



# Unit heater selection guide

The selection of a unit heater must take into account several parameters, such as : premises type, application, place of installation, etc.

The information below constitutes a help for the quick determination of the number and the type of the units, and cannot in no case replace a complete thermal study carried out by a consulting engineer office or organization qualified to deal with this.

## Estimation of the capacity to be installed

### 1) Premises heat losses :

- Building or premises badly insulated : 40 to 70 W / m<sup>3</sup>.
- Building or premises well insulated : 30 to 50 W / m<sup>3</sup>.

### 2) Heat losses by air renewal :

- $DRA = 0.34 (Qv \times \Delta t)$

With DRA : Heat losses by air renewal in W.

0.34 : Air volumic heat.

Qv : Renewed air volume in m<sup>3</sup>/h.

$\Delta t$  : Temperature difference between the minimum outdoor reference temperature and the desired indoor temperature.

### 3) Overcapacity of setting into regime :

For the installations with intermittent use, it is advisable to apply a multiplier of 1.2 to 1.3 on the sum of the heat losses to determine the capacity to be installed.

### 4) Air renewal rate :

The fresh air rates allowed are very variable according to the type of premises and occupation. The values taken as base are 1 or 2 volumes per hour of the premises for the industrial premises or 20 to 30 m<sup>3</sup>/h per person for the sales areas.

## Unit selection

### 1) Mixing rate :

The capacity to be installed having been determined, the total supply air flow shall allow a correct mixing to ensure the homogeneity of the ambient temperature.

$$\text{The mixing rate} = \frac{\text{Supply air flow (m}^3\text{/h)}}{\text{Room volume (m}^3\text{)}}$$

The values generally allowed are indicated below :

Room height	Room volume	Mixing rate
<5 metres	100 to 500 m <sup>3</sup>	6 to 7
	600 to 2000 m <sup>3</sup>	5 to 7
	2000 to 6000 m <sup>3</sup>	3 to 5
>5 metres	6000 to 15000 m <sup>3</sup>	2 to 4

The use of air blower, in addition to the unit heaters, allows to assure the correct mixing rates without increasing the installed capacity.

### 2) Supply temperature :

In order to avoid the hot air stratifications tied to a very high temperature or the cold airstreams tied to a very low temperature, it is recommended to look for a supply temperature included between 20 and 30 °C above the ambient temperature.

### 3) Installation height :

The installation height must be chosen according to the room height and the supply temperature.

If the height is lower than 4 m, it is possible to install the unit with direct discharge at 3 m above the ground.

If the height is higher than 4 m, the installation of a return duct to ground is recommended.

### 4) Sound level :

When looking for a lowest sound level, the selection of the units must be done at low speed.



7.5 to 179 kW

Hot water

Steam



Propeller type heater. A rugged unit for heating large buildings in the tertiary industries.

In winter, it is used for rapidly increasing air temperature using a mixing process for destratifying varying temperature layers.

It can be used in combination with the WESTHERM air blowing units.

In summer, it ensures space airing, with the hot water distribution stopped. It can operate as an air cooled fluid cooler (please consult the factory).

WESTHERM air blowing units ensure optimum ventilation.

WESTHERM units are supplied with a large choice of air diffusers and accessories and in varying arrangements ensuring permanent fresh air supply according to applicable standards and rules.

They improve working conditions and keep floor areas free. Their control and programming characteristics ensure power savings that increase when operating on low temperature water conditions.

WESTHERM units and accessories are available on stock, specially designed to meet present economical needs expressed in terms of investment, return time and operating balance-sheet.

> WESTHERM, hot water/steam type <

Casing

The casing consists of a cabinet assembled by rivets and of a single deflection M type air diffuser.

The cabinet is made of pre-painted RAL 9010 galvanized sheet steel; whereas the diffuser blades are coated with epoxy painting RAL 9010.

For the aggressive environment applications (marine, acid or polluted atmosphere, ...), the cabinet can be painted, as option, with a powder based epoxy coating.

Coils

Coils (1, 2 or 3 rows) are made of copper tubes with aluminium fins. These fins with full depth collars are mechanically bonded onto the tubes to assure perfect contact in order to offer optimum heat transfer efficiency.

Optional cupro-nickel tubes can be supplied for steam or high temperature hot water (see table of using limits).

Headers are of brass type with threaded connections for copper tubes or steel type with smooth connections for optional cupro-nickel tubes.

Fan motor assembly

Propeller fan with wide aluminium blades. Impeller special profile provides optimum air volume/pressure performance and assures a low noise level.

Fan is statically and dynamically balanced.

The air inlet side is designed to offer minimum pressure drop and noise level.

Fan speed is coded as follows :

Fan speed (rpm)	700	900	900/700	1400	1400/900
Code	7	9	9/7	14	14/9

Options and accessories

- Double deflexion N type diffuser.
- HP type diffuser.

- HO type diffuser.
- VR type diffuser.
- Fan guard.
- Cupro-nickel coils, for high temperature water or steam applications.
- Mounting support kit.
- Room thermostat.
- Two-speed motors (except size 35).
- Air filter to be fitted inside or outside the inlet cubic casing.
- Special mounting kits (VAL, VAF, VAK, VAJF, VAGK, VAGJF, VAGZ, VABGZ, VABF, HABGZ).

Air blowers

Air blowers are WESTHERM units, but without heat exchanger.

They are equipped with a HO, HN or HP type diffuser and are to be located at highest level in a given space to eliminate the hot air accumulated by stratification below the ceiling.

Air volumes of these air blowers are given as follows :

Models	Air volumes (m <sup>3</sup> /h)		
	700 rpm	900 rpm	1400 rpm
35	-	1340	1900
45	-	3260	4970
50	-	4560	6950
55	-	5980	9210
65	-	8130	12320
70	12200	15720	-



7 sizes  
Hot water or steam

7.5 to 179 kW

> **Compatibility between types of mounting and diffusers** <

Westerm units can be fixed in vertical or horizontal position. But, for some models, in order to drain the coil, it is necessary to indicate the mounting arrangement when placing the order (352, 353, 652, 653, 702, 703, 1102, 1103).

VERTICAL ARRANGEMENTS	HORIZONTAL ARRANGEMENTS
<p data-bbox="416 472 517 495">Diffuser VM</p>  <p data-bbox="153 965 320 987">Horizontal discharge</p>	<p data-bbox="1078 472 1179 495">Diffuser HN</p>  <p data-bbox="810 965 978 987">Air curtain discharge</p>
<p data-bbox="416 1005 517 1028">Diffuser VN</p>  <p data-bbox="153 1516 320 1538">Horizontal discharge</p>	<p data-bbox="1078 1005 1179 1028">Diffuser HO</p>  <p data-bbox="810 1516 978 1538">Horizontal discharge</p>
<p data-bbox="416 1574 517 1597">Diffuser VR</p>  <p data-bbox="153 2067 320 2089">Air curtain discharge</p>	<p data-bbox="1078 1574 1179 1597">Diffuser HP</p>  <p data-bbox="810 2067 962 2089">Vertical discharge</p>

> Unit locations <

WESTHERM units can be installed in :

- commercial or public buildings,
- workshops,
- stockage rooms,
- shops,
- warehouses,
- greenhouses,
- gymnasiums,
- halls,
- supermarkets,
- canteens,
- underground parkings,
- etc.

Lots of installation possibilities are conceivable according to the building type and its use.

In accordance with the number of units which are to be installed and for a maximum comfort, the air stream will be pointed to maximum heat loss area (small sales area) - figure 1 - or oriented in order to obtain a total homogeneity of temperatures - figure 2 - (tertiary buildings and large volumes).

Figure 1

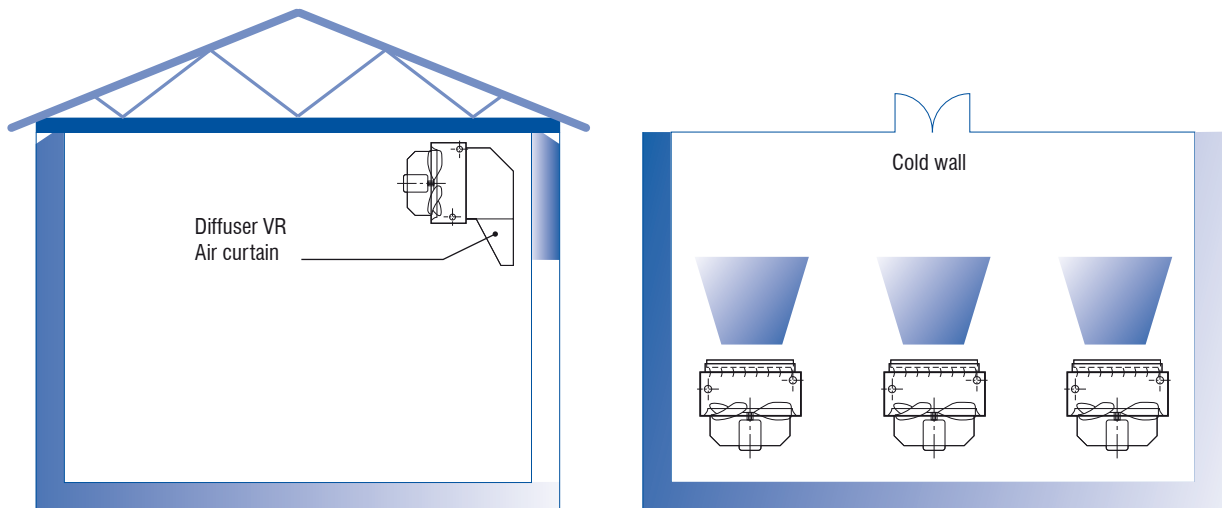
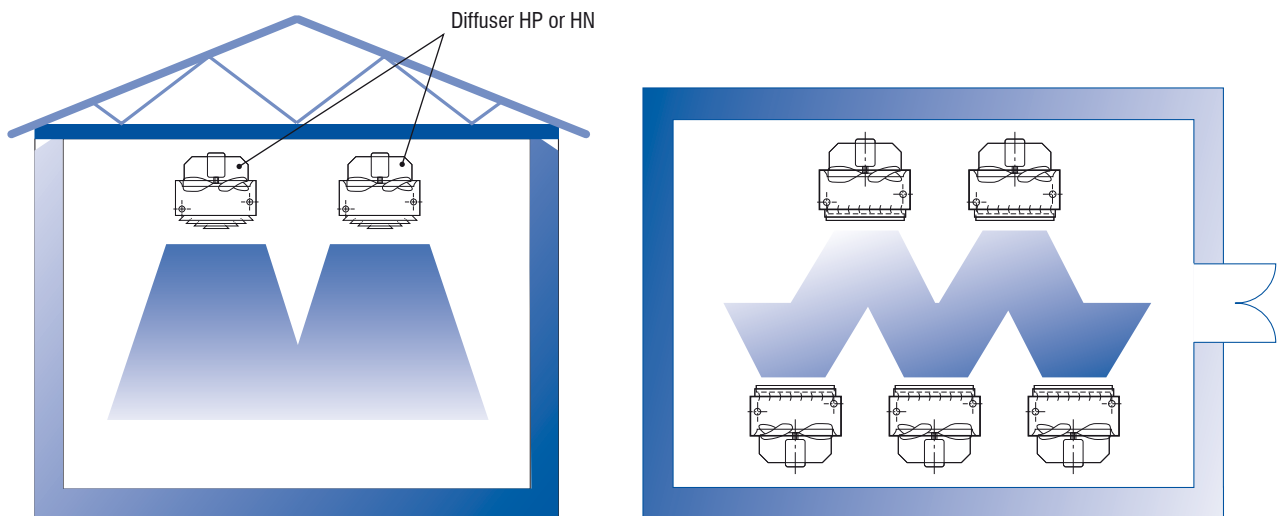


Figure 2





7 sizes  
Hot water or steam

7.5 to 179 kW

## > Ventilation characteristics <

### Air flow data

Models	Coil Number of rows	Volume (m <sup>3</sup> /h)		
		700 rpm motor	900 rpm motor	1400 rpm motor
35	1	-	1 300	1 840
	2	-	1 140	1 650
	3	-	1 030	1 530
45	1	-	3 160	4 820
	2	-	2 880	4 380
	3	-	2 620	4 120
50	1	-	4 420	6 750
	2	-	4 080	6 240
	3	-	3 820	5 830
55	1	-	5 800	8 940
	2	-	5 280	8 290
	3	-	4 950	7 760
65	1	-	7 890	11 960
	2	-	7 320	11 040
	3	-	6 980	10 460
70	1	11 830	15 260	-
	2	11 160	14 400	-
	3	10 660	13 780	-
110	1	-	11 600	17 880
	2	-	10 560	16 580
	3	-	9 900	15 520

### Motor data

Models	Speed (rpm)	Voltage (V - Ph - Hz)	Power (kW)	Current (A)	Class	IP
35	900	230-1-50	0.022	0.25	F	54
	900	230/400-3-50	0.037	0.46 / 0.27	F	54
	1400	230-1-50	0.06	0.6	F	54
	1400	230/400-3-50	0.038	0.4 / 0.23	F	54
45	900	230/400-3-50	0.25	1.44 / 0.83	F	55
	1400	230/400-3-50	0.25	1.41 / 0.81	F	55
	1400/900	400-3-50	0.4 / 0.12	1.38 / 0.51	F	55
50	900	230/400-3-50	0.25	1.44 / 0.83	F	55
	1400	230/400-3-50	0.55	2.46 / 1.42	F	55
	1400/900	400-3-50	0.55 / 0.18	1.62 / 0.73	F	55
55	900	230/400-3-50	0.25	1.44 / 0.83	F	55
	1400	230/400-3-50	0.55	2.46 / 1.42	F	55
	1400/900	400-3-50	0.55 / 0.18	1.62 / 0.73	F	55
65	900	230/400-3-50	0.37	2.08 / 1.19	F	55
	1400	230/400-3-50	0.75	3.22 / 1.86	F	55
	1400/900	400-3-50	1.1 / 0.38	2.65 / 1.35	F	55
70	700	230/400-3-50	0.37	2.00 / 1.16	F	55
	900	230/400-3-50	0.75	3.65 / 2.1	F	55
	900/700	Consult factory				
110 *	900	230/400-3-50	0.25	1.44 / 0.83	F	55
	1400	230/400-3-50	0.55	2.46 / 1.42	F	55
	1400/900	400-3-50	0.55 / 0.18	1.62 / 0.73	F	55

\* Equipped with 2 motors requiring 2 overload thermal protections.

Notes : Other classes of insulation upon request. Optional motors for glasshouses are available upon request. Data given in the table above are only for standard motors and are specific to a supplier. They can be modified, when changing the supplier (consult factory for new data). Data are in compliance with Standard C 51111.

### Sound levels

#### Sound levels at 5 m (dBA)

Sizes	35	45	50	55	65	70	110
Motor speed (rpm)	700	-	-	-	-	54	-
	900	39	46	49	52	50	55
	1400	46	53	57	61	63	64

#### Average sound levels (dBA)

Type of building	Sound levels
Gymnasium	50 - 55
Supermarkets, dining halls, small workshops, semi-industrial buildings	55 - 60
Machine shop, production shop, assembly room	60 - 65
Foundries, boiler rooms	65 - 70

> Selection and air throw <

Codification

<b>WESTHERM</b>	<b>45</b>	<b>2</b>	<b>E</b>	<b>C1</b>	<b>9</b>	<b>VM</b>	<b>3 Ph/230/400</b>	<b>1</b>
Size of casing : 35 to 110								
Coil number of rows : 1-2-3								
Type of heating fluid : E (water) - V (steam)								
Coil specification : C1 (Copper) - CN (Cupro-Nickel)								
Fan speed : 7 - 9 - 9/7 - 14 - 14/9 (x 100 rpm)								
Air diffuser : <b>VM VN HO HP VR HN</b>								
Voltage : 1 Ph/230 V - 3 Ph/230/400 V - 3 Ph/400 V								
Standard arrangements : see section "Optional arrangements"								

Using limits

Raw materials used according to temperatures and pressures.

Type	FLUID		TUBE	
	Temperatures/Pressures	Code	Raw material	Code
Hot water	<120 °C	E	Copper	C1
	>120 °C	E	Cupro Nickel	CN
Saturated steam	2 to 10 bar	V	Cupro Nickel	CN

Test pressure data

Tests are carried out after mechanical expansion of coils at a minimum pressure of 20 bar.

Operating pressure

Hot operating pressure shall not exceed 10 bar.

For higher pressure values, please consult the factory.

When units are not used or when the ambient temperature is under 0 °C, coils must be protected against freezing up and have to be carefully drained.

For horizontal installation, maximum water temperature shall be 120 °C.

Selection

Thermal capacity

Based on the needed heating (1 kW = 860 kcal/h).

Mixing rate

$$\text{The mixing rate} = \frac{\text{Supply air volume per hour}}{\text{Space area}}$$

Mixing rate plays an important part in providing uniform air temperature in a space.

Permissible values are generally as follows :

- for a room under 5 m high : 3 to 5.
- for a room above 5 m high : 4 to 5.

Should the value of mixing rate be under those above-mentioned, the supply air volume shall be increased by selecting a heater of a higher size or using more WESTHERM units.

Supply air temperature

In order to avoid stratification of air layers of varying temperatures, supply air temperature should range within following values :

- lower limit : 10 °C above ambient.
- upper limit : 35 °C above ambient.

Air throw

Corresponds to the distance between the WESTHERM unit and points where the air velocity is no longer felt by the human body (approx. 0.2 m/sec.).

Enables installation of units in the room.

The table on the next page gives the air throw for a given unit model and a supply air temperature of 15 °C above ambient.

For other temperature differences, use the correction factor.

Correction factor

Temp. difference	10 °C	15 °C	20 °C	30 °C	40 °C
Coefficient	1.28	1.00	0.90	0.70	0.60



> Selection and air throw (continued) <

**Air throw (m)**

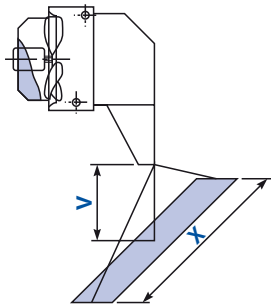
Values given for a temperature difference between ambient air and discharged air of 15 °C.

Sizes		35		45		50		55		65		70		110	
Fan speed		900	1400	900	1400	900	1400	900	1400	900	1400	700	900	900	1400
VM	L	8.0	12.0	10.0	14.0	12.0	16.0	14.0	18.0	16.0	20.0	16.0	20.0	14.0	18.0
	H	3.0	3.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
VN	L	8.0	12.0	10.0	14.0	12.0	16.0	14.0	18.0	16.0	20.0	16.0	20.0	14.0	18.0
	H	3.0	3.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
HN	D	7.0	10.0	9.0	12.0	11.0	14.0	12.0	16.0	14.0	18.0	14.0	18.0	12.0	16.0
	G*	4.0	4.5	4.5	5.0	4.5	5.5	5.0	6.0	5.5	6.5	5.5	6.5	5.0	6.0
HO	S	-	-	2.5 to 4.0		2.5 to 4.0		2.5 to 4.0		2.5 to 4.0		-	-	-	-
	L	-	-	6.0	8.0	6.5 to 8.5		7.0	9.0	7.5	9.0	-	-	-	-
HP	G	4.0	4.5	4.5	5.0	4.5	5.5	5.0	6.0	5.5	6.5	-	-	-	-
	D	7.0	10.0	9.0	12.0	11.0	14.0	12.0	16.0	14.0	18.0	-	-	-	-
VR	V	3.0	4.0	3.5	4.5	3.5	5.0	4.0	5.0	3.0	4.0	-	-	-	-
	X	3.0	4.0	4.0	5.0	4.5	5.5	5.0	6.0	5.5	6.5	-	-	-	-

\* : Air throw of diffuser HN can be increased by changing shutter position.

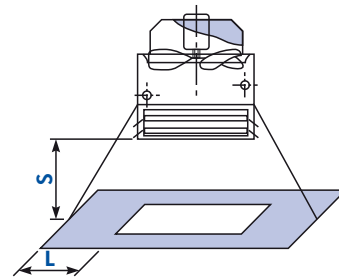
**Vertical arrangement**

**Diffuser VR (air curtain)**

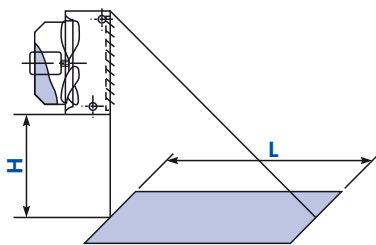


**Horizontal arrangement**

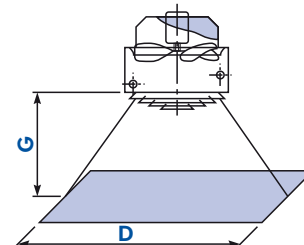
**Diffuser HO**



**Diffuser VM, VN**



**Diffuser HP, HN**



**> Performance data <**

**Thermal capacities for an inlet air temperature of : -15 °C**

	Sizes	Air flow (m³/h)	Water temperature (°C)				Steam pressure (bar)					
			45/37		90/70		2		4		6	
			Ts	P	Ts	P	Ts	P	Ts	P	Ts	P
Low speed (rpm)	351	1300	-	-	9	11.8	21	18.1	26	20.6	33	23.9
	352	1140	13	12.1	32	20.7	52	29.5	61	33.4	-	-
	353	1030	23	15.1	50	25.8	-	-	-	-	-	-
	451	3160	-	-	7	26.6	16	37.3	20	42.5	26	49.5
	452	2880	9	26.3	25	44.5	43	63.8	51	72.4	61	83.8
	453	2620	18	32.7	40	55.6	-	-	-	-	-	-
	501	4420	-	-	6	35.9	14	49.2	18	55.9	23	65.1
	502	4080	8	35.9	24	61.1	39	85.1	47	96.7	57	112.0
	503	3820	16	45.9	39	78.5	-	-	-	-	-	-
	551	5800	-	-	6	46.8	13	62.8	17	71.5	22	83.2
	552	5280	8	46.7	24	79.3	38	108.0	46	123.0	55	143.0
	553	4950	17	59.8	39	102.0	-	-	-	-	-	-
	651	7890	-	-	6	54.8	14	88.2	18	100.0	24	117.0
	652	7320	8	65.7	25	111.0	39	153.0	47	174.0	57	201.0
	653	6980	16	82.7	38	141.0	-	-	-	-	-	-
	701	11830	-	-	-	-	12	122.0	16	139.0	21	161.0
	702	11160	6	90.6	21	154.0	35	215.0	42	244.0	51	284.0
	703	10660	14	119.0	35	204.0	-	-	-	-	-	-
1101	11600	-	-	6	94.3	13	127.0	17	144.0	23	168.0	
1102	10560	8	92.3	24	157.0	39	218.0	46	248.0	56	287.0	
1103	9900	17	121.0	40	207.0	-	-	-	-	-	-	
High speed (rpm)	351	1840	-	-	-	-	15	21.3	19	24.3	25	28.3
	352	1650	9	15.1	25	25.6	42	36.2	50	41.1	60	47.6
	353	1530	19	19.7	42	33.5	-	-	-	-	-	-
	451	4820	-	-	-	-	9	44.8	13	51.1	17	59.6
	452	4380	-	-	18	55.6	32	78.7	38	89.5	47	104.0
	453	4120	12	42.9	31	72.9	-	-	-	-	-	-
	501	6750	-	-	-	-	7	56.5	10	64.5	14	75.3
	502	6240	-	-	16	75.1	28	103.0	34	118.0	42	137.0
	503	5830	11	58.7	30	100.0	-	-	-	-	-	-
	551	8940	-	-	-	-	6	70.9	9	81.0	13	94.5
	552	8290	-	-	15	96.9	26	130.0	32	149.0	39	173.0
	553	7760	11	77.1	29	131.0	-	-	-	-	-	-
	651	11960	-	-	-	-	7	101.0	10	116.0	14	135.0
	652	11040	-	-	17	137.0	29	185.0	35	211.0	43	246.0
	653	10460	11	105.0	29	178.0	-	-	-	-	-	-
	701	15260	-	-	-	-	7	131.0	11	150.0	15	175.0
	702	14400	-	-	16	174.0	29	241.0	35	274.0	43	319.0
	703	13780	11	138.0	29	235.0	-	-	-	-	-	-
1101	17880	-	-	-	-	6	144.0	9	165.0	13	192.0	
1102	16580	-	-	15	193.0	27	264.0	32	302.0	40	351.0	
1103	15520	11	157.0	30	267.0	-	-	-	-	-	-	

Ts : Outlet air temperature (°C) - P : Thermal capacity (kW).

**Air volume (D) and thermal capacity (P) correction factors**

	Standard arrangements (see section "Optional arrangements")										Diffusers O.P.R.	Filters 1 and E
	2	3	4	5	6	7	8	9	11			
D	0.98	0.95	0.95	0.92	0.92	0.92	0.90	0.93	0.90	0.91	0.85	
P	0.99	0.98	0.98	0.96	0.96	0.96	0.95	0.97	0.95	0.95	0.85	



> Performance data (continued) <

Thermal capacities for an inlet air temperature of : -7 °C

	Sizes	Air flow (m³/h)	Water temperature (°C)				Steam pressure (bar)					
			45/37		90/70		2		4		6	
			Ts	P	Ts	P	Ts	P	Ts	P	Ts	P
Low speed (rpm)	351	1300	-	-	15	10.4	28	16.9	33	19.3	40	22.5
	352	1140	17	10.1	37	18.5	58	27.4	-	-	-	-
	353	1030	26	12.6	53	23.1	-	-	-	-	-	-
	451	3160	-	-	13	23.7	23	34.9	27	39.9	33	46.7
	452	2880	13	21.7	30	39.7	48	59.3	56	67.8	-	-
	453	2620	21	27.1	44	49.6	-	-	-	-	-	-
	501	4420	-	-	13	32.1	21	45.8	25	52.5	30	61.5
	502	4080	13	29.9	29	54.7	45	79.2	53	90.6	-	-
	503	3820	20	38.3	42	70.2	-	-	-	-	-	-
	551	5800	-	-	12	42.0	20	58.5	24	67.0	29	78.5
	552	5280	13	39.0	29	70.9	44	101.0	52	115.0	61	134.0
	553	4950	20	49.9	42	91.1	-	-	-	-	-	-
	651	7890	-	-	12	56.9	21	82.2	25	94.1	31	110.0
	652	7320	13	54.7	30	99.7	45	142.0	53	163.0	-	-
	653	6980	19	68.6	41	126.0	-	-	-	-	-	-
	701	11830	-	-	11	77.8	19	113.0	23	130.0	28	153.0
702	11160	11	75.4	26	138.0	41	200.0	48	229.0	57	268.0	
703	10660	18	99.4	39	182.0	-	-	-	-	-	-	
1101	11600	-	-	13	84.6	20	118.0	24	135.0	30	159.0	
1102	10560	13	76.9	29	141.0	45	203.0	52	232.0	62	271.0	
1103	9900	21	102.0	43	186.0	-	-	-	-	-	-	
High speed (rpm)	351	1840	-	-	11	12.3	22	19.9	26	22.8	32	26.7
	352	1650	13	12.5	30	22.9	48	33.7	56	38.5	-	-
	353	1530	22	16.4	46	30.0	-	-	-	-	-	-
	451	4820	-	-	9	28.8	16	41.9	20	48.0	24	56.3
	452	4380	10	27.2	23	49.6	38	73.3	45	84.0	53	98.2
	453	4120	16	35.6	35	65.0	-	-	-	-	-	-
	501	6750	-	-	8	37.7	14	53.3	17	61.2	22	71.9
	502	6240	9	37.1	22	67.9	35	97.2	41	112.0	49	130.0
	503	5830	16	48.9	34	89.6	-	-	-	-	-	-
	551	8940	-	-	8	48.5	13	66.8	16	76.9	20	90.2
	552	8290	9	48.2	21	87.7	33	123.0	39	141.0	46	165.0
	553	7760	15	64.8	34	118.0	-	-	-	-	-	-
	651	11960	-	-	8	67.0	15	95.8	18	110.0	22	129.0
	652	11040	10	67.9	23	124.0	35	174.0	42	200.0	50	233.0
	653	10460	15	87.0	34	159.0	-	-	-	-	-	-
	701	15260	-	-	8	85.4	15	124.0	18	142.0	22	167.0
702	14400	9	85.7	22	157.0	35	226.0	41	259.0	50	303.0	
703	13780	15	115.0	34	210.0	-	-	-	-	-	-	
1101	17880	-	-	8	98.2	13	136.0	16	156.0	21	183.0	
1102	16580	8	95.3	21	174.0	33	249.0	39	286.0	47	334.0	
1103	15520	16	132.0	35	241.0	-	-	-	-	-	-	

Ts : Outlet air temperature (°C) - P : Thermal capacity (kW).

Air volume (D) and thermal capacity (P) correction factors

	Standard arrangements (see section "Optional arrangements")										Diffusers O.P.R.	Filters 1 and E
	2	3	4	5	6	7	8	9	11			
D	0.98	0.95	0.95	0.92	0.92	0.92	0.90	0.93	0.90	0.91	0.85	
P	0.99	0.98	0.98	0.96	0.96	0.96	0.95	0.97	0.95	0.95	0.85	

> Performance data (continued) <

Thermal capacities for an air inlet air temperature of : 0 °C

	Sizes	Air flow (m³/h)	Water temperature (°C)				Steam pressure (bar)					
			45/37		90/70		2		4		6	
			Ts	P	Ts	P	Ts	P	Ts	P	Ts	P
Low speed (rpm)	351	1300	10	4.6	20	9.3	34	15.8	39	18.2	45	21.4
	352	1140	20	8.4	40	16.6	62	25.6	-	-	-	-
	353	1030	28	10.5	56	20.8	-	-	-	-	-	-
	451	3160	9	10.7	19	21.3	29	32.7	33	37.7	39	44.3
	452	2880	17	17.9	34	35.6	53	55.5	61	63.8	-	-
	453	2620	24	22.4	47	44.5	-	-	-	-	-	-
	501	4420	9	14.6	18	29.0	27	43.0	31	49.6	36	58.4
	502	4080	17	24.8	33	49.3	50	74.2	58	85.3	-	-
	503	3820	23	31.8	46	63.2	-	-	-	-	-	-
	551	5800	9	19.2	18	37.8	26	54.9	30	63.3	35	74.6
	552	5280	17	32.4	33	63.9	49	94.4	57	109.0	-	-
	553	4950	23	41.4	46	82.0	-	-	-	-	-	-
	651	7890	9	25.9	18	51.1	27	77.1	31	88.9	37	105.0
	652	7320	17	45.5	34	89.8	50	133.0	58	153.0	-	-
	653	6980	22	56.7	45	113.0	-	-	-	-	-	-
	701	11830	8	35.2	16	70.0	25	107.0	29	123.0	34	145.0
702	11160	15	62.6	31	124.0	46	188.0	53	216.0	63	254.0	
703	10660	21	82.6	42	164.0	-	-	-	-	-	-	
1101	11600	9	38.6	18	76.3	26	111.0	30	128.0	36	151.0	
1102	10560	17	63.9	33	127.0	50	190.0	57	219.0	-	-	
1103	9900	24	84.7	47	168.0	-	-	-	-	-	-	
High speed (rpm)	351	1840	8	5.5	16	11.0	28	18.7	32	21.5	38	25.3
	352	1650	17	10.4	34	20.6	53	31.5	61	36.3	-	-
	353	1530	25	13.7	49	27.0	-	-	-	-	-	-
	451	4820	7	13.0	15	25.9	22	39.3	26	45.4	31	53.6
	452	4380	14	22.4	28	44.5	43	68.7	50	79.3	59	93.1
	453	4120	20	29.3	39	58.3	-	-	-	-	-	-
	501	6750	7	17.3	14	34.3	21	50.5	24	58.4	28	68.9
	502	6240	14	30.9	27	61.3	40	91.4	47	105.0	55	124.0
	503	5830	19	40.6	38	80.6	-	-	-	-	-	-
	551	8940	7	22.4	14	44.1	19	63.1	23	73.3	27	86.5
	552	8290	13	40.4	26	79.7	39	116.0	45	134.0	52	158.0
	553	7760	19	53.9	38	106.0	-	-	-	-	-	-
	651	11960	7	30.8	14	60.8	21	90.7	24	105.0	29	124.0
	652	11040	14	56.4	28	111.0	41	163.0	47	188.0	55	222.0
	653	10460	19	71.9	38	143.0	-	-	-	-	-	-
	701	15260	7	39.0	14	77.5	21	117.0	25	136.0	29	160.0
702	14400	14	71.1	27	141.0	41	212.0	47	245.0	55	288.0	
703	13780	19	95.5	38	190.0	-	-	-	-	-	-	
1101	17880	7	45.3	14	89.4	20	128.0	23	149.0	27	176.0	
1102	16580	13	79.8	26	158.0	39	235.0	45	272.0	53	320.0	
1103	15520	20	110.0	39	217.0	-	-	-	-	-	-	

Ts : Outlet air temperature (°C) - P : Thermal capacity (kW).

**Air volume (D) and thermal capacity (P) correction factors**

	Standard arrangements (see section "Optional arrangements")										Diffusers O.P.R.	Filters 1 and E
	2	3	4	5	6	7	8	9	11			
D	0.98	0.95	0.95	0.92	0.92	0.92	0.90	0.93	0.90	0.91	0.85	
P	0.99	0.98	0.98	0.96	0.96	0.96	0.95	0.97	0.95	0.95	0.85	



7 sizes  
Hot water or steam

 7.5 to 179 kW

> Performance data <

Thermal capacities for an inlet air temperature of : +12 °C

	Sizes	Air flow (m³/h)	Water temperature (°C)				Steam pressure (bar)					
			45/37		90/70		2		4		6	
			Ts	P	Ts	P	Ts	P	Ts	P	Ts	P
Low speed (rpm)	351	1300	18	2.9	29	7.5	43	14.1	48	16.4	55	19.5
	352	1140	26	5.5	46	13.5	-	-	-	-	-	-
	353	1030	32	7.0	60	17.0	-	-	-	-	-	-
	451	3160	18	7.0	28	17.3	39	29.1	43	33.9	49	40.4
	452	2880	24	11.7	41	28.9	61	49.3	-	-	-	-
	453	2620	28	14.7	52	36.2	-	-	-	-	-	-
	501	4420	18	9.7	27	23.7	37	38.3	41	44.8	47	53.3
	502	4080	24	16.5	40	40.3	58	65.9	-	-	-	-
	503	3820	28	21.2	51	51.7	-	-	-	-	-	-
	551	5800	18	12.7	27	31.0	36	49.1	40	57.2	46	68.1
	552	5280	24	21.5	40	52.3	58	83.9	-	-	-	-
	553	4950	28	27.6	51	67.1	-	-	-	-	-	-
	651	7890	18	16.9	27	41.6	37	68.7	41	80.3	47	95.5
	652	7320	24	30.2	41	73.4	59	118.0	-	-	-	-
	653	6980	27	37.3	50	91.8	-	-	-	-	-	-
701	11830	18	23.1	26	57.0	35	95.1	39	111.0	44	132.0	
702	11160	23	41.4	38	102.0	55	167.0	62	194.0	-	-	
703	10660	27	54.9	48	134.0	-	-	-	-	-	-	
1101	11600	18	25.8	28	62.7	37	98.8	41	115.0	46	137.0	
1102	10560	24	42.5	40	104.0	58	169.0	-	-	-	-	
1103	9900	29	57.1	52	138.0	-	-	-	-	-	-	
High speed (rpm)	351	1840	18	3.4	26	8.8	38	16.6	42	19.4	48	23.1
	352	1650	24	6.8	41	16.7	61	28.0	-	-	-	-
	353	1530	29	9.1	54	22.1	-	-	-	-	-	-
	451	4820	17	8.4	25	21.0	33	35.1	36	41.0	41	49.0
	452	4380	22	14.6	36	36.2	52	61.2	59	71.4	-	-
	453	4120	25	19.1	45	47.4	-	-	-	-	-	-
	501	6750	17	11.6	24	28.5	31	45.4	35	53.5	39	63.9
	502	6240	21	20.5	35	50.2	50	81.4	56	95.0	-	-
	503	5830	25	27.0	45	66.0	-	-	-	-	-	-
	551	8940	17	15.1	24	36.7	30	57.1	34	67.2	38	80.2
	552	8290	21	27.2	35	66.1	48	105.0	54	122.0	63	146.0
	553	7760	25	35.8	44	87.1	-	-	-	-	-	-
	651	11960	17	20.3	24	50.2	32	81.9	35	96.2	40	115.0
	652	11040	22	37.4	36	91.1	50	145.0	56	170.0	-	-
	653	10460	25	47.1	44	116.0	-	-	-	-	-	-
701	15260	17	25.7	24	63.8	32	106.0	35	124.0	40	148.0	
702	14400	21	47.1	35	115.0	50	189.0	56	221.0	-	-	
703	13780	25	63.4	44	155.0	-	-	-	-	-	-	
1101	17880	17	30.6	24	74.6	31	116.0	34	136.0	38	163.0	
1102	16580	21	53.3	35	131.0	49	211.0	55	247.0	63	294.0	
1103	15520	26	74.1	45	179.0	-	-	-	-	-	-	

Ts : Outlet air temperature (°C) - P : Thermal capacity (kW).

Air volume (D) and thermal capacity (P) correction factors

	Standard arrangements (see section "Optional arrangements")										Diffusers O.P.R.	Filters 1 and E
	2	3	4	5	6	7	8	9	11			
D	0.98	0.95	0.95	0.92	0.92	0.92	0.90	0.93	0.90	0.91	0.85	
P	0.99	0.98	0.98	0.96	0.96	0.96	0.95	0.97	0.95	0.95	0.85	

> Performance data (continued) <

Thermal capacities for an inlet air temperature of : +18 °C

	Sizes	Air flow (m³/h)	Water temperature (°C)				Steam pressure (bar)					
			45/37		90/70		2		4		6	
			Ts	P	Ts	P	Ts	P	Ts	P	Ts	P
Low speed (rpm)	351	1300	23	2.1	33	6.6	48	13.3	53	15.5	60	18.6
	352	1140	29	4.1	49	12.0	-	-	-	-	-	-
	353	1030	33	5.4	61	15.2	-	-	-	-	-	-
	451	3160	23	5.2	32	15.4	43	27.4	48	32.2	54	38.5
	452	2880	27	8.7	44	25.7	-	-	-	-	-	-
	453	2620	30	11.0	54	32.2	-	-	-	-	-	-
	501	4420	23	7.3	32	21.2	42	36.1	46	42.4	52	50.8
	502	4080	27	12.5	44	36.0	63	61.9	-	-	-	-
	503	3820	30	16.1	54	46.2	-	-	-	-	-	-
	551	5800	23	9.6	32	27.7	41	46.1	45	54.2	51	64.9
	552	5280	27	16.3	44	46.7	62	78.8	-	-	-	-
	553	4950	30	21.0	54	59.9	-	-	-	-	-	-
	651	7890	23	12.6	32	37.0	42	64.8	46	76.0	52	91.0
	652	7320	27	22.8	44	65.5	63	111.0	-	-	-	-
	653	6980	30	28.1	52	81.8	-	-	-	-	-	-
	701	11830	22	17.2	31	50.8	40	89.5	44	105.0	49	126.0
	702	11160	26	31.2	42	90.6	59	157.0	-	-	-	-
703	10660	29	41.7	51	120.0	-	-	-	-	-	-	
1101	11600	23	19.6	32	56.1	42	93.1	46	109.0	51	131.0	
1102	10560	27	32.1	44	92.6	62	159.0	-	-	-	-	
1103	9900	31	43.9	55	123.0	-	-	-	-	-	-	
High speed (rpm)	351	1840	22	2.5	30	7.8	43	15.7	47	18.4	53	22.0
	352	1650	27	5.1	45	14.9	-	-	-	-	-	-
	353	1530	31	7.0	56	19.8	-	-	-	-	-	-
	451	4820	22	6.2	29	18.6	38	33.0	42	38.9	47	46.8
	452	4380	25	10.8	40	32.1	57	57.5	63	67.5	-	-
	453	4120	28	14.3	48	42.1	-	-	-	-	-	-
	501	6750	22	8.8	29	25.6	37	43.1	40	51.0	45	61.3
	502	6240	25	15.5	39	44.8	54	76.5	60	90.0	-	-
	503	5830	28	20.5	48	58.9	-	-	-	-	-	-
	551	8940	22	11.4	29	33.0	36	54.2	39	64.1	43	77.1
	552	8290	25	20.5	39	59.0	53	98.4	59	116.0	-	-
	553	7760	28	27.1	47	77.8	-	-	-	-	-	-
	651	11960	22	15.1	29	44.7	37	77.1	40	91.2	45	110.0
	652	11040	25	28.2	40	81.3	54	137.0	61	161.0	-	-
	653	10460	28	35.3	47	103.0	-	-	-	-	-	-
	701	15260	22	19.2	29	56.8	37	99.0	41	117.0	45	141.0
	702	14400	25	35.5	39	103.0	54	178.0	61	209.0	-	-
703	13780	28	48.0	48	139.0	-	-	-	-	-	-	
1101	17880	22	23.5	29	67.1	36	110.0	39	130.0	44	157.0	
1102	16580	25	40.3	39	117.0	53	199.0	59	234.0	-	-	
1103	15520	29	56.7	48	160.0	-	-	-	-	-	-	

Ts : Outlet air temperature (°C) - P : Thermal capacity (kW).

**Air volume (D) and thermal capacity (P) correction factors**

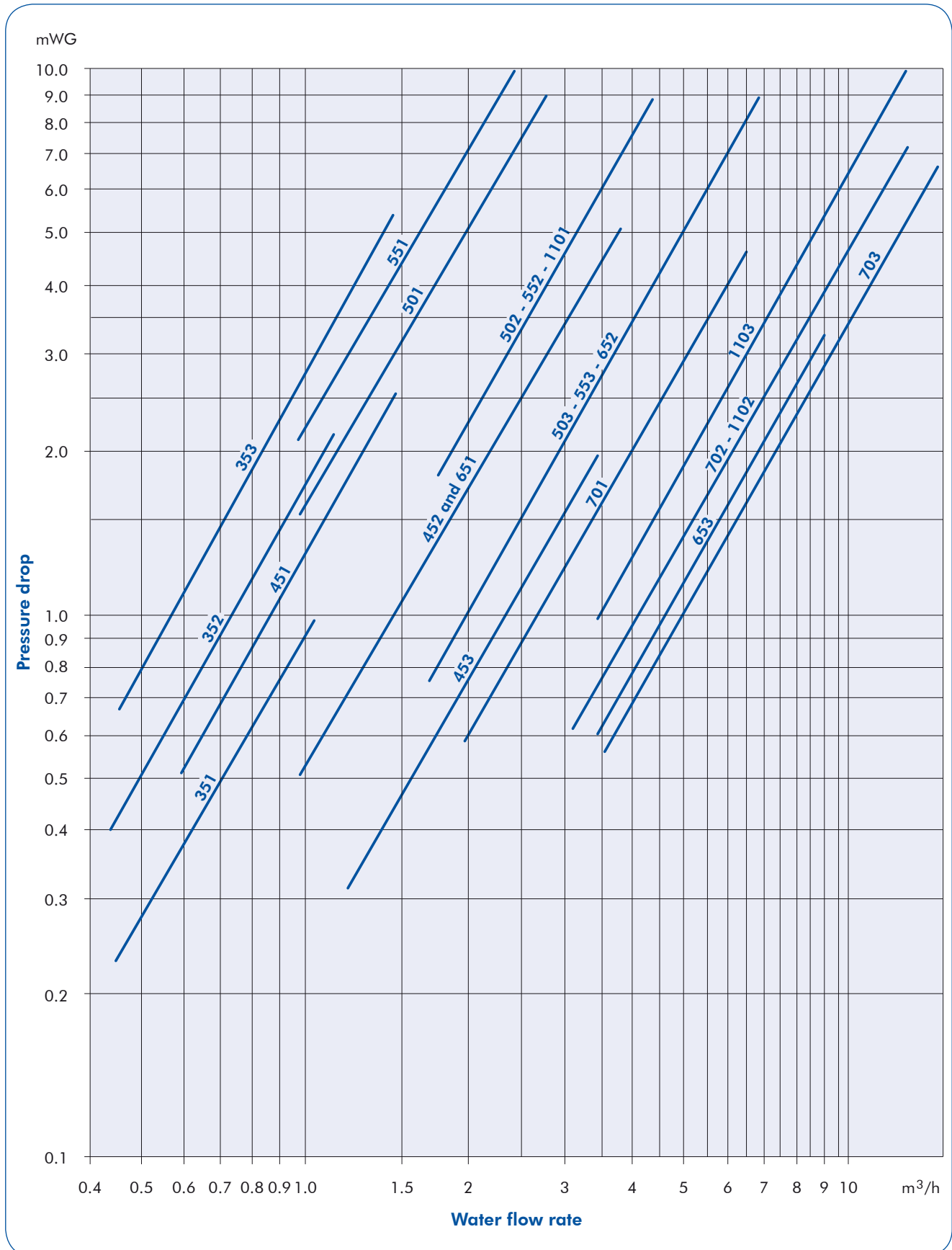
	Standard arrangements (see section "Optional arrangements")										Diffusers O.P.R.	Filters 1 and E
	2	3	4	5	6	7	8	9	11			
D	0.98	0.95	0.95	0.92	0.92	0.92	0.90	0.93	0.90	0.91	0.85	
P	0.99	0.98	0.98	0.96	0.96	0.96	0.95	0.97	0.95	0.95	0.85	



7 sizes  
Hot water or steam

7.5 to 179 kW

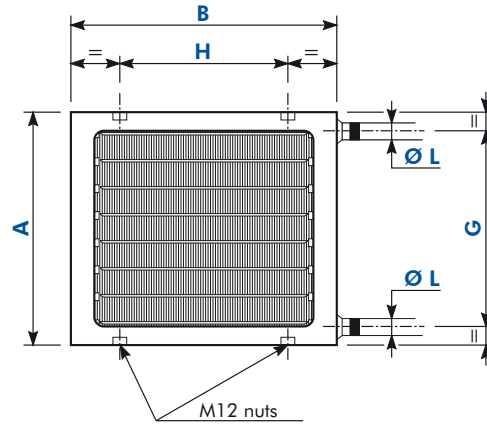
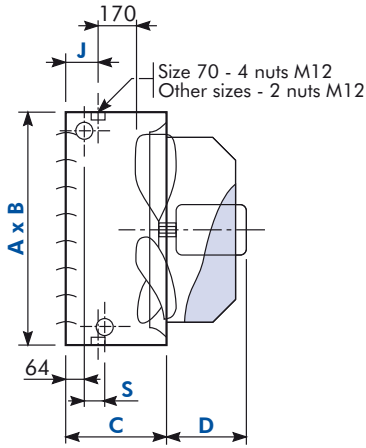
> Water pressure drop curves <



> Dimensions and weight <

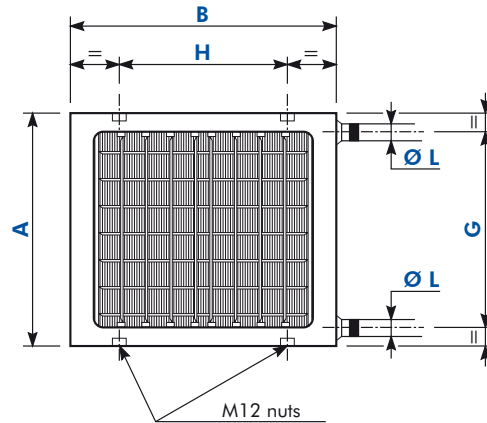
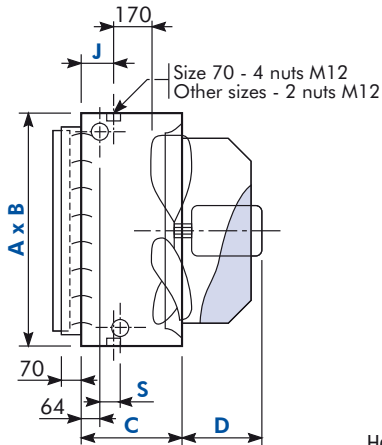
Vertical arrangement

Diffuser VM



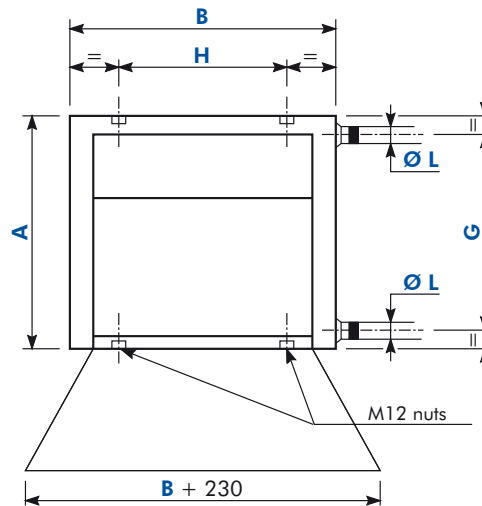
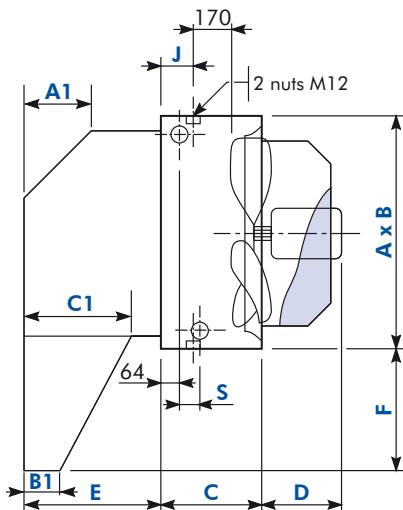
Horizontal discharge

Diffuser VN



Horizontal discharge (double deflection)

Diffuser VR (except sizes 70 and 110)



Vertical discharge

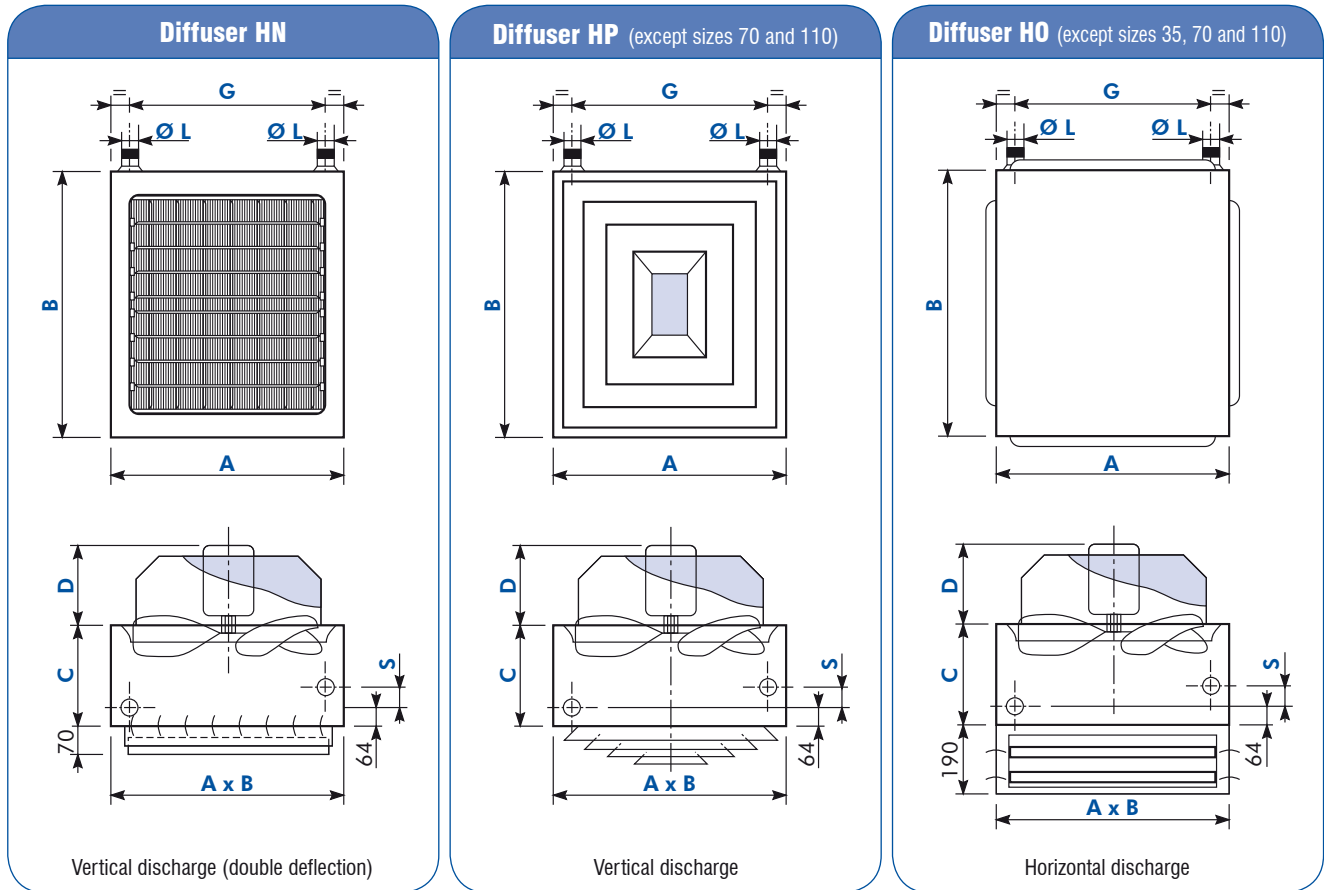


7 sizes  
Hot water or steam

7.5 to 179 kW

> Dimensions and weight (continued) <

Horizontal arrangement



Dimensions (mm)

Sizes	35	45	50	55	65	70	110
A	440	560	560	680	800	920	680
B	550	670	790	790	910	990	1580
C	300	300	300	300	300	440	300
D	245	275	275	275	295	295	275
E	300	400	400	400	400	-	-
F	270	370	370	370	370	-	-
G	330	450	450	570	690	810	570
H	320	440	560	560	680	700	1350
J	124	124	124	124	124	45	124
L	See table below						
S	30	60	60	60	60	60	60
A1	175	175	175	175	175	-	-
B1	98	160	200	249	249	-	-
C1	260	360	360	347	347	-	-

Coil header sizes (ØL)

Sizes	Cu/Alu coil Number of rows			Cupro-nickel/Alu coil Number of rows		
	1	2	3	1	2	3
35	20/27	20/27	20/27	15/21	15/21	15/21
45	20/27	26/34	26/34	15/21	33/42	33/42
50	20/27	26/34	26/34	15/21	33/42	33/42
55	20/27	26/34	26/34	15/21	33/42	33/42
65	26/34	26/34	33/42	40/49	40/49	40/49
70	33/42	33/42	33/42	40/49	40/49	40/49
110	26/34	33/42	33/42	40/49	40/49	40/49

Weight (kg)

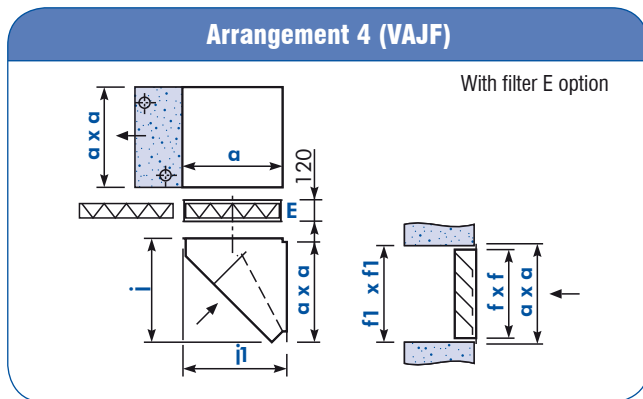
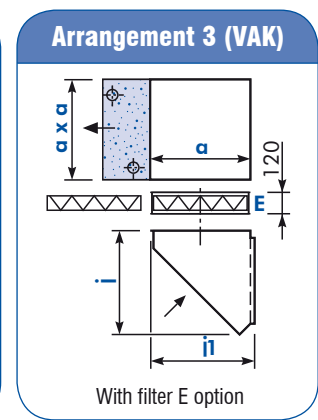
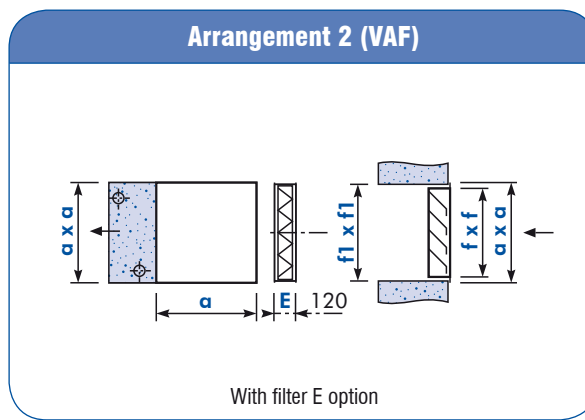
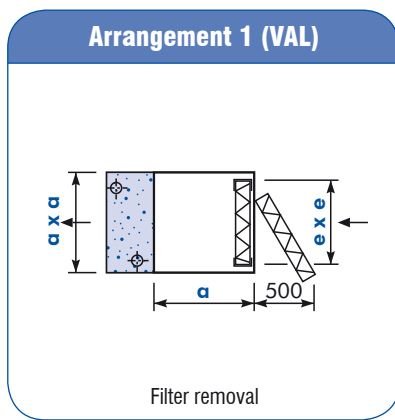
Sizes	Water volume (dm <sup>3</sup> )	Operating weight
351	1.8	20.0
352	3.9	22.5
353	5.8	25.0
451	3.0	32.5
452	6.5	37.5
453	9.5	42.0
501	3.6	41.0
502	7.7	47.0
503	11.3	54.0
551	4.2	45.5
552	9.0	52.0
553	13.2	58.5
651	8.0	56.0
652	14.0	65.0
653	20.0	74.0
701	10.4	82.0
702	18.4	92.0
703	27.2	103.0
1101	11.0	91.0
1102	20.0	104.0
1103	29.0	117.0

> Optional arrangements <

Component description

- V : Westerm vertical version.
- H : Westerm horizontal discharge.
- A : Cubic inlet casing for matching other accessories on 3 faces.
- B : Mixing dampers.
- E : Flat-bank filter box.
- F : External weatherproof louvre with bird guard.
- G : Duct.
- J : Mixing box with adjustable shutter and wire mesh guard.
- K : Return air plenum with wire mesh guard.
- L : Flat-bank filter for casing A.
- Z : Roof air inlet with bird guard and seal ring, to be mounted.

Standard combinations

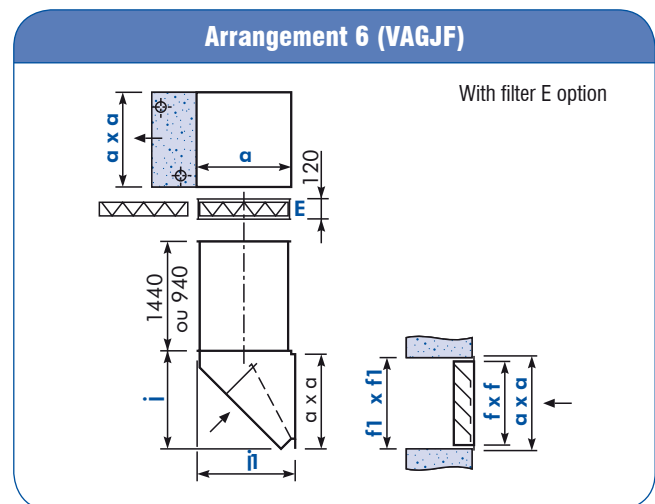
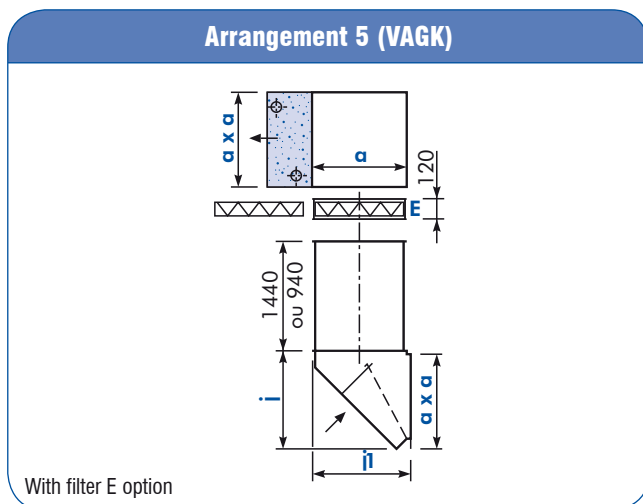


Dimensions (mm)

Sizes	35	45	50	55	65	70	110
a	440	560	560	680	800	800	680
e	370	490	490	610	730	730	610
f	382	502	502	622	742	742	622
f1	392	512	512	632	752	752	632
h	720	900	900	1080	1280	1280	1080 *
h2	190	230	230	275	310	310	275
h4	960	1080	1080	1200	1320	1320	1200
j	480	600	600	720	840	840	720
j1	460	580	580	700	820	820	700

\* 1080 x 1870

Note : The size 110 is equipped with 2 accessory sets of the size 55.



The filter box E allows a filter removal from one of the four sides.



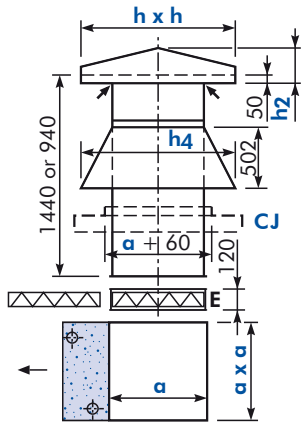
7 sizes  
Hot water or steam

7.5 to 179 kW

> Optional arrangements (continued) <

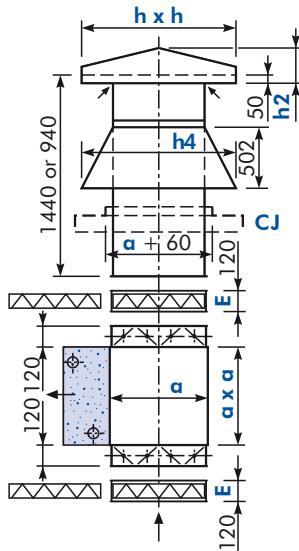
Standard combinations

Arrangement 7 (VAGZ)



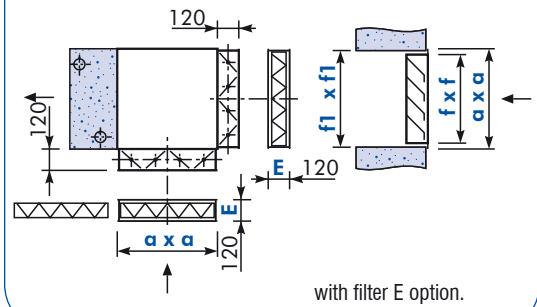
With filter E option.  
CJ gasket cover not supplied.

Arrangement 8 (VABGZ)



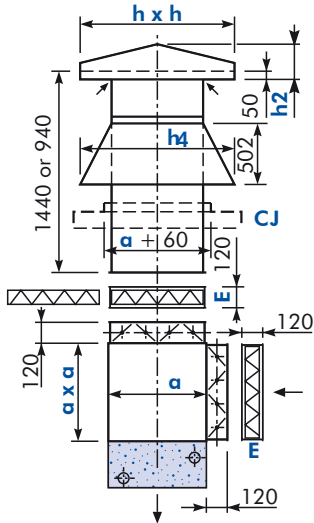
With filter E option.  
CJ gasket cover not supplied.

Arrangement 9 (VABF)



with filter E option.

Arrangement 11 (HABGZ)



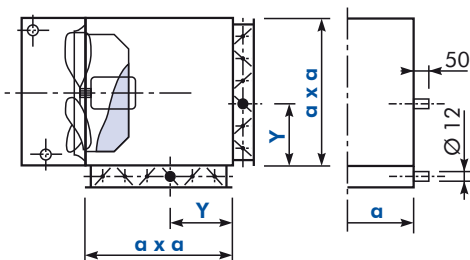
With filter E option.  
CJ gasket cover not supplied.

Weight (kg)

Sizes	35	45	50	55	65	70	110
Optional arrangements	1	10.0	15.0	15.0	22.0	29.0	44.0
	2	11.0	17.0	17.0	24.0	31.5	48.0
	3	17.0	25.5	25.5	35.0	46.5	70.0
	4	20.0	30.0	30.0	41.0	54.0	82.0
	5	37.0	51.5	51.5	67.0	84.5	134.0
	6	40.0	56.0	56.0	73.0	92.0	146.0
	7	57.0	75.5	75.5	95.0	117.0	190.0
	8	67.0	88.0	88.0	111.0	137.0	222.0
	9	21.0	29.5	29.5	40.0	51.5	80.0
	11	67.0	88.0	88.0	111.0	137.0	222.0
	Diffusers	N	3.0	4.5	5.5	6.5	7.5
O		-	10.0	11.0	12.5	16.0	-
P		1.5	2.5	3.0	3.5	5.0	-
R		12.0	17.0	18.5	20.0	23.0	-

Note : The size 110 is equipped with 2 accessory sets of the size 55.

Damper shaft position





### Features

- Available only in **vertical mounting** with single deflection air diffuser.
- Cabinet and diffuser coated with **epoxy painting**.
- **3-row coil only**.
- Fan motor assembly with **low rotational speed** (700 rpm).
- Available in **3 models** : 45, 55 and 65.
- Painted drain pan with extended edge to collect water droplets carried away by air stream.

### Option and accessory

- Double deflection N type diffuser.

## > Performance data <

CHILLED WATER - Rotational speed : 700 rpm - Supply voltage : 230/400V-3-50Hz								
Sizes	Air volume (m <sup>3</sup> /h)	Cooling capacity (W)	WPD (kPa)	Ts (°C)	Air throw (m)	Sound pressure level (dBA)	Absorbed current (A)	Absorbed power (kW)
453	2280	8726	8	19	7	42	0.78	0.18
553	3560	13738	22	18.6	9	48	0.85	0.25
653	5130	18442	22	19.1	11	48	0.85	0.25

**Performance based on** : Chilled water temperature 7/12 °C and air temperature 28 °C/50%.

**WPD** : Water pressure drop.

**Ts** : Discharge temperature.