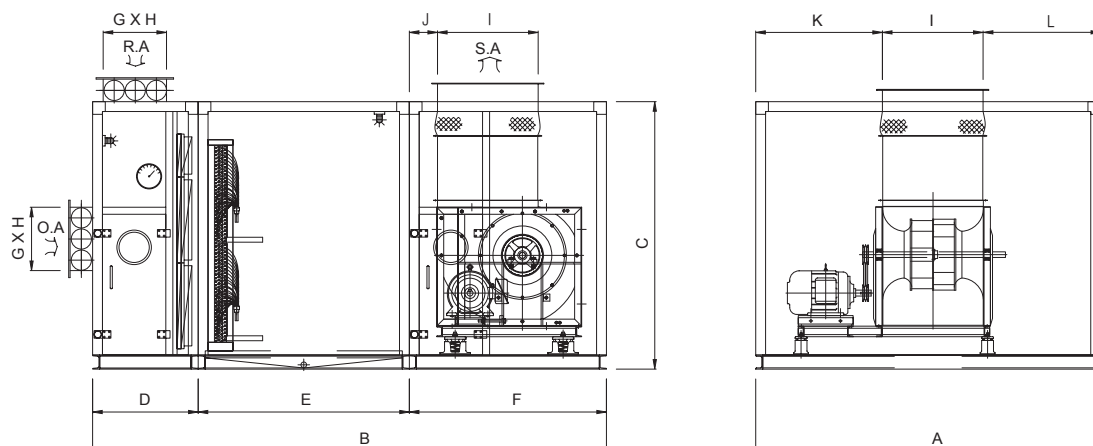
5) Other than above model, outdoor unit until 200HP can be used in combination and inquire to business team for details(Standard to DVM PLUS III).





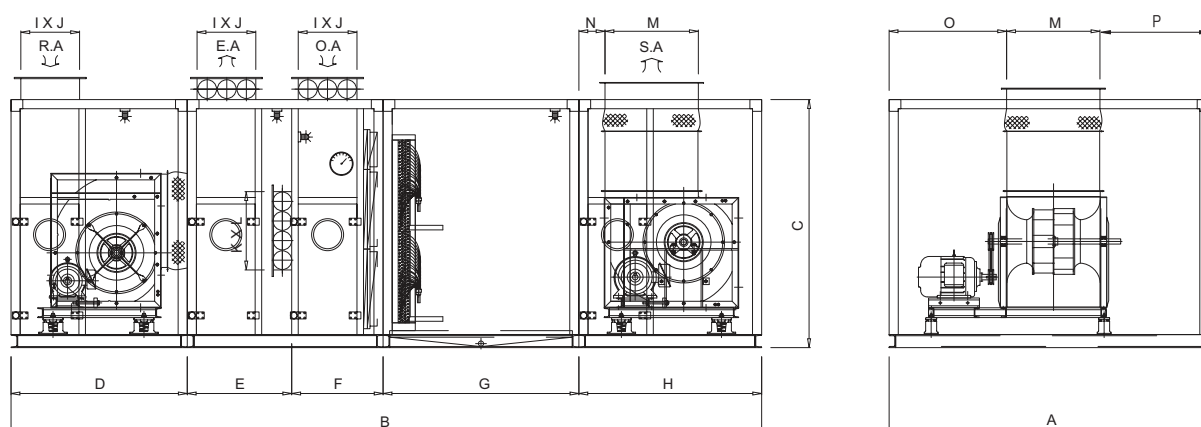
## Product Dimensions

### ■ Horizontal type (Return FAN separating type / Internal Motor type)



MODEL \ SIZE	Total Dimension			Mixing Part	Coil Part	FAN Part	Damper		Discharge a FAN size			
	A	B	C	D	E	F	G×H		I	J	K	L
KAE8010	1600	3150	1100	700	1200	1250	300	800	410	500	595	595
KAE8020	1700	3350	1500	700	1200	1450	300	1550	510	550	595	595
KAE8030	2100	3500	1600	700	1500	1300	300	1950	640	150	800	660
KAE8040	2350	3650	1800	750	1500	1400	450	2200	720	150	900	730
KAE8050	2650	3750	1900	750	1500	1500	450	2500	800	150	925	925
KAE8060	2650	3900	2200	750	1500	1650	450	2500	900	150	950	800
KAE8070	3000	3900	2200	750	1500	1650	450	2850	900	150	1050	1050
KAE8080	3100	4250	2400	900	1500	1850	600	2950	1010	150	1045	1045
KAE8090	3100	4250	2700	900	1500	1850	600	2950	1010	150	1045	1045
KAE8100	3200	4300	2800	950	1500	1850	630	3050	1010	150	1095	1095
KAE8120	2750	4450	2800	950	1500	2000	630	3600	1130	150	1310	1310

## ■ Horizontal type (Internal Return FAN type / Internal Motor type)

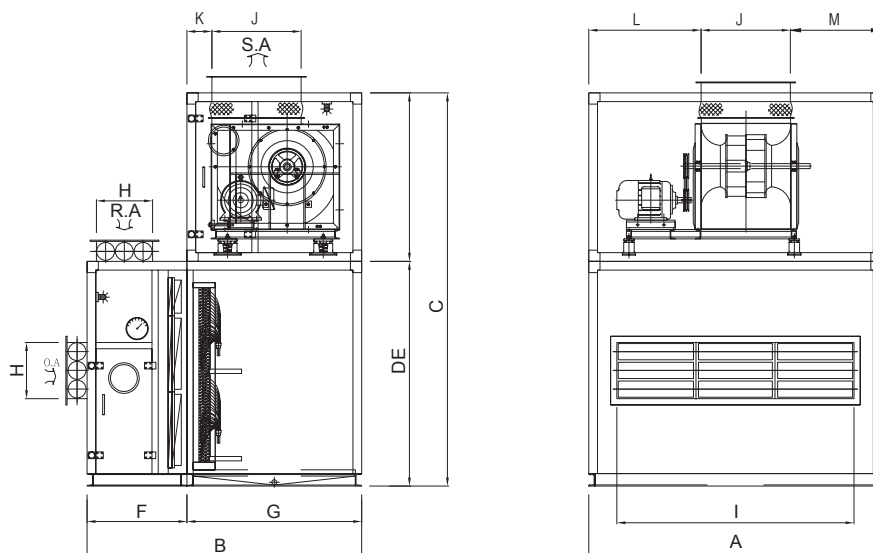


MODEL \ SIZE	Total Dimension			Return Part	Mixing Part	Filter Part	Coil Part	Supply Part	Damper		By-pass Air Damper		Supply FAN			
	A	B	C	D	E	F	G	H	I x J		K x L		M	N	O	P
KAE8010	1600	5100	1100	1250	700	700	1200	1250	300	800	300	800	410	500	595	595
KAE8020	1700	5350	1500	1300	700	700	1200	1450	300	1550	450	800	510	550	595	595
KAE8030	2100	5450	1600	1250	700	700	1500	1300	300	1950	450	1100	640	150	800	660
KAE8040	2350	5500	1800	1300	700	700	1500	1300	300	2200	450	1400	640	150	900	810
KAE8050	2650	5850	1900	1350	800	700	1500	1500	450	2500	450	1700	800	150	925	925
KAE8060	2650	6100	2200	1450	800	700	1500	1650	450	2500	600	1700	900	150	950	800
KAE8070	3000	6100	2200	1450	800	700	1500	1650	450	2850	600	2000	900	150	1050	1050
KAE8080	3100	6750	2400	1600	950	850	1500	1850	600	2950	600	2100	1010	150	1045	1045
KAE8090	3100	6750	2700	1600	950	850	1500	1850	600	2950	750	2100	1010	150	1045	1045
KAE8100	3200	6850	2800	1700	950	850	1500	1850	600	3050	750	2100	1010	150	1095	1095
KAE8120	3750	7000	2800	1700	950	850	1500	2000	600	3600	750	2100	1130	150	1310	1310



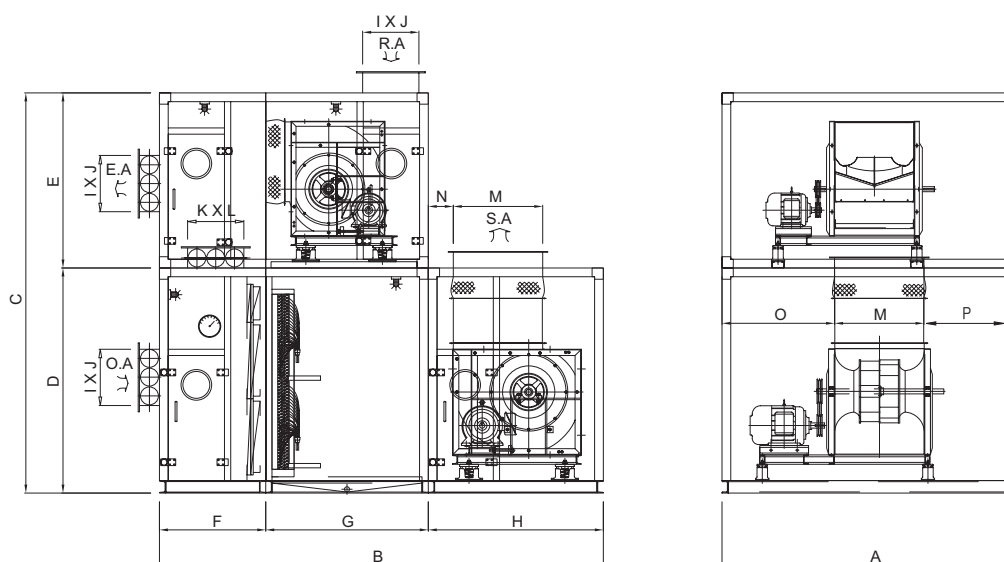


## ■ Combined type (Return FAN separating type / Internal Motor type)



MODEL \ SIZE	Total Dimension					Mixing Part	Coil Part	Damper		Discharge a FAN size			
	A	B	C	D	E	F	G	H×I		J	K	L	M
KAE8010	1600	1950	1950	980	970	700	1250	300	800	410	540	595	595
KAE8020	1700	2150	2600	1500	1100	700	1450	300	1550	510	590	595	595
KAE8030	2100	2300	2850	1600	1250	700	1600	300	1950	640	560	730	730
KAE8040	2350	2200	3150	1800	1350	800	1400	450	2200	715	200	900	735
KAE8050	2650	2300	3350	1900	1450	800	1500	450	2500	800	200	925	925
KAE8060	2700	2450	3800	2200	1600	800	1650	450	2550	900	200	950	850
KAE8070	3000	2750	4000	2200	1800	900	1850	480	2850	1010	200	995	995
KAE8080	3100	2850	4200	2400	1800	1000	1850	600	2950	1010	200	1045	1045
KAE8090	3100	2850	4500	2700	1800	1000	1850	600	2950	1010	200	1045	1045
KAE8100	3200	3000	4600	2800	1800	1150	1850	750	3050	1010	200	1095	1095
KAE8120	3750	3150	4750	2800	1950	1150	2000	750	3600	1130	200	1310	1310

■ Combined type (Internal Return FAN type / Internal Motor type)

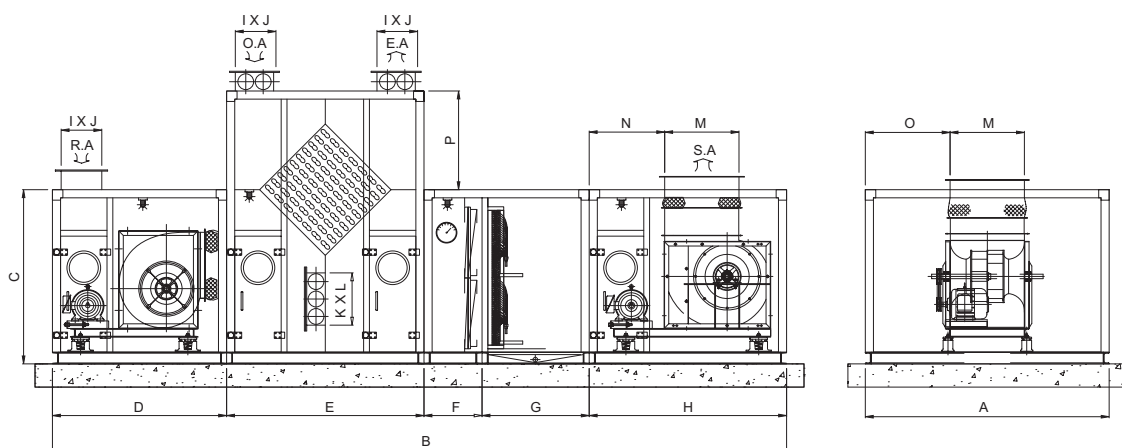


MODEL \ SIZE	Total Dimension					Mixing Part	Coil Part	FAN Part	Damper		By-pass Air Damper		Supply FAN			
	A	B	C	D	E	F	G	H	I x J		K x L		M	N	O	P
KAE8010	1600	3150	2000	1000	1000	700	1200	1250	300	800	300	800	410	500	400	400
KAE8020	1700	3500	2600	1500	1100	850	1200	1450	300	1550	450	800	510	550	595	595
KAE8030	2100	3950	2900	1600	1300	850	1500	1600	300	1950	450	1100	640	550	730	730
KAE8040	2350	3750	3200	1800	1400	850	1500	1400	450	2200	450	1400	715	200	900	735
KAE8050	2650	3850	3400	1900	1500	850	1500	1500	450	2500	450	1700	800	200	925	925
KAE8060	2700	4150	3850	2200	1650	1000	1500	1650	450	2550	600	1700	900	200	950	850
KAE8070	3000	4350	3850	2200	1650	1000	1500	1850	450	2850	600	2000	1010	200	995	995
KAE8080	3100	4350	4200	2400	1800	1000	1500	1850	450	2950	600	2100	1010	200	1045	1045
KAE8100	3200	4700	4800	2800	2000	1150	1700	1850	750	3050	750	2100	1010	200	1095	1095
KAE8120	3750	4850	4800	2800	2000	1150	1700	2000	750	3600	750	2700	1130	200	1310	1310





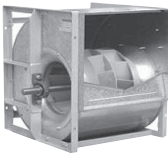
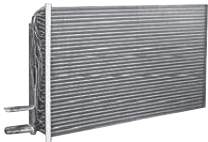
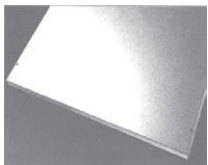




## ■ Sensible heat exchanger (Application type)



MODEL \ SIZE	Total Dimension			Return Part	Heat exchanger Part	Filter Part	Coil Part	Supply Part	Damper Size		By-pass Air Damper		Discharge a FAN size			High heat exchanger part
	A	B	C	D	E	F	G	H	I×J		K×L		M	N	O	P
KAE8010	1600	5100	1100	1250	1100	300	1200	1250	300	800	300	800	410	500	595	650
KAE8020	1700	5750	1500	1300	1500	300	1200	1450	300	1550	450	800	510	550	595	900
KAE8030	2100	6000	1600	1250	1650	300	1500	1300	300	1950	450	1100	640	150	800	1000
KAE8040	2350	6100	1800	1300	1700	300	1500	1300	300	2200	450	1400	640	150	900	1250
KAE8050	2650	6650	1900	1350	2000	300	1500	1500	450	2500	450	1700	800	150	925	1250
KAE8060	2650	7000	2200	1450	2100	300	1500	1650	450	2500	600	1700	900	150	950	1450
KAE8070	3000	7700	2200	1450	2200	300	1500	1650	450	2850	600	2000	900	150	1050	1500
KAE8080	3100	7650	2400	1600	2400	300	1500	1850	600	2950	600	2100	1010	150	1045	1600
KAE8090	3100	7750	2700	1600	2500	300	1500	1850	600	2950	750	2100	1010	150	1045	1700
KAE8100	3200	8000	2800	1700	2650	300	1500	1850	600	3050	750	2100	1010	150	1095	1750
KAE8120	3750	8200	2800	1700	2700	300	1500	2000	600	3050	750	2100	1130	150	1310	1850

## Main Components

### ■ Main components

Classification	Image	Characteristics
FAN		<ul style="list-style-type: none"> <li>- Germany Wolter (Wolter) affiliated high efficiency AIR FOIL</li> <li>- Balancing standard required is to Q2.5 VDI 2060</li> <li>- For models less than 630 are manufactured through Pittsburgh Lock method(no welding)</li> <li>- Models above 710 are manufactured in welding type</li> <li>- Applied with taper bushing pulley for easy maintenance</li> </ul>
Heat exchanger coil		<ul style="list-style-type: none"> <li>- Fin :Aluminum(Al) Hydrophilic coating pin t 0.14mm</li> <li>- Tube: Copper <math>\Phi 9.52 \times t0.7\text{mm}</math></li> <li>- Header :Copper</li> <li>- Frame: Galvanized steel sheet t2.0mm</li> <li>- Perfect adhesion between pin and tube through mechanical tube expansion method</li> <li>- Pressure test : 4.15MPa</li> </ul>
Casing		<ul style="list-style-type: none"> <li>- Flame retardant polyurethane foam double skin panels excellent with insulation</li> <li>- Middle mold is inserted to prevent leakage between panels</li> <li>- Assembly with clamp makes separating and combining fast</li> <li>- color steel application makes exterior beautiful</li> <li>- Color of outside plate : Blue (Munsell Number : 4.3PB 3.1/9.6</li> </ul>
Motors		<ul style="list-style-type: none"> <li>- Totally Enclosed, FAN-Cooled (TEFC), structured in a way where substance with more than 1mm diameter cannot enter</li> <li>- Cooling FAN is installed to increase cooling effect</li> </ul>
Filter		<ul style="list-style-type: none"> <li>- pressure loss is less and separation is easy</li> <li>- Pre Filter : AFI 60~90% (Use flame-retardant filter material)</li> <li>- Medium Filter : NBS 60~95% (Compact type)</li> </ul>
Damper		<ul style="list-style-type: none"> <li>- AMCA SEAL certified products</li> <li>- Adopted with counter flow wings which makes air flow smooth</li> <li>- Air Tight Type which makes pressure loss less during driving and operating</li> <li>- Dual structured air foil type aluminum wing</li> </ul>
Air volume control panel (option)		<ul style="list-style-type: none"> <li>- Automatic air volume control according to change in refrigerant flow amount</li> <li>- Accurate air volume control with inverter</li> <li>- Decrease power consumption through appropriate load balancing</li> <li>- Environmental improvement through noise reduction</li> </ul>





## Standard Specification for Each Part

### ■ Standard specification for each part

Classification		Standard	Non-standard
FAN	Air foil FAN	Air Foil Double Suction (AYZ, AYE)	Ventilation FAN (long shaft FAN) / Imports / customer requirements
	Multi Blade FAN	Sirocco Double Suction (TYZ, TYE)	Ventilation FAN (long shaft FAN) / Imports / customer requirements
Motor	3-phase induction motor	Totally enclosed (protection class IP 44, insulation class F class)	high efficiency, inverter and others
Casing	External plate	Colored resin steel 0.5mm	1.0t ~ 1.6t (SPHC, GAL, STS) and others
	Inner plate	Colored resin steel 0.5mm	0.6mm GAL, 0.5mm STS and others
	Insulation	Urethane Foam 30K, 48±2mm	Glass Fiber + Cloth 50mm and others
	Frame	AL. Mold Bar	SPG square pipe (outdoor type), for low temperature mold bar
	Corner Joint	3-Brench Leg (high-strength plastic)	
Base	Channel	SS400 (100×50×5.0mm)	1.6mm GAL, 1.5mm Stainless steel
	Steel Plate	SPHC 1.6mm	
	Drain Pan	STS 304 1.5t (lower Artilon 25mm insulation)	
	Drain Socket	40A (Stainless)	
Coil	Tube	Copper (OD 3/8"×0.7mm)	
	Fin	AL.-FOIL (0.11mm)	
	Header	Copper (AHU SPEC)	
	Frame	SPG (2.0mm)	1.5mm STS, 2.0mm STS and others
secondary Heating Coil		Responding to consumer requirements	Electric heating coil, steam heating coil, Hot water coil
Air Filter	Pre Filter	Unit Type 20mm	Chemical Filter, UV Lamp and others
	Medium Filter	Mini Pleat Type 75mm	Bag filter, HEPA filter
Damper	Air tight damper	Counter flow type (Opposed Blade)	Liner damper
Humidifier		Responding to consumer requirements	Electronic electrode type, water spray type, Steam Injecion
Swich Box	Motor startup panel	FAN Motor Local Panel	Automatic control (damper, humidity, UV Lamp), disaster prevention and linkage

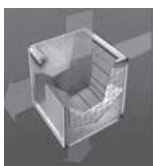
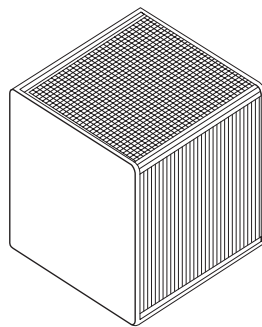
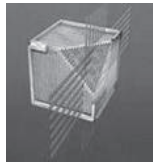
## Sensible Heat Exchanger

### ■ What is sensible heat exchanger?

It is essential to supply fresh outside air and emit polluted inside air in addition to adjustment of temperature and humidity to maintain healthy, comfortable indoor air. However, emitted air through this process increase cooling, heating expenses as cooling, heating energy is included in this ventilation process.

Sensible head exchanger collects emitted heat energy in exhaust duct and use them in pre-heating and pre-cooling the fresh outside air and reduce more than 70% of outside air load.

### ■ Characteristics of sensible heat exchanger

Classification	Image	Appearance and Regulations
Image · Appearance		
		
Advantage	<ul style="list-style-type: none"><li>- Epoxy resin confidential treatment (patent)</li><li>- High heat recovery ➡ Reduce initial investment cost</li><li>- No driving unit ➡ there is no wearing and continuous driving is possible</li><li>- Complete separation of the supply and exhaust air ➡ There is no mixing or pollution</li><li>- Power not required ➡ additional driving cost is not needed</li><li>- 2 types 3 series, various spec and plate intervals and etc ➡ optimum design is possible</li><li>- Lightweight compact design ➡ easy site application and installation</li><li>- Various accessories ➡ perfect solution that meets the proposed objectives</li></ul>	
Applied cases	<ul style="list-style-type: none"><li>- Indoor ventilation unit (Apartment, detached houses, hospitals)</li><li>- Commercial, industrial ventilation unit</li><li>- Plant, special facility workplaces</li><li>- Gym, swimming pool and sports center</li><li>- Hotels, restaurants, department stores and general shops, discount retail stores</li><li>- Hospitals, operating rooms, laboratories and research facilities</li></ul>	



## Static Pressure Table

### Internal static pressure

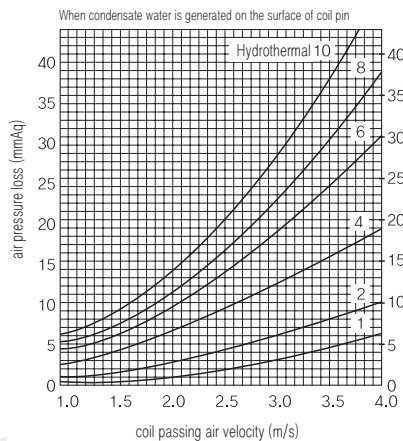
static pressure loss = coil + air filter + eliminator  
+ mixing box / casing + damper + others

$$P = P1 + P2 + P3 + P4 + P5$$

- P : Internal static pressure loss (mmAq)
- P1 : Static pressure loss due to D.X coil ※P1 = Table 1 × total correction (Table 2 × Table 3)
- P2 : Static pressure loss due to air filter
- P3 : Static pressure loss due to eliminator (for cases in which eliminator is installed)
- P4 : Static pressure loss due to mixing box, case
- P5 : Static pressure loss due to damper

### P1 : Static pressure loss due to D.X coil

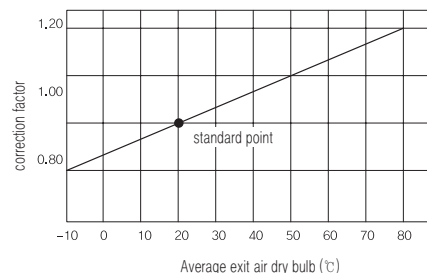
- Static pressure loss due to D.X coil (Table 1)



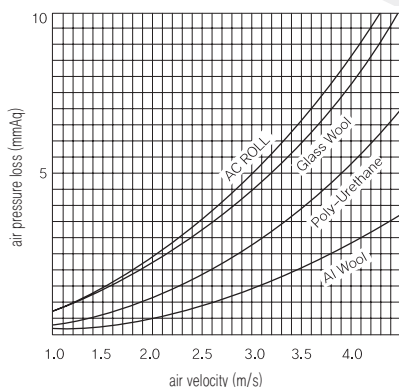
- Coil pin pitch static pressure loss correction factor (Table 2)

Fin number / 25.4mm	14	12	10	8	6	4	5
number (mm)	1.81	2.12	2.54	3.18	4.23	6.35	12.7
air pressure measured loss	1.95	1.60	1.35	1.00	0.72	0.43	0.26
total correction							

- air-side pressure loss temperature correction factor (Table 3)



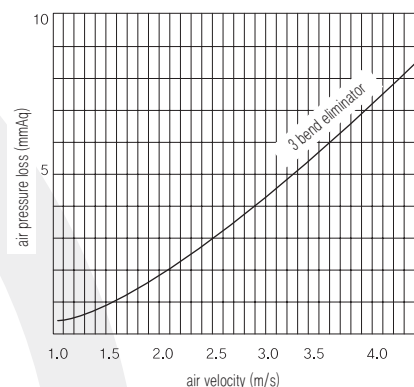
### P2 : Static pressure loss due to air filter



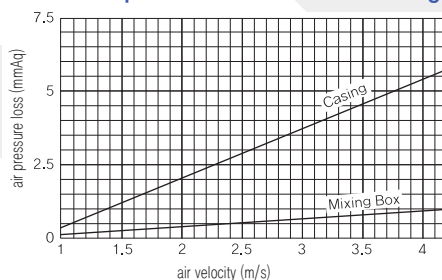
#### Reference

1. Loss in air pressure due to Air Filter can differ according to real Media used.
2. Additional calculation for pressure loss can be done according to dimensions, form and type of Air Filter.

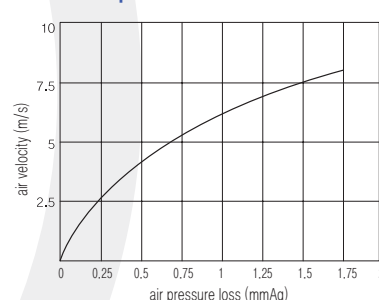
### P3 : Static pressure loss due to eliminator



### P4 : Static pressure loss due to mixing box, case



### P5 : Static pressure loss due to damper





# DVM AHU Jet

## Product Feature

### ■ Product feature

DVM AHU is a direct expansion type heat pump air handling unit which can form stream until 35M with powerful air volume discharge, suitable for large area.

#### 1) Easy installation

- ① Easy installation and cost saving through non-ducted type
- ② Minimize installation area
- ③ Possible to respond flexibly to lay out changes of installation environment

#### 3) Ensure ventilation distance

- ① Ensure high performance of the ventilation airflow reaching to 35m (optional up to 50m)
- ② Maximum effect exerted when applied to gymnasium and other large space
- ③ Applied with silent FAN type and installation noise absorbing material of FAN Camber Box makes reduction of noise possible [30HP standard 62dB (A)]

#### 2) Various type line up

- ① Has Line Up for 20, 30, 40, 50, 60HP types for various uses
- ② Can be vertical or horizontal according to installation environment

#### 4) Ease to use

- ① Since the direction of the discharge nozzle diffuser can be adjusted freely, flexible air flow direction change is possible according to the used environment
- ② All control Solution can be applied to system AHU, various Solutions are provided from wired remote control to internet remote control





## Product Standard

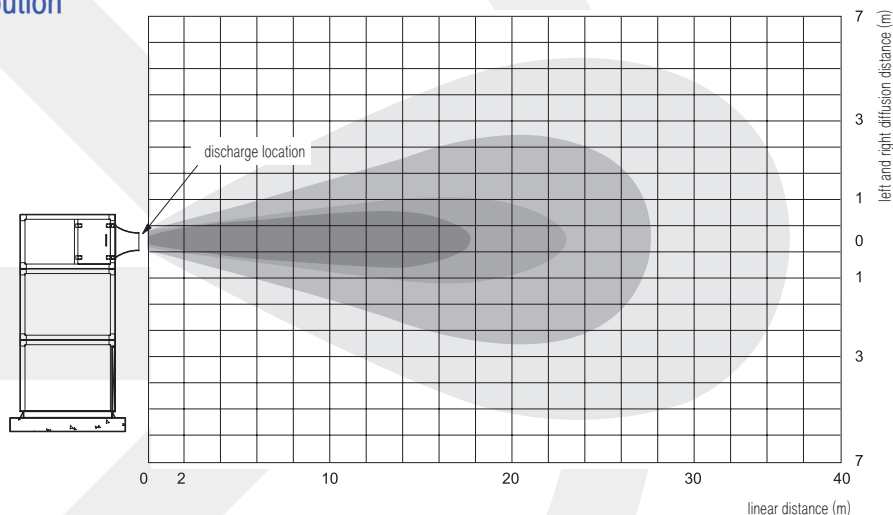
### Product standard

MODEL NO.(CMM)				TYZ620	TYZ630	TYZ640
FAN	air supply	airfoil	DS#	TYZ 400	TYZ 450	TYZ 400
			number	#2 3/4	#3	#3.5
		standard air volume	CMM	120	180	240
		static pressure	mmAq	50	50	50
		motor	kW	3.7	3.7	3.7
coil	cooling	capacity	kW	58	87	116
			Kcal/h	49,880	74,820	99,760
	heatin	capacity	kW	65.2	97.8	130.5
			Kcal/h	56,080	84,120	112,160
		- 15℃	kW	56	84	112
			Kcal/h	48,160	72,240	96,320
	face area		m²	1.00	1.50	2.00
	hot water coil		row	6	6	6
	outdoor unit capacity (HP)			20	30	40
refrigerant		types	R410A			
filter		Pre	AFI 80% <sup>1)</sup>			
		medium (option)	NBS 80% <sup>2)</sup>			
connecting pipe	R410A	gas	Φ, mm	22.23	22.23	28.58
		liquid	Φ, mm	9.52	9.52	15.88
drain			A	40		
weight			products Kg	620	830	950
			operating Kg	800	1,070	1,230

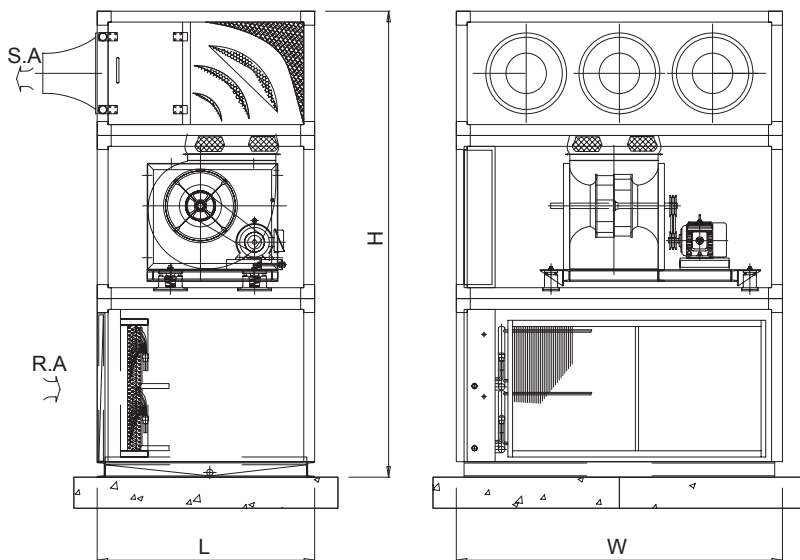
※ Other specifications out from above can be added additionally.

- 1) AFI 80% is standard for Pre Filter, AFI 60~80% products can be chosen.
- 2) NBS 80% is standard for Medium Filter, NBS 60~90% products can be chosen.
- 3) Humidifier is optional.
- 4) Cooling operation condition: Indoor 27℃ DB / 19℃ WB, Outdoor 35℃ DB / 24℃ W  
Heating operation condition: Indoor 20℃ DB / 15℃ WB, Outdoor 7℃ DB / 6℃ WB  
direct expansion type heat exchanger standard is 4~6ROW.

### Airflow Distribution



## ■ Product dimensions



HP	standard air volume [CMM]	External dimensions		
		H	L	W
20	120	2770	1400	1800
30	180	2900	1400	2100
40	240	3000	1400	2600

## ■ Required ventilation amount

Air volume is selected to use ventilation device for removing the odor of human health, exhaust system for discharging the dust, transporting device to transfer cement, grains and etc, combustion device for boiler, incinerator and etc.

### 1) Needed number of ventilation for ancillary room

Workshop	machine shop	casting factory	car maintenance	Plating plant	welding plant	dyeing plant	paper mill	food mill	mills	printing factory	textile factory
number of ventilation per hour	10 ~ 15	30 ~ 60	10 ~ 15	15 ~ 30	15 ~ 20	15 ~ 30	15 ~ 30	2 ~ 20	36 ~ 12	6 ~ 15	30 ~ 60

Workshop	carpentry factory	power station	substations	boiler room	warehouse	toilet	theater	cafeteria	kitchen	parking lot
number of ventilation per hour	10 ~ 20	20 ~ 30	30 ~ 50	20 ~ 60	6 ~ 12	6 ~ 15	8 ~ 20	8 ~ 10	20 ~ 30	4.5 ~ 6

### 2) Air velocity within duct

Type	Item	velocity (m/s)
Very light dust (gas, steam, sand and etc)	various gas, steam, zinc or aluminum inclusions, wood flour, gas car garage, spray painting's exhaust, the exhaust of kitchen furniture	10
Middle proportion of dry dust	wood, bop work, insects, wood material, grain, rubber or powder of Bakelite and etc	15
Normal industrial dust	spray, dust during grinding, dust of grounder, dust from concubine construction, dust during snatching, wood material, scattered dirt, shavings	20
Heavy dust	Foundry work, lathe work, paint powder in water and etc	25
Others	Coal (20), oxine (22.5), facial (25), facial (27.5), small (29), sand (35), cement (35), hematite (32.5)	

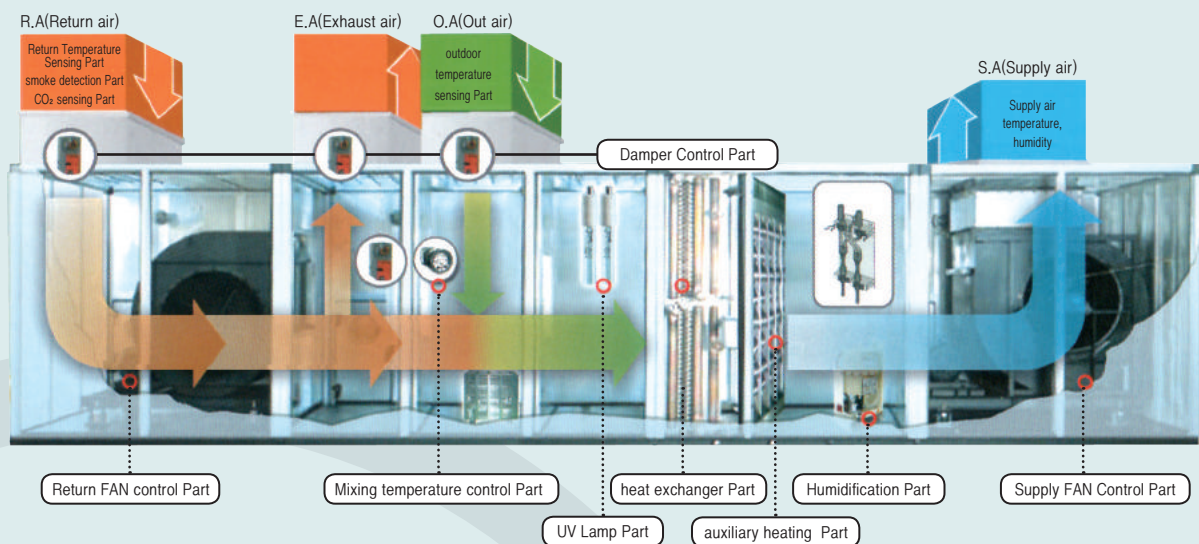




## Features and Specifications

### 1) Features

- Possible to minimize installation area
- Possible to drive in high efficiency with economic operation cost
- Various combination possible through section unit design
- Separation and assembly is easy and cost saving for installation
- Frame assembly method using aluminum mold bar
- Maintain complete confidentiality through special structured packing
- Structured to ease maintenance with large access door



### 2) Specification

- Model: Selection of various model according to each standard air flow
- Standard air volume: 65CMM ~ 2000CMM
- Application Type
  - ① Horizontal Type / Internal Motor Type, External Type
  - ② Combination Type
  - ③ Vertical Type
  - ④ Integral Type (Return FAN Mounted type / Internal Motor Type, External Type)

#### MODEL

0 0 0 - (a) (a) (a) (a) (b) (c)  
 0 0 0 : Model NO

CAU : COMBINATION AHU  
 CRA : CLEAN ROOM AHU  
 BAU : BUILT UP AHU  
 KAU : MODULE TYPE AHU

① : Air Volume (CMM)  
 ② : Basic Structure  
 H: Horizontal Type  
 V: Vertical Type  
 C: Combination Type  
 H: Integral Type  
 © : Return FAN Presence

## Properties of Each Part

### CASING

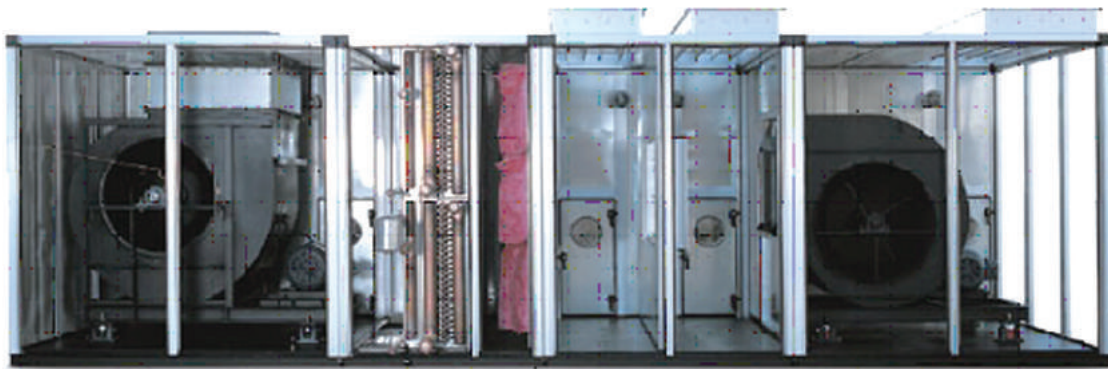
- Double skin structure
- Durable cooling rolled steel (external) and application of galvanized Punching Plate preventing damage of insulator
- Can choose from artilon, urethane foam, glass wool, glass cross
- Excellent thermal insulation, anti-condensation, sound absorbing effect

### HEAT EXCHANGER

- Use of high-performance waffle pin, adopted with mechanical tube expansion method to increase adhesion between copper pipe and pin contact part resulting to increase in heat efficiency
- Increase heat exchange efficiency through mechanical pipe expansion with deoxidized copper pipe (purity 99.9%)

### MOTOR FAN

- Applied with counter absorption Air foil FAN, Sirocco FAN with the best efficiency which are the products of Germany Wolter
- Precise rotors makes noise, vibration less and life time of bearing is long



### ACCESS DOOR

- Air Tight Type with no air leak during operation
- Installation of external inspection window
- Durability (chrome plated) is excellent and excellent exterior parts are used

### FILTER

- Pressure loss is less and easy to detach and attach
- AFI 80~85% is applied for Pre-Fiter
- Medium-Fiter can be selected 65~95% in Compact structure

### DAMPER

- Adopted with counter flow type blade with smooth air flow
- Air Tight with less pressure loss during driving and operation
- Complete air volume can be controlled through Type
- High density extruded material of aluminum above 1.2t is used for Blade and Frame. Seal of special material is attached at the end part of the Blade to minimize air leakage



## Conditions Needed for Type Selection

- Air volume :  $\text{m}^3/\text{min}$
- Cooling capacity :  $\text{kcal/h}$
- Heating capacity :  $\text{kcal/h}$
- Humidification capacity:  $\text{kg/h}$
- Air Filter Type

- Hot and cooling water flow :  $\ell/\text{min}$
- Steam conditions (pressure, temperature) :  $\text{kg}/\text{cm}^2\text{G}$ ,  $^{\circ}\text{C}$
- Static pressure outside the plane :  $\text{mmAq}$
- Hot and cooling water entrance temperature :  $^{\circ}\text{C}$

### [Loss of static pressure in-flight]

adjustment values in case of combination type

chilled water coil static pressure loss  
hot water coil static pressure loss  
pin pitch correction factors static  
pressure loss of the correction factor  
due to the air temperature

steam coil static pressure loss  
pin pitch correction factors  
static pressure loss of the correction factor  
due to the air temperature

air filter static pressure loss

eliminator static pressure loss

Total static pressure loss  
= (Static pressure loss in AHU + static  
pressure loss outside the AHU)

model selection

selection of cooling water coil  
and hot water coil  
(calculation of pressure loss of coil)

selection of steam coil

selection of air filter

selection for humidifier

presence of eliminator

selection of ventilator type  
selection of motor output

decision for box type

determination for location of each air  
conditioner at each device position

create orders specifications

### [Reference data]

standard specification table

standard capacity leading / pin pitch  
correction factors  
cooling water coil capacity correction factor  
hot water coil capacity correction factor  
cooling and hot water coil pressure loss table

standard capacity leading  
pin pitch correction factors  
steam coil capacity correction factor

selection of air filter

selection of humidifiers

selection of FAN

series configuration

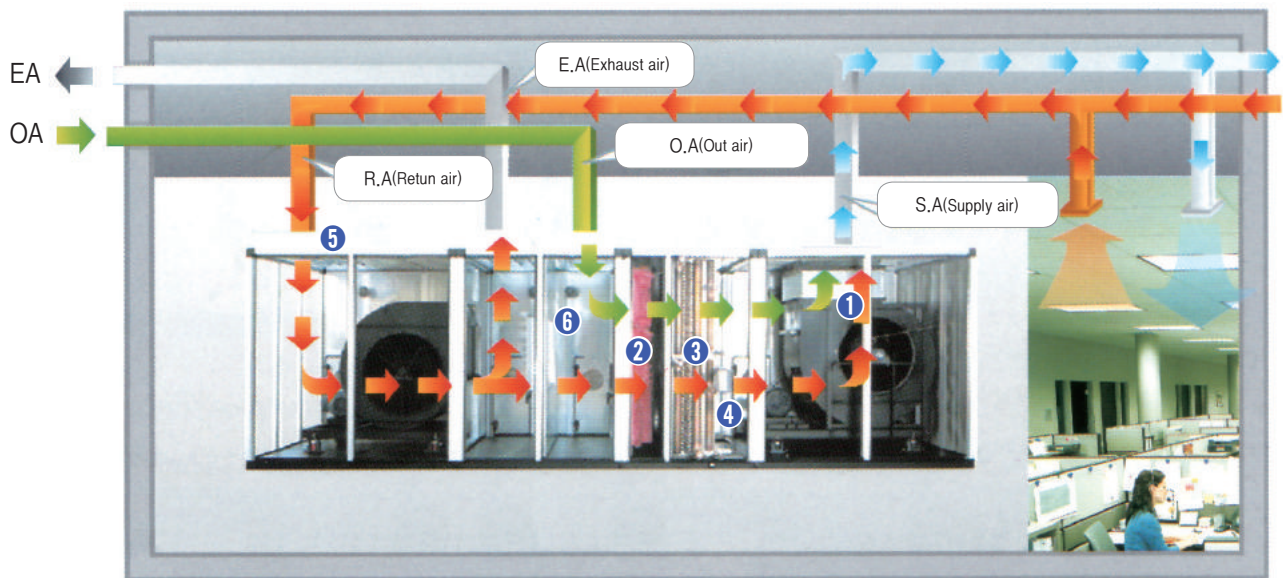
external dimensions table

orders specifications form

## Configuration

### 1) Internal structure

Comfortable environment is provided through smooth air circulation of internal and external air.



- ① FAN & Motor : Full performance guarantee and minimized vibration, noise
- ② Filter : Detachable, different specifications can be applied according to the customer needs (Option)
- ③ D.X Coil : Improved heat exchange performance of coil with complete mechanical tube-expansion
- ④ Humidifier : Steam injection, evaporation, electric electroed electrode humidifiers available depending on the environment (Option)
- ⑤ Damper : Complete confidentiality with less pressure losing Airtight Type for starting and operating
- ⑥ Casing : Excellent insulation and prevent condensation through double skin panel structure, excellent sound absorbing effect





## Standard Specification

### Return FAN Including (Internal Motor Type)

Classification				KAE-0065	KAE-0085	KAE-0120	KAE-0150	KAE-0200	KAE-0250	KAE-0300	KAE-0350	KAE-0400	KAE-0450	KAE-0500	
air volume	air supply	standard air volume	CMM	65	85	120	150	200	250	300	350	400	450	500	
			CMH	3,900	5,100	7,200	9,000	12,000	15,000	18,000	21,000	24,000	27,000	30,000	
		static pressure	mmAq	75	75	75	80	80	80	80	90	90	90	90	90
	ventilation	standard air volume	CMM	52	68	96	120	160	200	240	280	320	360	400	
			CMH	3,120	4,080	5,760	7,200	9,600	12,000	14,400	16,800	19,200	21,600	24,000	
		static pressure	mmAq	30	30	35	35	35	40	45	45	45	45	45	45
FAN	air supply	FAN NO.	AYZ	315	355	400	400	450	500	500	560	630	630	710	
		power	KW	2.2	2.2	3.7	5.5	5.5	7.5	11	11	11	15	15	
	ventilation	FAN NO.	AYZ	315	315	315	355	400	450	500	500	560	560	830	
		power	KW	0.75	0.75	1.5	2.2	2.2	3.7	3.7	5.5	5.5	7.5	7.5×6P	
coil	cooling	cooling water	capacity	Kcal/hr	23,000	30,000	43,000	53,000	71,000	89,000	106,000	124,000	141,000	159,000	177,000
			flow	LPM	77	100	143	177	237	297	353	413	470	530	590
			size	PASS(H) ×L×EA	16(610)× 700×1	22(838)× 650×1	22(838)× 920×1	24(914)× 1050×1	30(1143)× 1100×1	30(1143)× 1400×1	30(1143)× 1650×1	32(1219)× 1800×1	38(1448)× 1800×1	38(1448)× 1950×1	38(1448)× 2150×1
			diameter (inlet/outlet)	A×EA	32×1/32×1	32×1/32×1	40×1/40×1	50×1/50×1	50×1/50×1	65×1/65×1	65×1/65×1	80×1/80×1	80×1/80×1	100×1/100×1	100×1/100×1
			face area	m²	0.43	0.54	0.77	0.96	1.26	1.6	1.89	2.19	2.61	2.82	3.11
		hot water	capacity	Kcal/hr	31,000	40,000	57,000	71,000	94,000	117,000	141,000	164,000	187,000	211,000	234,000
			flow	LPM	52	67	95	118	157	195	235	273	312	352	390
			size	PASS(H) ×L×EA	16(610)× 700×1	22(838)× 650×1	22(838)× 920×1	24(914)× 1050×1	30(1143)× 1100×1	30(1143)× 1400×1	30(1143)× 1650×1	32(1219)× 1800×1	38(1448)× 1800×1	38(1448)× 1950×1	38(1448)× 2150×1
			diameter (inlet/outlet)	A×EA	32×1/32×1	40×1/40×1	50×1/50×1	50×1/50×1	65×1/65×1	65×1/65×1	80×1/80×1	80×1/80×1	100×1/100×1	100×1/100×1	100×1/100×1
	steam	capacity	Kcal/hr	37,000	48,000	68,000	85,000	113,000	141,000	169,000	197,000	226,000	254,000	282,000	
		amount of steam	kg/hr	72	93	132	164	219	273	327	381	437	491	545	
		size	PASS(H) ×L×EA	14(533)× 700×1	20(762)× 650×1	20(762)× 920×1	22(838)× 1050×1	28(1067)× 1100×1	28(1067)× 1400×1	28(1067)× 1650×1	30(1143)× 1800×1	36(1372)× 1800×1	36(1372)× 1950×1	36(1372)× 2150×1	
		diameter (inlet/outlet)	A×EA	25×1/20×1	32×1/20×1	32×1/20×1	32×1/20×1	50×1/32×1	50×1/32×1	50×1/32×1	65×1/40×1	65×1/40×1	65×1/40×1	65×1/40×1	
	humidification			kg/hr	10	13	18	23	30	38	45	52	60	67	75
	filter	(24"×24")	row x column	1.0×1.5	1.5×1.5	1.5×2.0	2.0×2.0	2.0×2.0	2.0×3.0	2.0×3.0	2.0×3.0	2.5×3.0	2.5×3.0	2.5×3.0	
	dimension			Height	1,200	1,200	1,200	1,250	1,500	1,500	1,500	1,600	1,800	1,800	1,800
				Width	1,200	1,200	1,450	1,550	1,600	1,900	2,150	2,300	2,300	2,150	2,150
Length				4,550	4,600	4,700	4,750	4,950	4,500	4,500	4,800	5,000	5,000	5,200	

Classification				KAE-0600	KAE-0700	KAE-0800	KAE-0900	KAE-1000	KAE-1100	KAE-1200	KAE-1350	KAE-1500	KAE-1800	KAE-2000	
air volume	air supply	standard air volume	CMM	600	700	800	900	1,000	1,100	1,200	1,350	1,500	1,800	2,000	
			CMH	36,000	42,000	48,000	54,000	60,000	66,000	72,000	81,000	90,000	108,000	120,000	
		static pressure	mmAq	100	100	100	100	100	100	100	100	100	100	100	100
	ventilation	standard air volume	CMM	480	560	640	720	800	880	960	1,080	1,200	1,440	1,600	
			CMH	28,800	33,600	38,400	43,200	48,000	52,800	57,600	64,800	72,000	86,400	96,000	
		static pressure	mmAq	50	50	50	50	50	50	50	50	50	50	50	50
FAN	air supply	FAN NO.	AYZ	710	800	800	900	900	1,000	1,000	1,000	800×2.EA	900×2.EA	900×2.EA	
		power	KW	18.5	22	30	30	30	37	37	45	22×2.EA	30×2.EA	30×2.EA	
	ventilation	FAN NO.	AYZ	630	710	710	800	800	900	900	1,000	710×2.EA	800×2.EA	900×2.EA	
		power	KW	11	11	15	15	15	15	18.5	18.5	11×2.EA	15×2.EA	15×2.EA	
coil	cooling	cooling water	capacity	Kcal/hr	212,000	247,000	282,000	318,000	353,000	388,000	423,000	476,000	529,000	635,000	705,000
			flow	LPM	707	823	940	1,060	1,177	1,293	1,410	1,587	1,763	2,117	2,350
			size	PASS(H) ×L×EA	46(1753)× 2150×1	48(1829)× 2400×1	26(991)× 2500×2	26(991)× 2800×2	30(1143)× 2700×2	30(1143)× 3000×2	30(1143)× 3300×2	30(1143)× 3700×2	30(1143)× 2040×4	30(1143)× 2450×4	30(1143)× 2700×4
			diameter (inlet/outlet)	A×EA	100×1/100×1	100×1/100×1	80×2/80×2	100×2/100×2	100×2/100×2	100×2/100×2	100×2/100×2	100×2/100×2	125×2/125×2	125×2/125×2	125×2/125×2
			face area	m²	3.77	4.39	4.95	5.55	6.17	6.86	7.54	8.46	9.37	11.2	12.34
	heating	hot water	capacity	Kcal/hr	281,000	327,000	374,000	421,000	467,000	514,000	561,000	631,000	701,000	841,000	934,000
			flow	LPM	468	545	623	702	778	857	935	1,052	1,168	1,402	1,557
			size	PASS(H) ×L×EA	46(1753)× 2150×1	48(1829)× 2400×1	26(991)× 2500×2	26(991)× 2800×2	30(1143)× 3000×2	30(1143)× 3300×2	30(1143)× 3700×1	32(1219)× 1800×1	30(1143)× 2050×4	30(1143)× 2450×4	30(1143)× 2700×4
			diameter (inlet/outlet)	A×EA	100×1/100×1	125×1/125×1	100×2/100×2	100×2/100×2	65×1/65×1	65×1/65×1	80×1/80×1	80×1/80×1	100×1/100×1	100×1/100×1	100×1/100×1
		steam	capacity	Kcal/hr	338,000	394,000	451,000	507,000	563,000	619,000	676,000	760,000	844,000	1,013,000	1,126,000
			amount of steam	kg/hr	654	762	872	981	1,089	1,197	1,308	1,470	1,632	1,959	2,178
			size	PASS(H) ×L×EA	44(1676)× 2150×1	46(1753)× 2400×1	24(914)× 2500×2	24(914)× 2800×2	28(1067)× 2700×2	28(1067)× 3000×2	28(1067)× 3300×2	28(1067)× 3700×2	28(1067)× 2050×4	28(1067)× 2450×4	28(1067)× 2700×4
			diameter (inlet/outlet)	A×EA	80×1/50×1	80×1/50×1	65×2/40×2	65×2/40×2	65×2/40×2	80×2/50×2	80×2/50×2	80×2/50×2	80×2/50×2	100×2/65×2	100×2/65×2
			humidification			kg/hr	90	104	119	134	149	164	179	201	223
filter	(24"×24")	row x column	3.0×3.5	3.0×4.0	3.5×4.0	3.5×5.0	4.0×4.5	4.0×5.0	4.0×5.5	4.0×6.0	4.0×7.0	4.0×8.0	4.0×9.0		
dimension			Height	2,100	2,200	2,400	2,400	2,700	2,750	2,750	2,750	2,750	2,750	2,750	
			Width	2,700	2,900	3,000	3,300	3,200	3,500	3,800	4,200	4,900	5,800	2,150	
			Length	5,500	5,800	5,900	6,200	6,450	6,800	6,800	6,950	6,950	5,000	5,200	

**Note 1.** Please consult our HVAC business department for specifications other than standard air volume range.

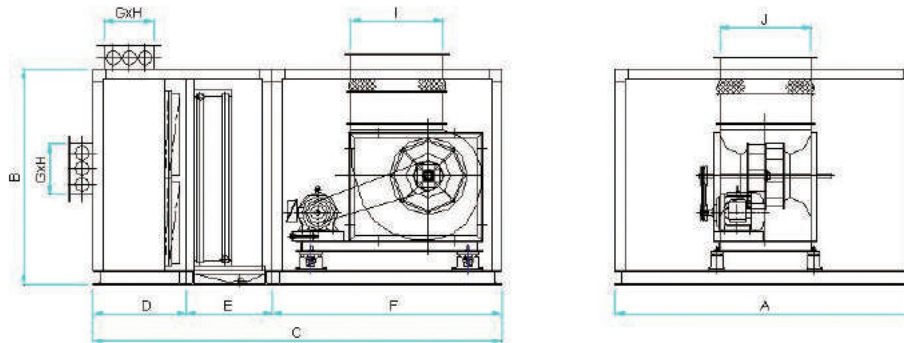
**Note 2. Drive condition**

- ▶ Cooling coil entrance air temperature: DB 28℃, WB 21℃
- ▶ Cooling water entrance temperature: 7℃ cooling water inlet and outlet temperature difference: 5℃
- ▶ Steam coil entrance air temperature: DB10℃ Steam pressure: 2.0kg/cm² ▶ Hot water coil entrance air temperature: DB15℃
- ▶ Entrance temperature 60℃ hot water inlet and outlet temperature difference temperature: 5℃
- ▶ Standards and specifications are subject to change without prior notice for product improvement.



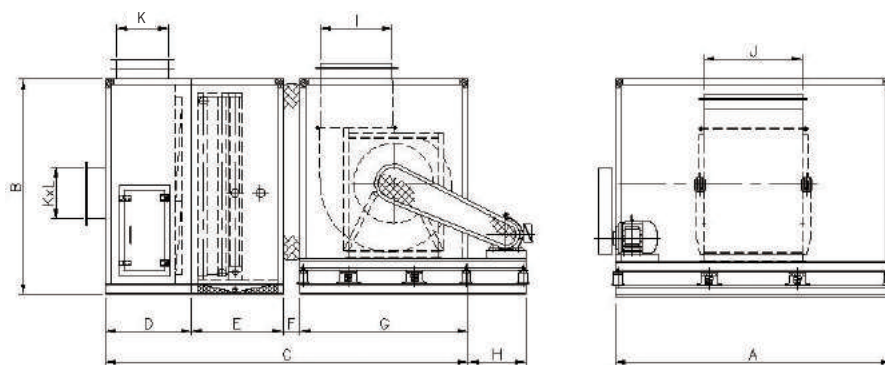
## Outer Dimension

### ■ Horizontal Type (Return FAN Separating Type / Internal Motor Type)



MODEL \ SIZE	A	B	C	D	E	F	G	H	AF	
									I	J
AHU-65	1200	1100	2250	650	600	1300	300	500	452	452
AHU-85	1200	1200	2550	650	600	1300	300	600	452	452
AHU-120	1450	1200	2650	650	600	1400	300	850	506	506
AHU-150	1550	1350	2650	650	600	1400	250	1400	506	506
AHU-200	1600	1500	2750	650	600	1500	300	1450	568	568
AHU-250	1800	1500	2850	650	600	1600	350	1650	638	638
AHU-300	2100	1500	2850	650	600	1600	350	1950	638	638
AHU-350	2250	1600	3050	650	600	1800	350	2100	714	714
AHU-400	2200	1800	3150	750	600	1800	450	2050	714	714
AHU-450	2450	1800	2850	750	600	1500	450	2300	800	800
AHU-500	2700	1800	2850	750	600	1500	450	2550	800	800
AHU-600	2600	2100	2950	850	600	1500	550	2450	800	800
AHU-700	2900	2100	3100	850	600	1650	550	2750	898	898
AHU-750	3050	2100	3100	850	600	1650	550	2900	898	898
AHU-800	3000	2400	3150	900	600	1650	600	2850	898	898
AHU-900	3300	2400	3500	900	600	2000	600	3150	1130	1130
AHU-1000	3600	2400	3550	950	600	2000	650	3450	1130	1130
AHU-1100	3500	2700	3750	1050	600	2100	750	3350	1130	1130
AHU-1200	3800	2700	3750	1050	600	2100	750	3650	1130	1130
AHU-1500	4100	3100	4000	1200	600	2200	900	3950	1266	1266
AHU-1800	4400	3400	4550	1200	600	2750	900	4250	1320	1780
AHU-2000	4400	3700	4950	1350	600	3000	1050	4250	1460	1960

## ■ Horizontal Type (Return FAN Separating Type / External Motor Type)

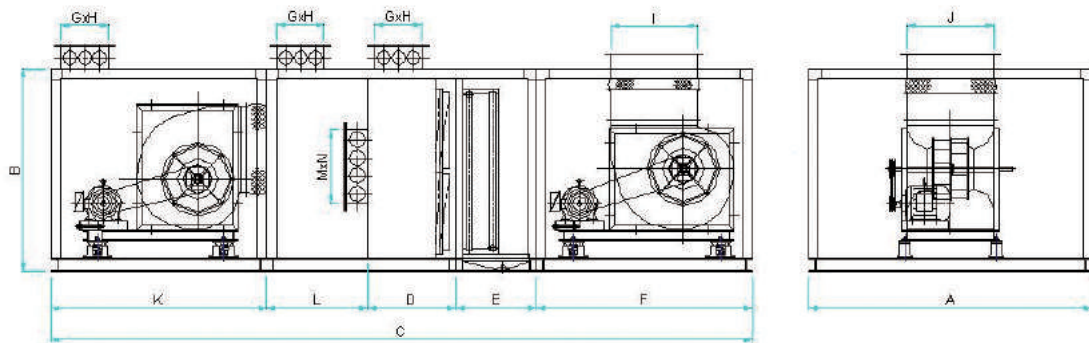


MODEL \ SIZE	A	B	C	D	E	F	G	H	AF		K
									I	J	
AHU-65	1400	1300	2450	650	600	150	1050	450	403	540	300
AHU-85	1400	1300	2450	650	600	150	1050	450	403	540	300
AHU-120	1450	1300	2450	650	600	150	1050	450	403	540	300
AHU-150	1550	1450	2600	650	600	150	1200	450	487	660	250
AHU-200	1600	1500	2600	650	600	150	1200	500	487	660	300
AHU-250	1800	1600	2750	650	600	150	1350	500	595	800	350
AHU-300	2100	1600	2750	650	600	150	1350	500	595	800	350
AHU-350	2250	1700	2900	650	600	150	1500	650	655	890	350
AHU-400	2200	1800	3000	750	600	150	1500	650	655	890	450
AHU-450	2450	1900	3150	750	600	150	1650	650	725	980	450
AHU-500	2700	1900	3150	750	600	150	1650	650	725	980	450
AHU-600	2600	2100	3400	850	600	150	1800	650	805	1080	550
AHU-700	2900	2100	3550	850	600	150	1950	650	886	1190	550
AHU-750	3050	2100	3550	850	600	150	1950	650	886	1190	550
AHU-800	3000	2400	3750	900	600	150	2100	650	980	1320	600
AHU-900	3300	2400	3750	900	600	150	2100	750	980	1320	600
AHU-1000	3600	2400	3800	950	600	150	2100	750	980	1320	650
AHU-1100	3500	2700	4100	1050	600	150	2300	750	1084	1470	750
AHU-1200	3800	2700	4100	1050	600	150	2300	750	1084	1470	750
AHU-1500	4100	3100	4450	1200	600	150	2500	900	1200	1610	900
AHU-1800	4400	3400	4850	1350	600	150	2750	900	1318	1780	1050
AHU-2000	4400	3700	5250	1500	600	150	3000	1000	1460	1960	1200





## Horizontal Type (Internal Return FAN Type / Internal Motor Type)



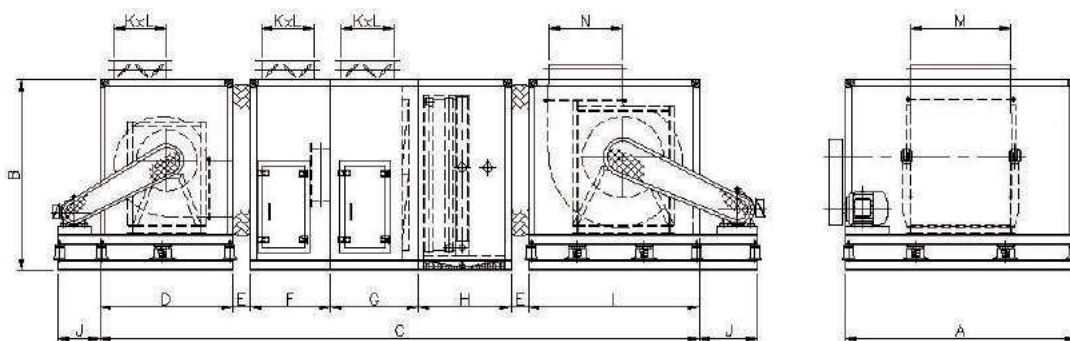
MODEL \ SIZE	A	B	C	D	E	F	G	H	AF		K	L	M	N
									I	J				
AHU-65	1200	1100	4300	650	600	1300	300	500	452	452	1100	650	300	500
AHU-85	1200	1200	4400	650	600	1300	300	600	452	452	1200	650	300	600
AHU-120	1450	1200	4550	650	600	1400	300	850	506	506	1250	650	450	560
AHU-150	1550	1350	4600	650	600	1400	250	1400	506	506	1300	650	450	780
AHU-200	1600	1500	4850	650	600	1500	300	1450	568	568	1450	650	450	960
AHU-250	1800	1500	5100	650	600	1600	350	1650	638	638	1500	750	450	1280
AHU-300	2100	1500	5200	650	600	1600	350	1950	638	638	1600	750	550	1240
AHU-350	2250	1600	5400	650	600	1800	350	2100	714	714	1600	750	550	1330
AHU-400	2200	1800	5700	750	600	1800	450	2050	714	714	1800	750	600	1540
AHU-450	2450	1800	4900	750	600	1500	450	2300	800	800	1300	750	600	1720
AHU-500	2700	1800	4950	750	600	1500	450	2550	800	800	1350	750	600	1910
AHU-600	2600	2100	5350	850	600	1500	550	2450	800	800	1500	900	750	1790
AHU-700	2900	2100	5500	850	600	1650	550	2750	900	900	1500	900	750	2010
AHU-750	3050	2100	5500	850	600	1650	550	2900	900	900	1500	900	750	2120
AHU-800	3000	2400	5700	900	600	1650	600	2850	900	900	1650	900	750	2280
AHU-900	3300	2400	6050	900	600	2000	600	3150	1130	1130	1650	900	750	2520
AHU-1000	3600	2400	6250	950	600	2000	650	3450	1130	1130	1800	900	750	2990
AHU-1100	3500	2700	6600	1050	600	2100	750	3350	1130	1130	1800	1050	900	2700
AHU-1200	3800	2700	6600	1050	600	2100	750	3650	1130	1130	1800	1050	900	3000
AHU-1500	4100	3100	7050	1200	600	2200	900	3950	1266	1266	2000	1050	900	3300
AHU-1800	4400	3400	7850	1200	600	2750	900	4250	1320	1780	2250	1050	1050	3500
AHU-2000	4400	3700	8400	1350	600	3000	1050	4250	1460	1960	2250	1200	1200	3500

**Note 1.** Please consult our HVAC business department for specifications other than standard air volume range.

**Note 2. Drive condition**

- ▶ Cooling coil entrance air temperature: DB 28°C, WB 21°C
- ▶ Cooling water entrance temperature: 7°C cooling water inlet and outlet temperature difference: 5°C
- ▶ Steam coil entrance air temperature: DB10°C Steam pressure: 2.0kg/cm<sup>2</sup> ▶ Hot water coil entrance air temperature: DB15°C
- ▶ Entrance temperature 60°C hot water inlet and outlet temperature difference temperature: 5°C
- ▶ Standards and specifications are subject to change without prior notice for product improvement.

## ■ Horizontal Type (Internal Return FAN Type / External Motor Type)



MODEL \ SIZE	A	B	C	D	E	F	G	H	I	J	N	M	AF	
													K	L
AHU-65	1400	1300	4100	850	150	650	650	600	1050	450	403	540	300	500
AHU-85	1400	1300	2100	850	150	650	650	600	1050	450	403	540	300	600
AHU-120	1450	1300	4200	950	150	650	650	600	1050	450	403	540	300	850
AHU-150	1550	1450	4350	950	150	650	650	600	1200	450	487	660	250	1400
AHU-200	1600	1500	4450	1050	150	650	650	600	1200	500	487	660	300	1450
AHU-250	1800	1600	4800	1050	150	750	750	600	1350	500	595	800	350	1650
AHU-300	2100	1600	4850	1200	150	750	650	600	1350	500	595	800	350	1950
AHU-350	2250	1700	5100	1300	150	750	650	600	1500	650	655	890	350	2100
AHU-400	2200	1800	5200	1300	150	750	750	600	1500	650	655	890	450	2050
AHU-450	2450	1900	5450	1400	150	750	750	600	1650	650	725	980	450	2300
AHU-500	2700	1900	5450	1400	150	750	750	600	1650	650	725	980	450	2550
AHU-600	2600	2100	5950	1500	150	900	850	600	1800	650	805	1080	550	2450
AHU-700	2900	2100	6100	1500	150	900	850	600	1950	650	886	1190	550	2750
AHU-750	3050	2100	6250	1650	150	900	850	600	1950	650	886	1190	550	2900
AHU-800	3000	2400	6450	1650	150	900	900	600	2100	650	980	1320	600	2850
AHU-900	3300	2400	6550	1750	150	900	900	600	2100	750	980	1320	600	3150
AHU-1000	3600	2400	6600	1750	150	900	950	600	2100	750	980	1320	650	3450
AHU-1100	3500	2700	7300	2000	150	1050	1050	600	2300	750	1084	1470	750	3350
AHU-1200	3800	2700	7300	2000	150	1050	1050	600	2300	750	1084	1470	750	3650
AHU-1500	4100	3100	7650	2000	150	1050	1200	600	2500	900	1200	1610	750	3950
AHU-1800	4400	3400	8450	2250	150	1200	1350	600	2750	900	1320	1780	900	4250
AHU-2000	4400	3700	8850	2250	150	1200	1500	600	3000	1000	1460	1960	900	4250



## Capacity Correction

### Capacity correction method

- Cooling and heating capacity of standard capacity table is capacity for standard operation condition so please adjust as the following if using condition is different.
- Cooling capacity (using condition standard) = standard cooling capacity × pin pitch correction factor (table 1) × cooling coil capacity correction factor
- Heating capacity (using condition standard) = standard heating capacity × pin pitch correction factor (table 1) × heating coil capacity correction factor (figure 2 or figure 3)

Table 1 5/8" Fin Heat Transfer Factor

pin number/per inch (pin pitch mm)	14 (1.81)	21 (2.12)	10 (2.54)	8 (3.18)	7 (3.63)	6 (4.23)
correction factor	1.34	1.26	1.13	1	0.92	0.81

Figure 1 5/8" Capacity Correction Factor of Cooling Coil

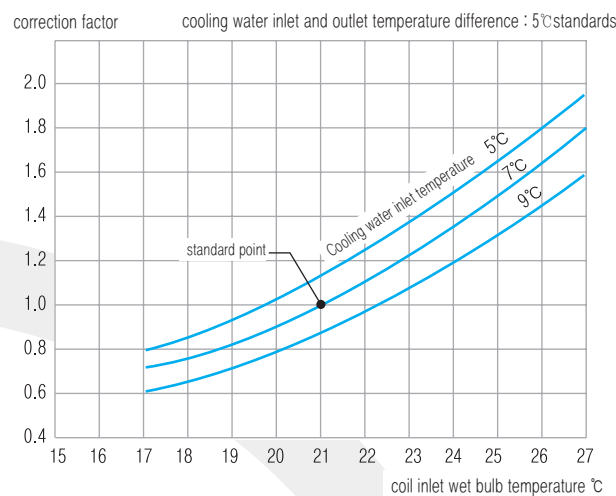


Figure 2 5/8" Capacity Correction Factor of Steam Coil

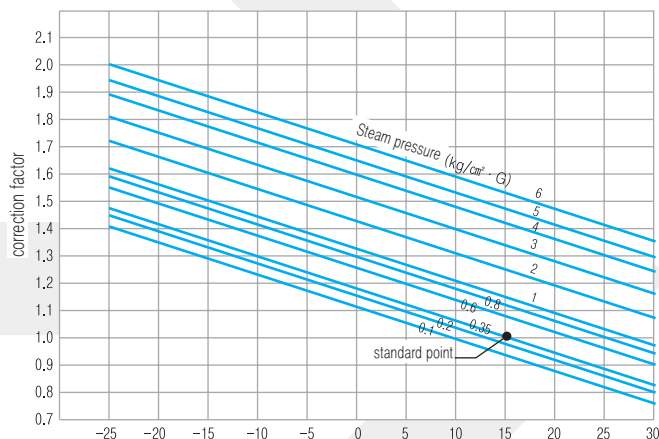
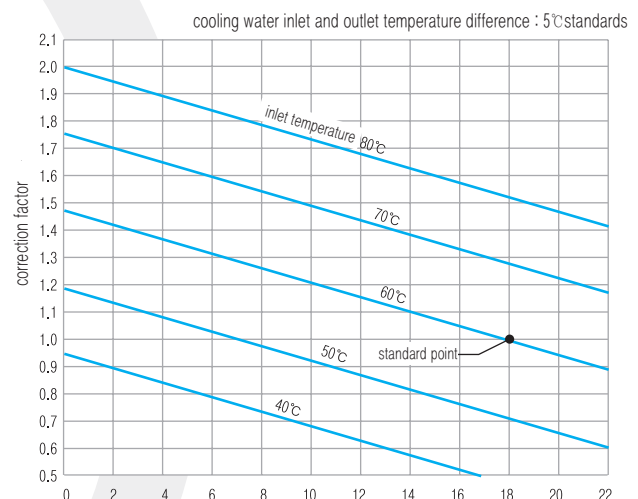


Figure 3 5/8" Capacity Correction Factor of Hot Water Coil



## Cooling and Hot Water Coil Pressure Loss

### ■ Cooling and hot water coil pressure loss

#### 1) Calculation method for cooling and hot water coil pressure loss

Pressure loss of cooling and hot water coil is water flow per 1 tube bon [Needed flow (ℓ/min)/ coil singular] length of tube(effective field).

#### 2) Air volume : 585CMM

Cooling capacity : 250,000kcal/h,

coil spec. : 6Row × 2060 (L) × 874 (H) × 2sets (46 column)

$$\frac{250,000}{60 \times 5(\text{cooling inlet and outlet difference temperature})} = 833(\ell/\text{min})$$

#### 3) In case of single flow (S.F)

Flow per 1 tube bon:  $833/46 \approx 18 (\ell/\text{min})$

tube length is 2.06m so 1.33mAq/m of right table is water pressure loss value.

Therefore, total water pressure loss is  $1.33\text{mAq/m} \times 6 = 7.89\text{mAq}$

#### 4) In case of double flow (D.F)

Flow per 1 tube bon:  $(833/46)/2 \approx 9 (\ell/\text{min})$

value of water pressure loss: 0.38mAq/m

total water pressure loss (in case of 8Row):  $0.38 \times (8/2) = 1.52\text{mAq}$

#### 5) Please set the water velocity inside tube within 0.6 ~ 1.5m/s

#### 6) Select single flow or double flow considering the water velocity and write down on the order sheet.

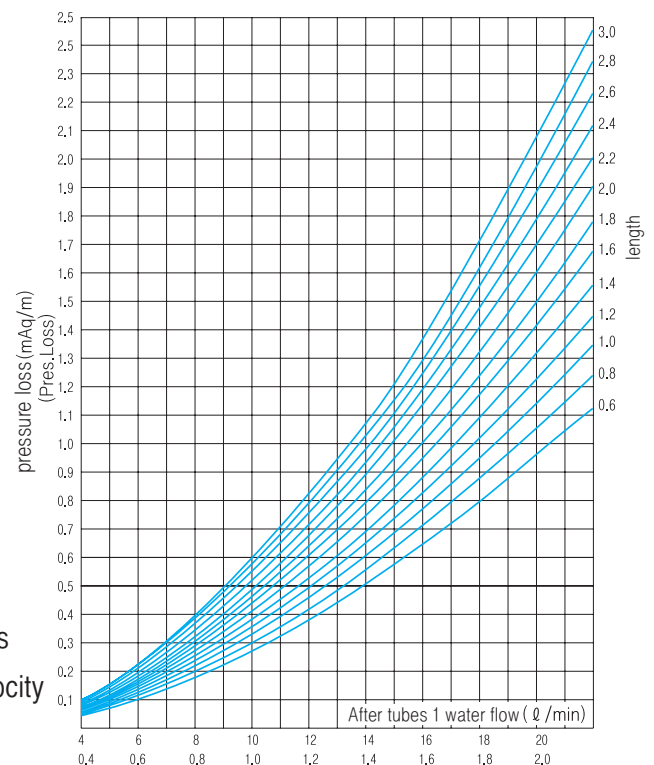


figure 4 Cooling and Hot Water Pressure Loss

### ■ Static pressure loss of air side : 5/8" standard pipe coil

#### 1) static pressure loss in AHU = static pressure loss of cooling water coil (figure 6) × pin pitch static pressure correction factor (table 1) × air temperature correction factor (figure 5)

- Pre-heating (hot water or steam) coil static pressure loss (figure 7) × pin pitch static pressure correction factor (table 2) × air temperature correction factor (figure 5)
- Static pressure of air filter loss (figure 8)
- Static pressure loss of damper and casing (figure 9)
- Static pressure loss of casing and complex type (figure 8)
- Eliminator static pressure loss (figure 8)

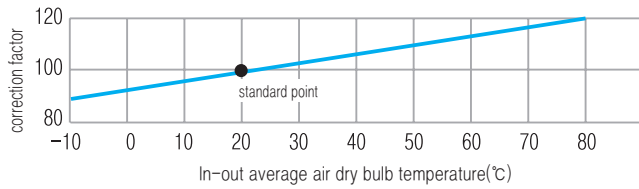
Figure 1 5/8" Fin Heat Transfer Factor

pin number/per inch (pin pitch mm)	14 (1.81)	12 (2.12)	8 (2.54)	7 (3.18)	4 (3.64)	3 (8.47)	2 (12.7)
pressure loss correction factor	1.95	1.60	1.00	0.86	0.49	0.43	0.26

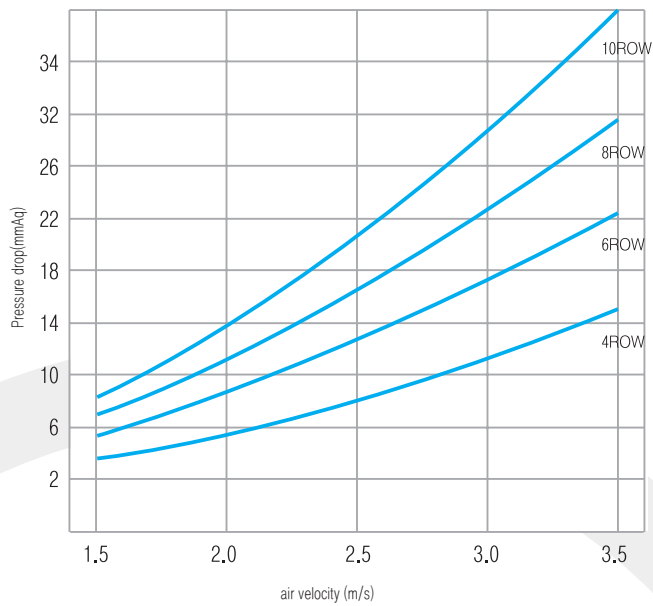




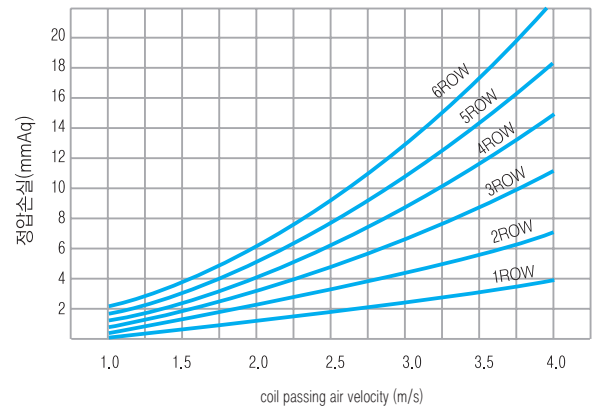
**Figure 5** Static Pressure Loss Factor by Air Temp



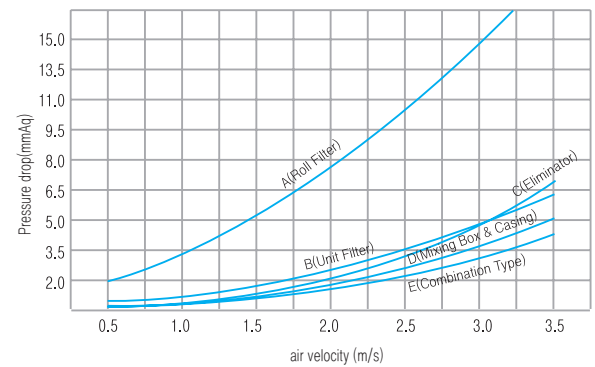
**Figure 6** Static Pressure Loss of Cooling Coil



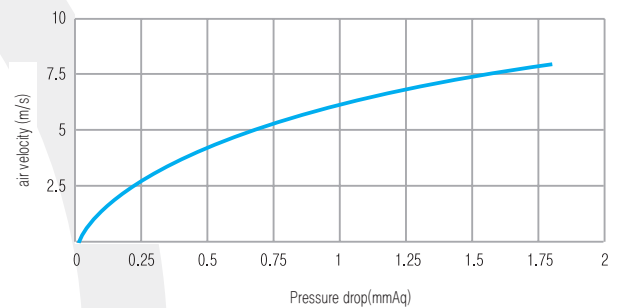
**Figure 7** Static Pressure Loss of Cooling Coil



**Figure 8** Air Filter, Eliminator, mixing box and the casing, correcting static pressure loss



**Figure 9** Static pressure loss of damper



## Cooling and Hot Water Coil Selection Method (5/8" standard pipe coil)

Specifications

1. Air volume  $Q_a = 12,000 \text{ m}^3/\text{h} (200 \text{ m}^3/\text{min})$
2. Cooling capacity  $q_c = 83,000 \text{ kcal/h}$   
Entrance air temperature  $DB1 = 27^\circ\text{C}$   $WB1 = 21^\circ\text{C}$   
outlet air temperature  $DB2 = 14^\circ\text{C}$   $WB2 = 13^\circ\text{C}$
3. Cooling water entrance temperature  $tw1 = 7^\circ\text{C}$   
Cooling water outlet temperature  $tw2 = 12^\circ\text{C}$   
water temperature difference  $WTR = 5^\circ\text{C}$

### [Cooling Water Coil]

#### 1) Calculate surface area of coil $F_a$ ( $\text{m}^2$ )

$$F_a = \frac{Q_a}{3,600 \times V_a} = \frac{12,000}{3,600 \times 2.7} = 1.235 \text{ m}^2$$

selected coil size: 1200L x 1064H (28단) ( $1.28 \text{ m}^2$ )

coil height = refer Table 6, the coil length = AHU width - 500

#### 2) The calculation of the flow $W$ ( $\ell/\text{min}$ ) and water velocity through the coil $V_w$ ( $\text{m/s}$ )

$$W = \frac{q_c}{(60 \times WTR)} = \frac{83,000}{(60 \times 5)} = 267.7 \text{ } \ell/\text{min}$$

A: cross section integer in pipe(10),  
n: tube bon number per 1 row of coil

$$V_w = \frac{W}{A \times n}$$

$$V_w = \frac{W}{(10 \times 28)} \text{ (tube bon number per 1 row is 28 bon)} = \frac{267.7}{(10 \times 28)} = 0.99$$

$0.05 < V_w \leq 0.2$  HALF FLOW

$0.2 < V_w \leq 2.01$  SINGLE FLOW

$2.01 < V_w \leq 4.02$  DOUBLE FLOW

#### 3) Calculation of coefficient of heat transfer $K_a$ ( $\text{kcal}/\text{h}\cdot\text{m}^2\cdot^\circ\text{C}$ ROW)

With table 7, read  $K_a$  of  $V_a = 2.6 \text{ m/s}$ ,  $V_w = 0.99 \text{ m/s}$

$K_a = 779 \text{ kcal}/\text{h}\cdot\text{m}^2\cdot^\circ\text{C}$  ROW

#### 4) Calculate number of rows of coil

$$\text{ROW} = \frac{q_c}{K_a \times \Delta t_{lm} \times F_a \times \text{WSF}}$$

ROW : number of rows of coil

$\Delta t_{lm}$ : Logarithmic mean temperature difference  $^\circ\text{C}$

$F_a$ : surface area of coil  $\text{m}^2$

WSF: Coefficient of humidity of coil surface (Table 9)

$$\Delta t_{lm} = \frac{\Delta t_1 - \Delta t_2}{2.3 \log_{10}(\Delta t_1 / \Delta t_2)} = \frac{\Delta t_1 - \Delta t_2}{\ell n(\Delta t_1 / \Delta t_2)}$$

$$\Delta t_1 = 27 - 12 = 15^\circ\text{C}$$

$$\Delta t_2 = 14 - 7 = 7^\circ\text{C}$$

$$= \frac{15 - 7}{\ell n(15/7)} = 10.5^\circ\text{C}$$

$$\text{ROW} = \frac{83,000}{779 \times 10.5 \times 1.28 \times 1.35} = 5.87$$

$\therefore$  Decided number of rows are 6 ROWS (Single Flow)

### [Hot Water Coil]

#### 1) Calculate surface area of coil $F_a$ ( $\text{m}^2$ )

$$F_a = \frac{Q_a}{3,600 \times V_a}$$

$$= 1200L \times 1064H (28\text{단}) (1.28 \text{ m}^2)$$

(Coil size is same as cooling coil)

#### 2) The calculation of the flow $W$ ( $\ell/\text{min}$ ) and water velocity through the coil $V_w$ ( $\text{m/s}$ )

$$W = \frac{q_h}{(60 \times WTR)} = \frac{100,000}{(60 \times 5)} = 333.4 \text{ } \ell/\text{min}$$

$$V_w = \frac{W}{A \times n}$$

$$= 333.4 / (10 \times 28)$$

$$= 1.19 \text{ m/s}$$

(FLOW deciding method should be same as cooling coil.)

#### 3) Calculation of coefficient of heat transfer $K_a$ ( $\text{kcal}/\text{h}\cdot\text{m}^2\cdot^\circ\text{C}$ ROW)

With table 8, read  $K_a$  of  $V_a = 2.6 \text{ m/s}$ ,  $V_w = 1.19 \text{ m/s}$

$K_a = 825.1 \text{ kcal}/\text{h}\cdot\text{m}^2\cdot^\circ\text{C}$  ROW

#### 4) Calculate number of rows of coil

$$\text{ROW} = \frac{q_h}{K_a \times \Delta t_{lm} \times F_a}$$

$$\Delta t_{lm} = \frac{\Delta t_1 - \Delta t_2}{\ell n(\Delta t_1 / \Delta t_2)}$$

$$\Delta t_1 = 55 - 18 = 37^\circ\text{C}$$

$$\Delta t_2 = 60 - 44 = 16^\circ\text{C}$$

$$= \frac{37 - 16}{\ell n(37/16)} = 25.1^\circ\text{C}$$

$$\text{ROW} = \frac{100,000}{825.1 \times 25.1 \times 1.28} = 3.77$$

$\therefore$  Decided number of rows are 4 ROW (single flow)



表 7 5/8" Copper tube coil heat transfer coefficient table (cooling water) – Heat Transfer Rate: Ka (kcal/hm<sup>2</sup>°C ROW)

Water velocity Vw (m/s)	Coil passing wind speed Va(m/s)								
	1	1.5	2	2.5	3	3.5	4	4.5	5
0.2	395	450	485	515	538	555	570	582	592
0.3	435	505	552	590	620	643	665	680	695
0.4	463	540	598	640	675	702	728	749	768
0.5	485	570	630	675	715	747	772	800	820
0.6	495	587	655	706	745	780	812	838	860
0.7	510	602	673	730	770	807	840	869	890
0.8	520	612	686	745	790	830	865	895	920
1	528	630	708	770	821	865	903	925	963
1.2	542	650	730	795	845	892	930	965	996
1.5	551	665	748	816	870	920	960	1000	1032
2	565	678	767	840	900	950	995	1037	1075

表 8 5/8" Copper tube coil heat transfer coefficient table (hot water) – Heat Transfer Rate: Ka (kcal/hm<sup>2</sup>°C ROW)

Water velocity Vw (m/s)	Coil passing wind speed Va(m/s)								
	1	1.5	2	2.5	3	3.5	4	4.5	5
0.2	445	510	540	600	630	652	674	692	708
0.3	475	557	612	649	692	724	750	774	792
0.4	497	586	648	699	728	770	800	825	848
0.5	506	600	669	725	770	808	839	865	886
0.6	520	617	687	746	790	832	868	897	924
0.7	528	630	700	760	810	851	888	920	948
0.8	537	640	714	775	826	866	905	940	968
1	546	652	730	796	848	894	932	968	1000
1.2	552	665	746	815	870	918	955	991	1025
1.5	560	672	760	830	888	938	980	1020	1054
2	570	688	779	852	910	960	1005	1048	1088

表 9 5/8" Copper tube coil table (increase in heat transfer due to wet) – Heat Transfer Rate: Ka (kcal/hm<sup>2</sup>°C ROW)

°C		Temperature difference between the dry bulb temperature of entering air and the entrance water temperature (DB <sub>1</sub> –tw <sub>1</sub> )																
		36	34	32	30	28	26	24	22	20	18	16	14	12	10	8	6	4
Temperature difference between dew point temperature of entering air and entrance water temperature (DB <sub>1</sub> –tw <sub>1</sub> )	25	1.79	1.87	1.95														
	24	1.71	1.79	1.97	1.95													
	23	1.64	1.71	1.79	1.87													
	22	1.58	1.64	1.71	1.79	1.88												
	21	1.52	1.58	1.64	1.71	1.79	1.88											
	20	1.46	1.52	1.57	1.64	1.71	1.79	1.87										
	19	1.4	1.45	1.51	1.57	1.63	1.7	1.78	1.87									
	18	1.36	1.4	1.45	1.5	1.56	1.63	1.7	1.78	1.88								
	17	1.31	1.35	1.39	1.44	1.49	1.55	1.62	1.7	1.8	1.92							
	16	1.26	1.3	1.34	1.38	1.43	1.48	1.55	1.62	1.71	1.82	1.96	1.96					
	15	1.22	1.25	1.29	1.33	1.37	1.42	1.47	1.54	1.61	1.71	1.84	1.85					
	14	1.18	1.21	1.25	1.28	1.32	1.36	1.41	1.47	1.54	1.62	1.72	1.76					
	13	1.15	1.18	1.21	1.24	1.27	1.31	1.35	1.4	1.46	1.53	1.63	1.76	1.78				
	12	1.12	1.14	1.17	1.19	1.22	1.26	1.3	1.34	1.39	1.45	1.53	1.63	1.67				
	11	1.1	1.12	1.14	1.16	1.19	1.22	1.25	1.29	1.33	1.38	1.45	1.54					
	10	1.05	1.09	1.11	1.13	1.15	1.18	1.2	1.24	1.28	1.32	1.38	1.45	1.56	1.72			
	9	1.05	1.07	1.08	1.1	1.12	1.14	1.16	1.19	1.22	1.26	1.31	1.37	1.46	1.57			
	8	1.03	1.05	1.06	1.07	1.09	1.1	1.12	1.15	1.17	1.2	1.25	1.3	1.37	1.47	1.57		
	7	1.03	1.04	1.04	1.05	1.06	1.08	1.09	1.11	1.13	1.16	1.19	1.24	1.29	1.37	1.49	1.53	
	6	1.01	1.02	1.02	1.03	1.04	1.05	1.06	1.08	1.1	1.12	1.15	1.19	1.24	1.3	1.39		
	5			1.01	1.02	1.02	1.03	1.04	1.06	1.07	1.09	1.11	1.14	1.17	1.22	1.29	1.4	
	4					1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.09	1.12	1.16	1.2	1.26	
	3						1.01	1.02	1.03	1.04	1.05	1.06	1.08	1.1	1.13	1.17	1.22	
	2							1.01	1.01	1.01	1.02	1.03	1.04	1.05	1.06	1.08	1.1	1.13
	1										1.02	1.01	1.01	1.02	1.03	1.04	1.05	1.07

## Steam Coil Selection Method (5/8" standard pipe coil)

### 1) Air temperature of coil entrance

$$DB1 = DB0 \times 0.3 + DBR \times 0.7 = -5 \times 0.2 + 20 \times 0.8 = 15^\circ\text{C}$$

### 2) Air temperature of coil outlet

$$DB2 = DB1 + \frac{qh}{1.2 \times C_p \times Q_a} = 15 + \frac{124,000}{1.2 \times 0.24 \times 12,000} = 50.9^\circ\text{C}$$

### 3) Required temperature difference

$$\Delta DB = 50.9 - 15 = 35.9^\circ\text{C}$$

### 4) coil surface passing velocity

$$V_a = 2.7 \text{ m/s}$$

### 5) Coil surface area $F_a = \frac{Q_a}{V_a \times 3,600} = \frac{12,000}{2.7 \times 3,600} = 1.23 \text{ m}^2$

### 6) Coil size

Selection : (1.28m<sup>2</sup>) 1200L × 1064H (28 column)

Coil height = Refer to table 6 , coil length = AHU width - 500

### 7) Coil correction factor

$$P_s = 0.35 \text{ kg/cm}^2\text{G} \quad DB1 = 15^\circ\text{C} \quad \text{correction factor: 1.0 (table 11 reference)}$$

### 8) Design temperature increasing value ( $\Delta t$ )

Temperature increase: 44.4°C when  $V_a = 2.6 \text{ m/s}$ ,  $N = 2$  row (Refer to table 10)

After correction, it is  $44.4 \times 1.0 = 44.4^\circ\text{C}$

### 9) Maximum heat capacity

$$QH = G \cdot C_p \cdot \Delta t = 12,000 \times 1.2 \times 0.24 \times 44.4 = 153,446 \text{ kcal/hr}$$

It can be used as required heating capacity is within maximum heat range

### 10) Number of rows decided

$$N = 2 \text{ ROW}$$

Specifications

1. Air flow :  $Q_a = 12,000 \text{ m}^3/\text{h}$
2. Heating capacity :  $qh = 124,000 \text{ kcal/h}$
3. Temperature of air outside :  $DB0 = -5^\circ\text{C}$
4. Out air temperature :  $P_s = 0.35 \text{ kg/cm}^2\text{G}$
5. Vapor latent heat :  $LH = 534 \text{ kcal/kg}$
6. air circulation temperature :  $DBR = 20^\circ\text{C}$
7. Volume of fresh air : 20%

table 10 5/8" Fin Heat Transfer Factor

Row (N) \ air velocity (m/s)	1.5	2	2.5	3	3.5	4
1	43	29	26	24	22	21
2	54	49	45	42	40	38

table 11 5/8" A copper tube coil heat transfer coefficient table (correction factor steam coil) – Heat Transfer Rate:  $K_a$  (kcal/hm<sup>2</sup>°C Row)

Water velocity $V_w$ (m/s)	Steam pressure (kg/cm <sup>2</sup> G)										
	0.1	0.2	0.35	0.6	0.8	1	2	3	4	5	6
-25	1.44	1.489	1.515	1.566	1.604	1.628	1.783	1.821	1.896	1.958	2.109
-20	1.371	1.421	1.448	1.497	1.535	1.561	1.669	1.753	1.829	1.892	1.952
-15	1.336	1.357	1.398	1.43	1.468	1.495	1.603	1.689	1.763	1.892	1.889
-10	1.24	1.291	1.32	1.362	1.402	1.43	1.583	1.623	1.7	1.766	1.824
-5	1.175	1.228	1.254	1.298	1.336	1.363	1.473	1.561	1.635	1.705	1.761
0	1.111	1.163	1.19	1.234	1.272	1.3	1.409	1.495	1.572	1.642	1.699
5	1.049	1.1	1.126	1.171	1.208	1.236	1.346	1.437	1.511	1.508	1.636
10	0.987	1.037	1.065	1.109	1.146	1.172	1.282	1.376	1.45	1.518	1.577
15	0.925	0.974	1	1.048	1.083	1.11	1.221	1.318	1.39	1.458	1.515
20	0.866	0.914	0.942	0.987	1.023	1.049	1.162	1.257	1.331	1.397	1.456
25	0.808	0.853	0.883	0.929	0.964	0.99	1.102	1.198	1.272	1.338	1.398
30	0.75	0.797	0.822	0.872	0.905	0.932	1.045	1.14	1.216	1.28	1.34





## Ceiling AHU Standard Specifications

### Standard specifications

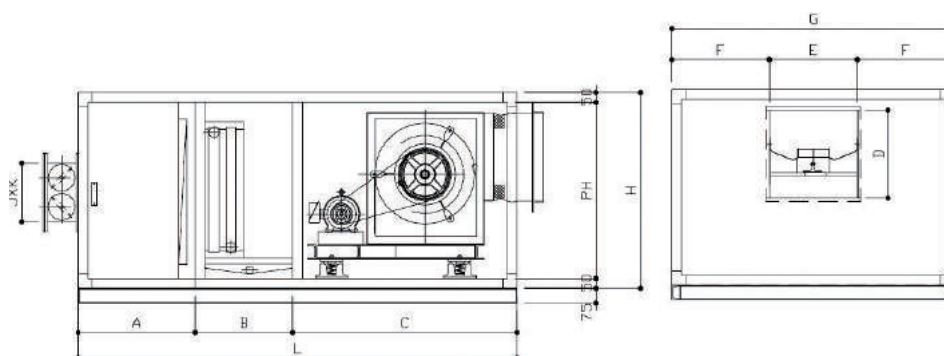
Classification				KAE-45H	KAE-65H	KAE-120H	KAE-160H	KAE-200H	KAE-240H	KAE-300H
air volume	air supply	standard air volume	CMM	45	65	85	120	200	240	300
			CMH	2,700	3,900	5,100	7,200	12,000	14,400	18,000
		static pressure	mmAq	35 ~ 50	35 ~ 50	35 ~ 50	45 ~ 65	45 ~ 65	45 ~ 65	45 ~ 65
air FAN	air supply	multi airfoil	TRZ#DS	05 - 225	05 - 225	05 - 280	05 - 315	05 - 400	05 - 450	05 - 500
		power	HP	0.75	1.5	1.5	3.7	5.5	5.5	7.5
coil	cooling	cooling water	capacity	Kcal/hr	19,000	27,500	36,000	51,000	85,000	102,000
			flow rate	LPM	63	92	120	170	283	433
			face area	m <sup>2</sup>	0.3	0.4	0.53	0.79	1.34	1.59
			number of pass	pass	14	14	14	16	22	24
			valid length	mm	560	750	1,000	1,300	1,600	1,900
			diameter (inlet/outlet)	A	32/32	32/32	40/40	50/50	65/65	80/80
	heating	hot water 4 heat	capacity	Kcal/hr	18,000	25,000	33,000	46,000	77,000	92,000
			flow rate	LPM	60	83	110	153	257	383
			face area	m <sup>2</sup>	0.3	0.4	0.53	0.79	1.34	1.59
			number of pass	pass	14	14	14	16	22	24
			diameter (inlet/outlet)	A	32/20	32/32	40/40	50/50	65/65	80/80
		steam	capacity	Kcal/hr	22,000	32,000	41,000	58,000	96,000	115,000
			steam flow	kg/hr	43	62	79	112	186	280
			face area	m <sup>2</sup>	0.26	0.34	0.46	0.69	1.22	1.45
			number of pass	pass	12	12	12	14	20	22
			valid length	mm	560	750	1,000	1,300	1,600	1,900
			diameter (inlet/outlet)	A	32/20	32/20	32/20	32/20	40/25	50/32
			vapor pressure	kg/cm <sup>2</sup>	2	2	2	2	2	2
filter	Pre (AFI 85%)	array(24"×24"×1")		1×1	1×1.5	1×1.5	1×2	1.5×2.5	1.5×3	1.5×3.5

**Note 1.** Please consult our HVAC business department for specifications other than standard air volume range.

**Note 2. Operating condition**

- ▶ Cooling coil entrance air temperature: DB 28℃, WB 21℃
- ▶ Chilled water entrance temperature: 7℃ chilled water inlet and outlet temperature difference: 5℃
- ▶ Steam coil entrance air temperature: DB10℃ Steam pressure: 2.0kg/cm<sup>2</sup>
- ▶ Hot water coil entrance air temperature: DB15℃
- ▶ Entrance temperature 60℃ hot water inlet and outlet temperature difference temperature: 5℃
- ▶ Standards and specifications are subject to change without prior notice for product improvement.

## ■ Ceiling type



## ■ Dimensions

	A	B	C	D	E	F	G	PH	H	L	J	K
KAE-45H	600	550	950	280	280	310	900	750	850	2100	300	400
KAE-65H	600	550	950	280	280	350	1250	700	850	2100	300	600
KAE-85H	600	550	1050	355	355	350	1500	750	900	2200	300	800
KAE-120H	600	550	1100	400	400	350	1800	750	1000	2250	300	1100
KAE-160H	600	550	1150	450	450	350	2000	800	1050	2300	300	1500
KAE-200H	600	550	1200	500	500	350	2100	800	1150	2350	450	1250
KAE-240H	600	550	1250	560	560	350	2450	850	1200	2400	450	1500
KAE-300H	600	550	1400	630	630	350	2650	850	1300	2550	450	1850

► Standards and specifications are subject to change without prior notice for product improvement.



## Air washer unit

### ■ Purpose of AWU use

It is an air handling unit where air cleaner contacts micro water drops with air to cool or heat air to establish humidity ability. When air and water drops are in contact, dust and gas of air are absorbed by the water drops and the theory of water drops falling is used to remove pollutants in air.

### ■ Principle

Water is sprayed by several spraying nozzles installed in indoors with pressure of 1.4~2.5kg/cm<sup>2</sup>. This water becomes micro water drops and contact air passing in 2.5~3.5m/s speed. Heat exchange between water droplets and air will make temperature appropriate and effectively achieve cooling, heating, humidifier purposes. The application performance is decided through water droplet and spraying water temperature, entrance air conditions. When state change is displayed at psychrometric chart within air cleaner, it will be as figure 1. When water droplets with lower than D.P of air are sprayed, dehumidification cooling effect is done and if it is lower than DBT, humidification cooling effect is activated and when it is higher than DBT, humidification heating effect is activated.

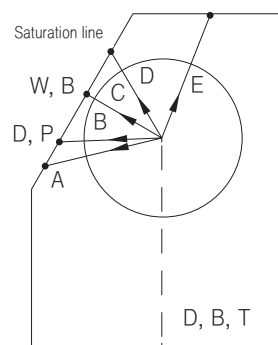
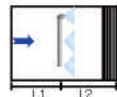
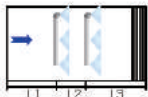
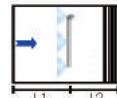
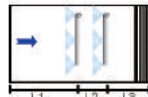
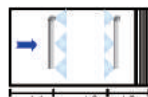
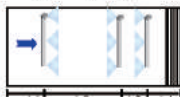


figure 1

### ■ Type

	air nozzle orientation and air flow direction	adiabatic saturation efficiency	standard				L
			L1	L2	L3	L4	
1BANK parallel flow		60 ~ 70%	300	1200			1500
2BANK parallel flow		85 ~ 90%	300	600	1200		2100
1BANK reverse flow		65 ~ 75%	1050	750			1800
2BANK reverse flow		90 ~ 95%	1050	600	750		2400
2BANK counter flow		90 ~ 95%	300	1050	750		2100
3BANK counter flow		95% ~	300	1050	600	750	2700

## ■ Design of AWU

Air flow volume : 1250m<sup>3</sup>/min

Entering water temperature : 7°C

Outside air condition : DB' = 32°C

WB' = 27.3°C RH' = 70%

Ventilation conditions : DB'' = 24°C

WB'' = 17.9°C RH'' = 55%

Exhaust conditions : DB2 = 15°C

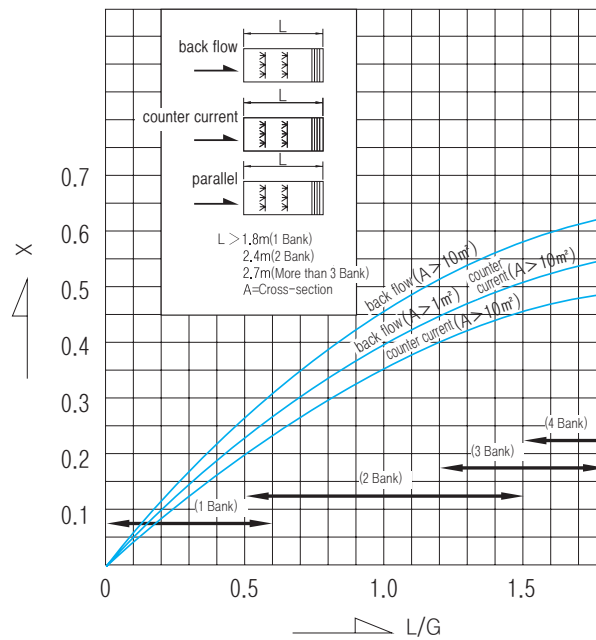
WB2 = 17.9°C RH2 = 55%

\* Outside air volume uses 20% of circulation air volume.

NO	ITEM		Symbol	Formula	Calculation	Reference
1	Mixed air	dry-bulb temperature	DB'	$DB' \times 0.2 + DB'' \times 0.8$	$32 \times 0.2 + 24 \times 0.8 = 25.5^\circ\text{C}$	
2		wet bulb temperature	WB'	$WB' \times 0.2 + WB'' \times 0.8$	$27.3 \times 0.2 + 17.9 \times 0.8 = 19.8^\circ\text{C}$	
3		enthalpy	i <sub>1</sub>	DB' = 25.5°C WB' = 19.8°C	13.6	psychrometric chart
4	Former efficiency of the saturated air enthalpy		iw <sub>1</sub>	tw <sub>1</sub> = 7°C	5.407	
5	cooling cap.		QT	G(i <sub>1</sub> -i <sub>2</sub> )	"1250×60×1.2 (13.9-9.8) = 342,000Kcal/hr"	
6	spray booth section area		A	$\frac{Q}{60 \times Va}$	$\frac{1,250}{60 \times 2.5} = 0.0\text{m}^2$	
7	Efficiency of heat transfer		X	$\frac{i_1 - i_2}{i_1 - iw_1}$	$\frac{13.6 - 9.8}{13.6 - 5.407} = 0.46$	
8	water, air ratio		L/G	X ; 0.46, A : 8.4m <sup>2</sup>	1.2	Table 1
9	spray part			L/G : 1.2	1stage 2bank	Table 1
10	air washer decision			Q ; 1250m <sup>3</sup> /min, 1stage 2bank		
11	circulation water		L	L/G×Q×r	1250×1.2×1.2 = 1,800L/MIN	
12	spary temperature		tw <sub>2</sub>	$tw_1 + \frac{QT}{L}$	$7 + \frac{342,000}{108,000} = 10.2^\circ\text{C}$	
13	Nozzle quantity			$\frac{L}{\text{Nozzle 1EA Sprayed capacity}}$ Access the study : 3/8" Ø Nozzle DIA : 4.7 Ø Nozzle 1EA Sprayed capacity : 450L/HR Pressure : 2kg/cm2"	$\frac{108,000}{450} = 240\text{EA}$	Table 2
14	of Nozzle 1EA	spray an area	A <sub>0</sub>	$\frac{A}{\text{Nozzle quantity}}$	$\frac{8.4}{120} = 0.0\text{m}^2$	
		spray diameter		$\sqrt{\frac{A_0}{\pi/4}}$	$\sqrt{\frac{A_0}{\pi/4}} = 0.298\text{m } \varnothing$	



**Table 1** Efficiency of heat transfer of Air Washer



**Table 2** Spraying amount per EA(L/HR)

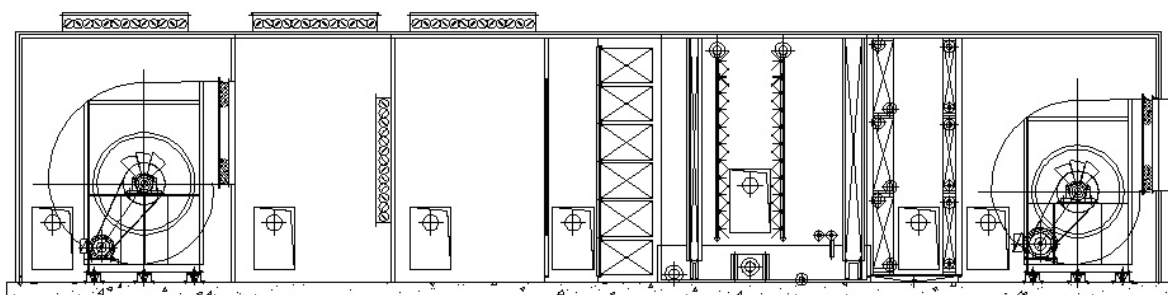
Connet	"Nozzle Hole (mm)"	Spray Pressure (kg/cm²)							
		0.5	0.75	1.0	1.5	2.0	2.5	3.0	3.5
3/8B	1.2	16	19	23	29	34	36	38	40
3/8B	3.2	100	120	140	180	210	230	240	250
3/8B	4.7	220	270	310	390	450	510	570	620
1/2B	6.3	390	480	560	700	830	940	1,100	1,250
3/4B	7.5	1,100	1,300	1,600	2,000	2,300	2,600	2,800	3,000
1B	12.7	1,900	2,400	2,800	3,400	4,000	4,500	5,100	5,600

**Table 3** Water, air ratio

	L/G		gpm/1000cfm	
	1 bank	2 bank	1 bank	2 bank
Humidification	0.2 ~ 0.6	0.4 ~ 1.2	2 ~ 6	4 ~ 11
Cooling, dehumidification	0.4 ~ 1.0	0.8 ~ 2.0	3 ~ 9	7 ~ 18



## Standard Specification



		KAW-056	KAW-063	KAW-071	KAW-089	KAW-097	KAW-099	KAW-127	KAW-130	KAW-142	KAW-160
Air volume	m <sup>3</sup> /min	560	630	710	890	970	990	1270	1300	1420	1600
Coil	number	2	2	2	2	2	3	3	3	3	3
	face area	3.6	4.1	4.6	5.8	6.3	6.5	8.2	8.5	9.1	10.2
	pass	26	32	22	34	26	26	26	20	26	28
	valid length	1800	1800	2800	2200	3300	2200	3800	2900	2400	4300
Water coil	4row	189.2	204.2	230	302.2	317.5	328.2	417.6	421.6	452.3	503.3
	6row	226.3	257.8	290	365.3	396.2	408.5	512.7	535.4	573.2	662.3
	8row	280.5	318.3	345.2	436.3	472.7	488.3	613.4	642.3	685.7	785.3
Steam coil	1row	263.2	300.1	336.2	424.3	462.3	476.4	600	620.2	665.6	770.2
	2row	420.5	476.5	537.3	678.5	735.5	762.3	953.6	992.5	1060.3	1226.9
Spraying flow	1 bank (L/min)	300	340	390	520	530	570	680	740	800	940
	2 bank (L/min)	560	670	730	940	980	1030	1280	1350	1460	1700
Spray nozzle	1 bank	63	72	82	102	110	113	144	150	164	184
	2 bank	126	144	164	204	220	226	288	300	328	368
Plodding nozzle	quantity	6	6	8	8	10	10	10	12	14	14
Specifications	A	1780	2030	1530	2290	1780	2540	2030	2790	3050	2290
	B	2030	2030	3050	2540	3560	2540	4060	3050	3050	4570
	C	2230	2480	1980	2740	2230	2990	2480	3240	3500	2740



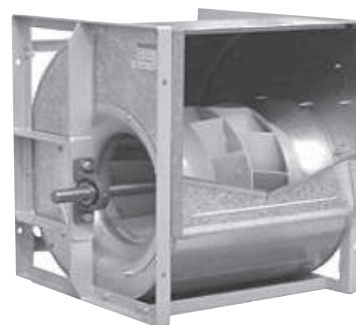
## FAN Summary

### 1) General Information

WOLTER centrifugal FAN is a product based on accumulated data for about 30 years. Efficiency of all FANs are ensured with performance in maximum pressure with silent driving together with performance efficiency. It is designed with a purpose of transporting air and normal gas – and normal temperature condition is from 30°C to 80°C.

Type: AYZ/AYE (Air foil), HRZ, HRE, HYZ, HYE (Backward curve), TRZ, TRE, TYZ, TYE (Forward curve) 3 types of models, 10 types.

All products are designed with dimensions of DIN 323 section R20 as standard. (AMCA certified product)



Version		Model name	specifications	
00		FORWARD 160-710/ BACKWARD 180-710 AREO FOIL 180-710	bear FAN impeller + housing	
01		FORWARD 160-710/BACKWARD 180-710 AREO FOIL 180-710	basic protrusion flange attachment	
02		FORWARD 160-710/BACKWARD 180-710 AREO FOIL 180-710	auxiliary supporting stand protrusion flange are non-inclusive	
03		FORWARD 160-710/BACKWARD 180-710 AREO FOIL 280-710	protrusion flange are non-inclusive basic external frame	
04		FORWARD 160-710/BACKWARD 180-710 AREO FOIL 280-710	basic protrusion flange attachment basic external frame	
05		FORWARD 200-710/BACKWARD 200-710 AREO FOIL 280-710	protrusion flange are non-inclusive basic external frame	
06		FORWARD 710-1000/BACKWARD 710-1000 AREO FOIL 710-1000	protrusion flange are non-inclusive this support outside the frame	
07		FORWARD 710-1000/BACKWARD 710-1000 AREO FOIL 710-1000	standard discharge flange this support outside the frame	

### 2) Casing

Casing is basically galvanized steel fabrication and discharge flange is DIN 24193 sheet 2 as standard.

### 3) Impeller

Twist preventing impeller ensures high drive stability. Impeller goes through balancing work by VDI 2060, Q2.5.

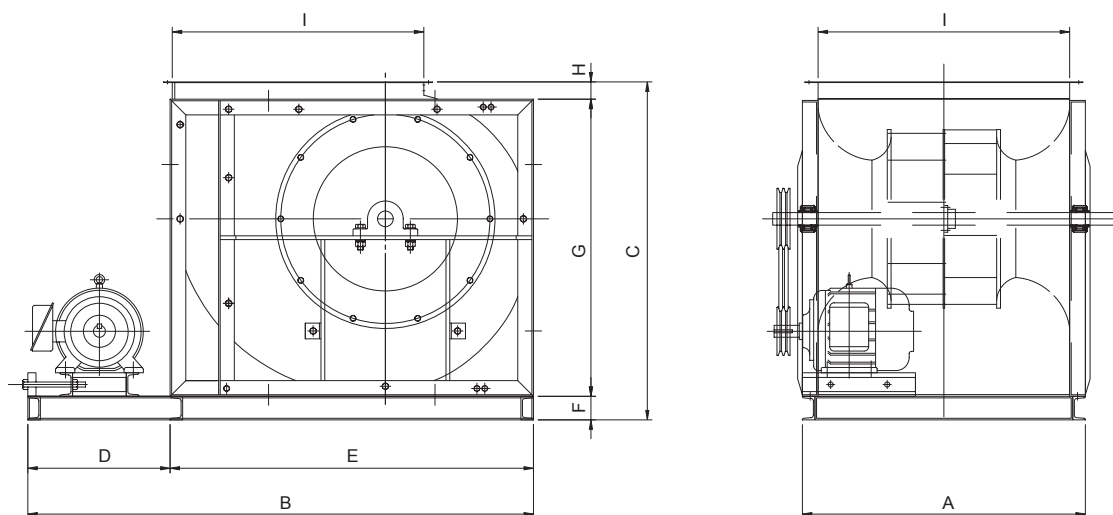
HRZ, HRE impeller use Aluminum as basic material.

TRZ, TRE impeller use zinc as the primary material.

Other air foil , HYZ, HYE, TYZ, TYE impeller use iron as basic material but galvanized material can be used for supply in option.

## Dimensions

### ■ FAN Ass'y Size (AYZ, TYZ)



MODEL \ SIZE	A	B	C	D	E	F	G	H	I
250	377	850	496	389	461	75	384	37	322
280	421	930	543	412	518	75	432	36	361
315	464	990	595	412	578	75	480	40	404
355	533	1,070	655	415	655	75	548	32	453
400	577	1,150	728	414	736	75	613	40	507
450	639	1,280	803	453	827	75	681	47	569
500	708	1,370	877	452	918	75	750	52	638
560	795	1,480	970	450	1,030	75	845	50	715
630	901	1,610	1,076	453	1,157	75	946	55	801
710	998	1,635	1,233	550	1,085	100	1,085	48	898
800	1,107	1,840	1,437	600	1,240	100	1,240	97	1,007
900	1,250	1,970	1,585	595	1,375	100	1,375	110	1,130
1000	1,387	2,130	1,725	620	1,510	100	1,510	115	1,261



## Basic Terminology

### ■ Definition of FAN

Gas device that converts given mechanical energy in the gas or fluid to pressure and velocity energy is referred as a FAN.

#### 1) Volume : Q

Air volume of a FAN is the flow rate of gas absorbed by the FAN per unit time converted into absorption state (standard state). Air volume differs a lot by temperature so the standard is absorption state.

Classification	temperature (°C)	Air pressure (mmHg)	Humidity (%)	Weight ratio (kg/m³)	display air volume
Standard Condition	20	760	65	1.200	Q (m³/min)
Normal Condition	0	760	0	1.293	0.81 (m³/min)

Airflow in terms of conversion

$$Q = Q_N \times \frac{273 + T}{273} \times \frac{10,330}{10,330 + P_s}$$

Unit    **Q** : use state of the inlet air volume  
           (1 m³/min = 35.3 ft³/min = 35.3 CFM)  
**Q<sub>N</sub>** : standard state (m³/min)  
**P<sub>s</sub>** : suction static pressure (mmAq)  
**T** : suction gas temperature

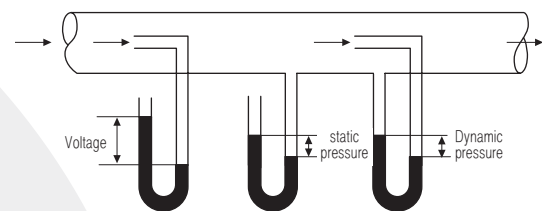
※ m³/sec (CMS), m³/min (CMM), m³/Hr (CMH), ft³/sec (CFS), ft³/min (CFM), ft/Hr (CFH)

#### 2) Static Pressure : P<sub>s</sub>

Static pressure (P<sub>s</sub>) is subtraction of dynamic pressure of exit of FAN from total pressure.

$$P_s = P_t - P_d$$

That is, static pressure (P<sub>s</sub>) is a pressure pushed by gas of surface of parallel object of gas flow and is measured through perpendicular Hole of surface. (Normally measured with Pilot Tube.)



#### 3) Dynamic Pressure = Velocity Pressure : P<sub>d</sub>

Dynamic pressure (P<sub>d</sub>) is conversion value from velocity energy to pressure energy and also called as speed pressure method and calculated by the following formula.

$$P_d = \frac{\gamma V^2}{2g}$$

$$V = \sqrt{\frac{2g \times P_d}{\gamma}}$$

Unit    **V** : velocity (m/s)  
**γ** : gravity (kg/m³)  
**g** : gravitational acceleration (m/s²)

#### 4) Total Pressure : P<sub>T</sub>

It is addition of static pressure(P<sub>s</sub>) and dynamic pressure (P<sub>d</sub>) in an air flowing state and the real FAN needs this pressure and should be displayed. The calculation formula for Total Pressure (P<sub>T</sub>) is as the following.

$$P_T = P_s + P_d$$

#### 5) Efficiency

Efficiency of FAN is divided into total pressure efficiency and static pressure efficiency but it is normally total pressure efficiency with no special regulations

FAN Type	Turbo FAN	Air Foil FAN	Sirocco FAN	Axial FAN	Roof Ventilator	Wall Ventilator	Plate FAN
Efficiency	60 ~ 80 %	7 ~ 85 %	40 ~ 60 %	40 ~ 85 %	40 ~ 50 %	30 ~ 50 %	40 ~ 70 %

※ Above FAN efficiency is general selection standard and may differ by manufacturer.

#### 6) Power

It is the amount of energy available in which the FAN provides the air per unit hour.

- Theoretical Air Power : (L<sub>a</sub>)

$$L_a = \frac{Q \times P_T}{6,120} \text{ (kW)} = \frac{Q \times P_T}{4,500} \text{ (HP)}$$

- Shaft Horsepower : (L<sub>s</sub>)

$$L_s = \frac{Q \times P_T}{6,120 \times \eta} \text{ (kW)} = \frac{Q \times P_T}{4,500 \times \eta} \text{ (HP)}$$

$$L_s = L_a / \eta \quad \eta : \text{FAN efficiency}$$

- Actual motor load factor of safety : (L<sub>h</sub>)

$$L_h = L_a \times (1 + \alpha) \quad \alpha \text{ (motor load factor of safety)}$$

- 25HP less than 20%
- 25 ~ 60HP less than 15%
- 60HP more than 10%





## 7) Head : H

The FAN inlet and the reversible one equivalent force applied to the base of the weight per unit by the rotation of the impeller in compression between the outlet (kg · m/kg) and it is called as water column head height (H)m.

$$\text{Theory of head ( } \epsilon p < 1.03 \text{ ) : } H = \frac{P_t}{\gamma}$$

Unit - P : t : voltage (kg/m<sup>2</sup>)

γ : gravity ratio (kg/m<sup>3</sup>)

$$\text{Pressure ratio ( } \epsilon p \text{ ) } = \frac{\text{Absolute outlet pressure (P}_2\text{)}}{\text{Inlet, absolute pressure (P}_1\text{)}}$$

## 8) Comparative rotation ratio (specific speed) : Ns

Comparative rotation ratio is imaginary rotation speed when wind pressure is 1m with air volume of 1m<sup>3</sup>/min thinking FAN geometrically similar to FAN and size of the FAN is not related and it is the value changed according to FAN's type(impeller type). This specific speed is indispensable dimensionless coefficients used to compare between same type of FANs, selection of impeller, property, structure.

$$\text{Comparative rotation ratio} = \frac{N \times \sqrt{Q}}{H}$$

Unit - Ns : Comparison of rotation (m<sup>3</sup>/min, rpm, m)

N : FAN speed (rpm)

Q : Air volume (m<sup>3</sup>/min)

H : Head (m)

In case of volume of double suction, air volume is set as Q/2 and for multi column, Head is set as H/ singular

## 9) FAN relevance law

Means a relevance to a certain rule and the law of variation factors (rpm) of the operating conditions from the FAN.

- Formula finding air volume, pressure, shaft power when number of rotation changes with same impeller diameter

$$\frac{Q_2}{Q_1} = \frac{N_2}{N_1} \quad \frac{P_2}{P_1} = \left( \frac{N_2}{N_1} \right)^2 \quad \frac{L_2}{L_1} = \left( \frac{N_2}{N_1} \right)^3$$

Unit - Q : air volume

N : rotation number

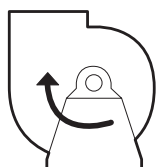
L : shaft power

D : diameter of impeller

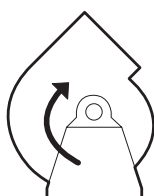
- Formula finding air volume, pressure, shaft power with same impeller rotation number and different diameter of impeller

$$\frac{Q_2}{Q_1} = \left( \frac{D_2}{D_1} \right)^3 \quad \frac{P_2}{P_1} = \left( \frac{D_2}{D_1} \right)^2 \quad \frac{L_2}{L_1} = \left( \frac{D_2}{D_1} \right)^5$$

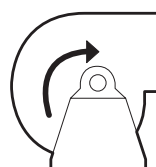
## 10) Rotation direction of FAN



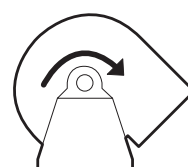
Rotary watch  
Upwards vertical  
discharge CW 360°



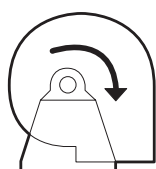
Rotary watch  
To raise the upper slopes of  
discharge  
CW 45°



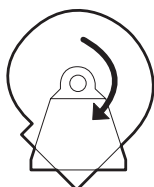
Rotary watch  
Horizontal discharge of the  
upper part  
CW 90°



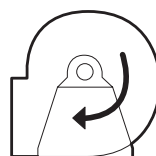
Rotary watch  
Lower the upper slopes of  
discharge  
CW 135°



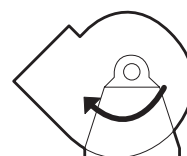
Rotary watch  
Downward vertical discharge  
CW 180°



Rotary watch  
Lower discharge  
downward slope  
CW 225°



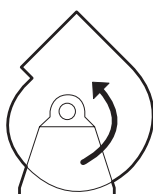
Rotary watch  
Lower horizontal discharge  
CW 270°



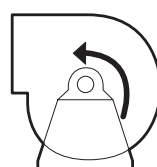
Rotary watch  
Discharge a matter for the  
bottom upward  
CW 315°



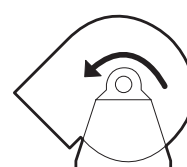
Counterclockwise rotation  
Upwards vertical discharge  
CW 360°



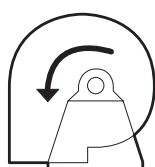
Counterclockwise rotation  
To raise the upper slopes  
of discharge  
CW 45°



Counterclockwise rotation  
Horizontal discharge of the  
upper part  
CW 90°



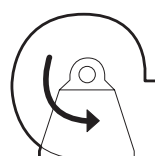
Counterclockwise rotation  
Lower the upper slopes of  
discharge  
CW 135°



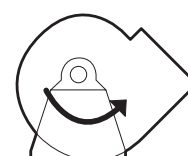
Counterclockwise rotation  
Downward vertical  
discharge  
CW 180°



Counterclockwise rotation  
Lower discharge  
downward slope  
CW 225°



Counterclockwise rotation  
Lower horizontal  
discharge  
CW 270°



Counterclockwise rotation  
Discharge a matter for the  
bottom upward  
CW 315°

\* This figure was quoted amca standard 90-2406-83.

\* Rotation direction is relative to the drive shaft (Plymouth-axis) of the FAN.

\* When it is installed on the ceiling and walls it is a standard when they were placed on the floor.



## Type of FAN

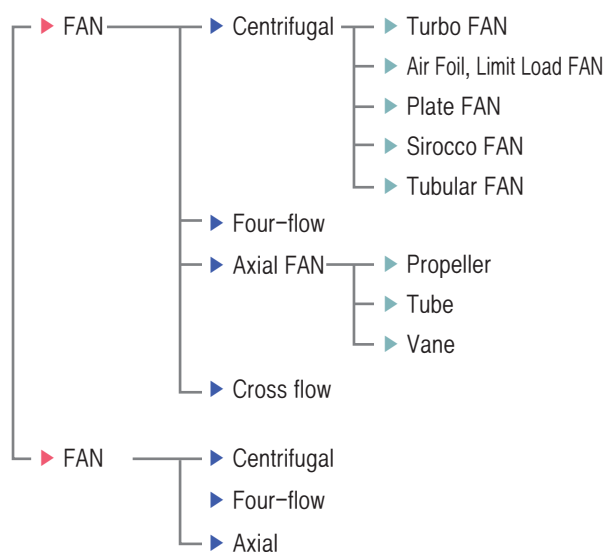
### ■ Categorization by the outlet pressure

Generally, FANS are classified into FAN for low pressure and Blower for high pressure.

Blower		Compressor
FAN	Blower	Compressor
1000mmAq less than (0.1kg/cm <sup>2</sup> less than)	1,000~10,000 mmAq less than (0.1kg/cm <sup>2</sup> ~ 1.0kg/cm <sup>2</sup> less than)	10,000 mmAq more than (0.1kg/cm <sup>2</sup> less than)

### ■ Blade divided into shape

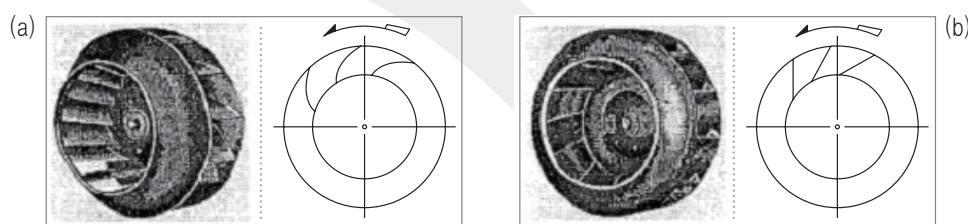
FAN can be divided according to rotating blade that affects transfer and compression to gas as the following.



### ■ Detail information

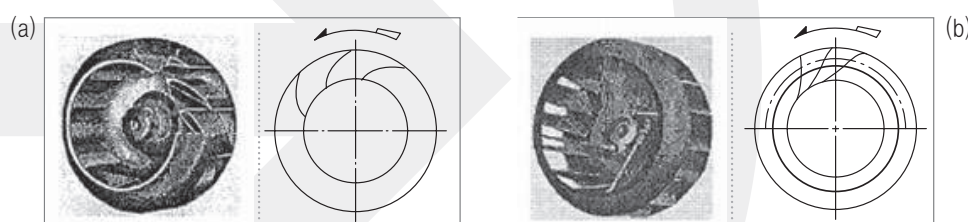
#### 1) Turbo FAN

It is a air foil FAN type where end part of the blade is bent to rotating direction like shown in (a) the blade is curved, and there is a straight blade like (b). Air foil type is high in efficiency and relatively quiet operation is possible in high speed and also applied in Turbo FAN.



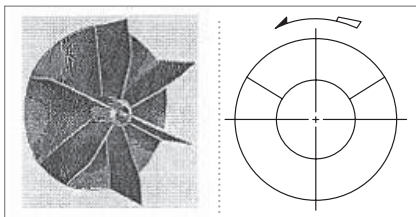
#### 2) Air Foil, Limit Load FAN

It is improved version of air foil type and multi air foil type. (a) is airfoil FAN, formed by folding a thin streamlined wings. Therefore, high-speed rotation is possible with less noise. Blades of (b) are folded in S shape and called as Limit Load FAN. Multi air foil type becomes overload as when air volume increases, the shaft power increases sufficiently. Thus, the improved type is airfoil type or Limit Load type.



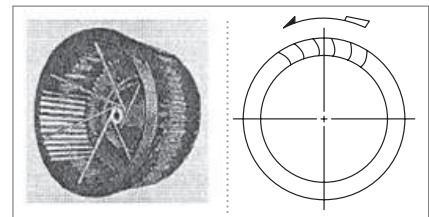
### 3) Plate FAN

It is reputation as radial blades. Radial type has Self Cleaning properties. It is appropriate for FANS in factories where accumulation of dusts are high and there are worries of damage in blades of FANS due to this. However, efficiency and noise are poorer than other FANS.



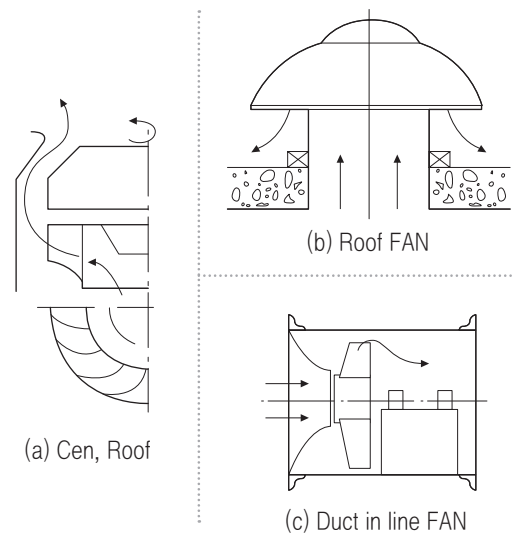
### 4) Sirocco FAN

It is a forward blades type FAN where end part of the blades are bent towards the rotating direction and its number of rotation is less than other FANS with same capacity. Its FAN size is small and suitable for FAN coil unit (FCU), it is called as low speed duct type FAN multi airfoil FAN(Sirocco FAN).



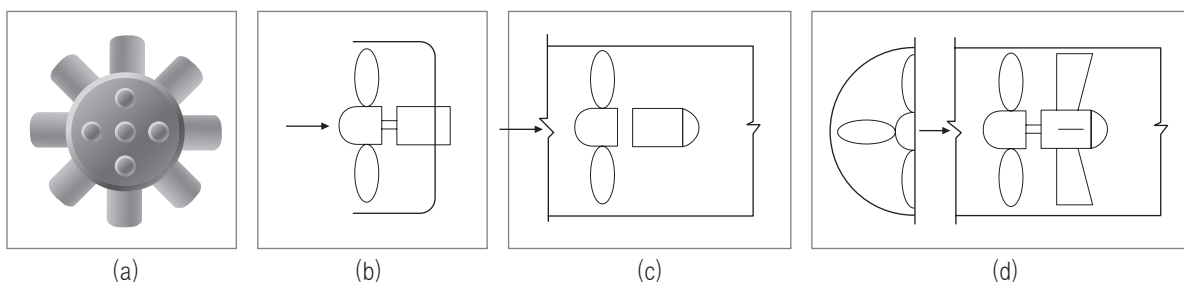
### 5) Tubular FAN

It is Tublar FAN with air foil blade type and air flow leaked by centrifugal power is headed towards the axis shown in the figure. Tublar FAN has relatively low static pressure and is a small FAN with small air volume ventilation which is often installed at rooftop. There is Duct in Line FAN application to this.



### 6) Axial FAN

propeller type blade blows the gas in axial direction as shown in (a). Axial FANS are suitable for blowing a lot of air volume in low wind pressure. In case with no duct system and low resistance in air flow, propeller FAN like figure(b) is used at FAN and small size cooling tower. (c) is Tube Axial FAN with tubular FAN in Housing. This type of FAN is installed in the middle of duct to increase air blowing pressure or in big colling tower.





## Comparison of properties for each FAN

please select the appropriate type of FAN according to the intended use as described below by reviewing pressure range, use condition, economical factor and properties of each model and its air blow range.

### 1) Property comparison of each FAN

type	Centrifugal FAN						Axial-flow FAN	
	sirocco type	limit load type	turbo type	airfoil type	four-flow type	tubular type	propeller type	axial type
blade shape								
characteristic								
air volume (mmAq)	10 ~ 200	20 ~ 3200	50 ~ 2000	30 ~ 3000	3 ~ 20	20 ~ 50	10 ~ 50 (fixed-wing)	15 ~ 1000
static pressure (mmAq)	10 ~ 100	10 ~ 150	50 ~ 400	50 ~ 250	0 ~ 8	10 ~ 50	0 ~ 6	10 ~ 55 (Vane nonexistence) 10 ~ 300 (Vane existence)
efficiency (%)	40 ~ 60	50 ~ 65	60 ~ 80	70 ~ 85	40 ~ 50	40 ~ 50	40 ~ 50	40 ~ 55 (Vane nonexistence) 50 ~ 85 (Vane existence)
blade number can	40 ~ 64	6 ~ 12	12 ~ 24	6 ~ 16	24 ~ 40	6 ~ 16	3 ~ 6	4 ~ 16
feature	Change in power and air volume is big	less air volume change and Limit Load characteristics	high static pressure and high noise Limit Load Characteristics	efficiency is good and Limit Load characteristics	efficiency variation is small and flywheel diameter is also small	centrifugal axial type	low static pressure low wind	large air volume
purpose	low-grade plastic ducts, supply and exhaust for air conditioning	supply and exhaust for factory	high voltage supply and discharge for industrial machinery	fast ducts for air conditioning	FAN coil units, air curtain	roof ventilation	unit cooler, unit heaters, cooling tower	ventilation for tunnel mines, air conditioning for air supply and exhaust / fixed wing



## Understanding the performance curve

### FAN characteristic curve

Curve of the FAN represents the characteristics of the FAN and each model has different shape. In addition, among the same types of blade size (Impeller), and pressure ratio will vary by its characteristics.

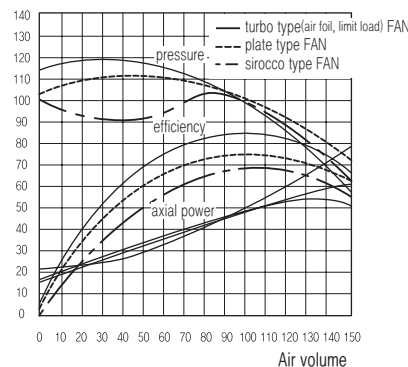
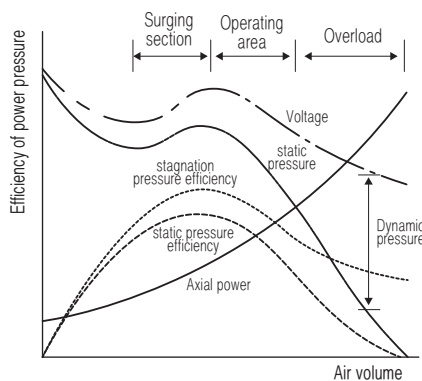
#### 1) The configuration of the characteristic curve

Each FAN has its own characteristics. These properties are referred to as the characteristic curve of the FAN shown as the diagram. That is, to show the characteristic of one FAN, in regular rotation number, horizontal axis become wind volume  $Q$  ( $\text{m}^3/\text{min}$ ), vertical axis is set with pressure (static pressure  $P_s$ , total pressure  $P_t$ ) (mmAq), efficiency (%), (mmAq), efficiency (%), power consumption  $L$  (kW)

and it is the changing process according to wind volume and below figure is one example of this.

According to the figure, when wind volume adjusting Damper which rotates in constant speed is opened to increase air blowing volume, shaft power (solid line) increases significantly, total pressure (1 dotted line) and static pressure (2 dotted line) forms a mountain and falls. Here, total pressure and static pressure is equal. There are VCC (dotted line), relative to the static pressure and static pressure efficiency (hidden line) for efficiency, it shapes as parabolic form which increases until one point and decreases.

Therefore, when wind volume reaches the limit, shaft power increases and pressure and efficiency decreases which is not good for driving in these two areas of re downward curve section with surging phenomenon with unstable FAN operation with overload phenomenon area.



#### Countermeasure for surging

- Windproof or bypass when wind volume is low and specification wind power is high.
- Adjust using absorption damper, discharge damper and R.P.M.

#### 2) Operating point of FAN and resistance curve of the device

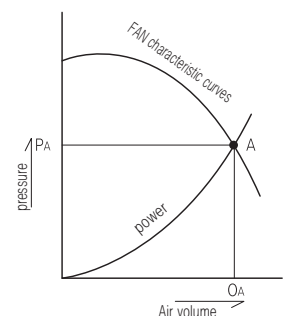
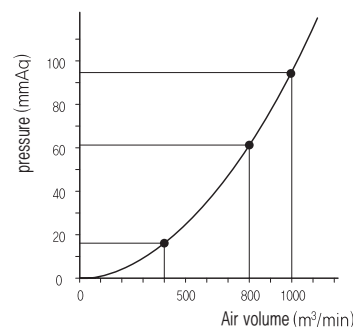
figure (a) is device resistance curve of the blowing system when wind volume flow is  $800\text{m}^3/\text{min}$  with  $60\text{mmAq}$  of resistance loss. When wind volume flow is set as  $400\text{m}^3/\text{min}$  which is  $1/2$ ,

$$\left(\frac{400}{800}\right)^2 \times 60 = 15\text{mmAq}$$

Also, when its flow is  $1000\text{m}^3/\text{min}$ ,

$$\left(\frac{1000}{800}\right)^2 \times 60 = 93.8\text{mmAq}$$

becomes like this and this pilot program equal with values obtained for each air volume and pressure loss is called a schematic device resistance curve. This overlapped addition of characteristic curve of the FAN and device resistance curve is figure (b) and intersection A is called operating point. There will be no problem is operating point is exact same as the plan but in reality, damage pressure is unbalanced due to changed plan during construction and others and sometimes desired air volume is not achieved.





## Motor

Motor is divided into single-phase two-wire and three-phase three-wire by power used. Also, in the case of single-phase or three-phase, respectively, it depends on the installation location and condition using voltage, insulation class, and cooling method changes so you must choose the right type of motor with appropriate properties, temperature, and motor installation location of the treated gas. And when it is exported to a foreign country the local frequency (Hz) and operating voltage (Voltage) are needed to be checked.

### ■ Classified by the protection scheme

FAN	Primary Classification	secondary classification	general name
	protection type about human body and solid	protection type by water intrusion	
IP22	– Keep your fingers away from any equipment, such as rotating parts or challenging part of the structure	The structure does not adversely affect the water droplets falling from the vertical to the direction of less than 15°	Drip Proof drip protection type (semi-enclosed)
IP23	– Structured to prevent large debris from entering the solid than 12mm diameter	The structure does not adversely affect the water droplets falling from the vertical to the direction of less than 60°	
IP44	– Structured in a way where tool or wire with larger than 1mm does not contact the rotating part inside the device – Structured to prevent large debris from entering the solid than 1mm diameter	Structured that does not get harmful affect to falling droplets in any directions	Total Enclose weatherproof (totally enclosed)
IP54	– Structured in a way nothing can contact the rotating part inside the device		Weather Proof (waterproof)
IP55	– Structure to prevent the intrusion of dust and actively example penetration does not interfere with the normal operation	Structured in a way where it does not get adverse effect even if the injection of water comes from any direction	Hose Proof type

### ■ Types of isolation and permitted maximum temperature

Insulation type	form of the body and protects the solid debris	allowable maximum temperature (°C)	Use
Example of A type	it is composed with material of jade surface, kite, paper. It improves stew or combined in oil. It has low Pillar torque is low, but has high maximum torque.	105	Centrifugal pumps, drills, presses, empty machine, FAN, FAN
Example of B type	it is composed of materials like Aika asbestos, glass fiber and etc together with adhesive materials.	130	Centrifugal pumps, drills, presses, empty machine, FAN, FAN
Example of C type	it is composed of pure aika, asbestos, china alone together with adhesive materials.	exceed 180	sprayer, compressor, con air, electric stairs
Example of F type	it is composed of aika, asbestos, glass fiber and etc together with adhesive materials like silicone alkyd resin of the epoxy. It has low starting current and required with low rotation speed.	155	Large FANs, rotary pumps
Example of H type	it is composed of materials like aika, asbestos, glass fiber and etc together with adhesive materials with same properties with silicone resin and also includes cases when materials with same property as aqueous and solid rubber silicone resin is used alone.	180	–

### ■ Type

구분	이미지	특징
Totally enclosed FAN cooled type (TEFC)		– Structured in a way where tool or wire with larger than 1mm does not contact the rotating part inside the device – Structure to prevent large solids with than 1mm in diameter from entering – Install cooling FAN to increase cooling effect
Inverter		– frequency total pressure is changed in accordance with load characteristics by controlling the rotation speed to minimize power used – Separate inverter panel is required
high efficiency		– the energy loss than standard motors 20 to 30% reduction in the efficiency by about 4–10% increased motor – Low noise and the life is long but 15 to 30% high price compared to the standard motor price
high efficiency inverter		– Reducing the power usage to a minimum by adding an inverter (frequency converter) functions in the high efficiency of the motor – Separate inverter panel is required

## Selection Method

### ■ FAN selection method

#### 1) Change the provided air velocity (V) and static pressure (Ps) into unit provided by the catalogue.

- ex. : CMM → change to CMH, mmAq → change to Pa

#### 2) Calculate discharged air speed of the FAN. (unit: m/s)

- Set FAN number.
- Use discharge size [Formula: Air volume(CMH) ÷ 3600 ÷ discharge area(m<sup>2</sup>)]

#### 3) Find dynamic pressure (Pd<sub>2</sub>).

##### ① Use of formula

- ex. : CMM → change to CMH, mmAq → change to Pa
- formula :  $Pd_2(\text{mmAq}) = (r \times V^2) / (2 \times g)$
- unit is in mmAq so change into Pa unit.

##### ② Use of catalogue

- Calculate dynamic pressure using dynamic pressure (Pd<sub>2</sub>), C<sub>2</sub> (m/s) at bottom of the catalogue.

V : Volume	m <sup>3</sup> /h = CMH, m <sup>3</sup> /h = CMS 1CMS = 3600CMH = 2119CFM 1CMM = 35.31668CFM
Ps : Static Pressure Pt : Total Pressure Pd : Dynamic Pressure	1mmAq = 9.80665 Pa 1in.WG = 25.4 mmAq
C <sub>2</sub> : Speed of air	m/s
p : constant	1.2 kg/m <sup>3</sup> at 20°C
g : Acceleration of gravity	9.8 m/s <sup>2</sup>

#### 4) Calculate total pressure (Pt) by adding static pressure and dynamic pressure provided.

#### 5) Use air volume and total pressure to select power (kW), rotation number (rpm) and noise (dB) in catalogue

- Use the Catalogue that match the FAN determined in Section 2.
- Select power, number of rotation and noise at the point of intersection of air volume and total pressure.

### [Example of selection]

#### 1) Air volume (V) : 22,000CMH, static pressure (Ps) : 60 mmAq (= 588.4 Pa)

#### 2) Calculate discharge air speed of FAN. (unit : m/s)

- Selection of FAN number(ex. selection as AYZ 630 model)
- AYZ 630 Discharge area: 801mm × 801mm = 0.6416m<sup>2</sup>
- Ejection velocity (C<sub>2</sub>) = air volume (CMH) ÷ 3600 ÷ discharge port area (m<sup>2</sup>) C<sub>2</sub> = 22,000 ÷ 3600 ÷ 0.6416 = 9.525 m/s

#### 3) Find dynamic pressure(Pd<sub>2</sub>).

##### ① formula : $Pd(\text{mmAq}) = (r \times V^2) / (2 \times g) = (1.2 \times 9.525^2) / (2 \times 9.8) = 5.55 \text{ mmAq} (= 54.4 \text{ Pa})$

##### ② Using catalogue

- Dynamic pressure can be selected matching the air speed at bottom of the catalogue.

#### 4) Total pressure (Pt) = static pressure (Ps) + dynamic pressure (Pd) = 588.4 + 54.4 = 642.8 → 643 Pa

#### 5) Using air volume and total pressure, power (kW), number of rotation (rpm) and noise (dB) selection from catalogue (refer to catalogue)

- Power : 5.3 kW (Motor selection is selected with 20% margin)
- Rotating number : 1,100 rpm
- Noise : 87dB





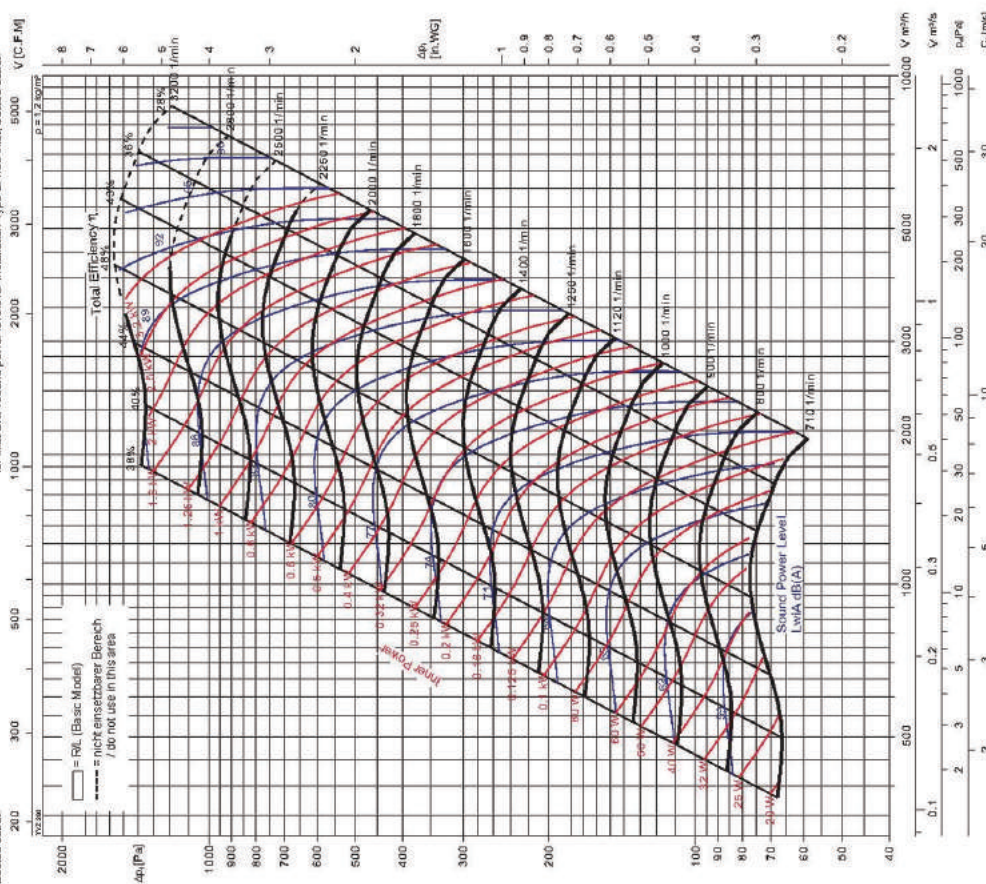
## Kennlinie

### Performance curve

#### TYZ 200

Fan test laboratory AMCA 210/69 Fig.12, 120000 cmm Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.
TYZ 03 200	161203	7.4	TYZ 03 225	161253	9.2
TYZ 05 200	161205	9.4	TYZ 05 225	161255	10.8

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90



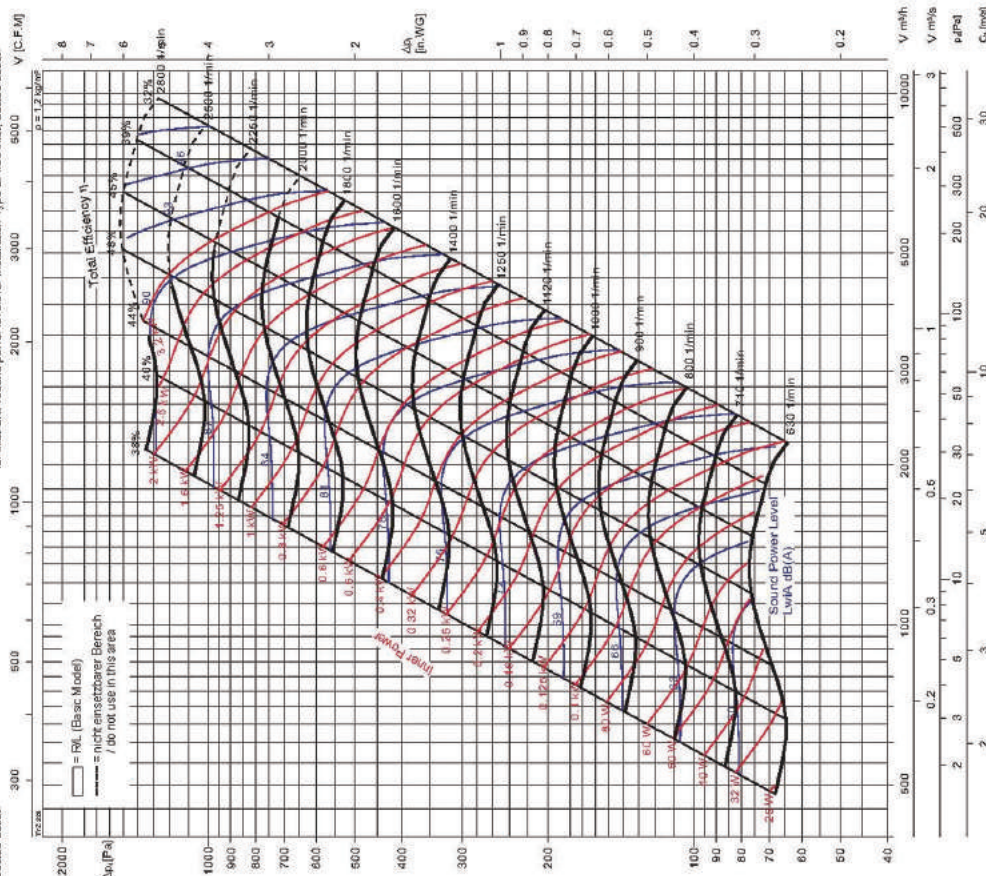
## Kennlinie

### Performance curve

#### TYZ 225

Fan test laboratory AMCA 210/69 Fig.12, 120000 cmm Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.
TYZ 03 225	161253	9.2	TYZ 03 225	161253	9.2
TYZ 05 225	161255	10.8	TYZ 05 225	161255	10.8

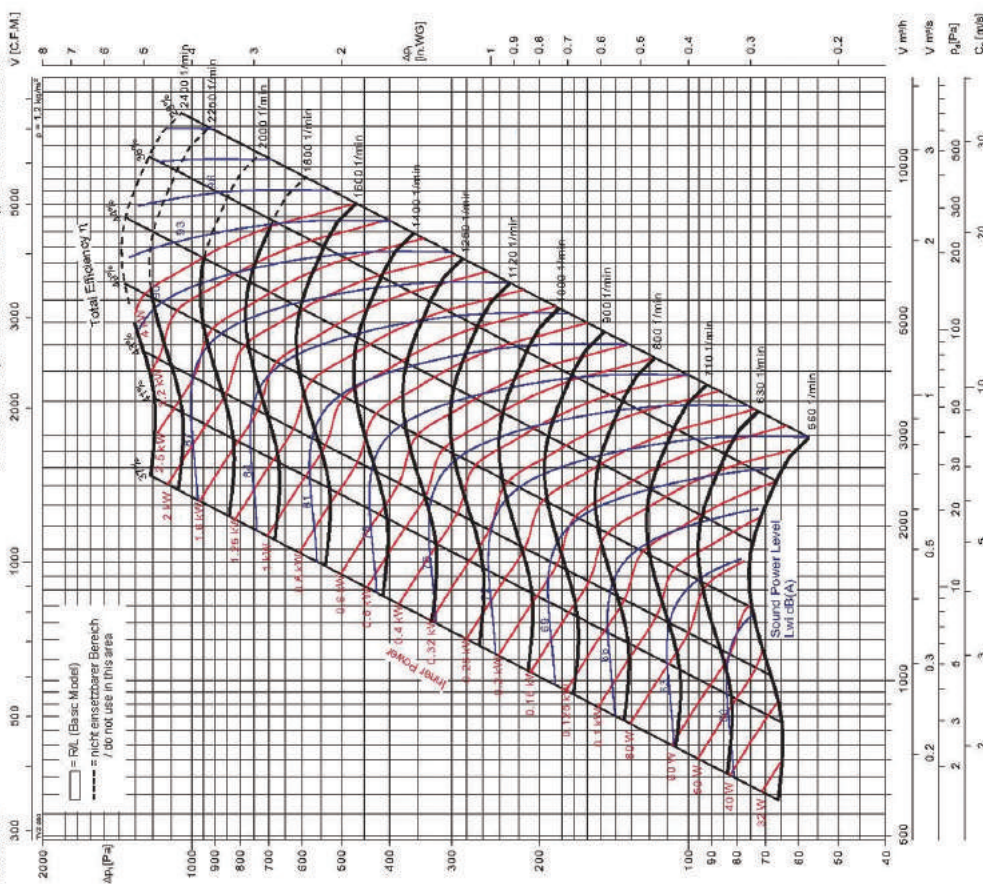
Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90





## TYZ 250

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWd sound power levels for installation Type B: free inlet, ducted outlet.



	Art.Nr.	■	kg	Typ	Art.Nr.	■	kg	Typ	Laufdurchmesser	Wheel diameter	D =	250 mm
	16 1303	11							Scharfzahn	number of blades	z =	46
	18 1305	13							Massenträgheitsmoment	moment of inertia	J =	0,343 kgm²
									Gewicht	weight	G =	11 kg
									Drehzahl maximal	speed limit	n <sub>max</sub> =	2400 /min

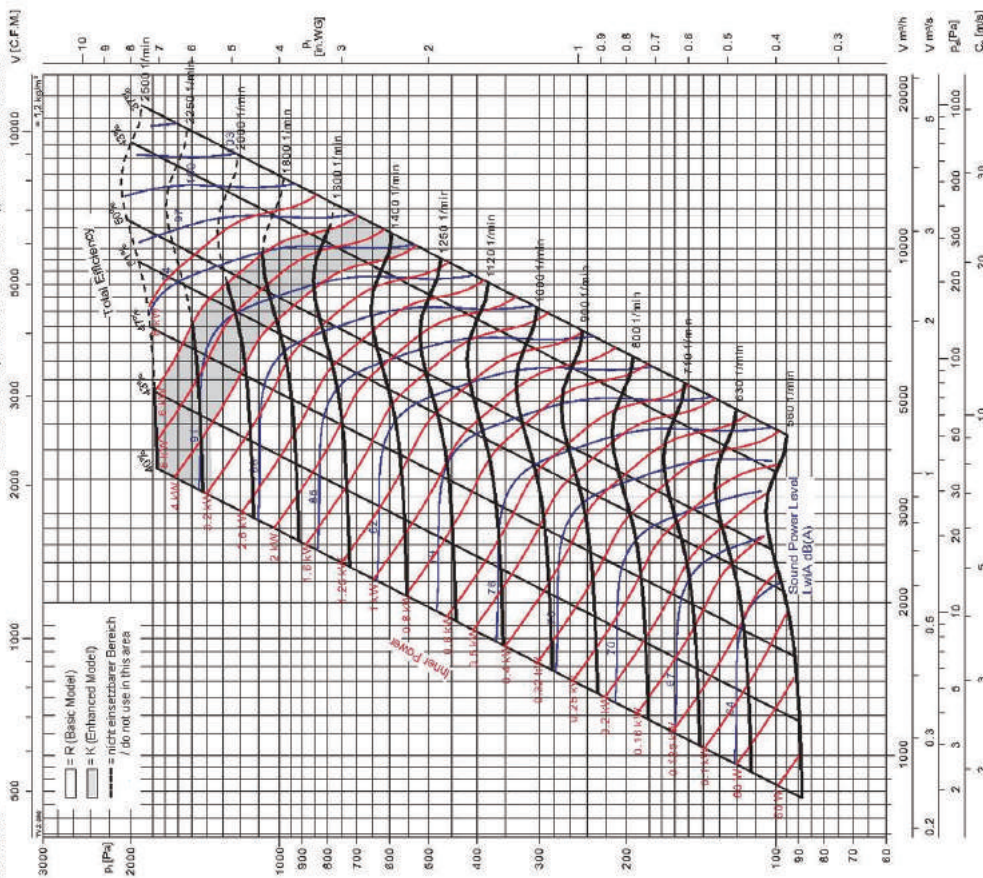
Zeichenerklärung auf Seite 1 Explanation of symbols see page 90

Zeichenerklärung auf Seite / Explanation of symbols see page 90



## TYZ 280

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated per ANCA International Standard 301. Values shown are for inlet LwA sound power levels for installation Type B: free inlet, ducted outlet.



	Type	Art.Nr.	■ [kg]		Type	Art.Nr.	■ [kg]	
	T.VZ 03 280	161953	19		Laufdrahtmesser	D = 280	mm	
					Schneefallzählgerät	number of blades Z = 23		
	T.VZ 05 280	161955	29		Messschälgeländemoment of inertia J = 14,028 kgm <sup>2</sup>			
					Gewicht G = 19	kg		
					Drehzahl maximal $n_{\text{max}}$ = 2500	1/min		

Zuscherklärung auf Seite 1 Explanation of symbols see page 90

Zeichenerklärung auf Seite / Explanation of symbols see page 90

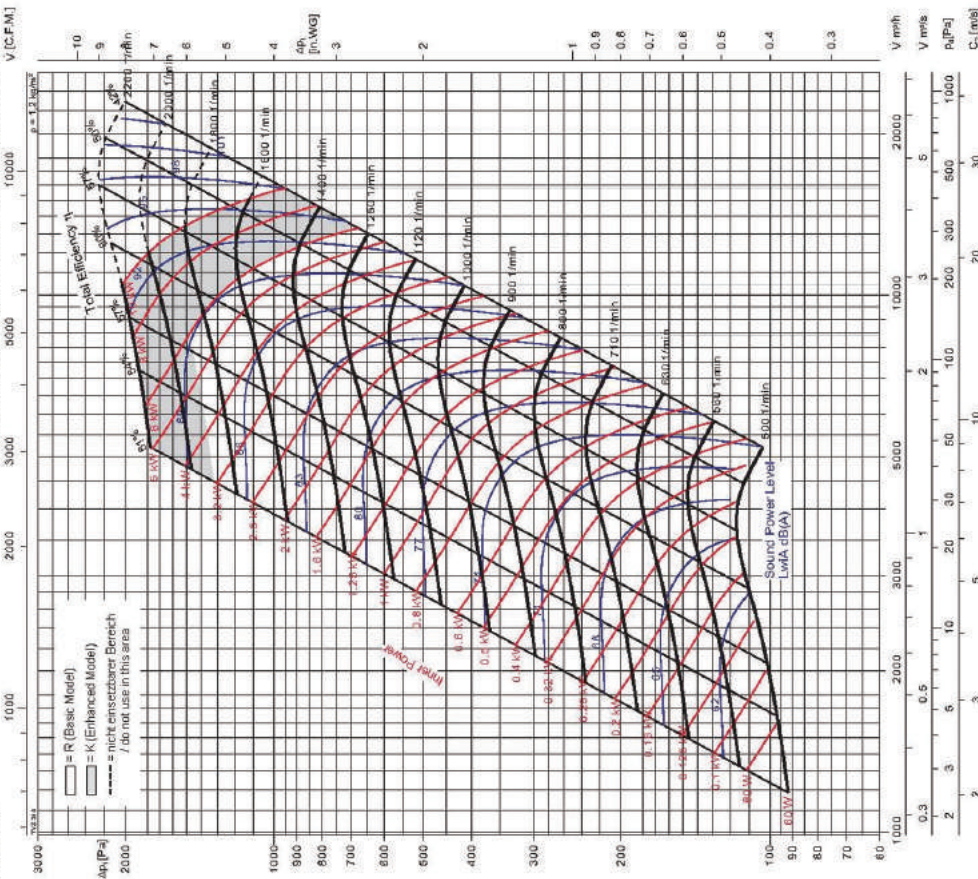




## Kennlinie

## TYZ 315

Fan test laboratory AMCA 210/99 Fig.12, 120000 cmh Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet.



	Type	Art.Nr.	[kg]		Type	Art.Nr.	[kg]	
Laufraddurchmesser	D =	315 mm			Schneidzahl	z =	21	
Messgerätmoment	J =	19 459 kgf <sup>m</sup>			Gewicht	G =	25 kg	
Drehzahl maximal	n <sub>max</sub> =	2 200 1/min						

Zeilenerklärung auf Seite 7 / Explanation of symbols see page 90

Zeichenerklärung auf Seite / Explanation of symbols see page 90

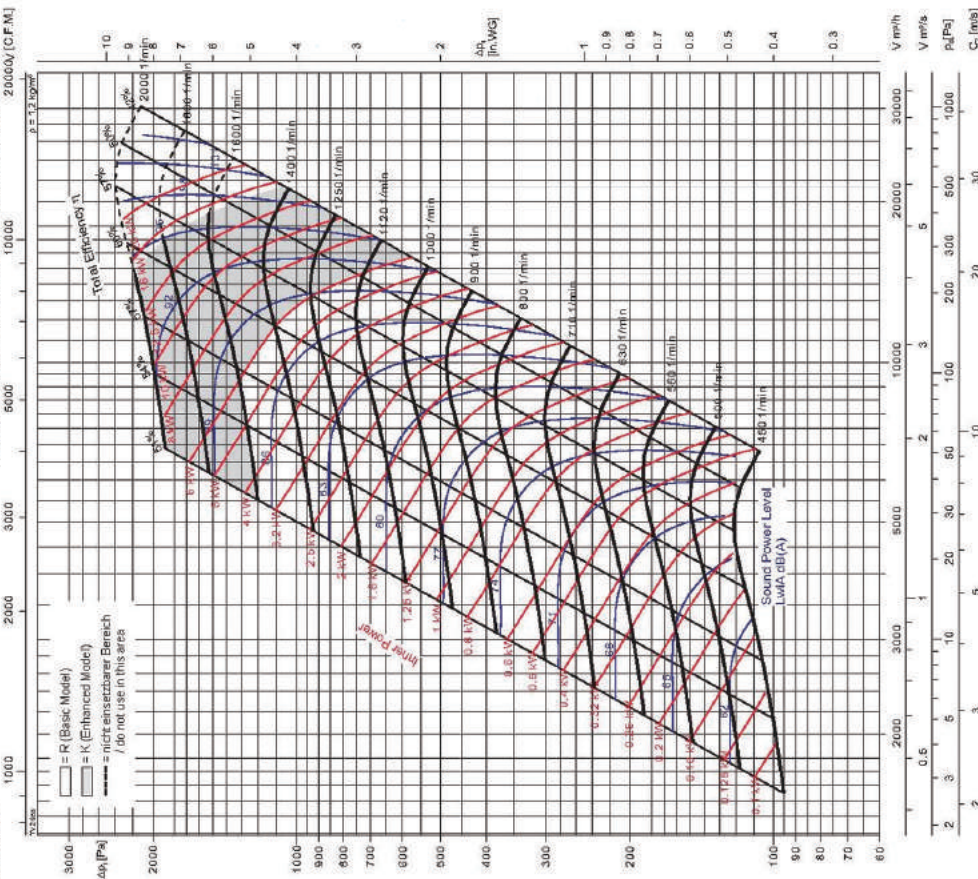


### Kennlinie

Performance curve

## TYZ 355

Fan test laboratory AMCA 210/99 Fig. 12. 120000 cfm Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet



	<b>Type</b>	<b>Art.Nr.</b>	<b>A [kg]</b>	<b>Type</b>	<b>Art.Nr.</b>	<b>A [kg]</b>
TVZ D3 355		181456	38			
TvZ 09 355		181457	42			

Laufraddurchmesser     D = 355 mm  
Schneifenanzahl       number of blades     z = 24  
Massenträgheitsmoment moment of inertia     J = 35.971 kgf<sup>m²</sup>  
Gewicht weight                 G = 38 kg  
Drehzahl maximal speed rev/min     n<sub>max</sub> = 2000 /min

Zuscherklärung auf Seite 4 Explanation of symbols see page 90

Zeichenerklärung auf Seite / Explanation of symbols see page 90





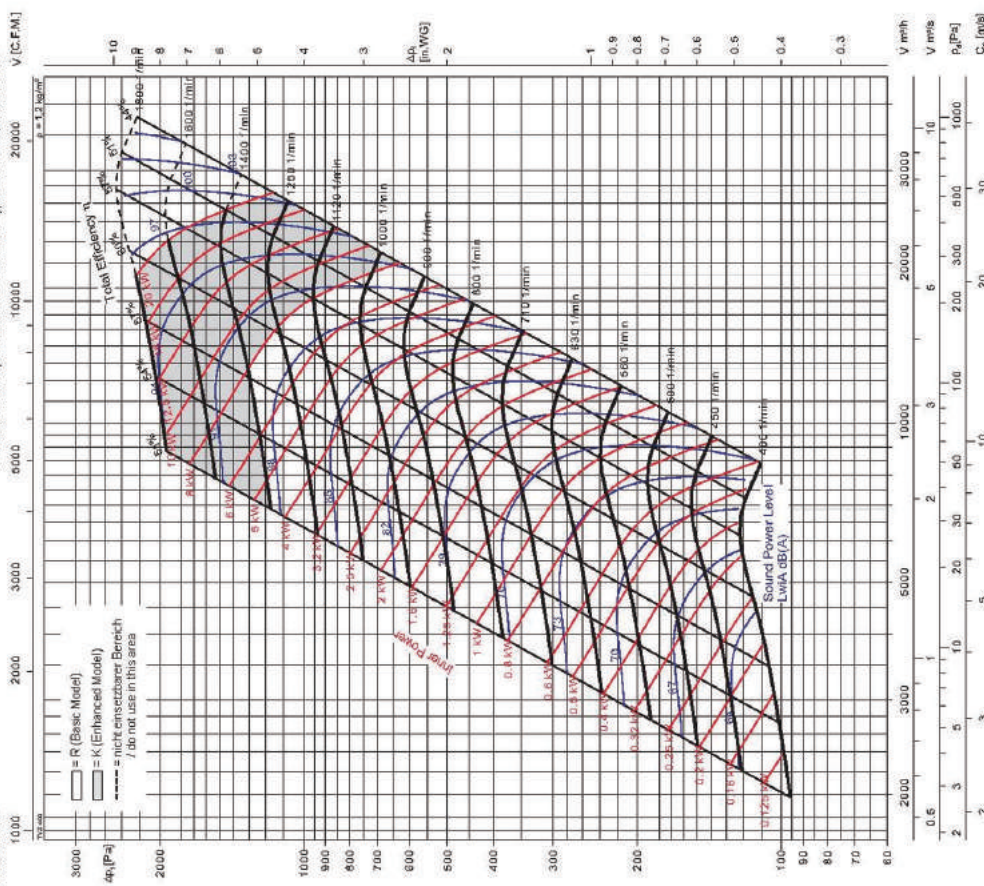
## Kennlinie Performance curve

### TYZ 400



Fan test laboratory AMCA 210/69 Fig.12, 120000 cmm Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet sound power levels for installation type B-Free inlet, ducted outlet.



Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.
TYZ 03 400	161503	44	TYZ 05 400	161505	57	TYZ 07 400	161507	72	TYZ 09 400	161509	87
TYZ 11 400	161511	102	TYZ 13 400	161513	117	TYZ 15 400	161515	132	TYZ 17 400	161517	147
TYZ 19 400	161519	152	TYZ 21 400	161521	167	TYZ 23 400	161523	182	TYZ 25 400	161525	197
TYZ 27 400	161527	202	TYZ 29 400	161529	217	TYZ 31 400	161531	232	TYZ 33 400	161533	247
TYZ 35 400	161535	262	TYZ 37 400	161537	277	TYZ 39 400	161539	292	TYZ 41 400	161541	307
TYZ 43 400	161543	322	TYZ 45 400	161545	337	TYZ 47 400	161547	352	TYZ 49 400	161549	367
TYZ 51 400	161551	382	TYZ 53 400	161553	397	TYZ 55 400	161555	412	TYZ 57 400	161557	427
TYZ 59 400	161559	442	TYZ 61 400	161561	457	TYZ 63 400	161563	472	TYZ 65 400	161565	487
TYZ 67 400	161567	502	TYZ 69 400	161569	517	TYZ 71 400	161571	532	TYZ 73 400	161573	547
TYZ 75 400	161575	562	TYZ 77 400	161577	577	TYZ 79 400	161579	592	TYZ 81 400	161581	607
TYZ 83 400	161583	622	TYZ 85 400	161585	637	TYZ 87 400	161587	652	TYZ 89 400	161589	667
TYZ 91 400	161591	682	TYZ 93 400	161593	697	TYZ 95 400	161595	712	TYZ 97 400	161597	727
TYZ 99 400	161599	742	TYZ 101 400	161601	757	TYZ 103 400	161603	772	TYZ 105 400	161605	787
TYZ 107 400	161607	802	TYZ 109 400	161609	817	TYZ 111 400	161611	832	TYZ 113 400	161613	847
TYZ 115 400	161615	862	TYZ 117 400	161617	877	TYZ 119 400	161619	892	TYZ 121 400	161621	907
TYZ 123 400	161623	922	TYZ 125 400	161625	937	TYZ 127 400	161627	952	TYZ 129 400	161629	967
TYZ 131 400	161631	982	TYZ 133 400	161633	997	TYZ 135 400	161635	1012	TYZ 137 400	161637	1027
TYZ 139 400	161639	1042	TYZ 141 400	161641	1057	TYZ 143 400	161643	1072	TYZ 145 400	161645	1087
TYZ 147 400	161647	1102	TYZ 149 400	161649	1117	TYZ 151 400	161651	1132	TYZ 153 400	161653	1147
TYZ 155 400	161655	1162	TYZ 157 400	161657	1177	TYZ 159 400	161659	1192	TYZ 161 400	161661	1207
TYZ 163 400	161663	1222	TYZ 165 400	161665	1237	TYZ 167 400	161667	1252	TYZ 169 400	161669	1267
TYZ 171 400	161671	1282	TYZ 173 400	161673	1297	TYZ 175 400	161675	1312	TYZ 177 400	161677	1327
TYZ 179 400	161679	1342	TYZ 181 400	161681	1357	TYZ 183 400	161683	1372	TYZ 185 400	161685	1387
TYZ 187 400	161687	1402	TYZ 189 400	161689	1417	TYZ 191 400	161691	1432	TYZ 193 400	161693	1447
TYZ 195 400	161695	1462	TYZ 197 400	161697	1477	TYZ 199 400	161699	1492	TYZ 201 400	161701	1507
TYZ 203 400	161703	1522	TYZ 205 400	161705	1537	TYZ 207 400	161707	1552	TYZ 209 400	161709	1567
TYZ 211 400	161711	1582	TYZ 213 400	161713	1597	TYZ 215 400	161715	1612	TYZ 217 400	161717	1627
TYZ 219 400	161719	1642	TYZ 221 400	161721	1657	TYZ 223 400	161723	1672	TYZ 225 400	161725	1687
TYZ 227 400	161727	1702	TYZ 229 400	161729	1717	TYZ 231 400	161731	1732	TYZ 233 400	161733	1747
TYZ 235 400	161735	1762	TYZ 237 400	161737	1777	TYZ 239 400	161739	1792	TYZ 241 400	161741	1807
TYZ 243 400	161743	1822	TYZ 245 400	161745	1837	TYZ 247 400	161747	1852	TYZ 249 400	161749	1867
TYZ 251 400	161751	1882	TYZ 253 400	161753	1897	TYZ 255 400	161755	1912	TYZ 257 400	161757	1927
TYZ 259 400	161759	1942	TYZ 261 400	161761	1957	TYZ 263 400	161763	1972	TYZ 265 400	161765	1987
TYZ 267 400	161767	2002	TYZ 269 400	161769	2017	TYZ 271 400	161771	2032	TYZ 273 400	161773	2047
TYZ 275 400	161775	2062	TYZ 277 400	161777	2077	TYZ 279 400	161779	2092	TYZ 281 400	161781	2107
TYZ 283 400	161783	2122	TYZ 285 400	161785	2137	TYZ 287 400	161787	2152	TYZ 289 400	161789	2167
TYZ 291 400	161791	2182	TYZ 293 400	161793	2197	TYZ 295 400	161795	2212	TYZ 297 400	161797	2227
TYZ 299 400	161799	2242	TYZ 301 400	161801	2257	TYZ 303 400	161803	2272	TYZ 305 400	161805	2287
TYZ 307 400	161807	2302	TYZ 309 400	161809	2317	TYZ 311 400	161811	2332	TYZ 313 400	161813	2347
TYZ 315 400	161815	2362	TYZ 317 400	161817	2377	TYZ 319 400	161819	2392	TYZ 321 400	161821	2407
TYZ 323 400	161823	2422	TYZ 325 400	161825	2437	TYZ 327 400	161827	2452	TYZ 329 400	161829	2467
TYZ 331 400	161831	2482	TYZ 333 400	161833	2497	TYZ 335 400	161835	2512	TYZ 337 400	161837	2527
TYZ 339 400	161839	2542	TYZ 341 400	161841	2557	TYZ 343 400	161843	2572	TYZ 345 400	161845	2587
TYZ 347 400	161847	2602	TYZ 349 400	161849	2617	TYZ 351 400	161851	2632	TYZ 353 400	161853	2647
TYZ 355 400	161855	2662	TYZ 357 400	161857	2677	TYZ 359 400	161859	2692	TYZ 361 400	161861	2707
TYZ 363 400	161863	2722	TYZ 365 400	161865	2737	TYZ 367 400	161867	2752	TYZ 369 400	161869	2767
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TYZ 403 400	161903	3022	TYZ 405 400	161905	3037	TYZ 407 400	161907	3052	TYZ 409 400	161909	3067
TYZ 411 400	161911	3082	TYZ 413 400	161913	3097	TYZ 415 400	161915	3112	TYZ 417 400	161917	3127
TYZ 419 400	161919	3142	TYZ 421 400	161921	3157	TYZ 423 400	161923	3172	TYZ 425 400	161925	3187
TYZ 427 400	161927	3202	TYZ 429 400	161929	3217	TYZ 431 400	161931	3232	TYZ 433 400	161933	3247
TYZ 435 400	161935	3262	TYZ 437 400	161937	3277	TYZ 439 400	161939	3292	TYZ 441 400	161941	3307
TYZ 443 400	161943	3322	TYZ 445 400	161945	3337	TYZ 447 400	161947	3352	TYZ 449 400	161949	3367
TYZ 451 400	161951	3382	TYZ 453 400	161953	3397	TYZ 455 400	161955	3412	TYZ 457 400	161957	3427
TYZ 459 400	161959	3442	TYZ 461 400	161961	3457	TYZ 463 400	161963	3472	TYZ 465 400	161965	3487
TYZ 467 400	161967	3502	TYZ 469 400	161969	3517	TYZ 471 400	161971	3532	TYZ 473 400	161973	3547
TYZ 475 400	161975	3562	TYZ 477 400	161977	3577	TYZ 479 400	161979	3592	TYZ 481 400	161981	3607
TYZ 483 400	161983	3622	TYZ 485 400	161985	3637	TYZ 487 400	161987	3652	TYZ 489 400	161989	3667
TYZ 491 400	161991	3682	TYZ 493 400	161993	3697	TYZ 495 400	161995	3712	TYZ 497 400	161997	3727
TYZ 499 400	161999	3742	TYZ 501 400	162001	3757	TYZ 503 400	162003	3772	TYZ 505 400	162005	3787
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TYZ 515 400	162015	3862	TYZ 517 400	162017	3877	TYZ 519 400	162019	3892	TYZ 521 400	162021	3907
TYZ 523 400	162023	3922	TYZ 525 400	162025	3937	TYZ 527 400	162027	3952	TYZ 529 400	162029	3967
TYZ 531 400	162031	3982	TYZ 533 400	162033	3997	TYZ 535 400	162035	4012	TYZ 537 400	162037	4027
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TYZ 563 400	162063	4222	TYZ 565 400	162065	4237	TYZ 567 400	162067	4252	TYZ 569 400	162069	4267
TYZ 571 400	162071	4282	TYZ 573 400	162073	4297	TYZ 575 400	162075	4312	TYZ 577 400	162077	4327
TYZ 579 400	162079	4342	TYZ 581 400	162081	4357	TYZ 583 400	162083	4372	TYZ 585 400	162085	4387
TYZ 587 400	162087	4402	TYZ 589 400	162089	4417	TYZ 591 400	162091	4432	TYZ 593 400	162093	4447
TYZ 595 400	162095	4462	TYZ 597 400	162097	4477	TYZ 599 400	162099	4492	TYZ 601 400	162101	4507
TYZ 603 400	162103	4522	TYZ 605 400	162105	4537	TYZ 607 400	162107	4552	TYZ 609 400	162109	4567
TYZ 611 400	162111	4582	TYZ 613 400	162113	4597	TYZ 615 400	162115	4612	TYZ 617 400	162117	4627
TYZ 619 400	162119	4642	TYZ 621 400	162121	4657	TYZ 623 400	162123	4672	TYZ 625 400	162125	4687
TYZ 627 400	162127	4702	TYZ 629 400	162129	4717	TYZ 631 400	162131	4732	TYZ 633 400	162133	4747
TYZ 635 400	162135	4762	TYZ 637 400	162137	4777	TYZ 639 400	162139	4792	TYZ 641 400	162141	4807
TYZ 643 400	162143	4822	TYZ 645 400	162145	4837	TYZ 647 400	162147	4852	TYZ 649 400	162149	4867
TYZ 651 400	162151	4882	TYZ 653 400	162153	4897	TYZ 655 400	162155	4912	TYZ 657 400	162157	4927
TYZ 659 400	162159	4942	TYZ 661 400	162161	4957	TYZ 663 400	162163	4972	TYZ 665 400	162165	4987





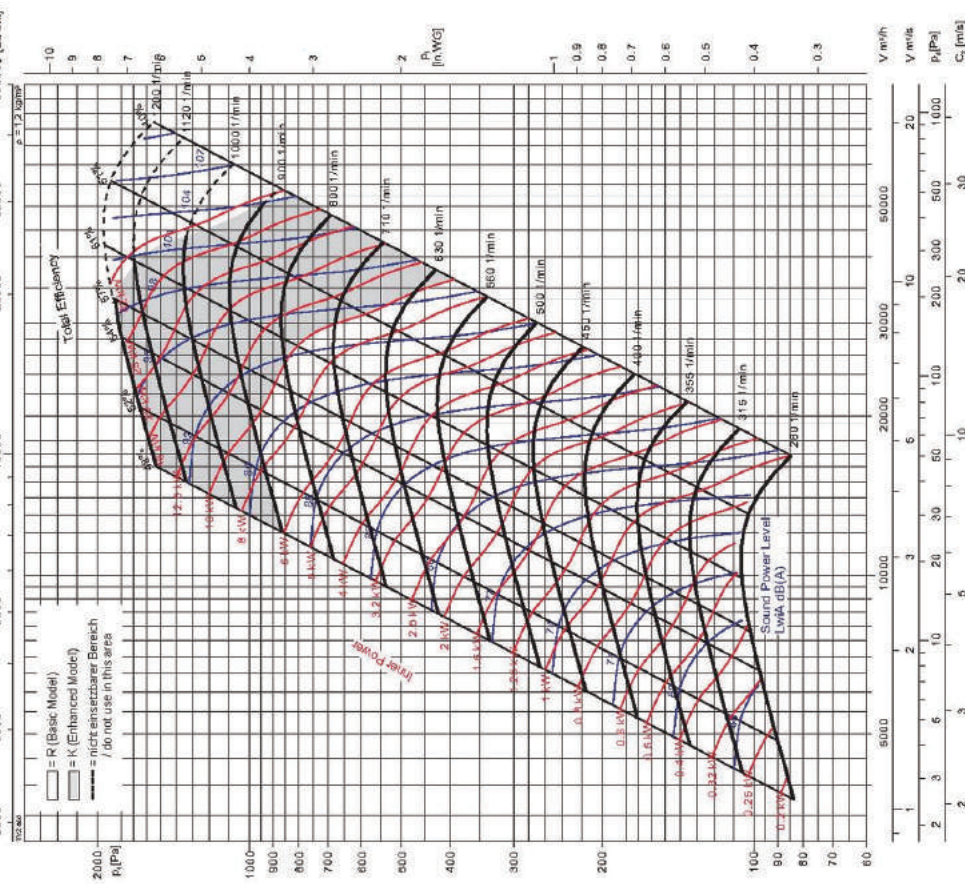
### Kennlinie

#### Performance curve

### TYZ 560

Fan test laboratory AMCA 210/99 Fig. 12, 120000 cmh Test Chamber. Performance ratings do not include the effects of apparatus losses (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of apparatus losses (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Type	Art.Nr.	Art.Nr.	Type	Laufdurchmesser	Wheel diameter	D =	mm
TYZ 05 560	161855	131	Schauflerzahl	number of blades	z =	21	
TYZ 07 560	161857	160	Massenträgheitsmoment	moment of inertia	J =	213.57	kgm²
			Gewicht	weight	G =	131	kg
			Drehzahl maximal	speed limit	n <sub>max</sub> =	1200	1/min

Zeichenerklärung auf Seite 90 / Explanation of symbols see page 90



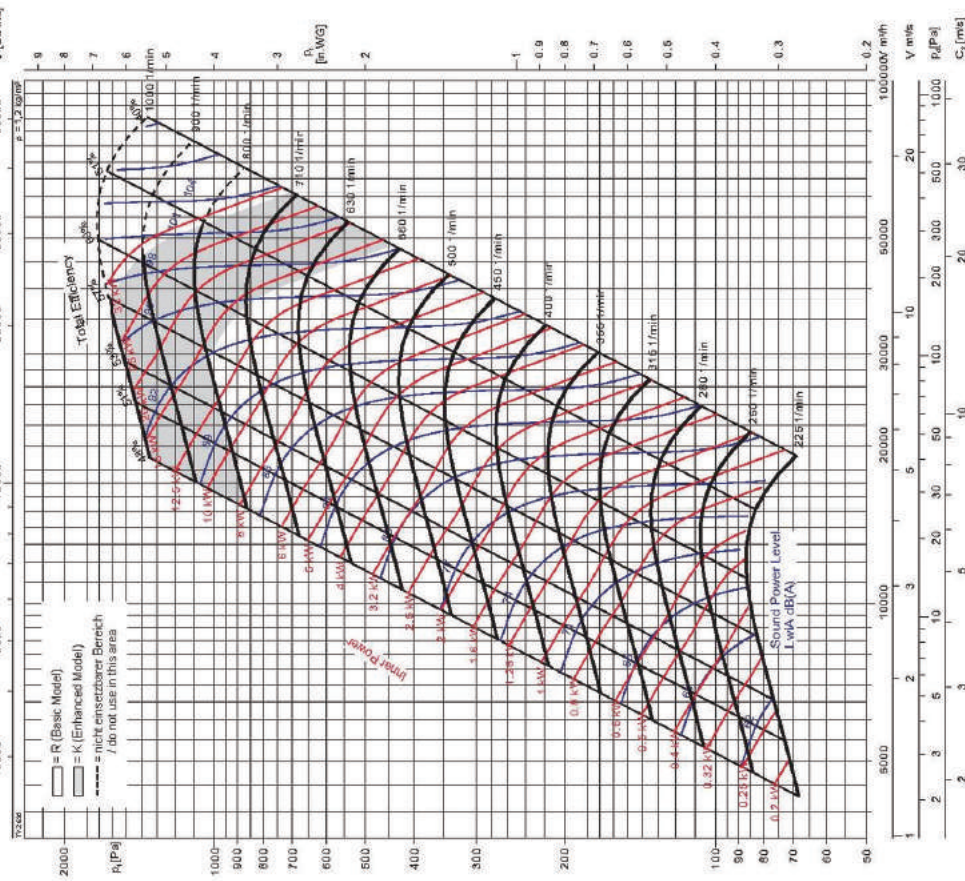
### Kennlinie

#### Performance curve

### TYZ 630

Fan test laboratory AMCA 210/99 Fig. 12, 120000 cmh Test Chamber. Performance ratings do not include the effects of apparatus losses (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of apparatus losses (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Type	Art.Nr.	Art.Nr.	Type	Laufdurchmesser	Wheel diameter	D =	mm
TYZ 05 630	161705	156	Schauflerzahl	number of blades	z =	19	
TYZ 07 630	161707	195	Massenträgheitsmoment	moment of inertia	J =	305.32	kgm²
			Gewicht	weight	G =	156	kg
			Drehzahl maximal	speed limit	n <sub>max</sub> =	1000	1/min

Zeichenerklärung auf Seite 90 / Explanation of symbols see page 90





## TYZ 710

[illegible]

	Typ	Art.Nr.	■ [kg]	Typ	Art.Nr.	■ [kg]	Laufdurchmesser	■ wheel diameter	D =	710	mm
	TYZ 05 710	161755	192				Schwalzenzahl	number of blades	Z =	21	
	TYZ 07 710	161757	240				Massenträgheitsmoment	moment of inertia	J =	561,45	kgm <sup>2</sup>
							Gewicht	weight	G =	240	kg
							Drehzahl maximal	speed limit	n <sub>max</sub> =	950	1/min

Zeichenerklärung auf Seite 4 (Explanation of symbols see page 90)

Zeichenerklärung auf Seite / Explanation of symbols see page 90



## TYZ 800

[illegible]

Zeichenerklärung auf Seite / Explanation of symbols see page 90





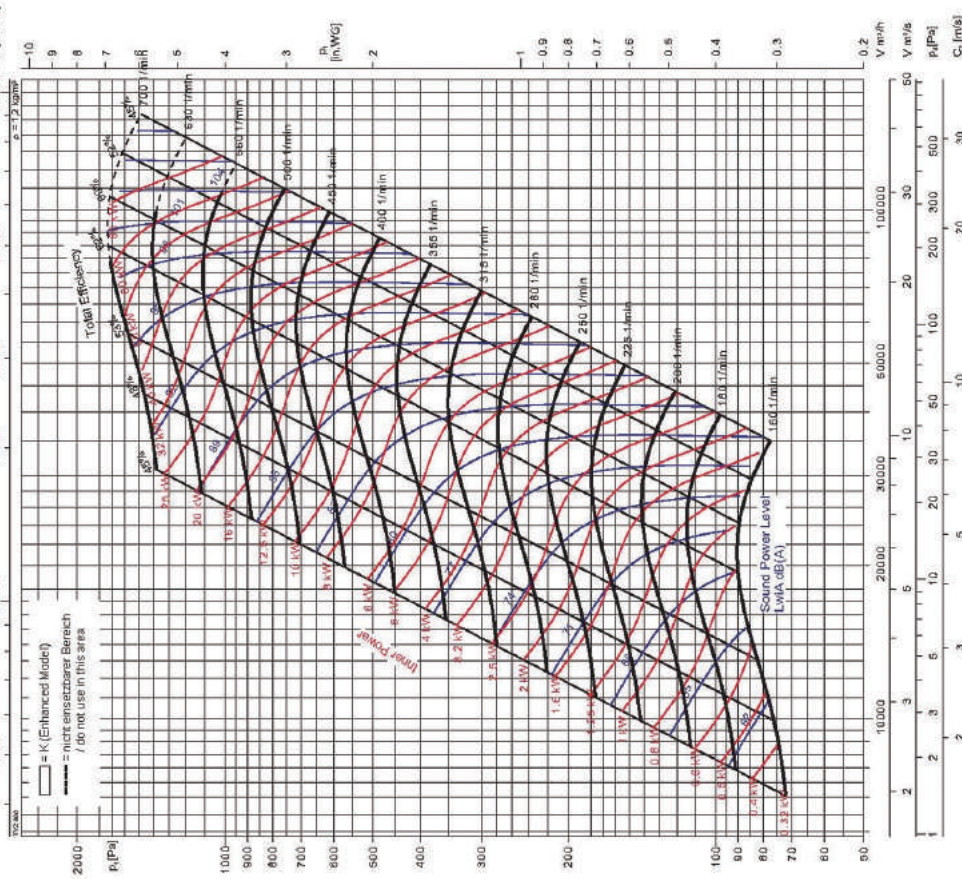
### Kennlinie

#### Performance curve

### TYZ 900

Fan test laboratory AMCA 210/99 Fig. 12, 120000 cmh Test Chamber. Performance certified is for installation type B-Free inlet, ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B: free inlet, ducted outlet.



Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.
TYZ 07 900	161857	305						

Zeichenerklärung auf Seite 90 / Explanation of symbols see page 90



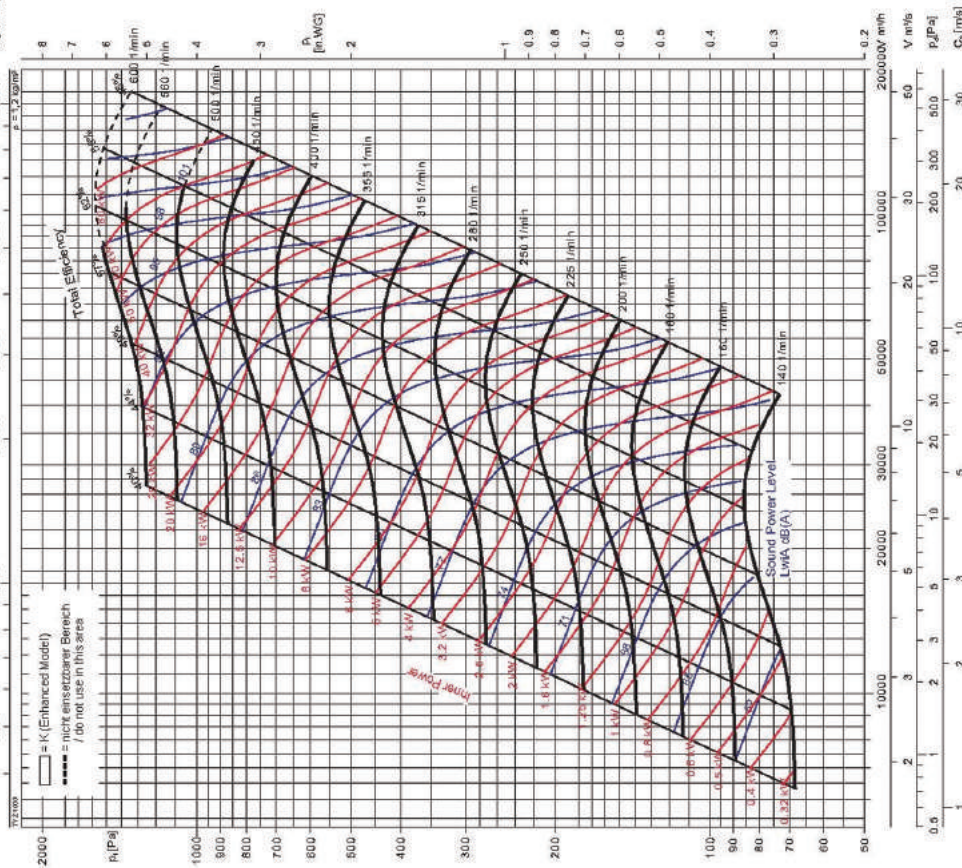
### Kennlinie

#### Performance curve

### TYZ 1000

Fan test laboratory AMCA 210/99 Fig. 12, 120000 cmh Test Chamber. Performance certified is for installation type B-Free inlet, ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B: free inlet, ducted outlet.



Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.	Typ	Art.Nr.	Art.Nr.
TYZ 07 1000	161907	480						

Zeichenerklärung auf Seite 90 / Explanation of symbols see page 90



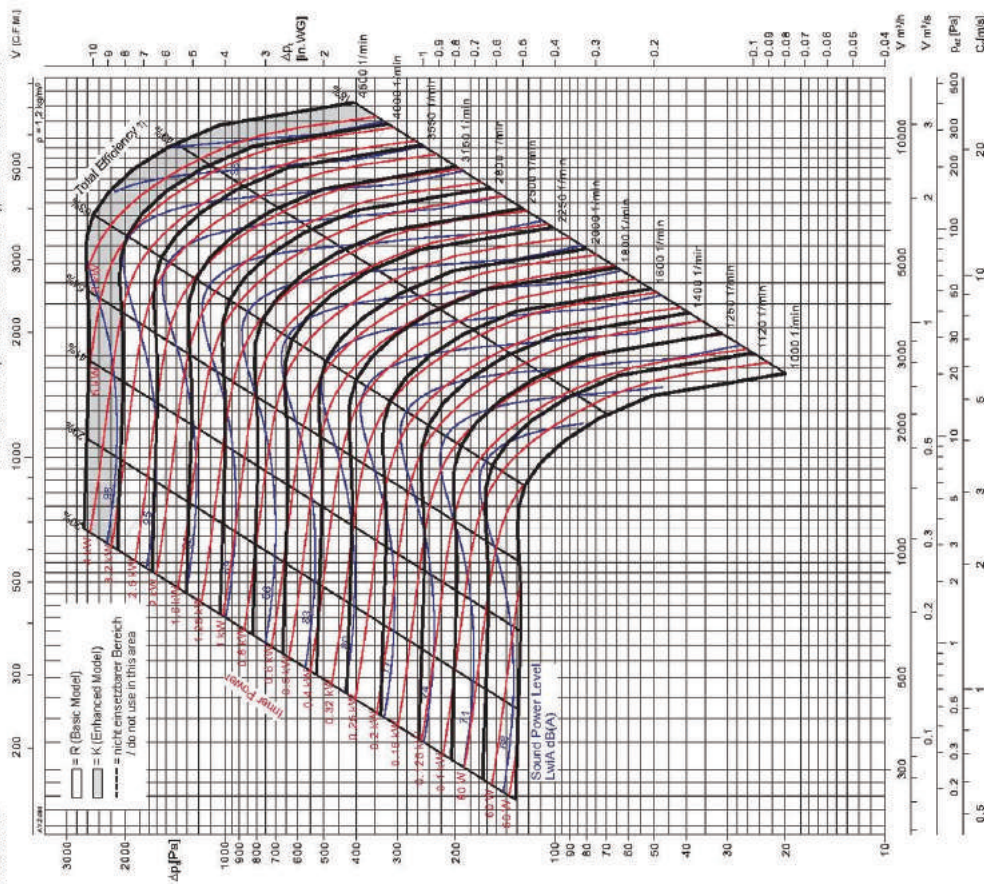


## Kennlinie Performance curve

AYZ 280



Fan test laboratory AMCA 210/99 Fig.12, 120000 cmm Test Chamber. Performance ratings do not include the effects of appearance (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Type	Art.Nr.	Art.Nr.	Typ	Laufdurchmesser	Wheel diameter	D =	mm
AYZ 03 280	168353	22		Schuldrzahl	number of blades	z =	24
AYZ 05 280	168355	32		Massenträgheitsmoment	moment of inertia	J =	2,9283 kgm²
				Gewicht	weight	G =	22 kg
				Drehzahl maximal	speed limit	n <sub>max</sub> =	4500 1/min

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90

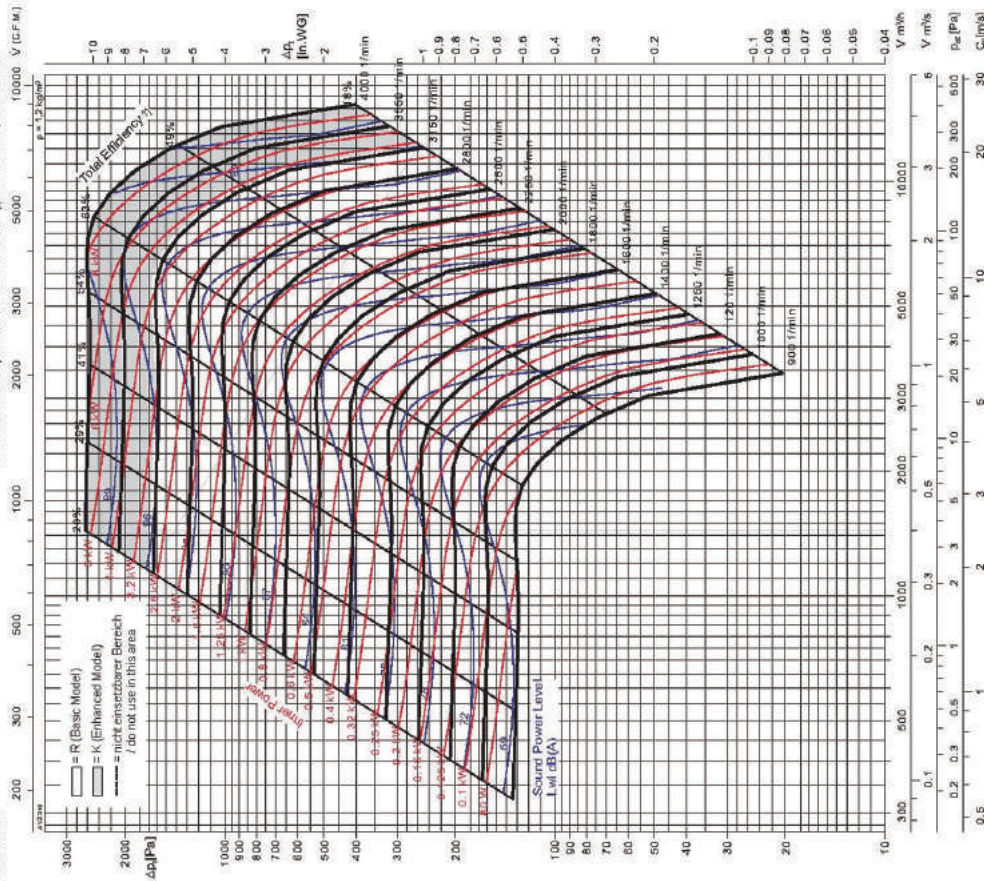


## Kennlinie Performance curve

AYZ 315



Fan test laboratory AMCA 210/99 Fig.12, 120000 cmm Test Chamber. Performance ratings do not include the effects of appearance (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Type	Art.Nr.	Art.Nr.	Typ	Laufdurchmesser	Wheel diameter	D =	mm
AYZ 03 315	168403	32.6		Schuldrzahl	number of blades	z =	24
AYZ 05 315	168405	42.6		Massenträgheitsmoment	moment of inertia	J =	6,5026 kgm²
				Gewicht	weight	G =	32.6 kg
				Drehzahl maximal	speed limit	n <sub>max</sub> =	4000 1/min

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90



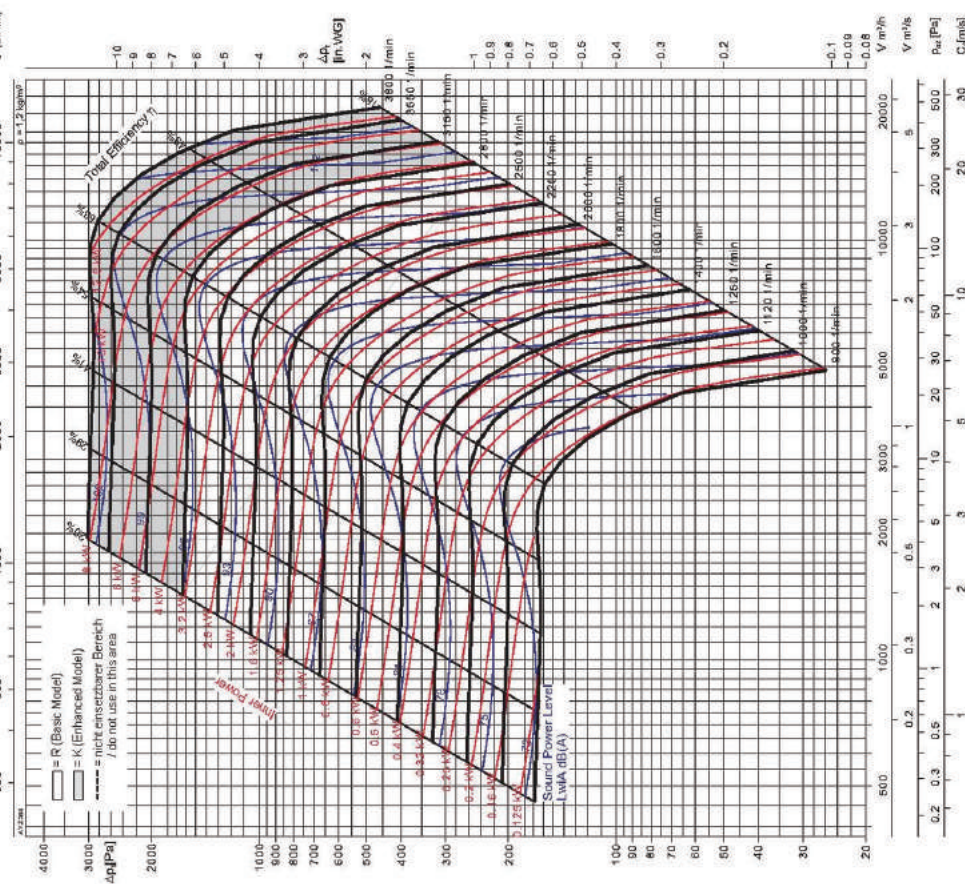


**Kennlinie**  
Performance c

**AYZ 355**



Fan test laboratory AMCA 210/98 Fig. 12, 120000 cmh Test Chamber. Performance is certified for installation type B-Free inlet, ducted outlet.



	Type	Art.Nr.	kg	Type	Art.Nr.	kg	
Laufdrahtdurchmesser							
wheel diameter							D = 36,5 mm
number of blades							Z = 24
Schnellzahl		198453	42,7				j = 11,23 s/km <sup>2</sup>
Momentenabgleichment		ANZ 05 355	54,7				G = 42,7 kg
Weight							
Drehzahl maximal							n <sub>max</sub> = 3500 /min
speed limit							

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90

Zeichenerklärung auf Seite / Explanation of symbols see page 90



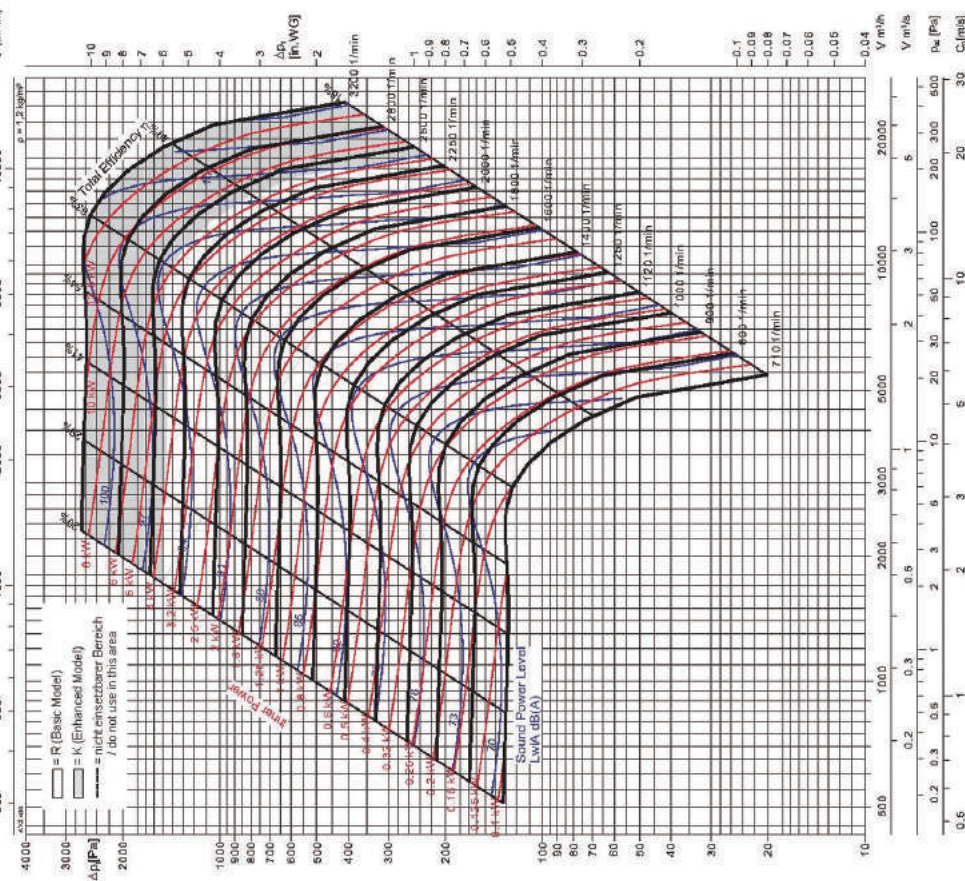
### Kennlinie

Performance curve

## AYZ 400



Fan test laboratory AMCA 210/99 Fig. 12, 120000 cfm Test Chamber. Performance certified is for installation type B-Free inlet, ducted outlet.



	Typ	Art.Nr.	■ [kg]	Typ	Art.Nr.	■ [kg]	
AVZ 03 400		1695.03	50,6				Laufraddurchmesser
AVZ 05 400		1695.05	63,6				Wheel diameter
							D = 400 mm
							Schneulenzahl
							number of blades
							Z = 24
							Massenträgheitsmoment
							moment of inertia
							J = 18,506 kgm <sup>2</sup>
							Gewicht
							weight
							G = 50,6 kg
							Drehzahl maximal
							speed limit
							n <sub>max</sub> = 3200 1/min

Zuscherklärung auf Seite 1 / Explanation of symbols see page 90

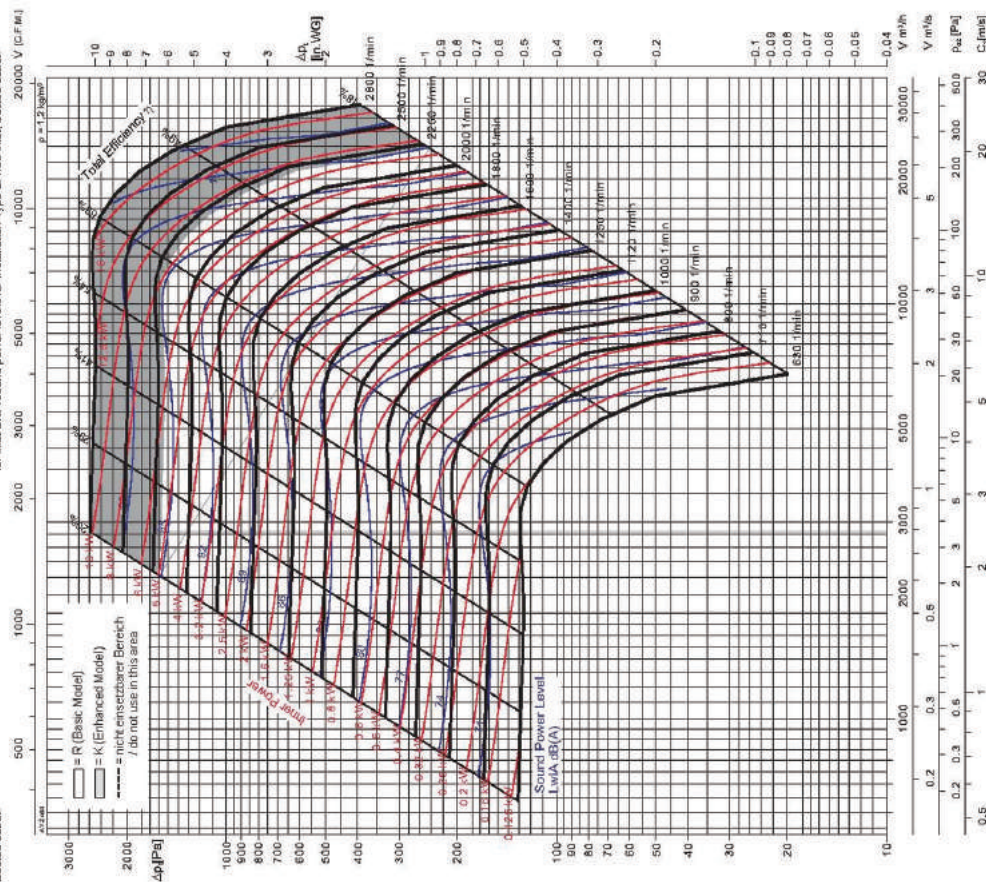
Zeichenerklärung auf Seite / Explanation of symbols see page 90





**AYZ 450**

Fan test laboratory AMCA 210/99 Fig.12, 1120000 cmh Test Chamber. Performance certified is for installation type B-Free inlet, ducted outlet.



Typ	Art.Nr.	[kg]	Type	Art.Nr.	[kg]
AZ 05 450	189555	67,5	Laufraddurchmesser		D = 450 mm
AZ 07 450	189557	82,5	Schafelzahl		number of blades z = 24
			Messenträgheitsmoment		J = 25,43 l kgm <sup>2</sup>
			Gewicht		G = 67,5 kg
			Drehzahl maximal		n <sub>max</sub> = 2600 1/min

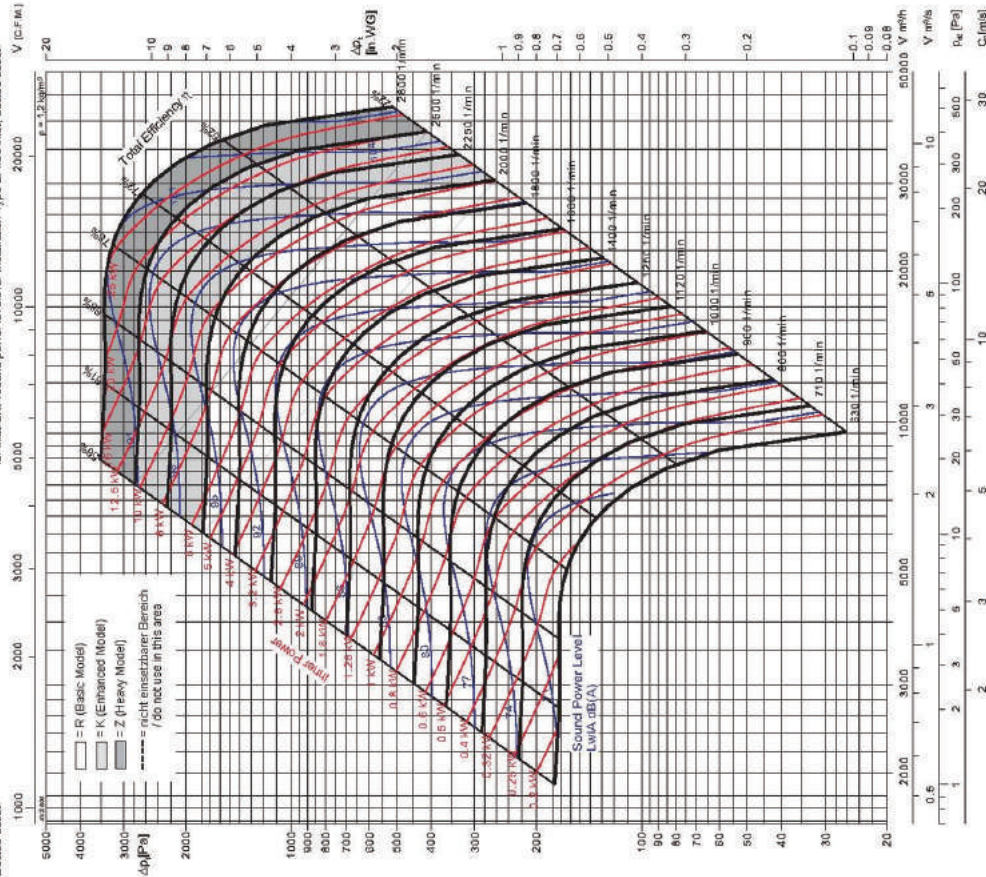
Zeichenerklärung auf Seite 1 Erklärungen of symbols see page 90

Zeichenerklärung auf Seite / Explanation of symbols see page 90



**AYZ 500**

Fan test laboratory AMCA 210/99 Fig. 12, 120000 cfm Test Chamber. Performance certified is for installation type B-Free inlet, ducted outlet.



Type	Art.Nr.	■ [kg]	Type	Art.Nr.	■ [kg]
AYZ 05 500	168605	84,2	Laufraddurchmesser	■ heel diameter	D = 500 mm
AYZ 07 500	168607	104,2	Schraubzahl	number of blades	z = 24
			Massestrahlmoment	moment of inertia	J = 45,27 kgm <sup>2</sup>
			Gewicht	weight	G = 84,2 kg
			Drehzahl maximal	speed limit	n <sub>max</sub> = 2800 1/min

Zuscherklärung auf Seite 1 / Explanation of symbols see page 90

Zeichenerklärung auf Seite / Explanation of symbols see page 90





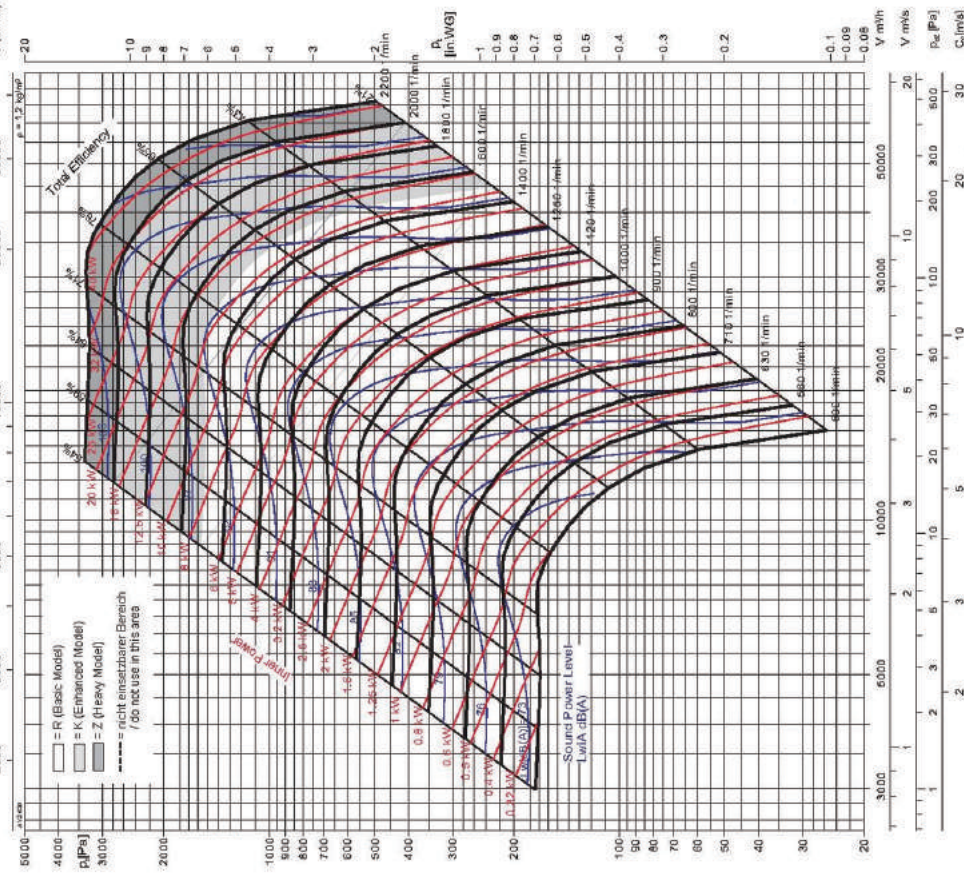
**Kennlinie**  
Performance curve

**AYZ 630**



Fan test laboratory AMCA 210/99 Fig. 12, 120000 cmh Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Type	Art.Nr.	Art.Nr.	Type	Laufdurchmesser	Wheeldiameter	D	mm
AYZ 06 630	168705	168	Schaufelzahl	number of blades	z	24	
AYZ 07 630	168707	197	Massenträgheitsmoment	moment of inertia	J	145,71	kgm <sup>2</sup>
			Gewicht	weight	G	168	kg
			Drehzahl maximal	speed /min	n <sub>max</sub>	2200	1/min

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90



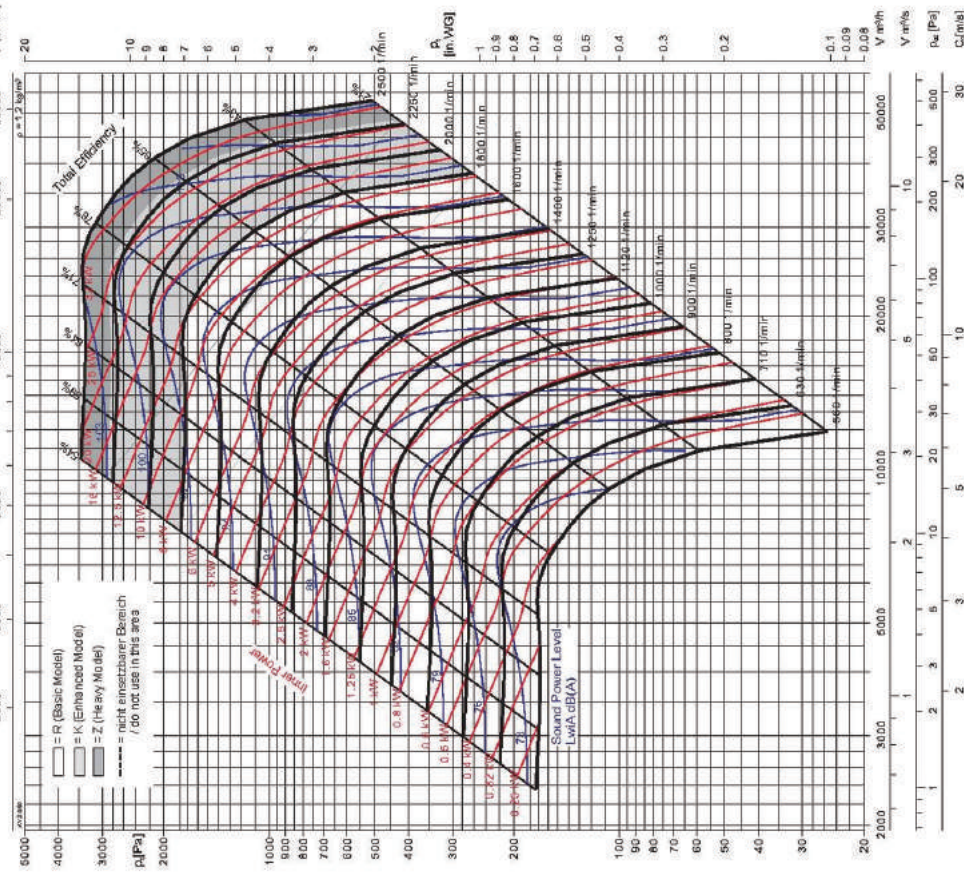
**Kennlinie**  
Performance curve

**AYZ 560**



Fan test laboratory AMCA 210/99 Fig. 12, 120000 cmh Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Type	Art.Nr.	Art.Nr.	Type	Laufdurchmesser	Wheeldiameter	D	mm
AYZ 05 560	168655	142	Schaufelzahl	number of blades	z	24	
AYZ 07 560	168657	171	Massenträgheitsmoment	moment of inertia	J	84,619	kgm <sup>2</sup>
			Gewicht	weight	G	142	kg
			Drehzahl maximal	speed /min	n <sub>max</sub>	2500	1/min

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90





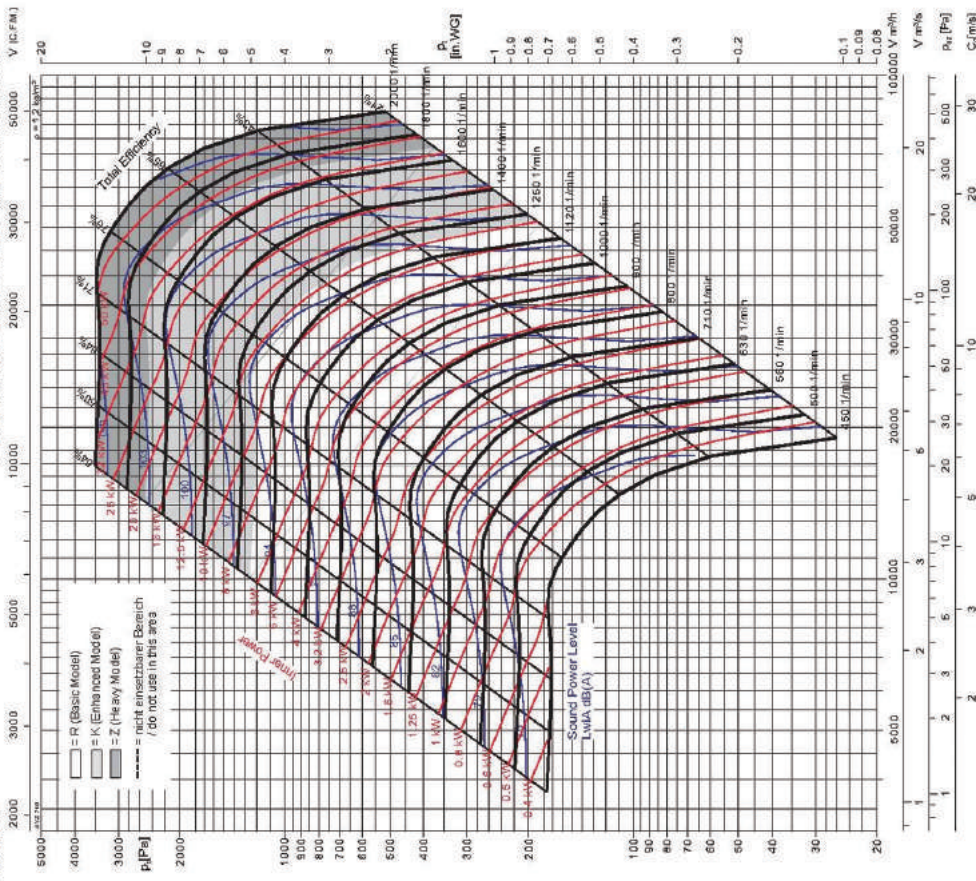
## Kennlinie Performance curve

AYZ 710



Fan test laboratory AMCA 210/69 Fig.12, 120000 cmm Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Type	Art.Nr.	Art.Nr.	Type	Laufradurchmesser	Wheal diameter	D =	mm
AYZ 05 710	168755	223		Schuldrzahl	number of blades	z =	24
AYZ 07 710	168757	271		Massenträgheitsmoment	moment of inertia	J =	271,3 kgm²
				Gewicht	weight	G =	274 kg
				Drehzahl maximal	speed limit	n <sub>max</sub> =	2000 1/min

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90



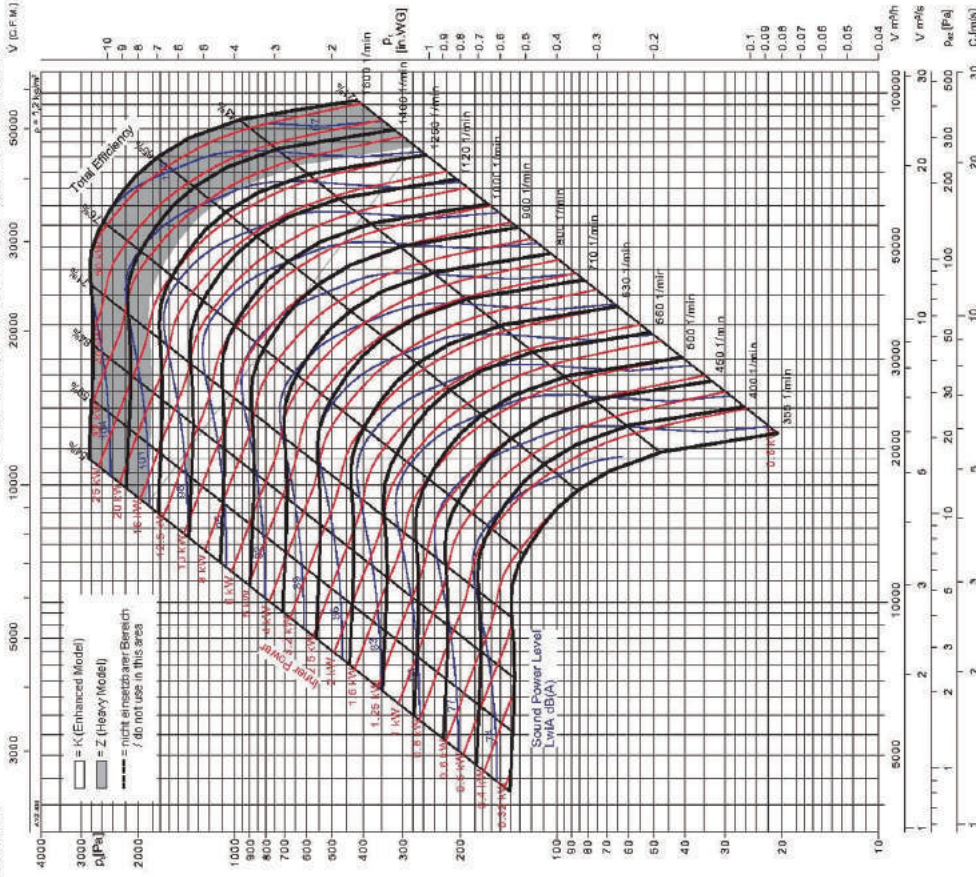
## Kennlinie Performance curve

AYZ 800



Fan test laboratory AMCA 210/69 Fig.12, 120000 cmm Test Chamber. Performance certified is for installation type B-Free inlet, Ducted outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWA sound power levels for installation Type B-Free inlet, ducted outlet.



Type	Art.Nr.	Art.Nr.	Type	Laufradurchmesser	Wheal diameter	D =	mm
AYZ 07 800	168807	300		Schuldrzahl	number of blades	z =	24
				Massenträgheitsmoment	moment of inertia	J =	357,01 kgm²
				Gewicht	weight	G =	300 kg
				Drehzahl maximal	speed limit	n <sub>max</sub> =	1600 1/min

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90





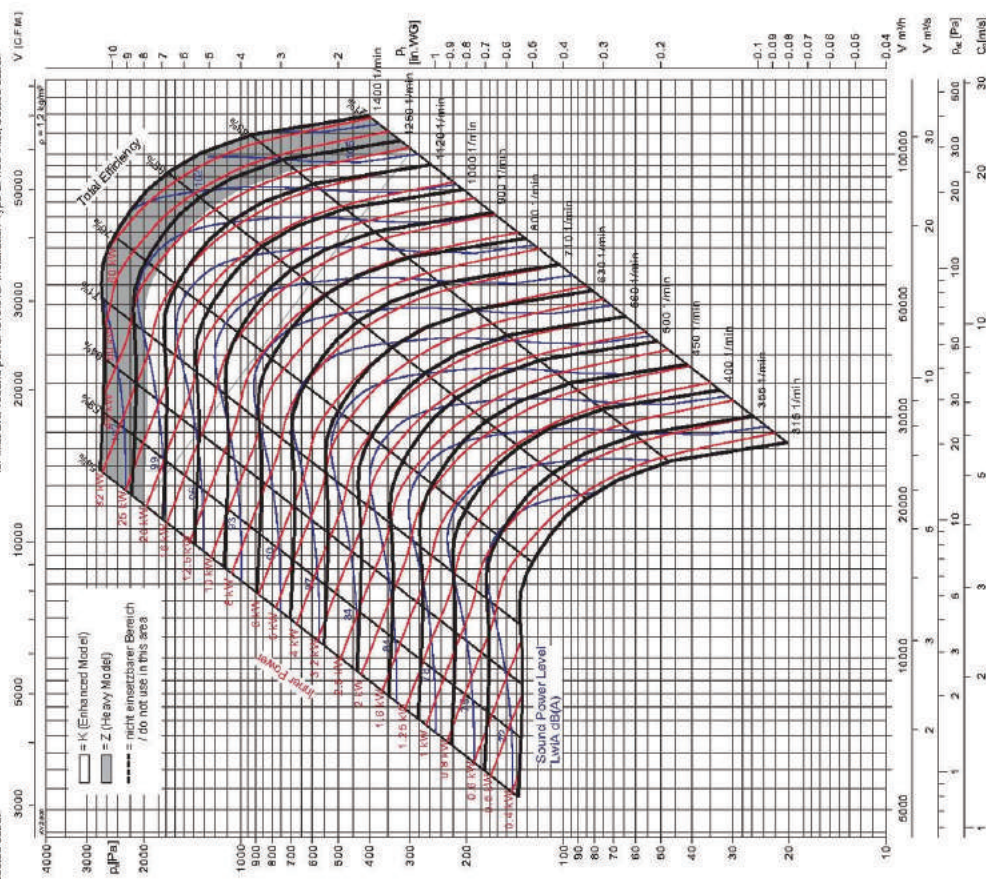
### Kennlinie

Performance curve

**AYZ 900**



Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of airpump(s) accessories). The A-weighted sound ratings shown have been calculated per AINCA International Standard 301. Values shown are for mid Low sound power levels for installation type B. Free inlet, ducted outlet.



	Type	Art.Nr.	kg		Type	Art.Nr.	kg	
	AVZ 07 900	108857	481,5					
Schneefläche					Laufrad Durchmesser	D = 900 mm		
Massenflächmoment					Anzahl der Blätter	Z = 24		
Gewicht					Massenflächmoment des Kettenrads	J = 622,62 kgm²		
Drehzahl maximal					Gewicht	G = 481,5 kg		
					Drehzahl maximal	n <sub>max</sub> = 1400 1/min		

Zeichenerklärung auf Seite / Explanation of symbols see page 90



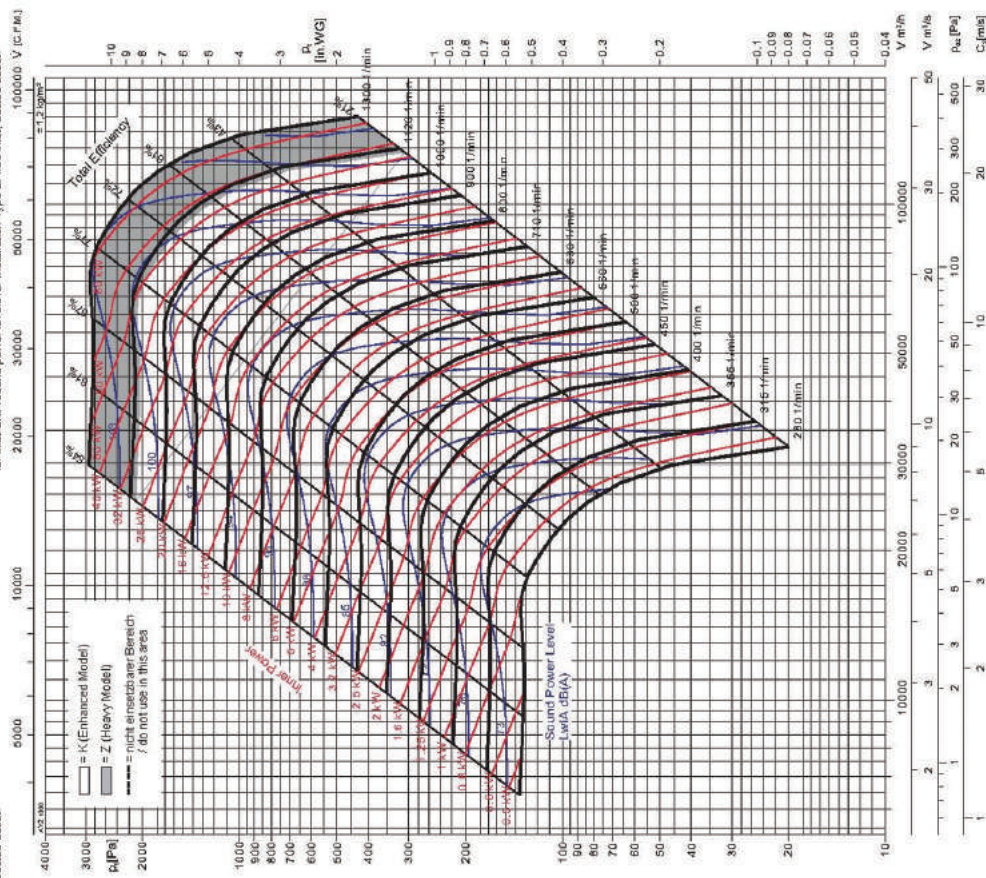
### Kennlinie

Performance curve

**AYZ 1000**



Power rating [kW] does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated for AICA International Standard 301. Values shown are for inlet Low sound power levels for installation Type B; see inlet, ducted outlet.



	Type	Art.Nr.	[kg]	Typ	Art.Nr.	[kg]	
	AVZ 07 1000	1899 07	5,30				
Laufraddurchmesser							D = 1012 mm
Schneidteilzahl							Z = 24
Messentaghtismoment							J = 911,4 kgm <sup>2</sup>
Gewicht							G = 53,0 kg
Drehzahl maximal							n <sub>max</sub> = 1500 1/min

Zeichenerklärung auf Seite 1 / Explanation of symbols see page 90

Zeichenerklärung auf Seite / Explanation of symbols see page 90

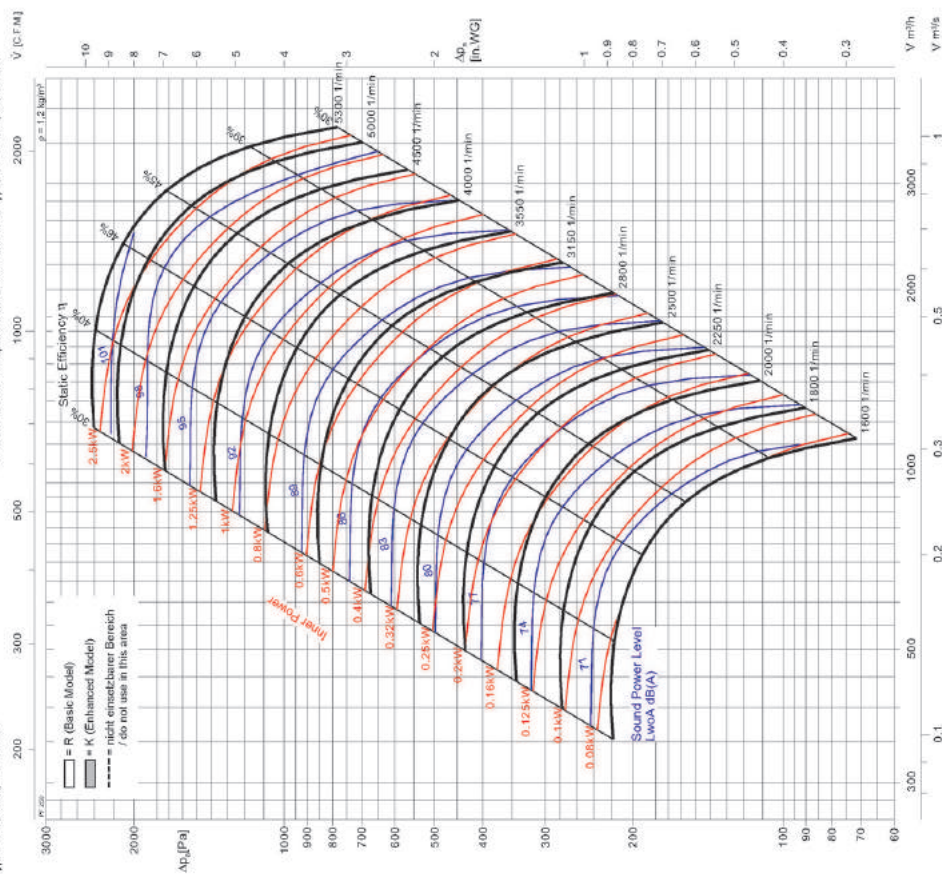




## PF 250

Fan test laboratory AMCA 210/99  
Fig. 12, 120000 cmh Test Chamber.  
Performance certified is for installation  
type A-Free inlet, Free outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of apertures (accessories). The A-weighted sound ratings shown have been calculated per IEC International Standard 301. Values shown are for ducted two sound power levels for installation Type A, free inlet, free outlet.

[illegible]

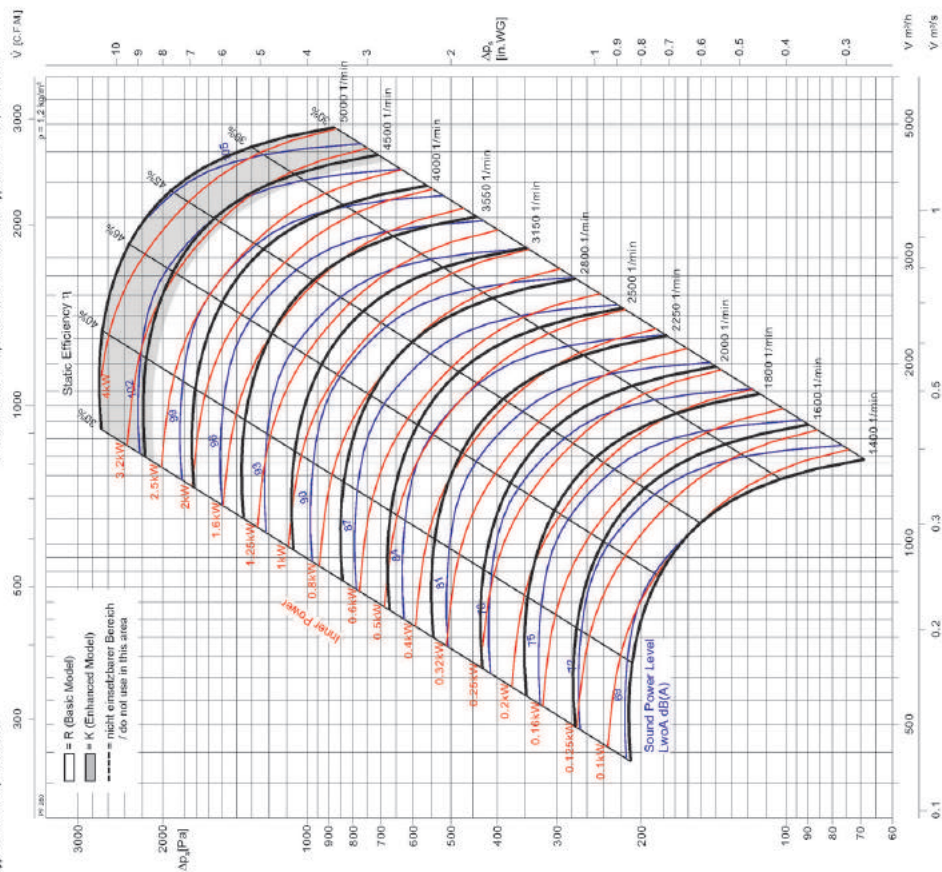
Explanation of symbols see page II



PF 280

Fan test laboratory AMCA 210/99  
Fig. 12, 120000 cfm Test Chamber.  
Performance certified for installation  
type A-Free inlet, Free outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of apertures (accessories). The A-weighted sound ratings shown have been calculated per AINCA International Standard 507. Values shown are for outlet 1, low sound power levels for installation Type A; free inlet, free outlet.

[illegible]

Explanation of symbols see page II









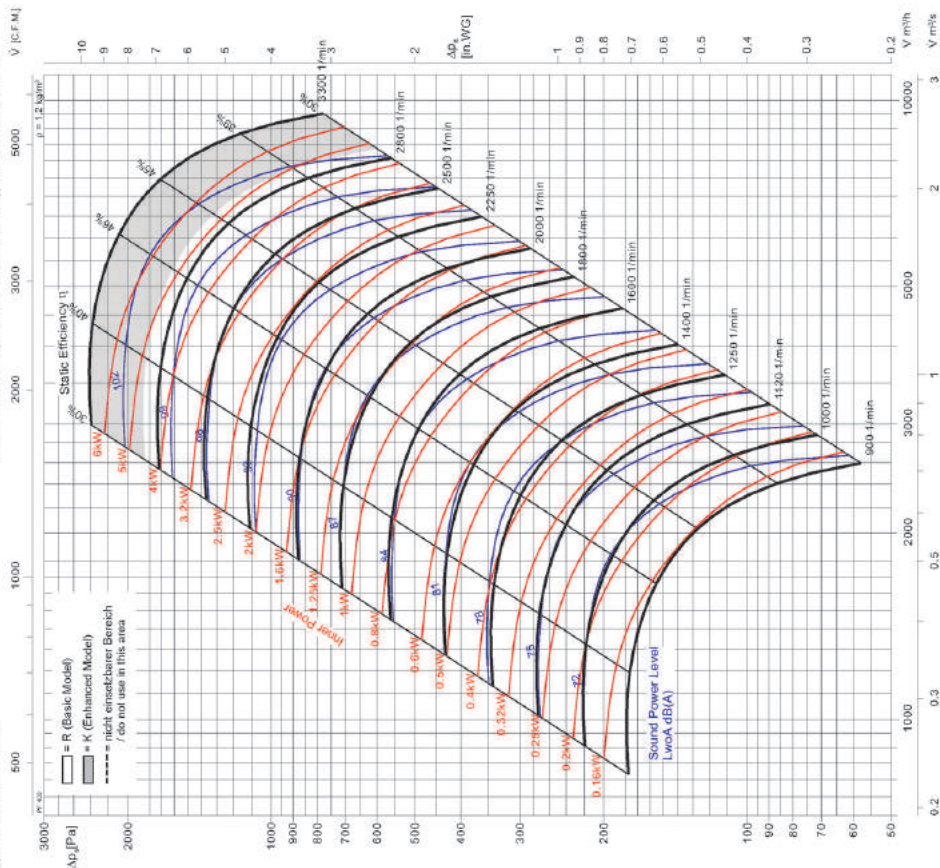
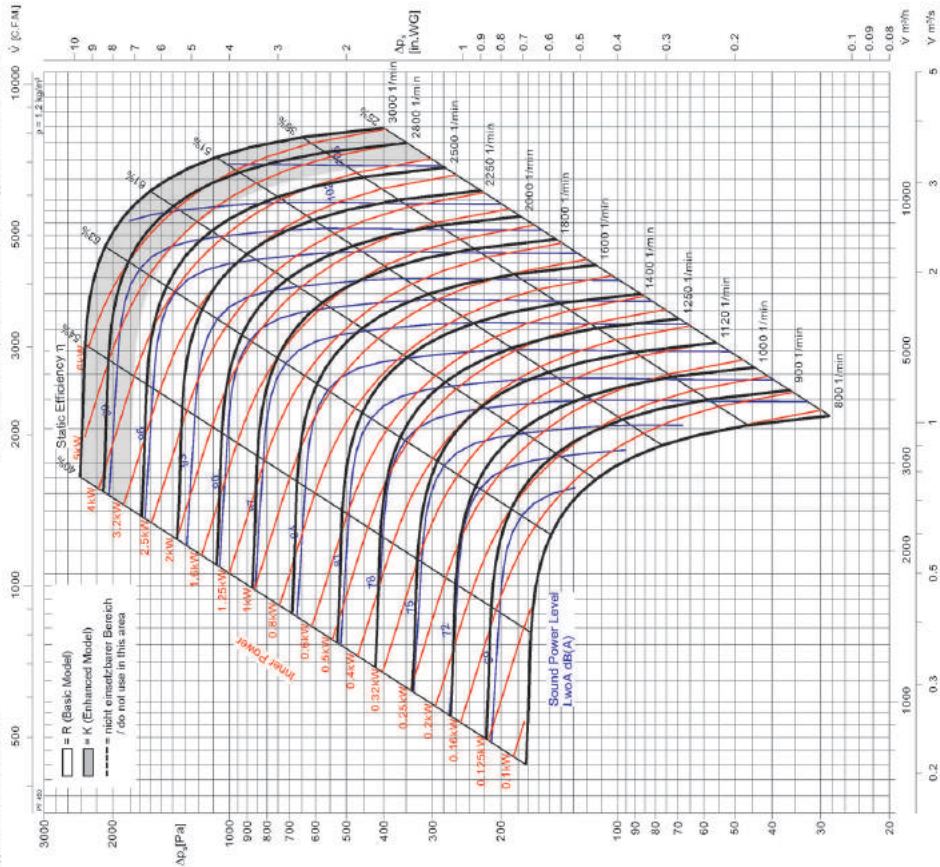
**PF 400**



### Performance Curve

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated per MCA International Standard 361. Values shown are for outflashed sound power levels for installation Type A: free inlet, free outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet TwoA sound power levels for installation Type A: free inlet, free outlet.

[illegible][illegible]



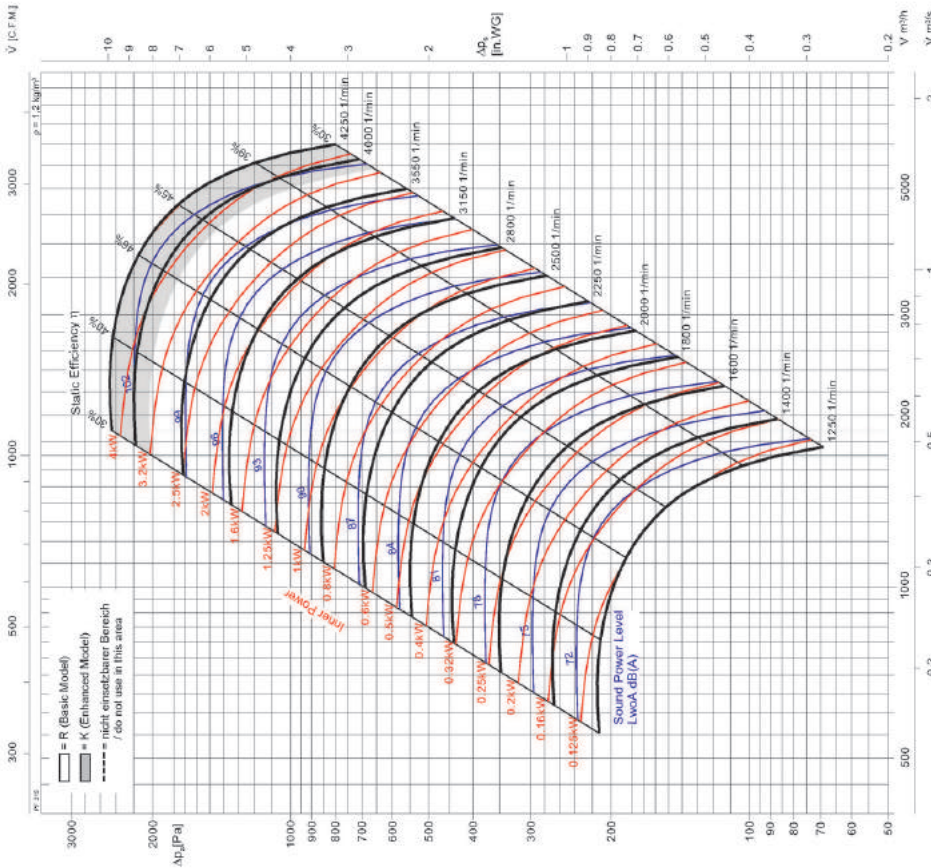


## Performance Curve

PF 315



For test laboratory AMCA 210/99  
Fig. 12, 120000 unit Test Chamber  
Performance certified is for installation  
type A-Free inlet, Free outlet.  
Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LeqA sound power levels for installation Type A, free inlet, free outlet.



Typ	Art.Nr.	kg	Typ	Art.Nr.	kg	Wheel diameter	D =	mm
PF 315	132315	-				Number of blades	z =	8
						Outlet Area	A =	0.0670 m²
						Impeller Weight	G =	kg
						Speed limit	n <sub>max</sub> =	4000 1/min

Explanation of symbols see page II

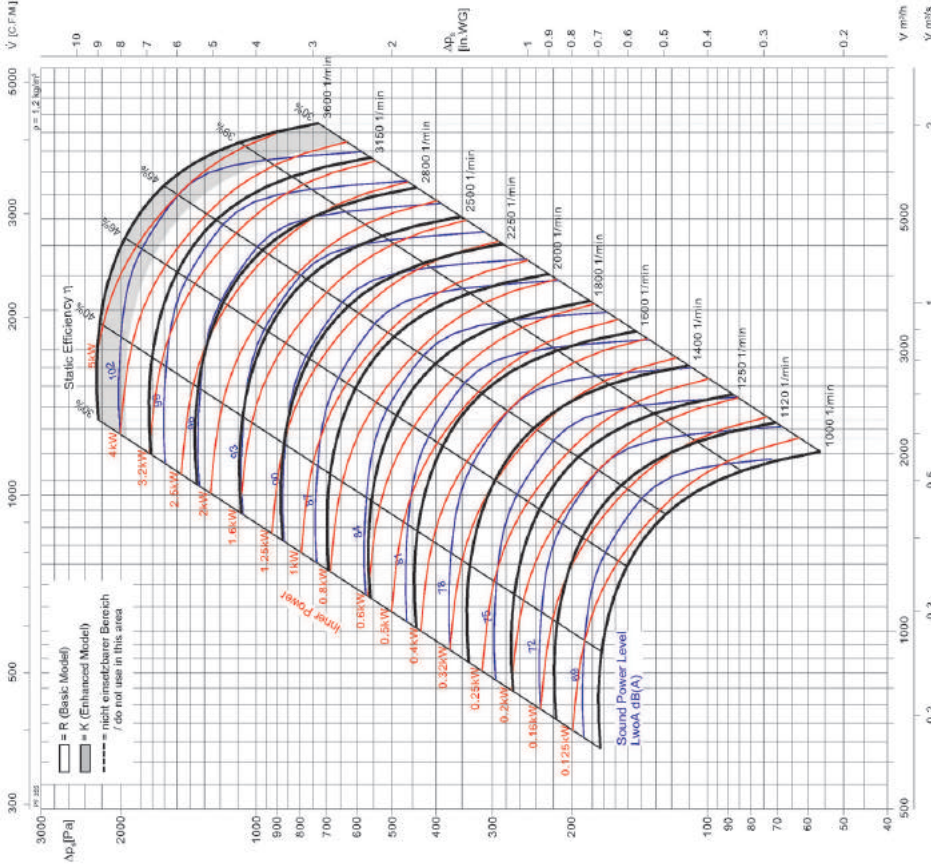


## Performance Curve

PF 355



For test laboratory AMCA 210/99  
Fig. 12, 120000 unit Test Chamber  
Performance certified is for installation  
type A-Free inlet, Free outlet.  
Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LeqA sound power levels for installation Type A, free inlet, free outlet.



Typ	Art.Nr.	kg	Typ	Art.Nr.	kg	Wheel diameter	D =	mm
PF 355	132355	-				Number of blades	z =	8
						Outlet Area	A =	0.1238 m²
						Impeller Weight	G =	kg
						Speed limit	n <sub>max</sub> =	3500 1/min

Explanation of symbols see page II

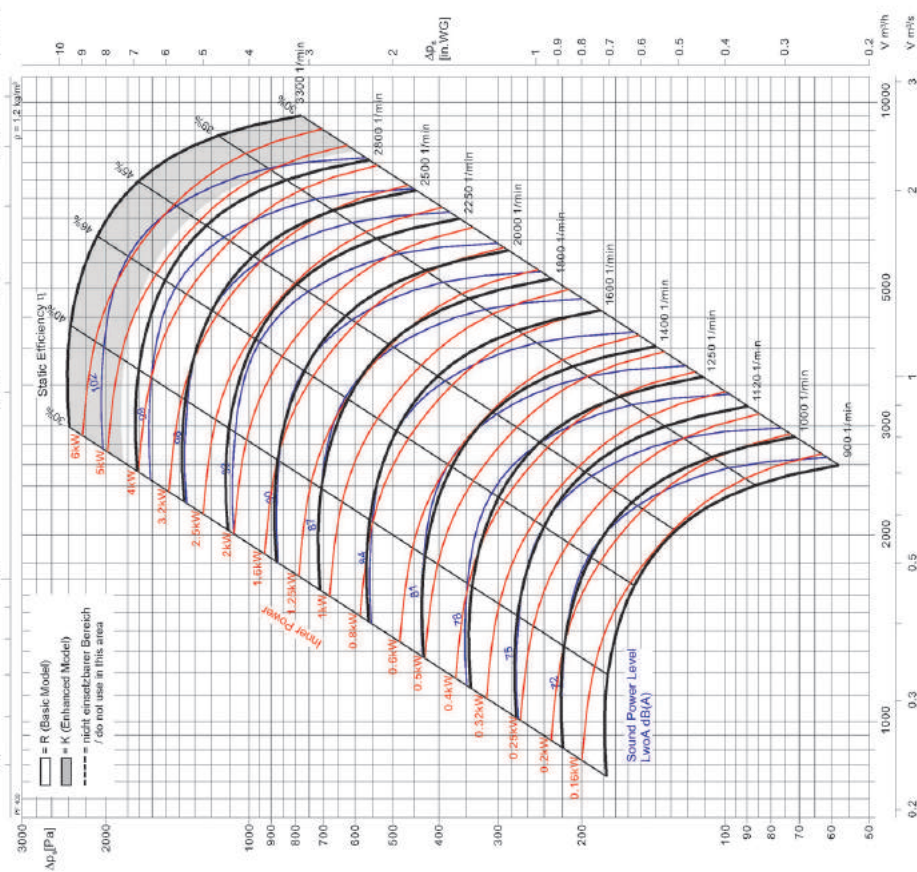




**PF 400**



$\dot{V}$ [C.F.M.]	500	1000	2000	3000	5000
$\dot{V}_1$ [C.F.M.]	500	1000	2000	3000	5000

[illegible]

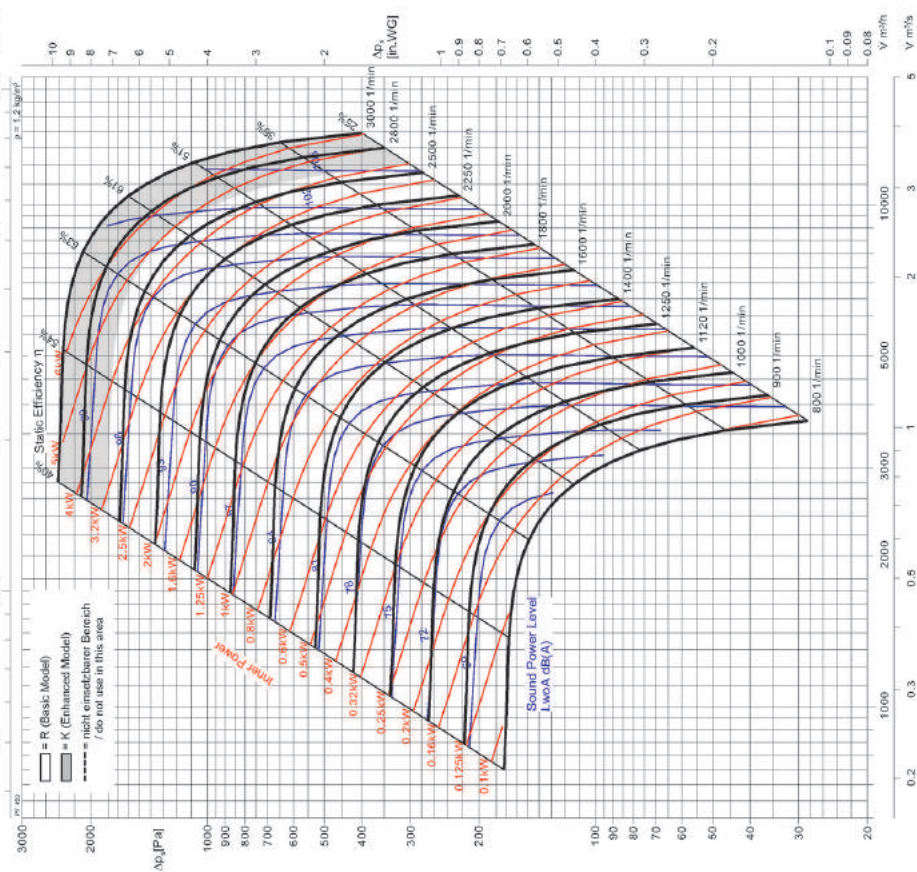
Explanation of symbols see page II



**PF 450**



	500	1000	2000	3000	5000	10000 $\dot{\gamma}$ [C.F.M]
(a)						
(b)						
(c)						
(d)						
(e)						
(f)						
(g)						
(h)						
(i)						
(j)						
(k)						
(l)						
(m)						
(n)						
(o)						
(p)						
(q)						
(r)						
(s)						
(t)						
(u)						
(v)						
(w)						

[illegible]

Explanation of symbols see page II





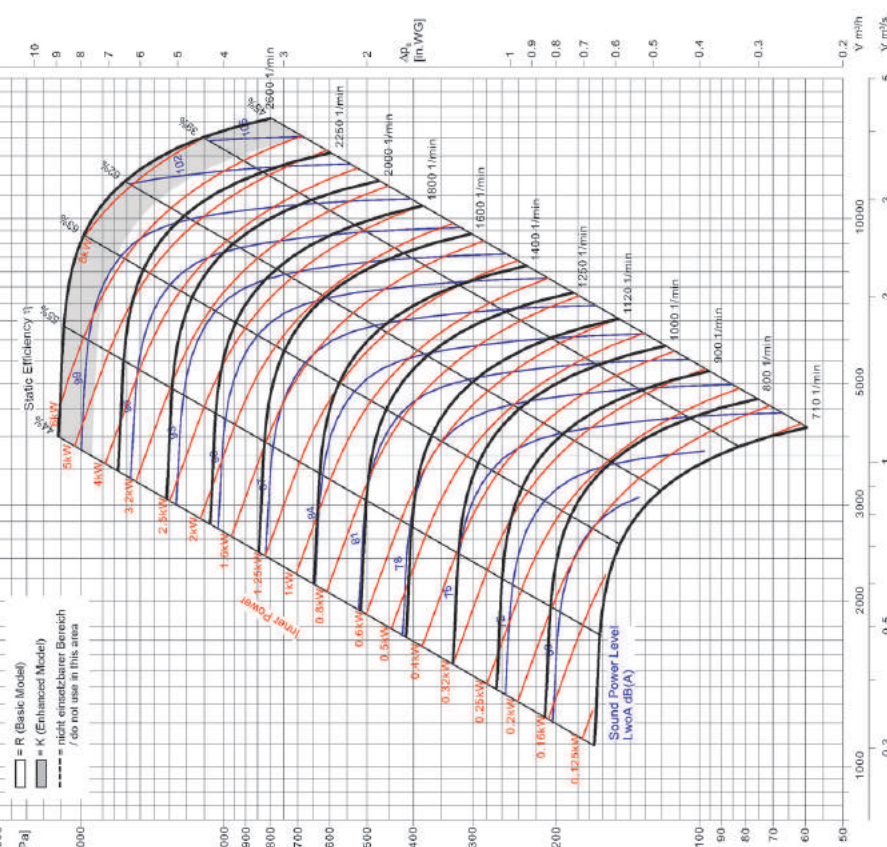
### Performance Curve

**PF 500**



Fan test laboratory AMCA 210/99  
Fig. 12, 120000 cmh Test Chamber.  
Performance certified is for installation  
type A-Free inlet, Free outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated per IEC 60335-2-100. Values shown are for our standard sound power levels for installation type A, free inlet, free outlet.

[illegible]

Explanation of symbols see page II



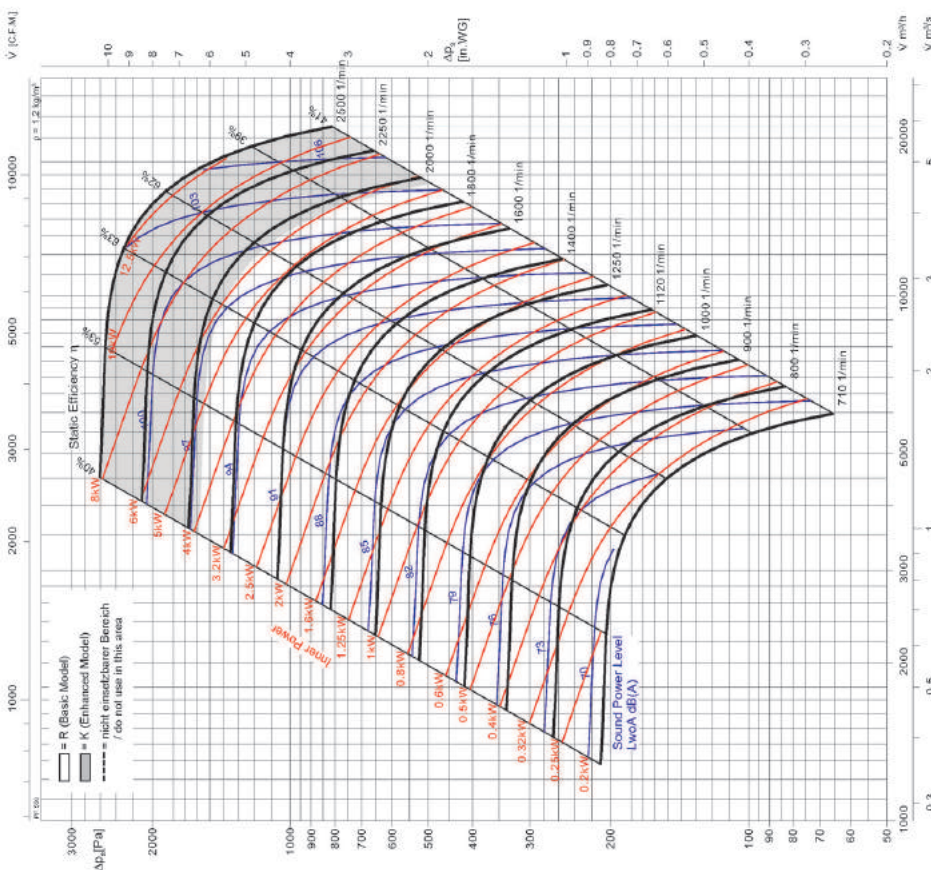
### Performance Curve

**PF 560**



Fan test laboratory AMCA 210/99  
Fig. 12, 120000 cfm Test Chamber.  
Performance certified is for installation  
type A-Free inlet, Free outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated per AFCA International Standard 507. Values shown are for outlet Low sound power levels for installation Type A, free inlet, free outlet.

[illegible]

Explanation of symbols see page II

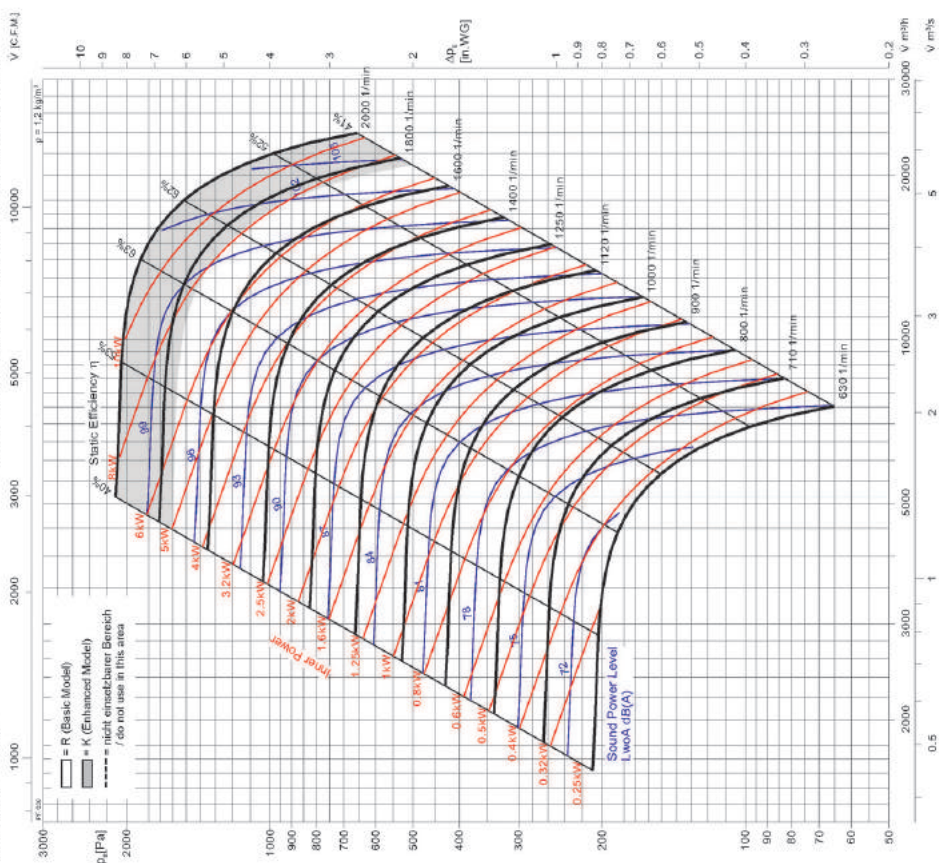




## PF 630

Fan test laboratory AMCA 210/99  
Fig 12, 120000 cmh Test Chamber.  
Performance certified is for installation  
type A-Free inlet, Free outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for our full-load sound power levels for installation Type A, free inlet, free outlet.

[illegible]

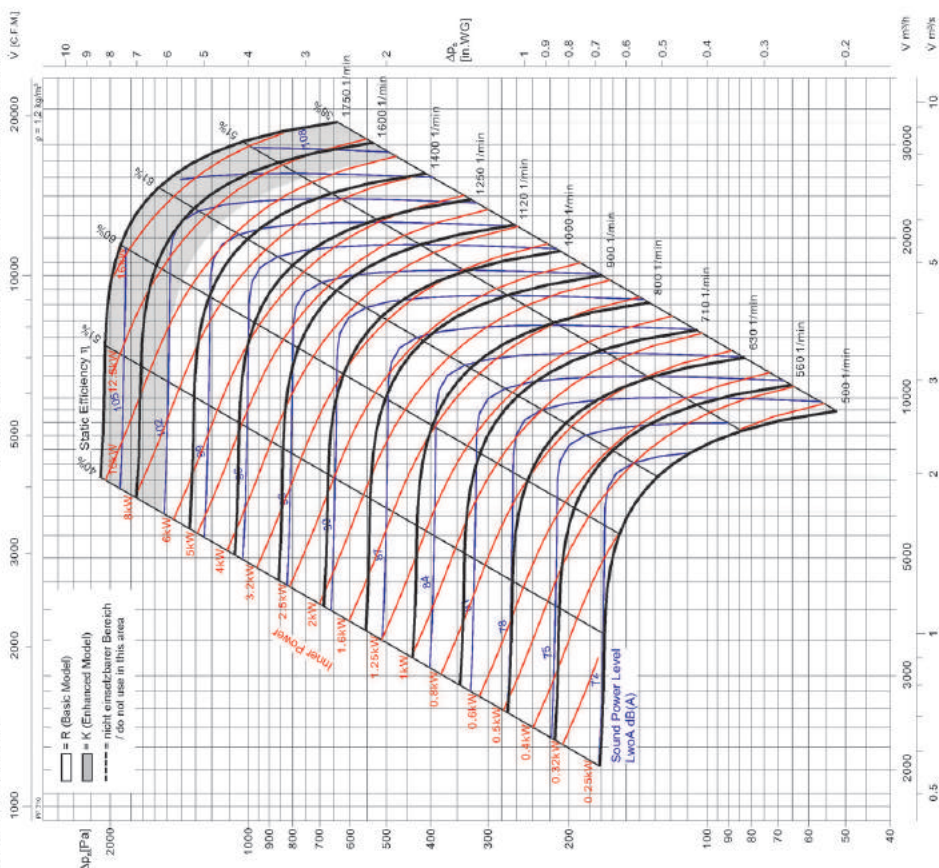
Explanation of symbols see page II



## PF 710

Fan test laboratory AMCA 210/99  
Fig. 12, 120000 cfm Test Chamber.  
Performance certified is for installation  
type A-Free inlet, Free outlet.

Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appliances (accessories). The A-weighted sound ratings shown have been calculated per MICA International Standard 301. Values shown are for our full two-octave power levels for installation Type A; first inlet, free outlet.

[illegible]

Explanation of symbols see page II

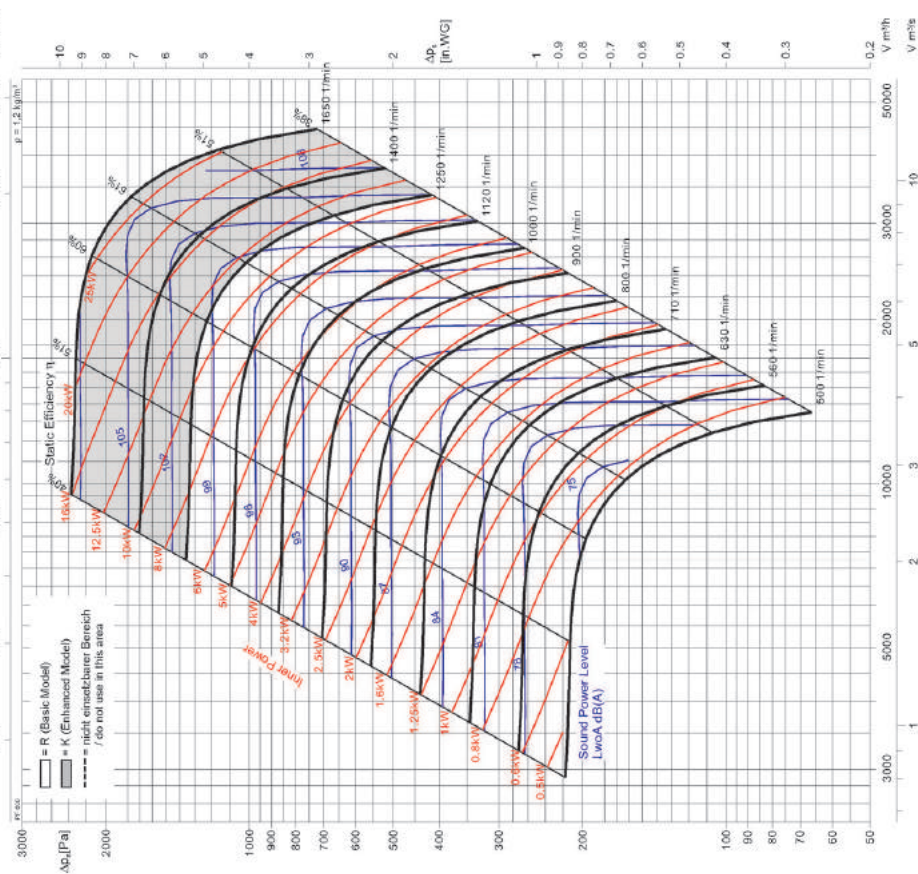




## Performance Curve

### PF 800

For test laboratory AMCA 210/99  
Fig. 12, 120000 unit Test Chamber  
Performance certified is for installation  
type A-Free inlet, Free outlet.  
Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet Leq sound power levels for installation Type A, free inlet, free outlet.



Type	Art.Nr.	Art.Nr.	Typ	Wheel diameter	D = 800 mm
PF 800	132800	-		Number of blades	z = 8
				Outlet Area	A = 0.6183 m²
				Impeller Weight	G = - kg
				Speed limit	n <sub>max</sub> = 1400 1/min

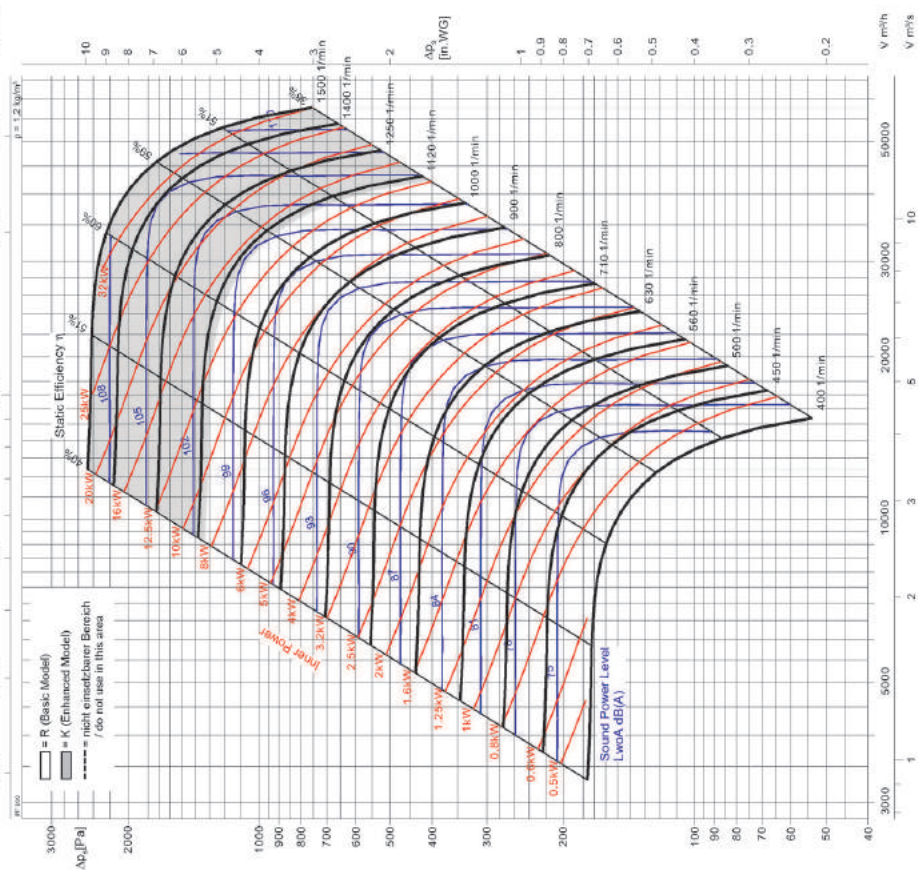
Explanation of symbols see page II



## Performance Curve

### PF 900

For test laboratory AMCA 210/99  
Fig. 12, 120000 unit Test Chamber  
Performance certified is for installation  
type A-Free inlet, Free outlet.  
Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet Leq sound power levels for installation Type A, free inlet, free outlet.



Type	Art.Nr.	Art.Nr.	Typ	Wheel diameter	D = 900 mm
PF 900	132800	-		Number of blades	z = 8
				Outlet Area	A = 0.7804 m²
				Impeller Weight	G = - kg
				Speed limit	n <sub>max</sub> = 1250 1/min

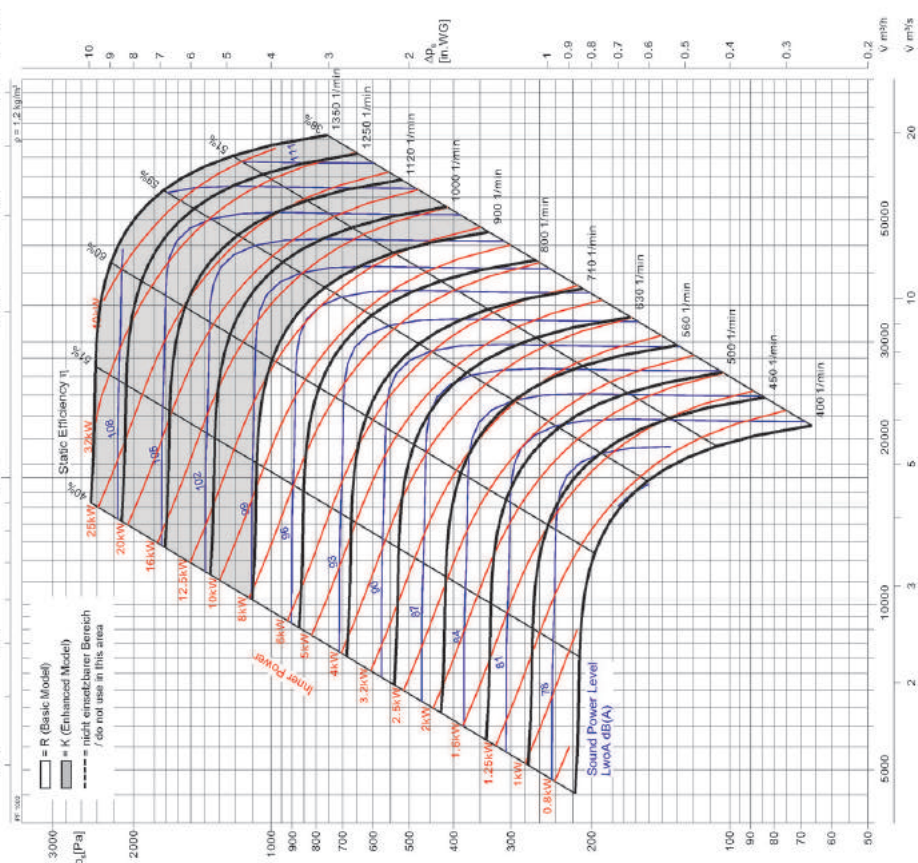
Explanation of symbols see page II



## PF 1000



Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of accessories (accessories). The A-weighted sound ratings shown have been calculated per AMCA International Standard 30.1. Values shown are for outlet LWd sound power levels for installation Type A, free inlet, free outlet.

[illegible]

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