Page 1

Standard Series
Size: 4

Calculation of external available Pressure

Air flow volume	[m³/h]	4000	6000	8000	10000	11000	12000	13000	14000	15000	16000	17000	19000	21000	23000

1. Step

1. Criterion flow velocity (Ref. 20°C)

Do not design units in conditions acc. to white areas!

Supply Unit with air conditioning elements:

Flow velocity related to ***Cross section of filter (long)***	[m/s]	0,79	1,19	1,59	1,98	2,18	2,38	2,58	2,77	2,97	3,17	3,37	3,76		
Flow velocity related to ***Finned surface of heater***	[m/s]	0,85	1,27	1,70	2,12	2,33	2,54	2,76	2,97	3,18	3,39	3,60	4,03	4,45	
Flow velocity related to ***Finned surface of cooler***	[m/s]	0,89	1,33	1,78	2,22	2,44	2,67	2,89	3,11	3,33	3,56	3,78			

Extract Unit without air conditioning elements:

Flow velocity related to ***Inner cross section of unit***	[m/s]	0,69	1,04	1,38	1,73	1,90	2,07	2,25	2,42	2,59	2,76	2,94	3,28	3,63	3,97

2. Step

Calculation of external available statical air pressure by deduction of internal pressure losses

Deduct the respective pressure losses of needed elements from available stat. pressure of fan!

2. Pressure Calculation

Available statical pressure [Pa] at rated voltage
without consideration of pressure regain!

Ventilator Unit	VN 406	1130	1080	978	773	617	416	165							
	VN 407	1100	1017	937,5	838	773,6	695,5	600,9	486,9	350,5	189				
	VN 409	1379	1342	1302	1250	1216	1177	1129	1073	1007	930	841	622	342	
	VN 410	769	665	531	374	288	200	109							
	VN 411	1029	998	939	854	803	747	687	623	555	484	411	259	102	
	VN 412	1312	1290	1254	1204	1174	1141	1105	1066	1025	981	935	837	732	621
	VN 413	1468	1449	1419	1377	1351	1323	1292	1258	1221	1182	1139	1045	940	823

The following air conditioning elements reduce pressure available!

Pressure loss [Pa] at above statet air volume

Pocket filter F5	Calculated resistance	108	113	117	122	125	128	130	133	136	139	142	148		
Short filter (195 mm pocket)	Clean resistance	16	25	35	45	50	55	61	66	72	78	84	96		

Recommended final resistance: 200 - 300 Pa

To ensure long filter life time please dimension the unit with consideration of „Calculated resistance“

Pocket filter F5	Calculated resistance	103	106	110	115	118	121	125	128	132	136	141			
Long filter (600 mm pocket)	Clean resistance	6	12	20	30	36	42	49	56	64	72	81			

Recommended final resistance: 200 - 300 Pa

Pocket filter F7	Calculated resistance	113	121	129	139	144	149	154	160	165	171				
Long filter (600 mm pocket)	Clean resistance	26	42	59	77	87	98	108	119	131	143				

Recommended final resistance: 200 - 300 Pa

Pocket filter F9	Calculated resistance	168	178	189	200	206	213	219	226	232					
Long filter (600 mm pocket)	Clean resistance	35	56	77	100	113	125	138	151	165					

Recommended final resistance: 300 - 400 Pa

Air Heater LW	LW 1	4	7	12	17	20	24	27	31	34	38	42	51	60	
Medium: PWW (pump circulated hot water)	LW 2	7	13	21	31	36	42	48	54	61	68	76	91	108	
	LW 3	11	22	35	51	60	70	80	90	101	113	125	150	178	

Subtotal
External statical pressure [Pa] available

Page 2

Standard Series
Size: 4

Calculation of external available Pressure

Air Flow Volume	[m³/h]	**4000**	**6000**	**8000**	**10000**	**11000**	**12000**	**13000**	**14000**	**15000**	**16000**	**17000**	**19000**	**21000**	**23000**

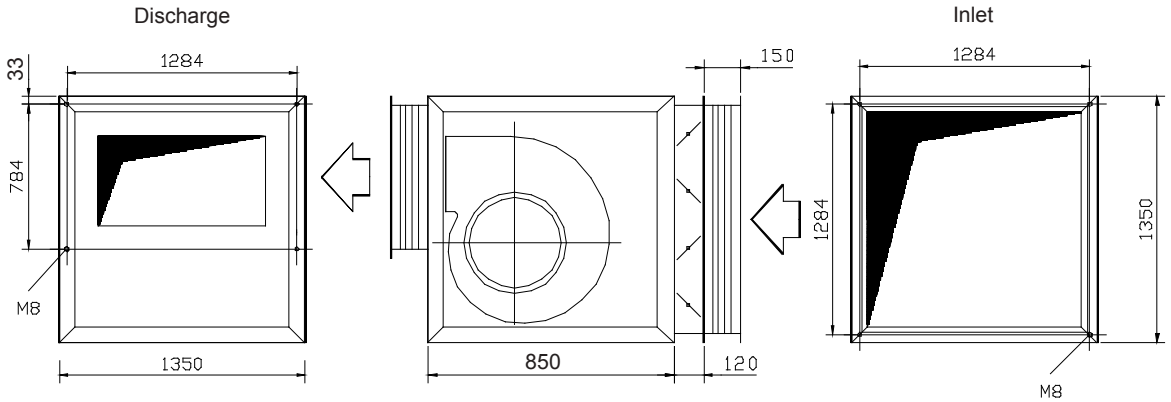
2. Pressure calculation *The following air conditioning elements reduce pressure available!*

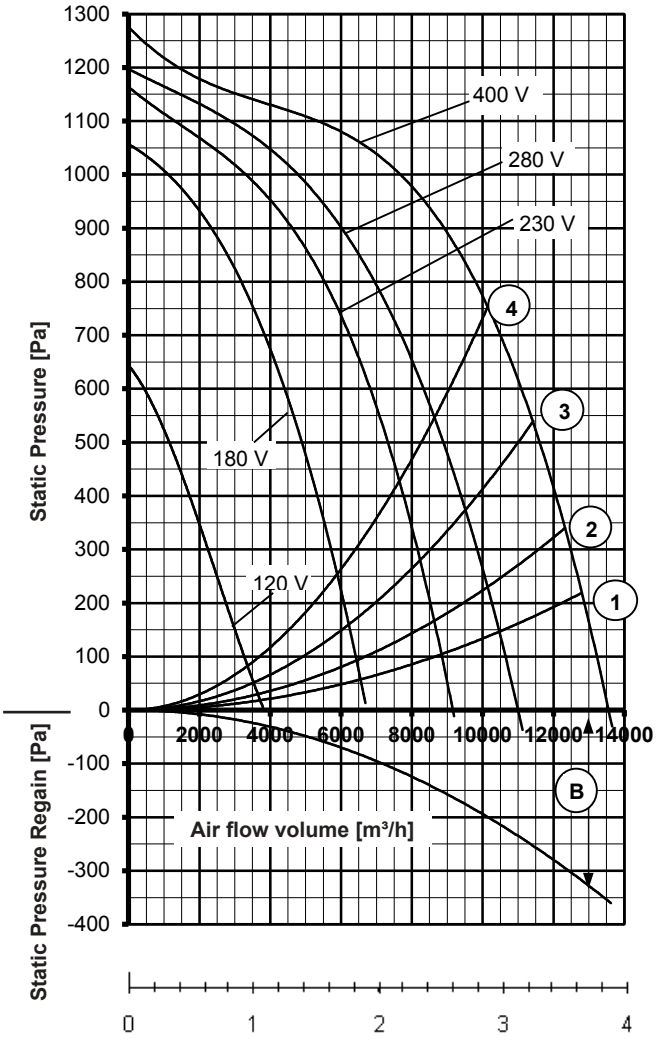
Calculation of external available statical air pressure by deduction of internal pressure losses

Deduct the respective pressure losses of needed elements from available stat. pressure of fan!

Subtotal of page before of external available statical pressure [Pa]															
		Pressure loss [Pa] at above stated air volume													
Air Cooler LK and LKV	LK 2	16	31	49	71	84	97	110	125	140	156	172			
Medium. chilled water KKW	LK 4	20	39	64	93	109	126	145	164	184	205	227			
	LK 6	24	47	77	113	134	155	178	202	227	253	281			
Water Eliminator		3	6	10	15	18	22	25	29	33	37	41			
Damper	class type A	1	2	3	4	5	6	6	7	8	9	10	12	14	16
	class type B	3	6	11	15	18	21	24	27	30	34	37	45	53	62
		Pressure losses to be taken into consideration only with damper on inlet side.													
Luftmischermodule	class type A	1	2	3	4	5	6	6	7	8	9	10	12	14	16
LJ, LM, CLM	class type B	3	6	11	15	18	21	24	27	30	34	37	45	53	62
		Pressure losses to be taken into consideration only with air mixer on inlet side.													
	Unit length														
Attennuator SD	850 mm	1	2	4	6	8	9	11	12	14	16	18	23	28	33
	1350 mm	1	3	5	8	10	11	13	15	18	20	23	29	35	42
	1750 mm	2	3	6	10	12	14	16	19	22	25	28	35	42	51
	2250 mm	2	4	7	11	14	16	19	22	25	29	32	41	50	59
Plate heat Exchange APD with integrated Bypass resistance calculated at 22°C/30% r. H.		on request													
Coarse Filter GF	clean resistance	29	57	93	136	160	189								
		Regularly cleaning required!													
Activated Carbon Filter Calculated resistance same than clean resistance		31	60	97	140										
Electric Air Heater LE	LE 48	12	19	27	35	39	43	48	52	57	61	66	75		
Operating voltage 400V/50Hz	LE 95	14	23	32	42	47	52	58	63	69	74	80	91		
	LE 143	16	25	36	47	53	58	64	70	76	83	89	102		
Total External statical pressure [Pa] available															

2. Step





Average Discharge-Air-Velocity $\bar{v}$ [m/s] related to standard connection size B

Max. permissable Air Inlet Temperature:
Below system curve (1): do not operate in this area!
Above system curve (1) to (2): 30°C
Above system curve (2) to (3): 40°C
Above system curve (3) to (4): 50°C
Above system curve (4): 60°C

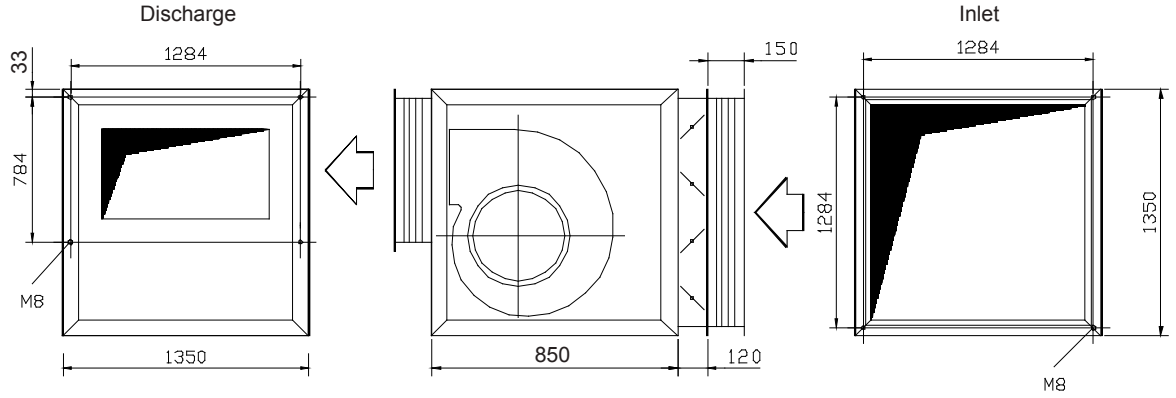
The data for external static pressure take into account all pressure losses due to integration of the fan within unit. Performance based upon free inlet and discharge.
Max. power consumption 9,2 kW
Max. current consumption 17,9 A
I_A / I_N: 2,9
Static Pressure Regain (B) can be read from the performance curve. It is available when the unit is fitted with a straight discharge duct, sized according to the standard connection size B. Minimum duct length neccessary: 3,5 m

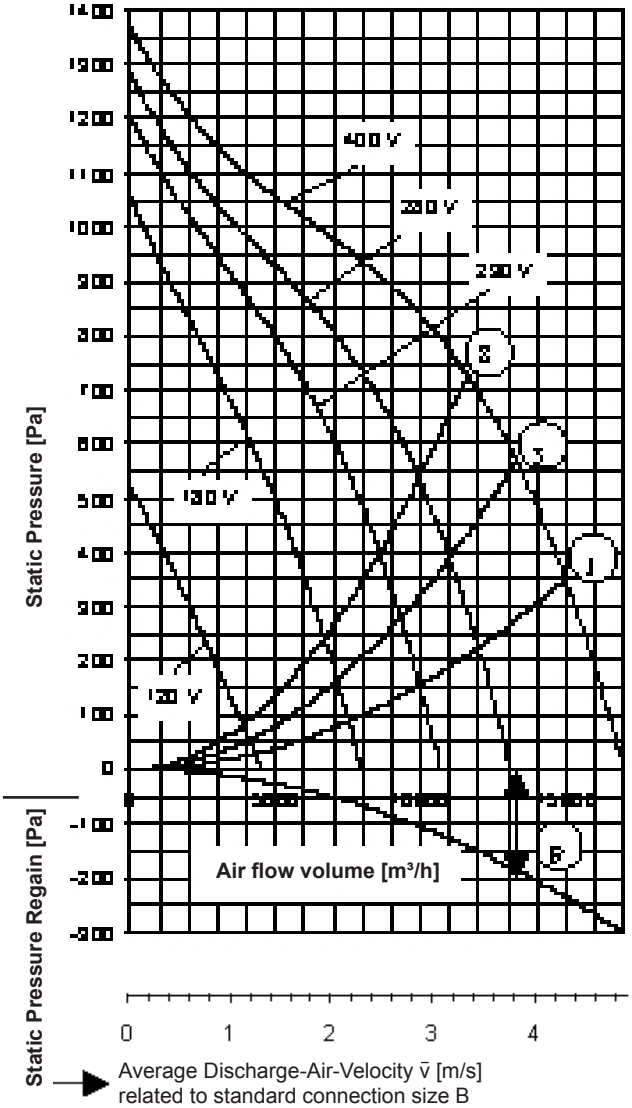
Voltage [V]	At free air [m³/h] and [A]	External static pressure Δ pst [Pa] available for AHU and system pressure losses						
		200	400	600	800	1000	1100	1200
		1. line: Air Flow Volume V_L [m³/h] bei ρ = 1,2 kg/m³ **2. line: Current consumption [Pa]**						
120	3825 **11,73**	2750 **10,78**	1720 **9,93**					
180	6725 **16,93**	6080 **15,46**	5330 **13,88**	4410 **12,14**	3185 **10,17**	1120 **7,73**		
230		8520 **17,18**	7765 **15,61**	6825 **13,81**	5535 **11,64**	3310 **8,68**	1305 **6,86**	
280		10260 **17,88**	9390 **16,38**	8335 **14,67**	6945 **12,58**	4785 **9,70**	2875 **7,53**	
400			12070 **16,88**	11095 **15,68**	9800 **14,24**	7675 **12,22**	5340 **10,51**	1410 **8,85**

Save power and even more silent with FISCHBACH SPEED CONTROLLERS

Voltage Control	Type	Order-No.
Stepless 0 - 100% and 100% - 0 *	FDR 200/3	6235
Stepwise, 5 Steps *	FDR 20/3	6177
FISCHBACH-AUTOMATIC-CONTROL *	FRA 200/3	6285
Frequency Inverter *	FFU 180	6314

* with integrated motor protection and outlet fuses



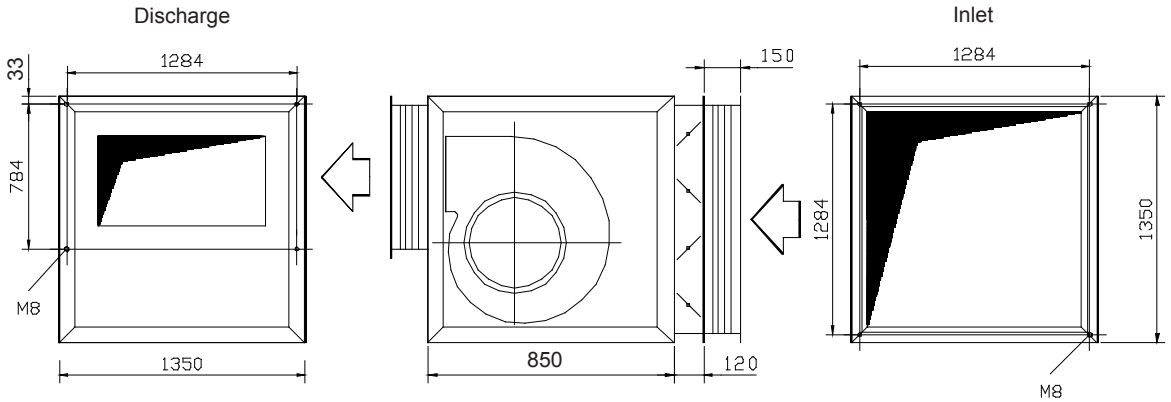


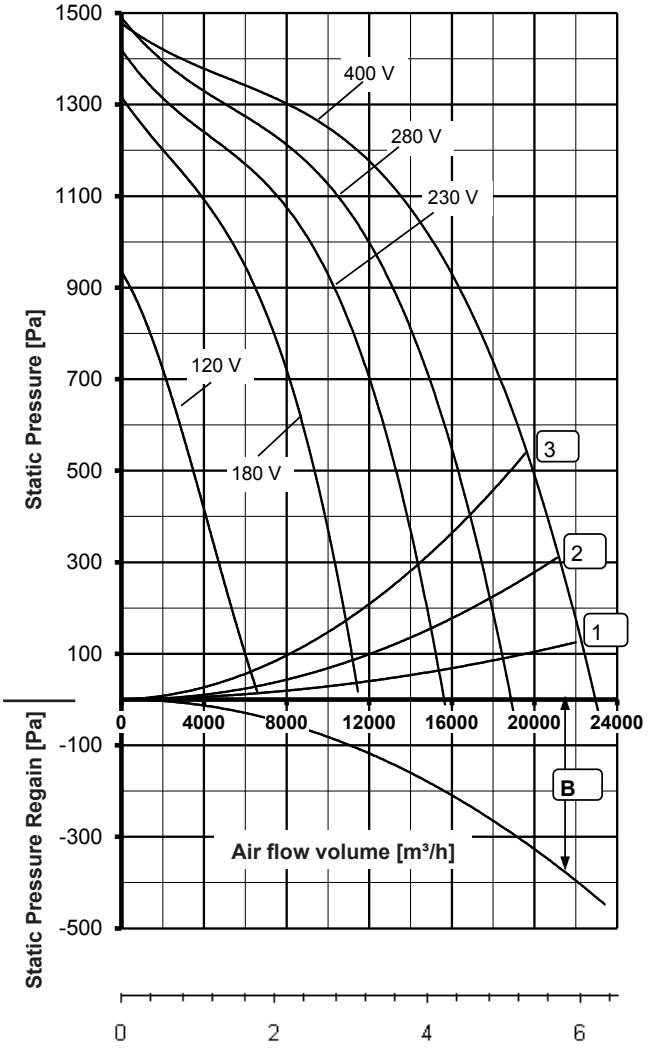
Max. permissable Air Inlet Temperature:
Below system curve (1): do not operate in this area!
Above system curve (1) to (2): 40°C
Above system curve (2) to (3): 50°C
Above system curve (3): 60°C

The data for external static pressure take into account all pressure losses due to integration of the fan within unit. Performance based upon free inlet and discharge.
Max. power consumption 10,0 kW
Max. current consumption 18,0 A
I_A / I_N: 2,8
Static Pressure Regain (B) can be read from the performance curve. It is available when the unit is fitted with a straight discharge duct, sized according to the standard connection size B. Minimum duct length neccessary: 3,5 m

Voltage [V]	At free air [m³/h] and [A]	External static pressure Δ pst [Pa] available for AHU and system pressure losses						
		200	400	600	800	1000	1100	1200
		1. line: Air Flow Volume V_L [m³/h] bei ρ = 1,2 kg/m³ **2. line: Current consumption [Pa]**						
120	4520 **11,07**	2895 **10,12**	1170 **9,39**					
180	7690 **15,77**	6945 **14,30**	5705 **12,69**	4160 **10,99**	2315 **9,39**			
230		9750 **16,76**	8600 **14,83**	7070 **12,60**	4965 **10,15**	3655 **8,98**	2310 **8,06**	
280			10950 **16,06**	9400 **13,90**	7110 **11,21**	5510 **9,68**	3720 **8,31**	
400			14700 **17,40**	13010 **15,43**	10610 **13,03**	8830 **11,57**	6445 **10,02**	4005 **8,92**

Save power and even more silent with FISCHBACH SPEED CONTROLLERS		
Voltage Control	**Type**	**Order-No.**
Stepless 0 - 100% and 100% - 0 *	FDR 200/3	6235
Stepwise, 5 Steps *	FDR 20/3	6177
FISCHBACH-AUTOMATIC-CONTROL *	FRA 200/3	6285
Frequency Inverter *	FFU 180	6314
* with integrated motor protection and outlet fuses		





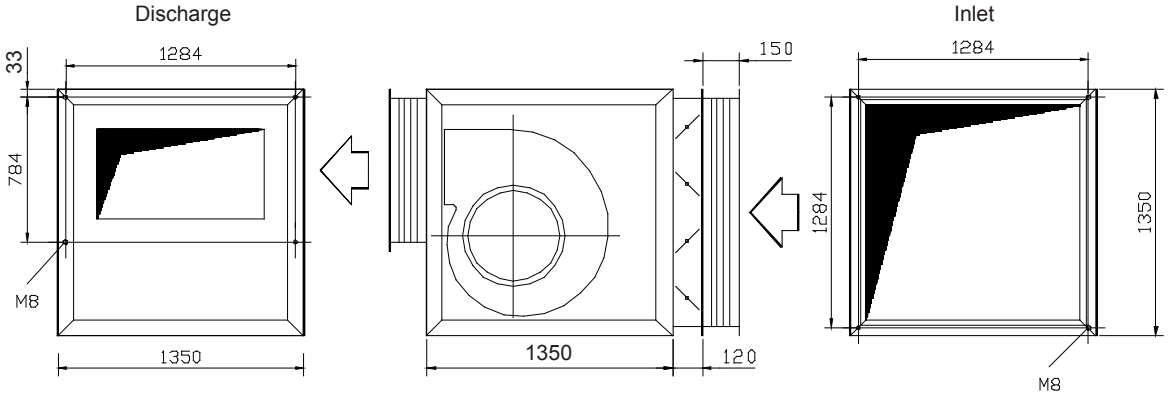
Average Discharge-Air-Velocity $\bar{v}$ [m/s] related to standard connection size B

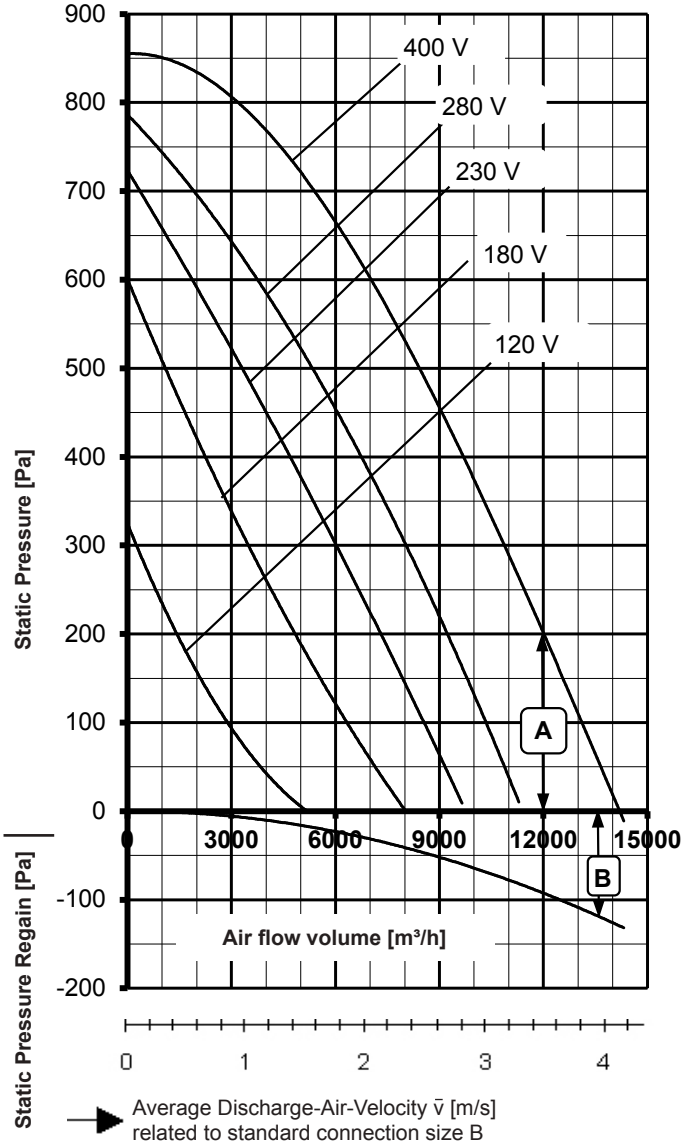
Max. permissable Air Inlet Temperature:
Below system curve (1): do not operate in this area!
Above system curve (1) to (2): 30°C
Above system curve (2) to (3): 40°C
Above system curve (3): 50°C

The data for external static pressure take into account all pressure losses due to integration of the fan within unit. Performance based upon free inlet and discharge.
Max. power consumption 20,0 kW
Max. current consumption 38,0 A
I_A / I_N: 2,8
Static Pressure Regain (B) can be read from the performance curve. It is available when the unit is fitted with a straight discharge duct, sized according to the standard connection size B. Minimum duct length neccessary: 3,5 m

Voltage [V]	At free air [m³/h] and [A]	External static pressure Δ pst [Pa] available for AHU and system pressure losses						
		200	400	600	800	1000	1100	1200
		1. line: Air Flow Volume V_L [m³/h] bei ρ = 1,2 kg/m³ **2. line: Current consumption [Pa]**						
120	6785 **23,10**	5335 **21,45**	4095 **19,96**	2840 **18,46**				
180	11520 **32,33**	10755 **30,12**	9865 **27,70**	8785 **24,99**	7385 **21,85**	5350 **18,00**		
230	15620 **37,35**	14800 **34,83**	13845 **32,05**	12700 **28,95**	11240 **25,36**	9140 **20,92**	7555 **18,11**	
280		17950 **35,90**	16895 **33,25**	15650 **30,31**	14100 **26,95**	11980 **22,89**	10480 **20,40**	8335 **17,37**
400		21855 **35,13**	20620 **33,00**	19175 **30,68**	17420 **28,10**	15095 **25,12**	13540 **23,39**	11435 **21,38**

Save power and even more silent with FISCHBACH SPEED CONTROLLERS		
Voltage Control	**Type**	**Order-No.**
Stepless 0 - 100% and 100% - 0 *	FDR 400/3	6237
Stepwise, 5 Steps *	FDR 40/3	6179
FISCHBACH-AUTOMATIC-CONTROL *	FRA 400/3	6287
Frequency Inverter *	on request	
* with integrated motor protection and outlet fuses		



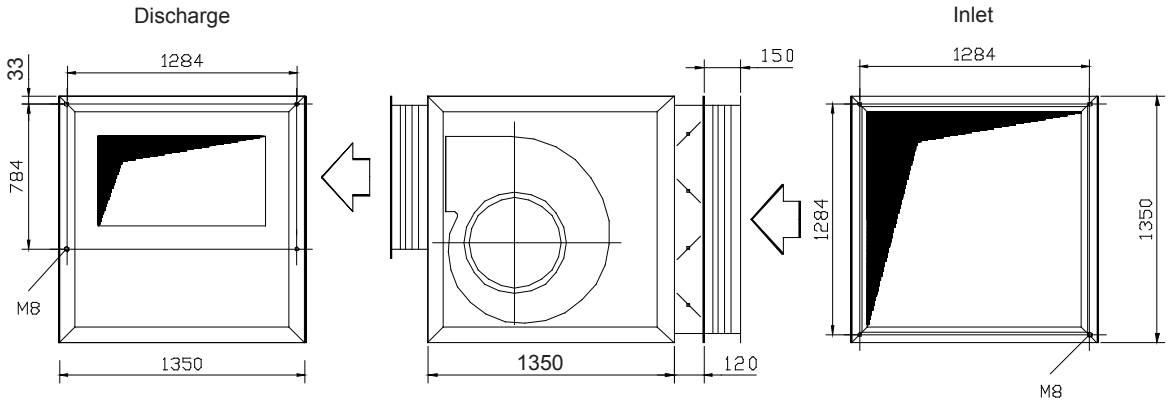


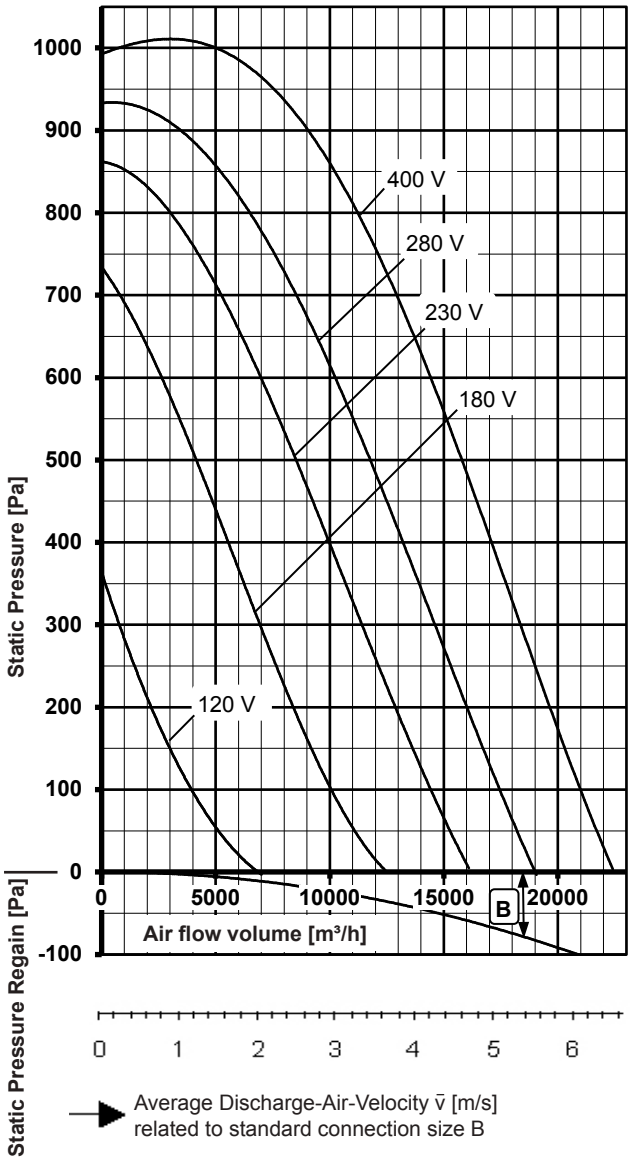
Max. permissable Air Inlet Temperature: 60°C

The data for external static pressure take into account all pressure losses due to integration of the fan within unit. Performance based upon free inlet and discharge.
Max. power consumption 3,7 kW
Max. current consumption 7,83 A
I_A / I_N: 1,9
Static Pressure Regain Ⓑ can be read from the performance curve. It is available when the unit is fitted with a straight discharge duct, sized according to the standard connection size B. Minimum duct length neccessary: 3,5 m

Voltage [V]	At free air [m³/h] and [A]	External static pressure Δ pst [Pa] available for AHU and system pressure losses						
		200	300	400	500	600	700	800
		1. line: Air Flow Volume V_L [m³/h] bei ρ = 1,2 kg/m³ **2. line: Current consumption [Pa]**						
120	5170 **4,50**	1425 **3,99**						
180	8020 **6,03**	4840 **5,61**	3490 **5,20**	2250 **4,79**	1195 **4,15**			
230	9760 **6,77**	7310 **6,38**	6025 **6,05**	4700 **5,63**	3310 **5,09**	1870 **4,42**		
280	11390 **7,16**	6230 **6,82**	8030 **6,56**	6750 **6,22**	5335 **5,78**	3750 **5,20**	1920 **4,41**	
400	14190 **7,83**	12005 **7,60**	10885 **7,45**	9690 **7,26**	8420 **7,04**	7025 **6,76**	5100 **6,39**	3200 **5,81**

Save power and even more silent with FISCHBACH SPEED CONTROLLERS		
Voltage Control	**Type**	**Order-No.**
Stepless 0 - 100% and 100% - 0 *	FDR 120/3	6233
Stepwise, 5 Steps *	FDR 11.3/3	6185
FISCHBACH-AUTOMATIC-CONTROL *	FRA 120/3	6283
Frequency Inverter *	FFU 80	6301
* with integrated motor protection and outlet fuses		



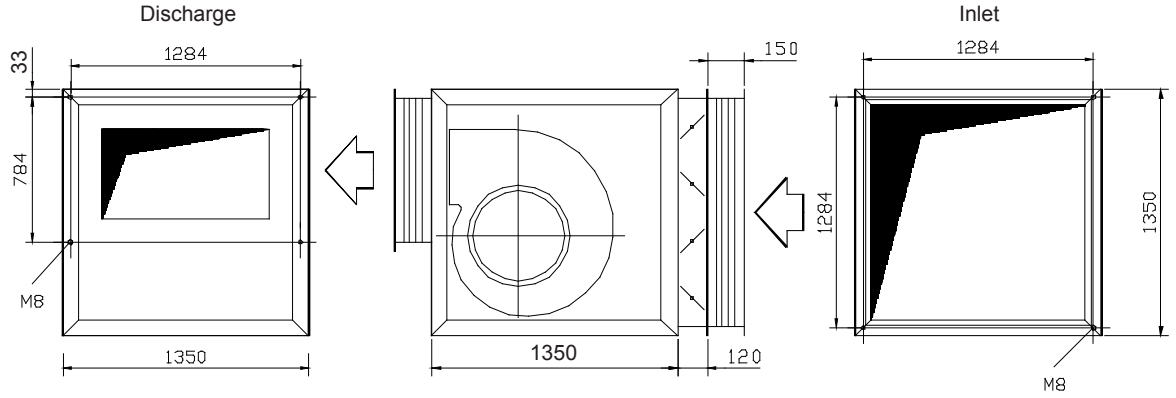


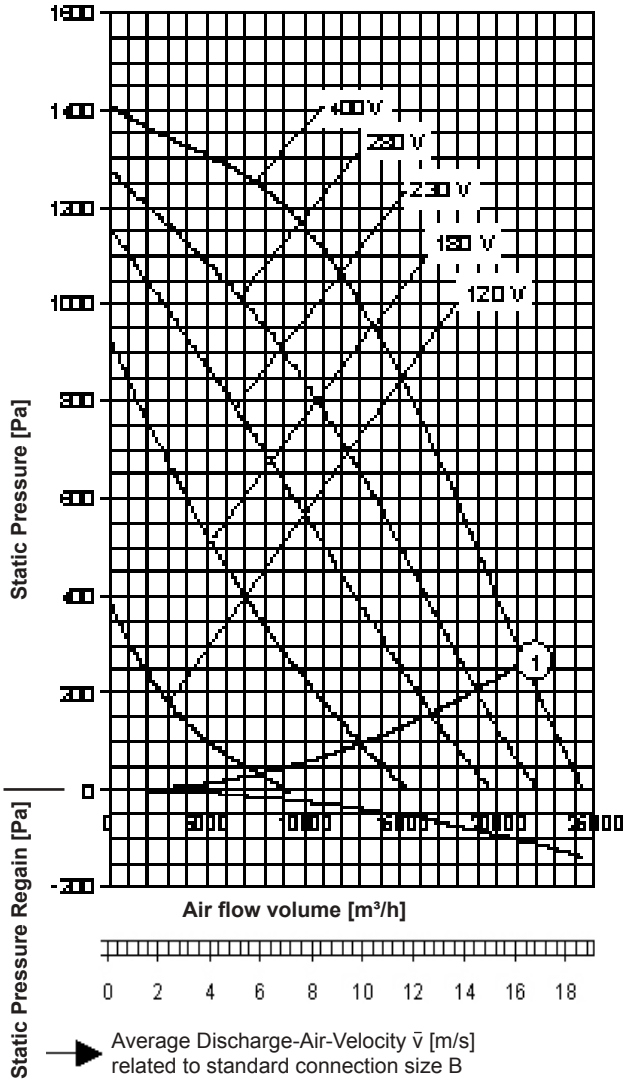
Max. permissable Air Inlet Temperature: 60°C

The data for external static pressure take into account all pressure losses due to integration of the fan within unit. Performance based upon free inlet and discharge.
Max. power consumption 7,9 kW
Max. current consumption 16,13 A
I_A / I_N: 2,9
Static Pressure Regain Ⓑ can be read from the performance curve. It is available when the unit is fitted with a straight discharge duct, sized according to the standard connection size B. Minimum duct length neccessary: 2,5 m

Voltage [V]	At free air [m³/h] and [A]	External static pressure Δ pst [Pa] available for AHU and system pressure losses						
		200	400	500	600	700	800	900
		1. line: Air Flow Volume V_L [m³/h] bei ρ = 1,2 kg/m³ **2. line: Current consumption [Pa]**						
120	6855 **10,80**	275 **10,16**						
180	12505 **14,67**	8400 **13,98**	5555 **12,64**	4150 **11,72**	2640 **10,53**			
230	16180 **16,13**	12875 **15,33**	9980 **14,17**	8525 **13,42**	6985 **12,52**	5250 **11,36**		
280	18955 **15,89**	16050 **15,37**	13215 **14,54**	11745 **13,98**	10200 **13,30**	8500 **12,44**	6510 **11,29**	
400	22305 **15,19**	19765 **14,84**	17155 **14,36**	15785 **14,05**	14344 **13,70**	12790 **13,27**	11050 **12,74**	8975 **12,04**

Save power and even more silent with FISCHBACH SPEED CONTROLLERS		
Voltage Control	**Type**	**Order-No.**
Stepless 0 - 100% and 100% - 0 *	FDR 200/3	6235
Stepwise, 5 Steps *	FDR 20/3	6177
FISCHBACH-AUTOMATIC-CONTROL *	FRA 200/3	6285
Frequency Inverter *	FFU 180	6314
* with integrated motor protection and outlet fuses		





(1) **at free air related to fan outlet area 0,373 m², Max. permissable Air Inlet Temperature: 50 °C**

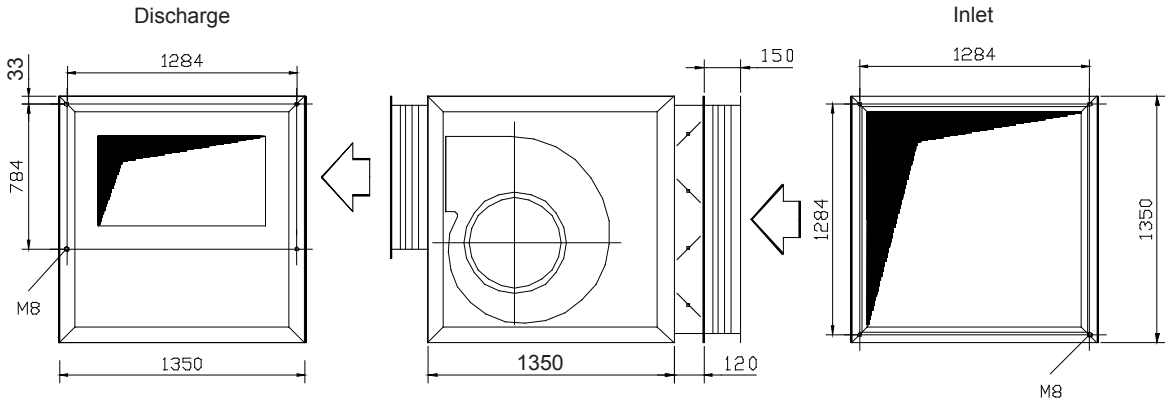
The data for external static pressure take into account all pressure losses due to integration of the fan within unit. Performance based upon free inlet and discharge.
Max. power consumption 7,25 kW
Max. current consumption 14,50 A
I_A / I_N: 3,2
Static Pressure Regain (B) can be read from the performance curve. It is available when the unit is fitted with a straight discharge duct, sized according to the standard connection size B. Minimum duct length neccessary: 2,5 m

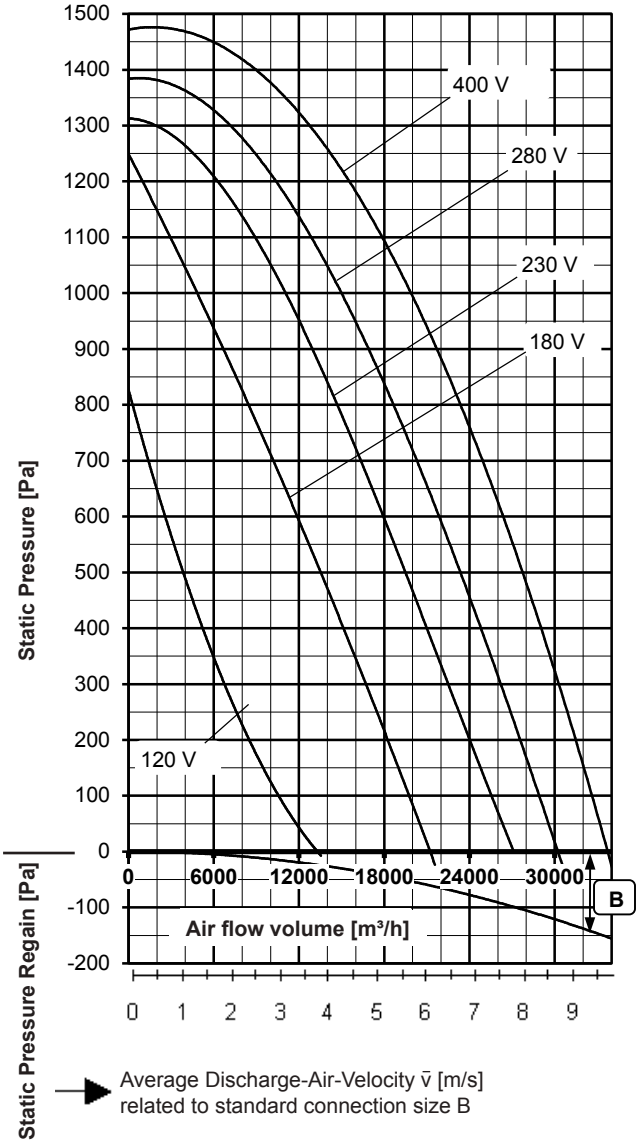
Voltage [V]	At free air [m³/h] and [A]	External static pressure Δ pst [Pa] available for AHU and system pressure losses]						
		300	500	700	900	1000	1100	1300
		1. line: Air Flow Volume V_L [m³/h] bei ρ = 1,2 kg/m³ **2. line: Current consumption [Pa]**						
120	9360 **10,50**	1100 **10,00**						
180	15320 **13,70**	8700 **14,00**	5200 **13,00**	2420 **11,50**				
230	19680 **14,10**	14020 **15,00**	10940 **14,80**	7900 **13,80**	4210 **11,90**	2490 **10,50**		
280	22010 **13,60**	17690 **14,60**	14830 **14,90**	12220 **14,60**	8820 **13,50**	6570 **12,40**	4140 **11,00**	
400	24500 **13,00**	21110 **13,80**	18720 **14,20**	16640 **14,50**	14340 **14,20**	13050 **14,00**	10970 **13,50**	4050 **11,00**

Save power and even more silent with FISCHBACH SPEED CONTROLLERS

Voltage Control	Type	Order-No.
Stepless 0 - 100% and 100% - 0 *	FDR 200/3	6235
Stepwise, 5 Steps *	FDR 20/3	6177
FISCHBACH-AUTOMATIC-CONTROL *	FRA 200/3	6285
Frequency Inverter *	on request	

* with integrated motor protection and outlet fuses





Max. permissable Air Inlet Temperature: 60°C

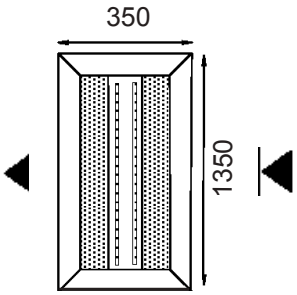
The data for external static pressure take into account all pressure losses due to integration of the fan within unit. Performance based upon free inlet and discharge.
Max. power consumption 13,9 kW
Max. current consumption 30,2 A
I_A / I_N: 2,9
Static Pressure Regain (B) can be read from the performance curve. It is available when the unit is fitted with a straight discharge duct, sized according to the standard connection size B. Minimum duct length neccessary: 2,5 m

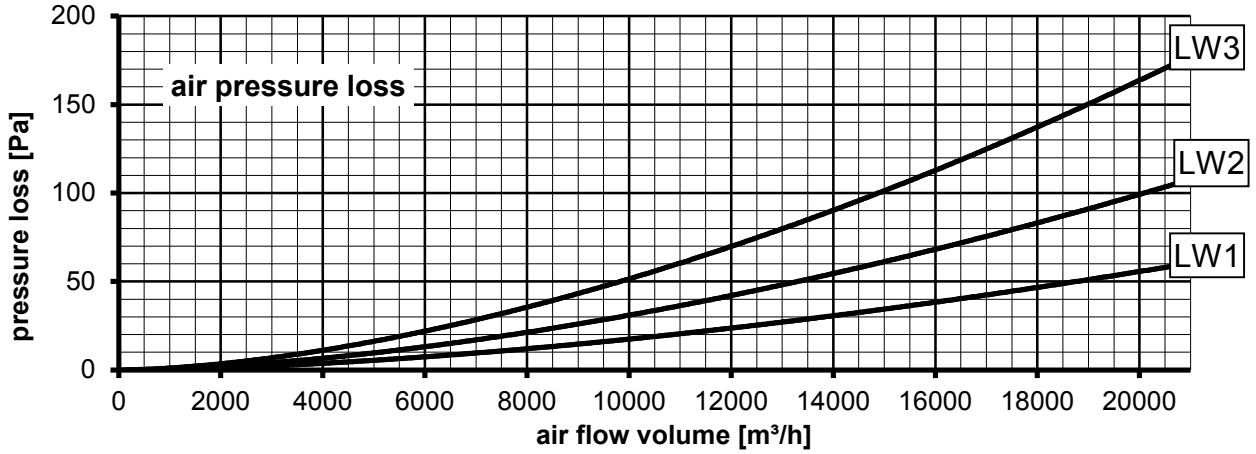
Voltage [V]	At free air [m³/h] and [A]	External static pressure Δ pst [Pa] available for AHU and system pressure losses						
		200	400	600	800	1000	1100	1200
		1. line: Air Flow Volume V_L [m³/h] bei ρ = 1,2 kg/m³ **2. line: Current consumption [Pa]**						
120	13295 **22,22**	8490 **21,75**	5225 **20,16**					
180	21230 **28,76**	18245 **27,97**	15135 **26,59**	11880 **24,56**	8455 **21,76**	4835 **18,07**		
230	27110 **30,22**	24020 **29,26**	21000 **28,023**	17940 **26,47**	14700 **24,49**	11050 **21,86**	6290 **17,78**	
280	30225 **29,23**	27570 **28,54**	24805 **27,65**	21865 **26,50**	18655 **25,02**	14990 **23,03**	10385 **20,08**	
400	33730 **29,09**	31480 **28,63**	29045 **28,10**	26375 **27,46**	23375 **26,67**	19885 **25,68**	15545 **24,30**	8960 **21,94**

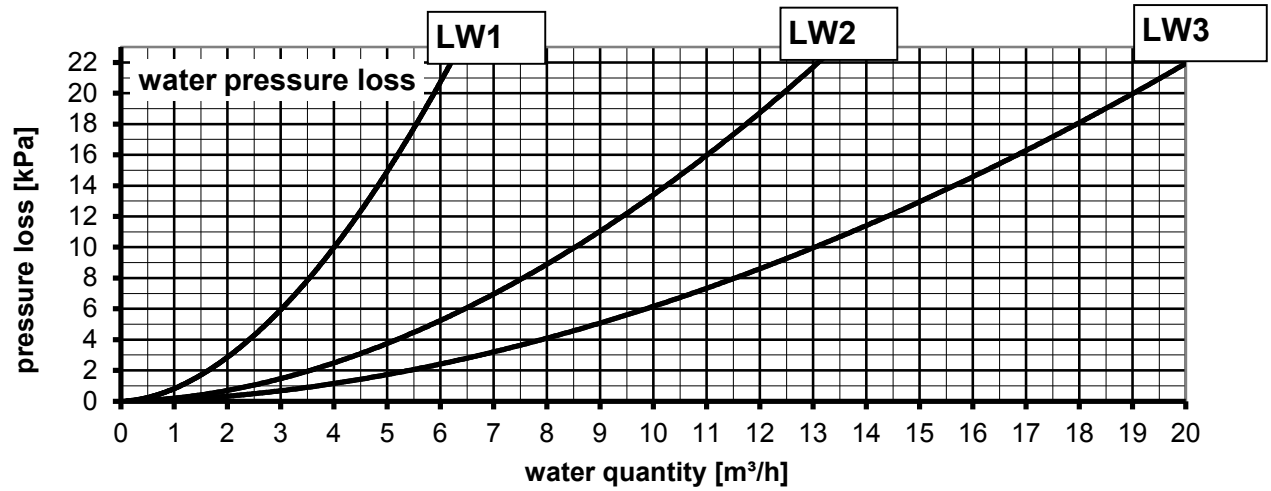
Save power and even more silent with FISCHBACH SPEED CONTROLLERS		
Voltage Control	**Type**	**Order-No.**
Stepless 0 - 100% and 100% - 0 *	FDR 200/3	6235
Stepwise, 5 Steps *	FDR 20/3	6177
FISCHBACH-AUTOMATIC-CONTROL *	FRA 200/3	6285
Frequency Inverter *	FFU 180	6314
* with integrated motor protection and outlet fuses		

Standard Series
Size: 4 , Module depth 1350 mm
The unit sides marked by arrow are open!

Air Heater Unit LW
for medium pump circulated water PWW







The formula for calculation of heating performance [kW] of air heater is dependant on air flow volume and the air temperature difference (between air on-coil and air off-coil, to be taken out of following diagrams) is as follows:

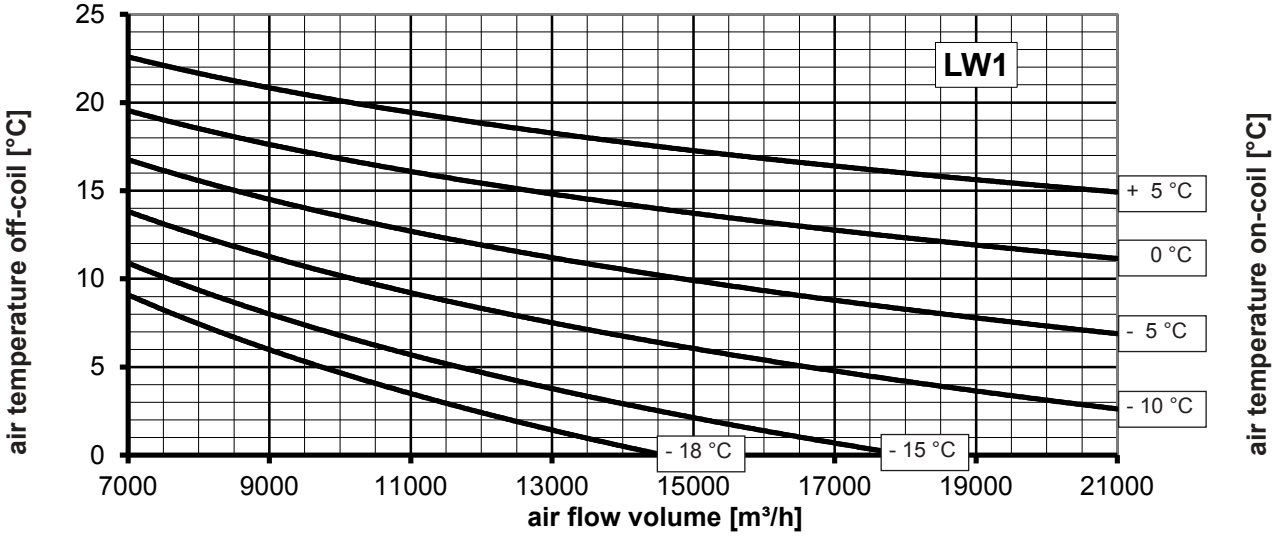
$$\dot{Q}_h[kW] = \dot{V}_L/3600 \times (t_{LA} - t_{LE}) \times \rho_L \times cp_L$$

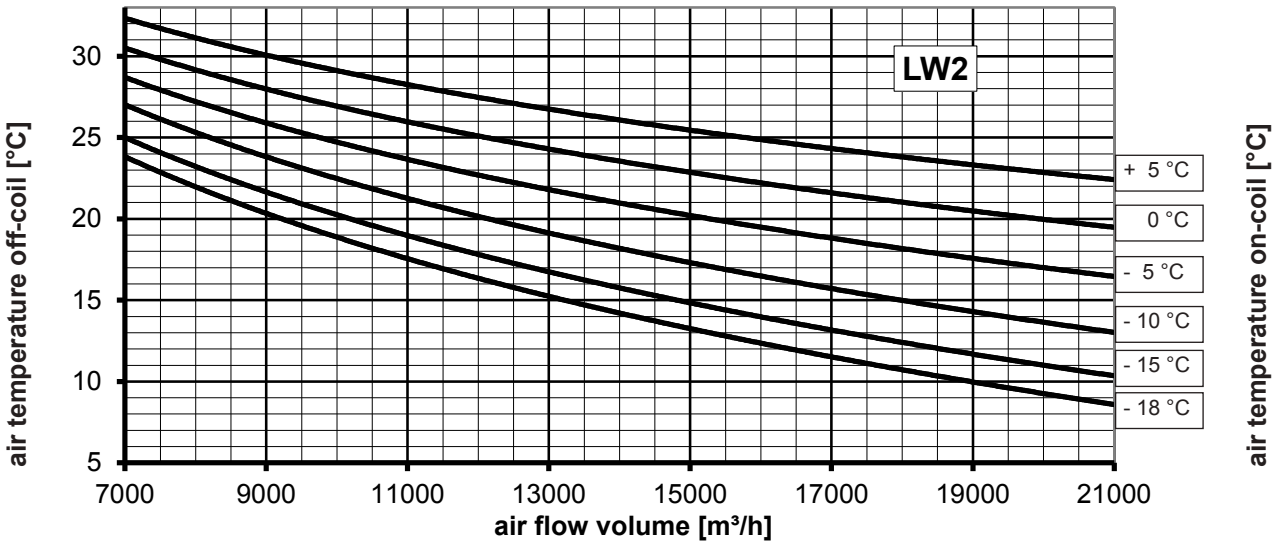
$\dot{Q}_h$ = heating performance [kW]
$\dot{V}_L$ = air flow volume [m³/h]
t_{LA} = air temperature off-coil [°C]
t_{LE} = air temperature on-coil [°C]
ρ_L = specific weight of air = 1,2 [kg/m³]
cp = specific heat capacity of air = 1,0 [kJ/kg K]

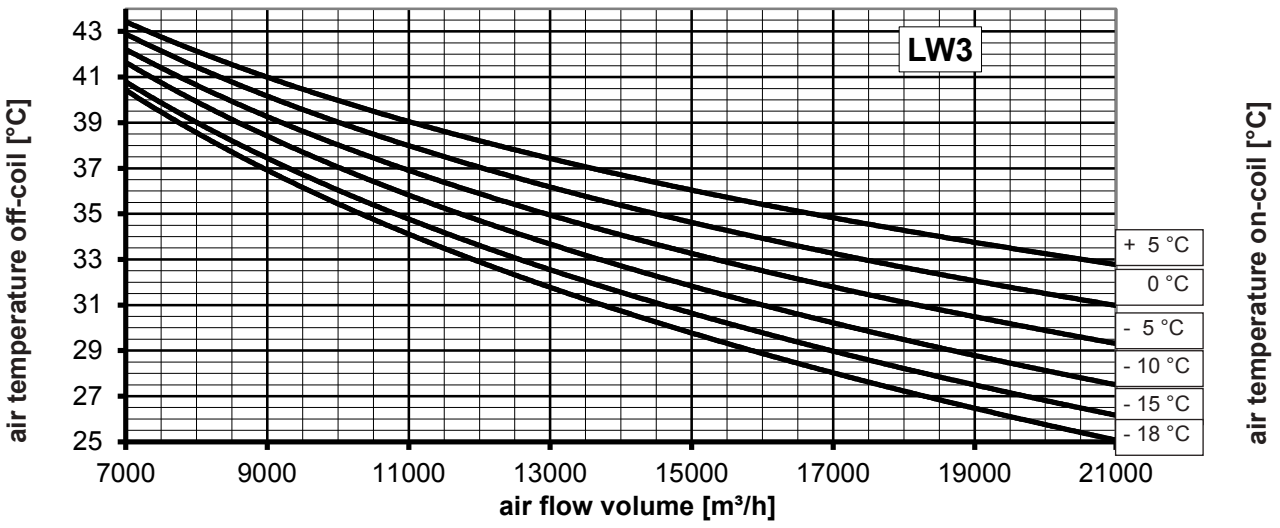
Standard Series
Size: 4

Air Heater Unit LW
for medium pump circulated water

Heating performance for water temperature on-/off-coil 55/45°C



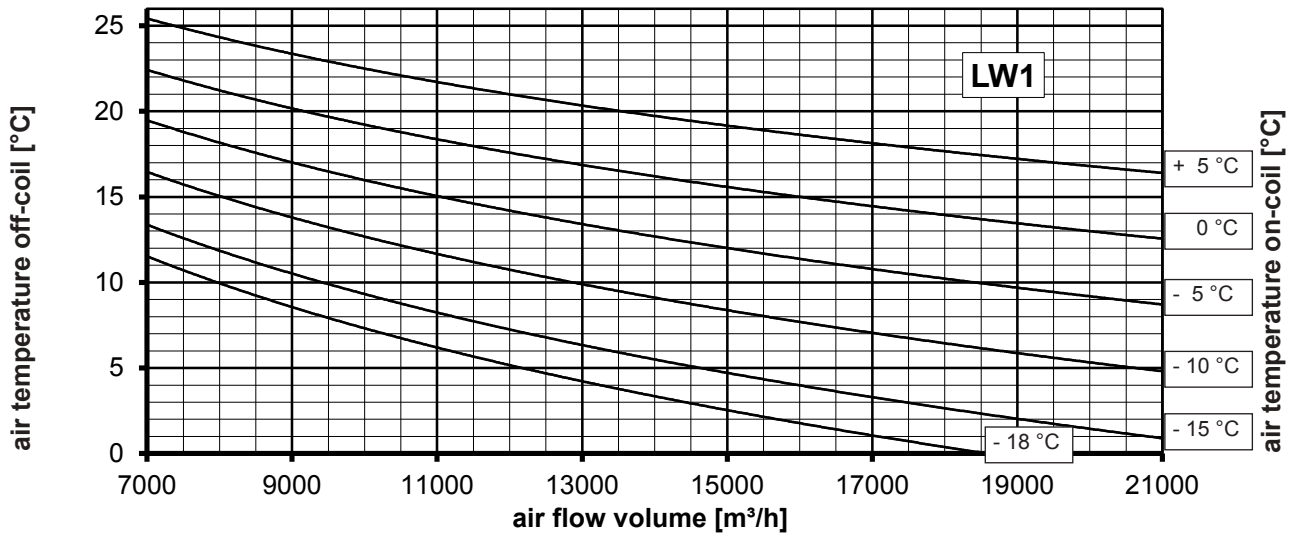


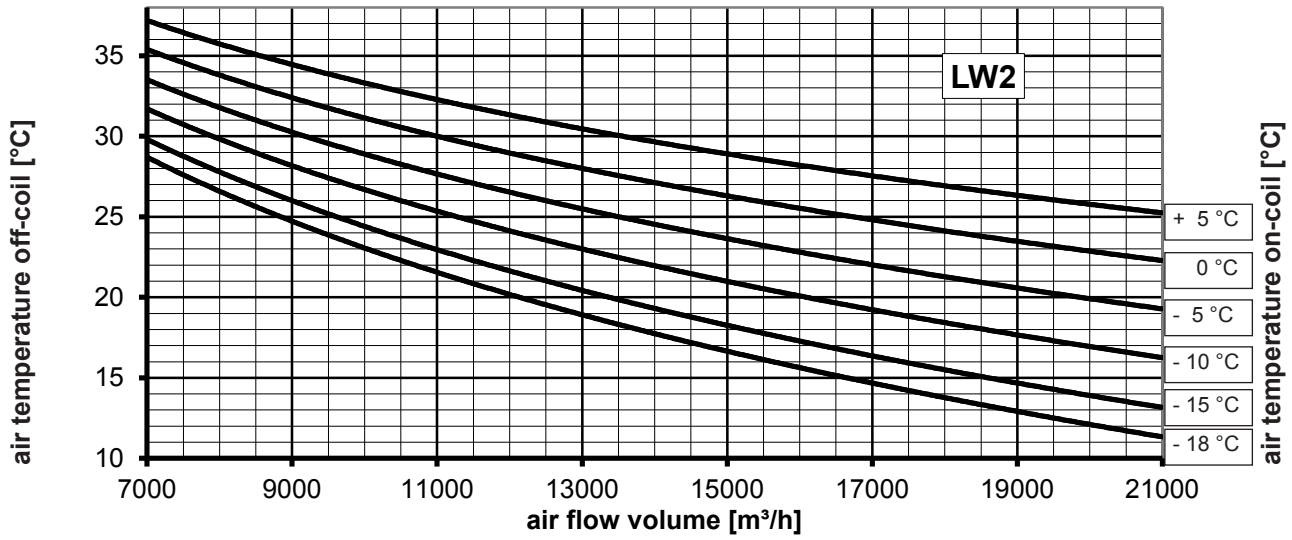


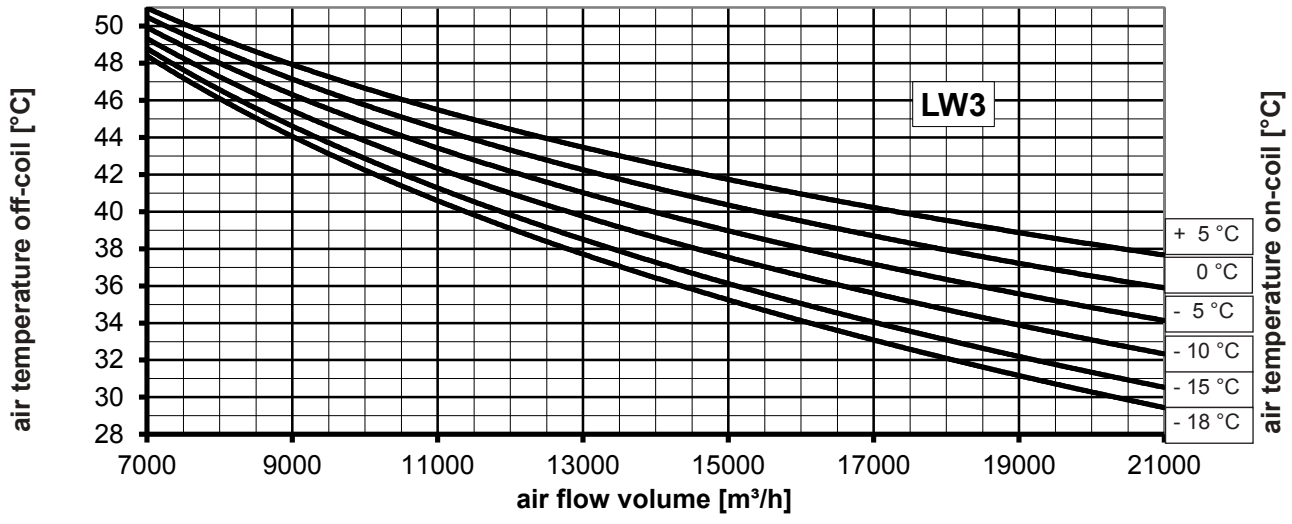
Standard Series
Size: 4

Air Heater Unit LW
for medium pump circulated water

Heating performance for water temperature on-/off-coil 70/50°C



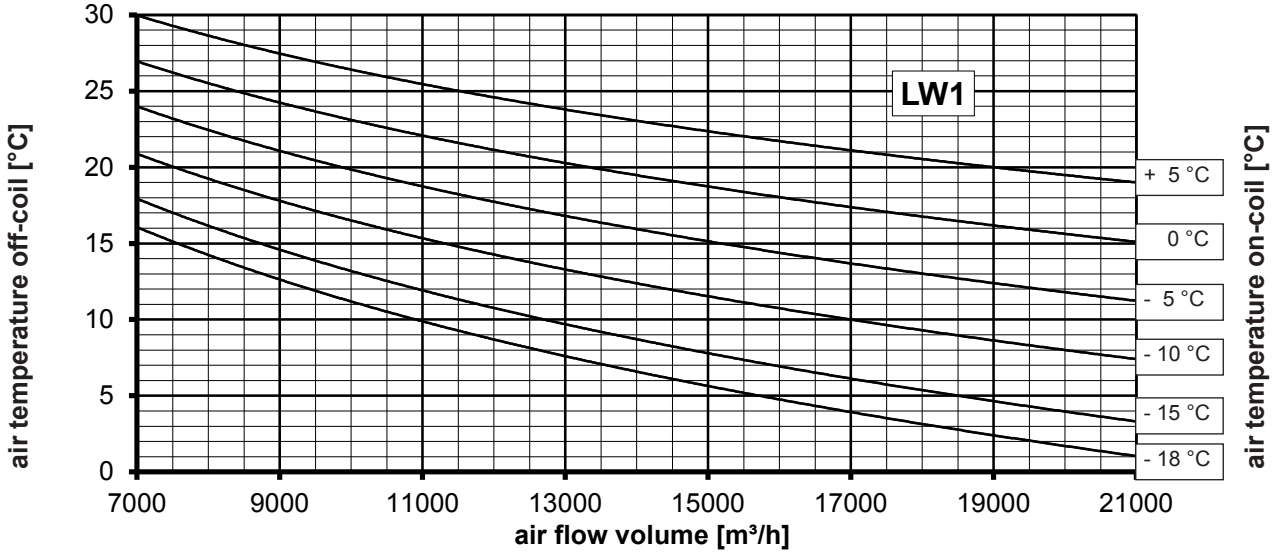


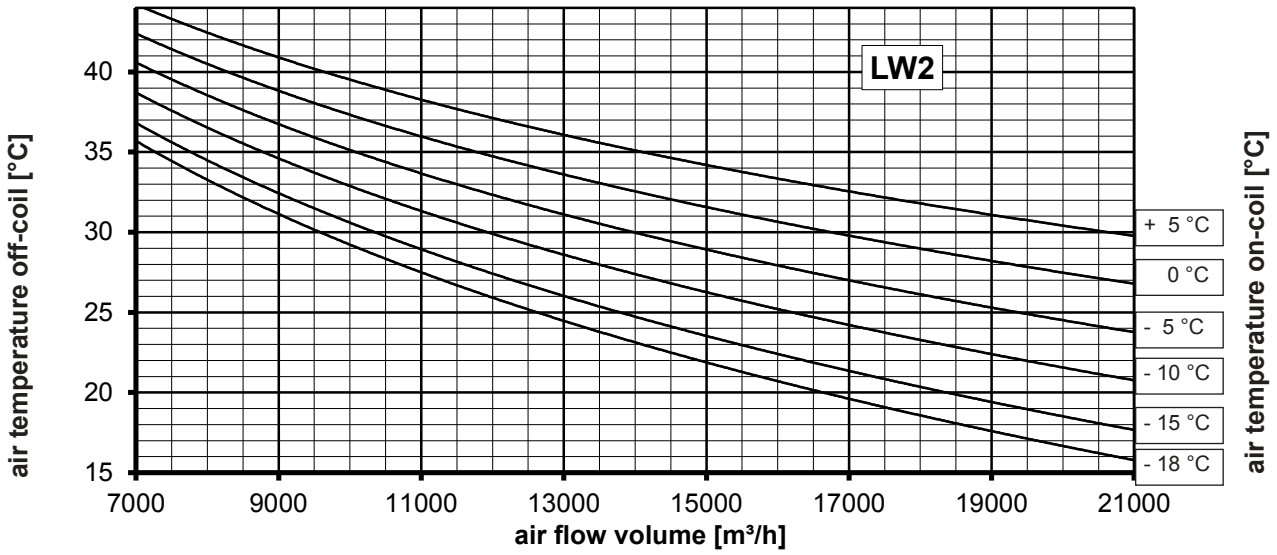


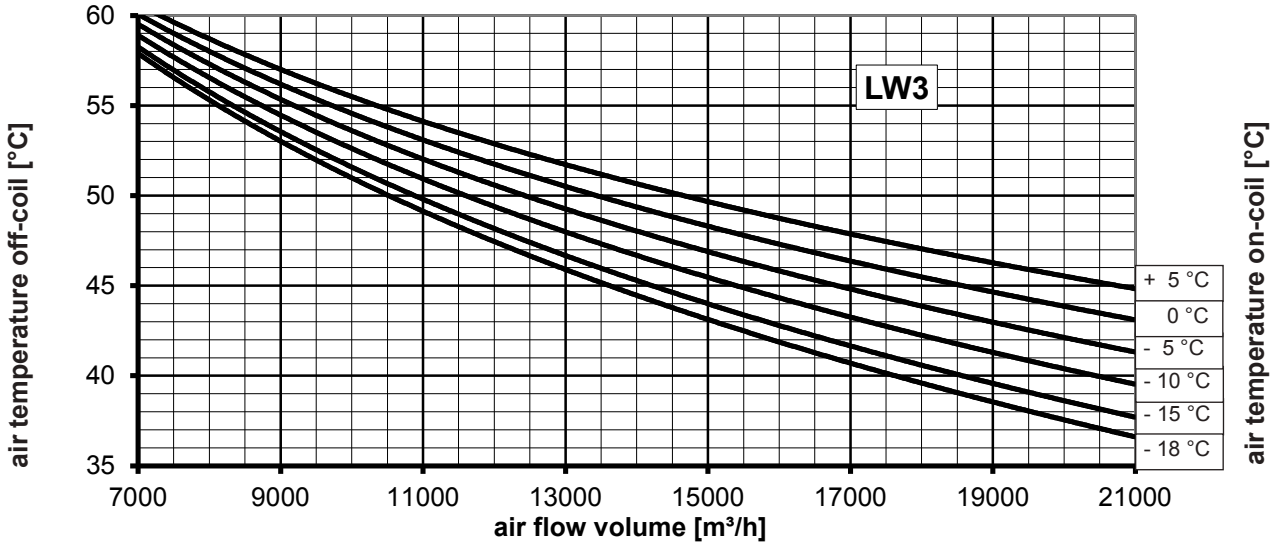
Standard Series
Size: 4

Air Heater Unit LW
for medium pump circulated water

Heating performance for water temperature on-/off-coil 80/60°C

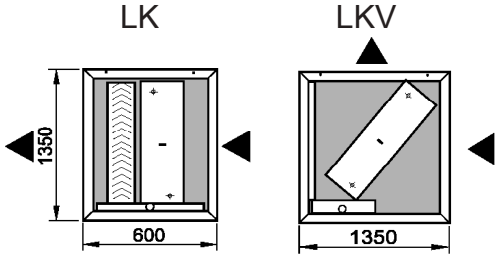






Standard Series
Size: 4, Module depth 1350 mm
The unit sides marked by arrow are open!

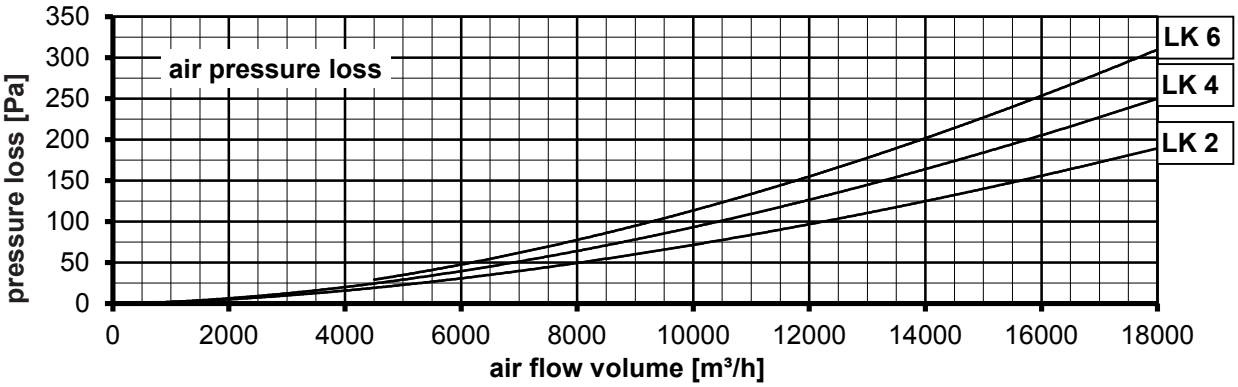
Air Cooler Units LK and LKV
for cooling medium chilled water KKW
Water temperature on-/off-coil 6/10 or 6/12, without glycol

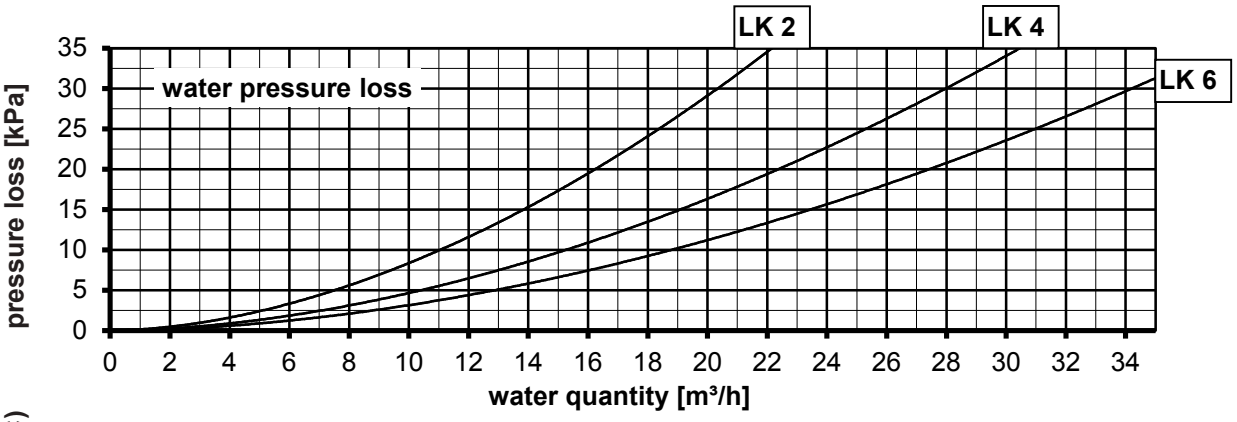


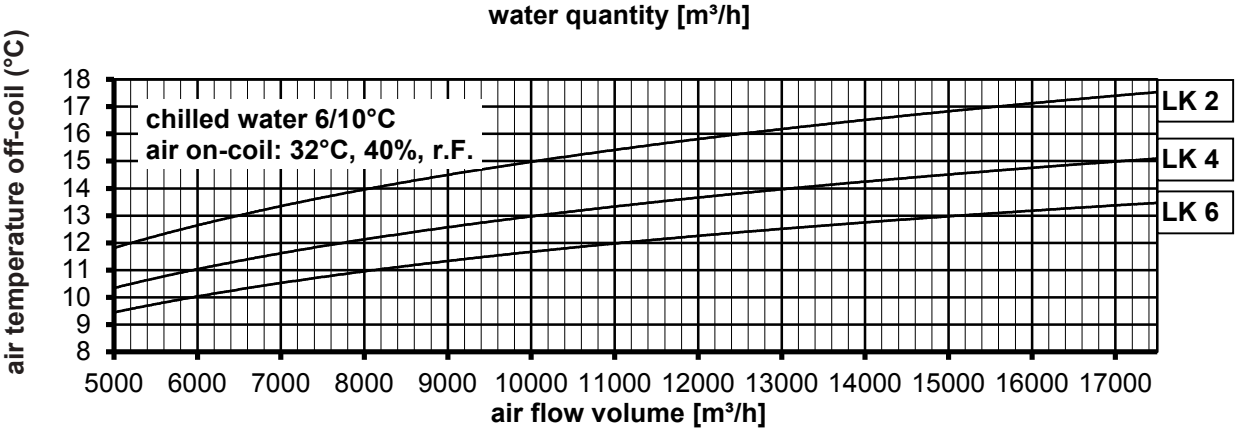
The required amount of water can be calculated with the formula:

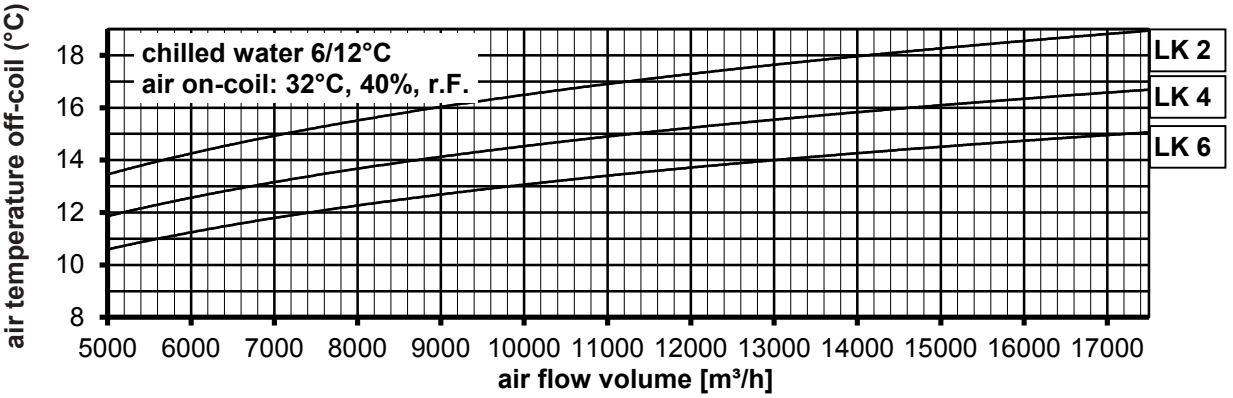
$$\dot{V}_w[m^3/h] = (\dot{Q}_h \times 3600)/(\Delta t_w \times c_w \times \rho_w)$$

$\dot{Q}_h$ = cooling performance [KW]
$\dot{V}_w$ = quantity of water [m³/h]
Δt_w = water temperature difference [Kelvin] (4K at 6/10°C or 6K at 6/12°C)
ρ_w = specific weight of water = 1000 [kg/m³]
c_w = specific heat capacity of water = 4,19 kJ/kg K





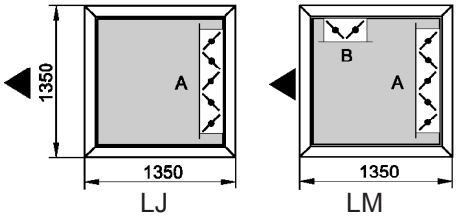




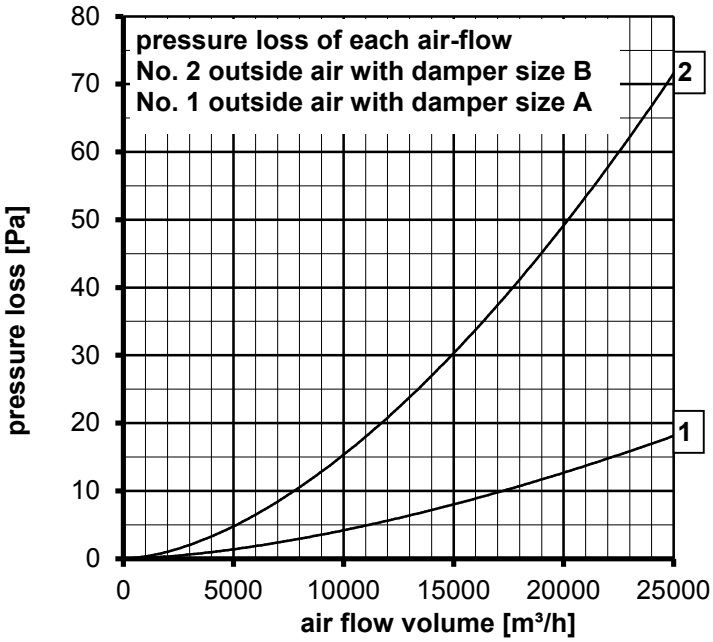
Standard Series
Size: 4, Module depth 1350 mm
The unit sides marked by arrow are open!

Air Mixer Unit LJ and LM

for AHU with supply and extract air arranged on top of each other

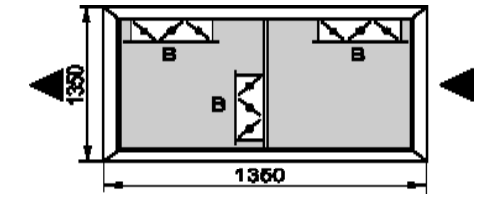


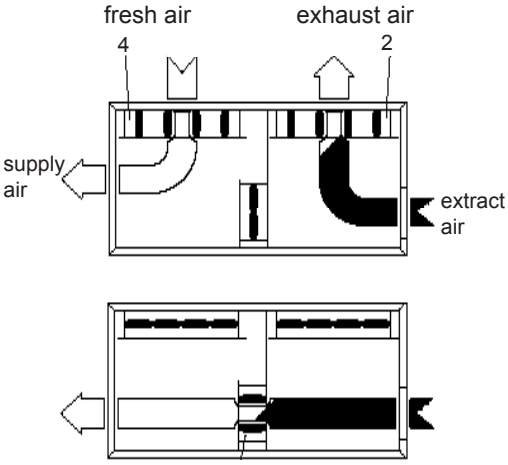
Damper size A: 1262x1262 mm (inner size)
Damper size B: 1262x762 mm (inner size)

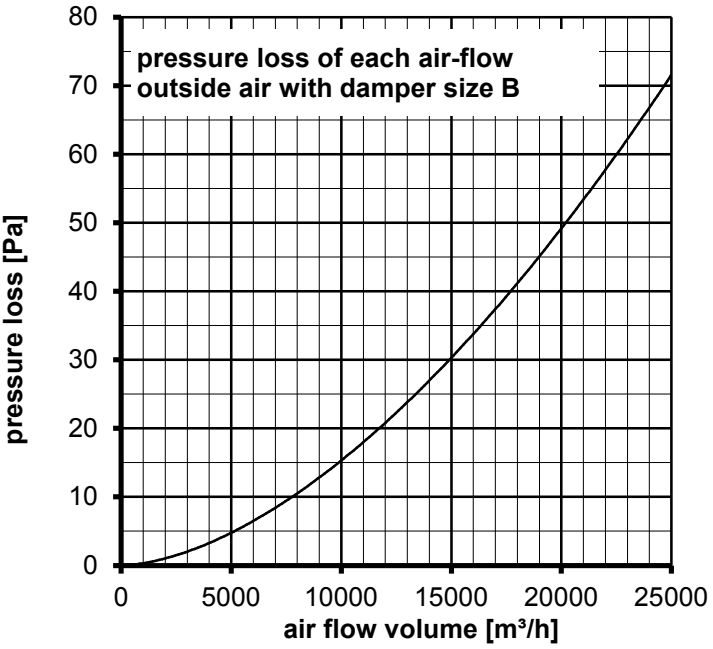


Air Mixer Unit CLM

for AHU with supply and extract air arranged in row





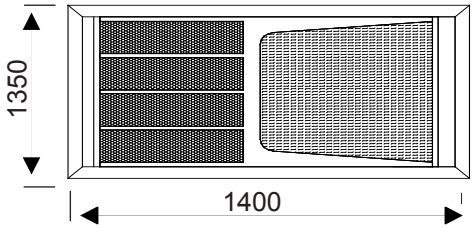


Note for units type LJ, LM and CLM:
Pressure loss of Air Mixing Units is calculated on base „free air“. That means, for connected duct of same cross section no additional dynamical intake losses have to be considered.

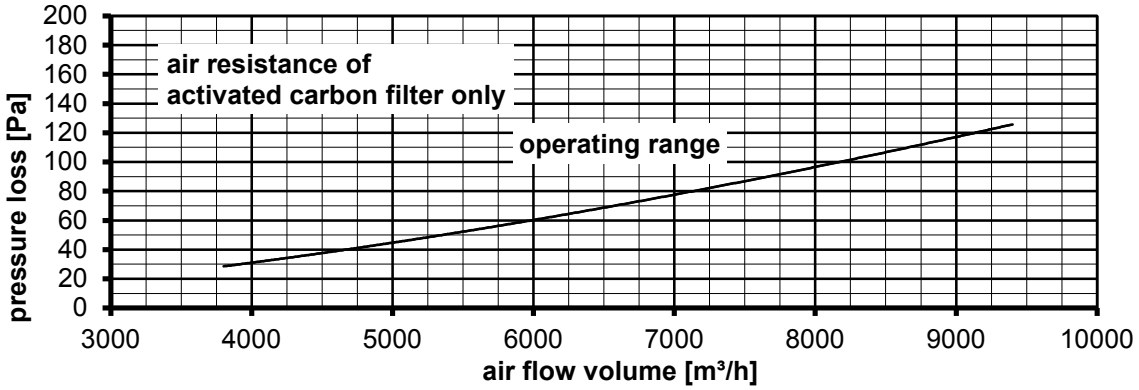
In case of pressure side connection with a ventilator unit the resulting pressure regain is bigger than the pressure loss. Therefore, no statical pressure loss needs to be considered.

Standard Series
Size: 4, Module depth 1350 mm

Combinated Activated Carbon Filter Unit AKCF
for elimination of dust and undesireable odours

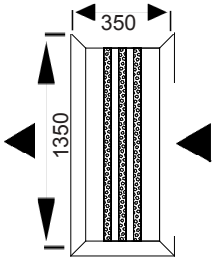


equipped with:
1. Activated carbon filter with 64 filter cartridges (bayonet fixing),
2. Pocket filter, quality class F7 (EU7), length 600mm
Total air resistance of combinated filter unit is a sum of pressure drops of the filter steps 1 and 2.
Therefore, the pressure loss of filter EU7 has to be added separately to below values for activated carbon filter (to be found in diagram for the respective filter module).

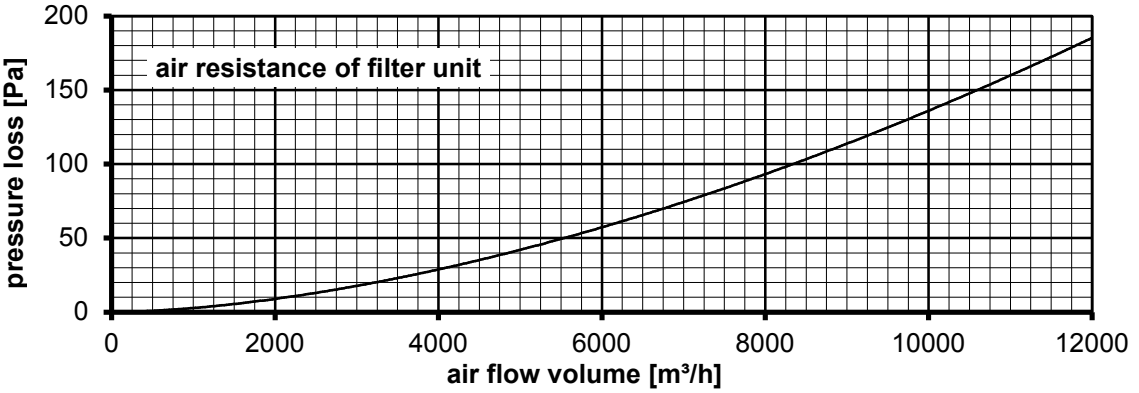


The unit sides marked by arrow are open!

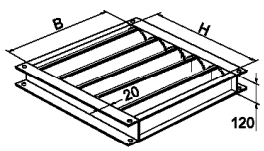
Coarse Filter Unit GF



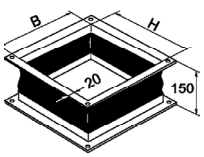
equipped with:
3 Filter steps:
2 Metal mat work filter and
1 Fibre mat filter G3 (EU3) with an exchange frame with drain tray
(regularly cleaning required)

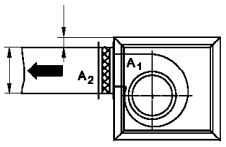


Dampers and Flexible Connections



Damper type „A“: for total cross section of unit
1262 mm width (B) x 1262 mm height (H)
Damper type „B“ (1262 mm width (B) x 762 mm height (H) for fan unit´s discharge opening (smaller); fitting for flexible connection B

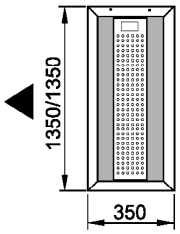




Flexible Connection: to be used for outlet- and inlet side
type „A“: 1262 mm width (B) x 1262 mm height (H) for total cross section of unit.
type „B“: 1262 mm width (B) x 762 mm height (H) for mounting on fan unit´s discharge and on air mixer units with damper size „B“

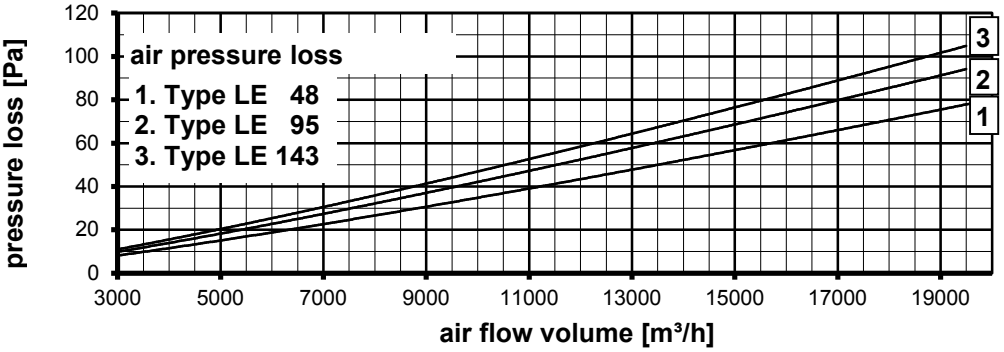
Standard Series
Size: 4, Module depth 1350 mm
The unit sides marked by arrow are open!

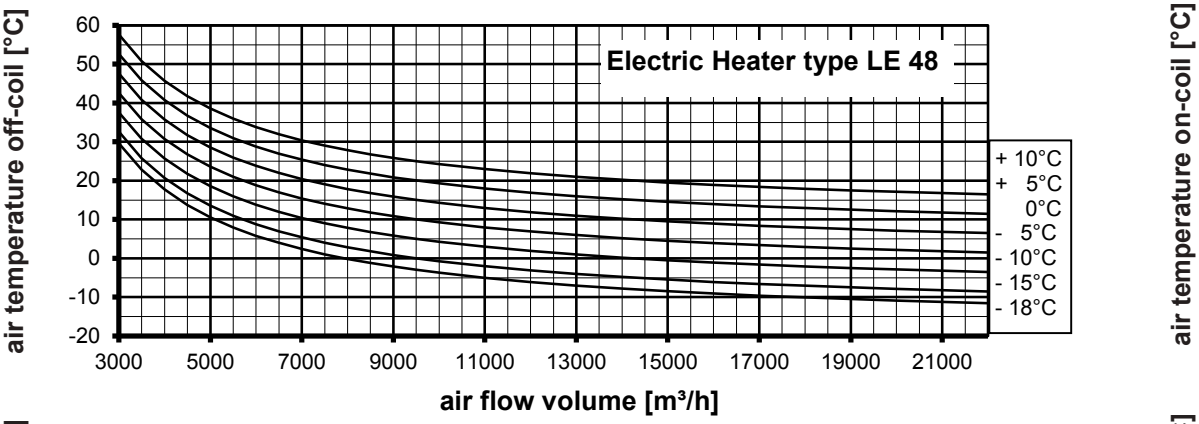
Electric Air Heater Unit LE
for 400V/50Hz operating voltage

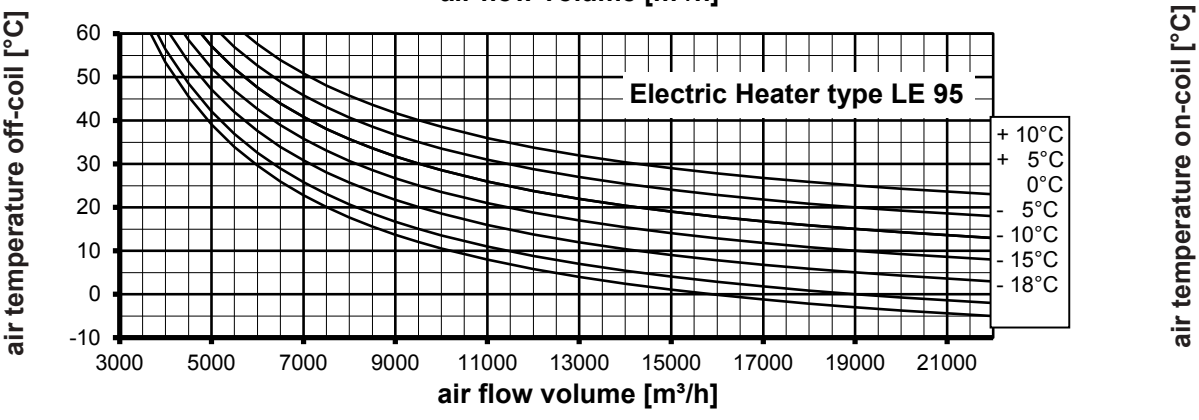


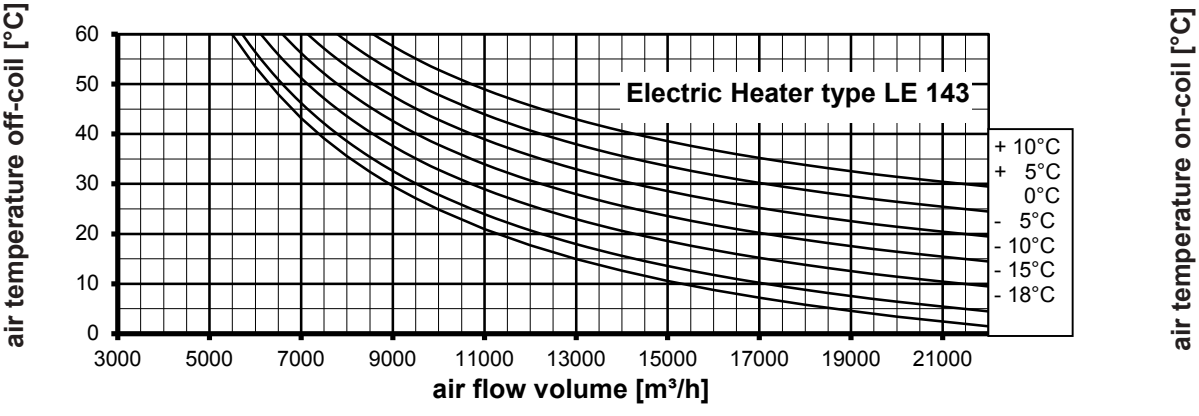
Heating performance, pressure loss and air temperature on-/off-coil

Type LE 48 (kW), 28 elements, current max. 68,7 A, 4 switching levels
Type LE 95 (kW), 56 elements, current max. 137,4 A, 4 switching levels
Type LE 143 (kW), 84 elements, current max. 206,0 A, 4 switching levels







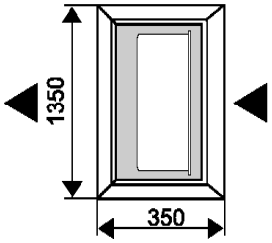


Standard Series
Size: 4, Module depth 1350 mm
The unit sides marked by arrow are open!

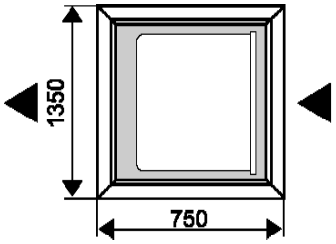
Air Filter Unit KFS
with short pocket (195mm) and
long pocket filters (600mm)

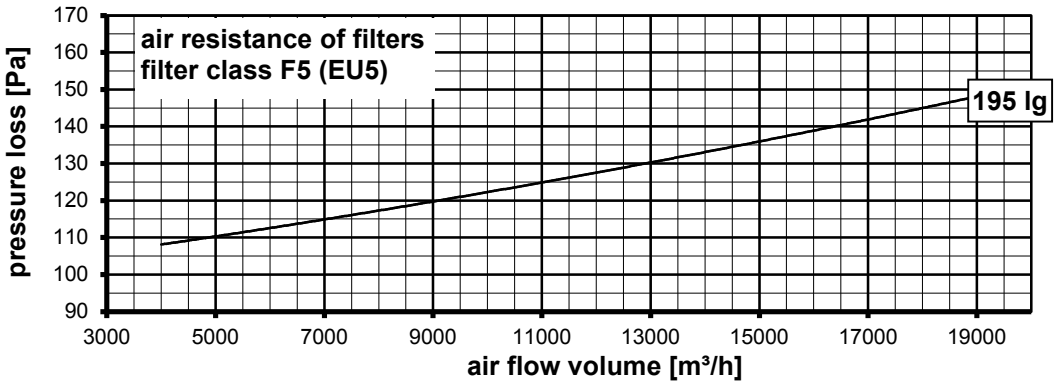
Technical data and resistance:

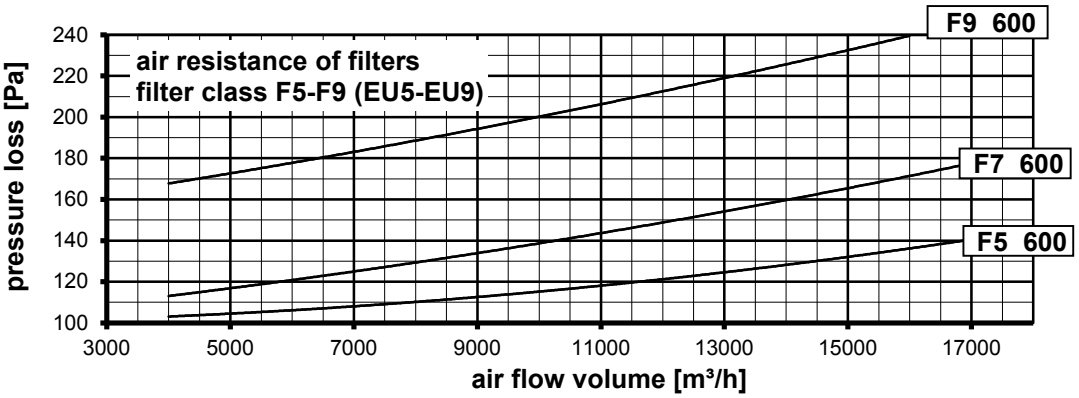
Air Filter Unit with: short pocket



long pocket







Standard Series
Size: 4

Sound data for Ventilator Unit VN 406 - VN 407

VN 406 Fan: DS 9-070/D 5

*sound pressure level L_p in dB (A)					
voltage [V]	120	180	230	280	400
inlet	57	67	72	75	78
discharge	59	69	74	77	80

* related to room absorption of 8 db (25m² Sabine), at free air! measured in distance of 3 m

inlet side: sound power level in Lw [dB] at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]	**discharge side: sound power level in Lw [dB]** at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]
voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200	voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200
120	62	60	57	60	59	57	57	53	65	**120**	61	60	61	63	63	59	57	53	67
180	70	70	66	70	69	68	67	63	75	**180**	69	70	70	73	73	70	67	63	77
230	74	74	71	75	74	73	72	68	80	**230**	73	74	75	78	78	75	72	68	82
280	76	77	74	78	77	76	75	71	83	**280**	75	77	78	81	81	78	75	71	85
400	78	80	76	81	80	79	78	74	86	**400**	77	80	80	84	84	81	78	74	88

VN 407 Fan: DS 9-001/D 5

*sound pressure level L_p in dB (A)					
voltage [V]	80	100	125	150	170
inlet	56	67	72	75	78
discharge	58	69	74	77	80

* related to room absorption of 8 db (25m² Sabine), at free air! measured in distance of 3 m

inlet side: sound power level in Lw [dB] at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]	**discharge side: sound power level in Lw [dB]** at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]
voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200	voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200
120	62	60	56	59	58	57	57	53	64	**120**	61	60	60	62	62	59	57	53	66
180	70	70	66	70	69	68	67	63	75	**180**	69	70	70	73	73	70	67	63	77
230	74	74	71	75	74	73	72	68	80	**230**	73	74	75	78	78	75	72	68	82
280	76	77	74	78	77	76	75	71	83	**280**	75	77	78	81	81	78	75	71	85
400	78	80	77	81	80	79	79	75	86	**400**	77	80	81	84	84	81	79	75	88

Standard Series
Size: 4

Sound data for Ventilator Unit VN 409 - VN 411

VN 409 Fan: DS 0-101/TD 10

*sound pressure level L_p in dB (A)					
voltage [V]	120	180	230	280	400
inlet	62	71	75	78	81
discharge	65	73	78	81	84

* related to room absorption of 8 db (25m² Sabine), at free air! measured in distance of 3 m

inlet side: sound power level in Lw [dB] at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]	**discharge side: sound power level in Lw [dB]** at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]
voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200	voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200
120	67	66	62	66	65	63	63	59	70	**120**	66	66	66	69	69	65	63	59	73
180	73	74	70	74	73	72	72	68	79	**180**	72	74	74	77	77	74	72	68	81
230	77	78	74	79	78	77	76	72	83	**230**	76	78	78	82	82	79	76	72	86
280	79	81	77	81	80	79	79	75	86	**280**	78	81	81	84	84	81	79	75	89
400	81	84	80	84	83	83	82	78	89	**400**	80	84	84	87	87	85	82	78	92

VN 410 Fan: HD 500/D 2.5

*sound pressure level L_p in dB (A)					
voltage [V]	80	100	125	150	170
inlet	43	59	68	73	80
discharge	47	63	72	77	85

* related to room absorption of 8 db (25m² Sabine), at free air! measured in distance of 3 m

inlet side: sound power level in Lw [dB] at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]	**discharge side: sound power level in Lw [dB]** at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]
voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200	voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200
120	55	50	57	35	34	40	38	46	51	**120**	55	51	63	40	40	43	40	47	55
180	68	68	74	59	58	58	56	56	67	**180**	68	69	78	62	62	61	56	57	71
230	75	77	81	69	68	67	64	61	76	**230**	75	77	86	73	73	70	65	62	80
280	79	82	85	76	75	72	70	65	81	**280**	79	83	90	80	80	75	71	65	85
400	85	88	91	84	83	80	77	69	88	**400**	84	89	96	88	88	83	78	70	93

VN 411 Fan: HD 560/D 5

*sound pressure level L_p in dB (A)					
voltage [V]	80	100	125	150	170
inlet	43	61	71	77	83
discharge	47	65	75	81	87

* related to room absorption of 8 db (25m² Sabine), at free air! measured in distance of 3 m

inlet side: sound power level in Lw [dB] at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]	**discharge side: sound power level in Lw [dB]** at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]
voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200	voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200
120	55	50	57	35	34	39	38	45	51	**120**	55	51	63	39	39	43	40	47	55
180	69	70	75	60	59	59	57	57	69	**180**	69	70	80	64	64	62	58	58	73
230	78	80	84	73	72	70	68	63	79	**230**	77	81	89	77	77	73	69	64	83
280	82	85	88	80	79	77	74	67	85	**280**	82	86	93	84	84	80	75	68	89
400	87	91	93	87	86	83	79	70	91	**400**	87	92	98	91	91	86	81	71	95

Standard Series
Size: 4

Sound data for Ventilator Unit VN 412 - VN 413

VN 412 Fan: HD 630/D 5
Sound data: only fan!

sound pressure level L_p in dB (A)					
voltage [V]	120	180	230	280	400
inlet *	70	80	87	91	93
discharge **	54	63	71	76	77

* sound pressure level A - measured in distance of 4m from the inlet, (room absorption 8 dB)
** sound pressure level A - at free air measured in distance of 4m from the discharge, (absorption 20 dB)

inlet side: sound power level in Lw [dB] at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]	**discharge side: sound power level in Lw [dB]** at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]
voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200	voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200
120	77	73	80	77	73	63	56	54	84	**120**	79	72	73	73	69	66	57	59	82
180	90	83	90	87	81	73	74	62	95	**180**	84	82	84	82	77	68	72	61	90
230	93	91	97	92	92	79	84	78	100	**230**	89	89	91	89	88	75	80	74	96
280	96	93	100	95	96	84	87	85	104	**280**	90	96	98	92	93	80	83	83	102
400	96	95	101	96	99	86	88	89	105	**400**	93	96	98	93	94	83	84	87	103

VN 413 Fan: HD 630/TD 10

*sound pressure level L_p in dB (A)					
voltage [V]	120	180	230	280	400
inlet	55	73	81	88	90
discharge	60	78	86	91	95

* related to room absorption of 8 db (25m² Sabine), at free air! measured in distance of 3 m

inlet side: sound power level in Lw [dB] at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]	**discharge side: sound power level in Lw [dB]** at mid frequency in (Hz) (at free air!)									L_{WA} [dB(A)]
voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200	voltage [Volt]	63	125	250	500	1000	2000	4000	8000	total 45-11200
120	64	63	69	52	51	53	51	53	63	**120**	65	65	75	57	57	56	53	55	68
180	79	81	85	76	75	72	69	64	81	**180**	80	83	91	81	81	76	71	66	86
230	85	88	91	85	84	80	77	69	89	**230**	86	90	97	90	90	84	79	71	94
280	88	92	95	90	89	85	82	71	94	**280**	89	95	101	95	95	89	84	73	99
400	91	96	98	94	93	89	86	74	98	**400**	92	98	104	99	99	94	88	76	103