KG 40 - 250 Standard

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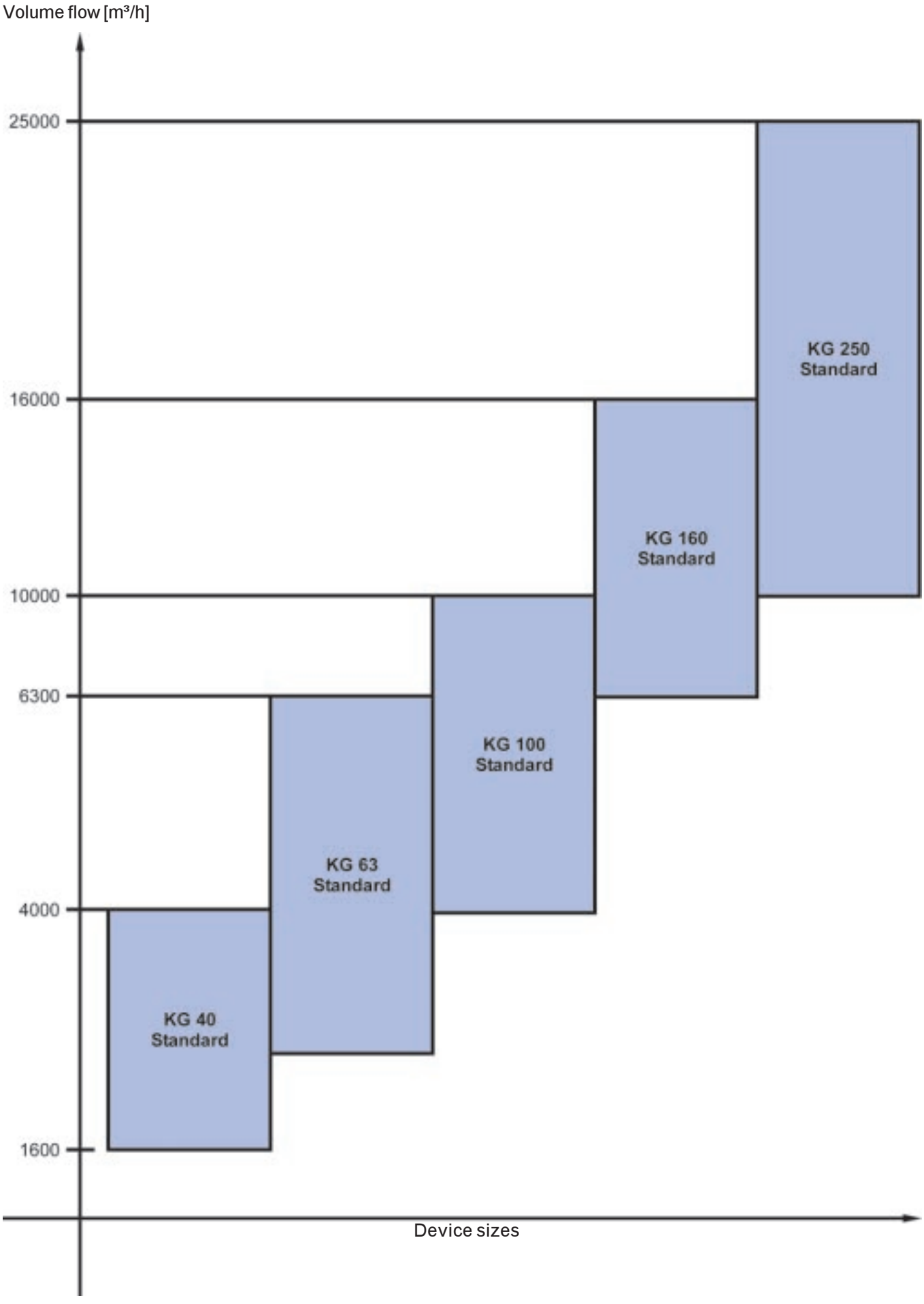

Volume flow [m³/h]
25000
16000
10000
6300
4000
1600
KG 250
Standard
KG 160
Standard
KG 100
Standard
KG 63
Standard
KG 40
Standard
Device sizes

Air conditioners:

Profile frame construction in welded and galvanised design.
Inspection door with turn locks on the operating side.
Subsequent change of the equipment arrangement possible.
Transport eyelets on request.

Cladding / technical data

Panels double-walled, removable, galvanised.
Acoustic and thermal insulation with mineral wool mats.
Material class A2, non inflammable according to DIN 4102

Thickness of the panel	25	mm
Thermal conductivity:	0.035	W/mK
Heat transmission coefficient:	1.16	W/m²K
Heat transmission resistance:	0.86	m²K/W
Sound reduction coefficient RW according to DIN/EN 20140-3:	36	dB

On request: Frame insulation

Inspection door

Thickness of inspection door: 25 mm. Inspection door can be opened with regular tools. May be opened to the right or left depending on order.
Surrounding, non-ageing special sealing profile with sealing lip.
Inspection door consisting of fully galvanised steel sheets.
High quality mineral wool insulation inserted between inside and outside element, enclosed with metal on all sides.

Fan element

With high speed radial fan with bi-directional suction and backward or forward rotor blades.
Balanced shaft, set off to standard diameter on both ends for the addition of V-belt pulleys.
With sturdy suspension and noise-verified precision deep groove ball bearing, greased with non-ageing lithium soap grease, rotor wheel balanced statically and dynamically according to VDI 2060.
Easily removable from casing for repair and maintenance work.
Driven by three phase motor 400 V/50 Hz, construction type B3, heat class F, degree of protection IP 55.
Tested by TÜV-GS; wired motors are generally high-voltage and PE conductor tested.
Power transmission with high-power V-belt and V-belt pulleys.
V-belt pulleys fastened with taper-lock clamping bushes according to DIN 6885.
Belt protection standard for KG 250, removable only with tools.
Fan and motor attached in the housing vibration-free.
Potential equalisation between fan and casing is standard.
Elastic connection between fan and casing.
Suction and exhaust openings can be arranged in any position.
Operating side with double-walled inspection door, tools necessary to open.

KG 40 - 100 Standard

Fan and motor in sturdy diagonal construction flexibly mounted with vibration absorbers, easily removable in two directions.

KG 160 - 250 Standard

Fan and motor mounted on sturdy base frame. Base frame with vibration absorbers, flexibly mounted.

On request

Fan with direct driven rotor wheel up to model KG 100
Fan spiral housing with inspection opening.
Fan spiral housing with condensate connector
V-belt protection up to model KG 160
Fan with free-running wheel

On request

Change-pole motor
Motor with explosion-protected design
Three phase motor with speed control
Motor protection with PTC thermistor or thermal contacts
Repair switch, mounted and wired
Potential equalisation

Free-running fan wheel

Fan/motor with free-running, backward-curved high-power rotor wheel, mounted directly on motor shaft. Screwed support construction made of galvanised steel sheets. Complete unit attached to C profiles and decoupled by rubber vibration damping elements. Rotor wheel in welded steel sheet design and surface protection with powder coating, or in polyamide for models up to KG100.
Rotor wheel balanced with hub, balancing grade G 2.5 according to ISO 1940 P1. Retracted entry nozzle made of galvanised steel sheets for optimum flow-in of the rotary wheel. Entry nozzle rigidly connected with support frame and adjusted, ensuring optimum slot centring. Taper lock hub made of grey cast iron, screwed in. IEC three phase standard motor, 400 V, 50 Hz, motor protection with PTC thermistor, heat class F motor suitable for operation with frequency converters. Maximum permissible air temperature: 60 °C. Measuring possibilities at inlet nozzle for volume flow determination.
Custom models on request:
Rotor wheel in welded aluminium design, surface untreated.
Motor with built-in frequency converter

Accessories on request
for continuous speed control

Pressure sensor for transmission of measured values.

Transducer

Power supply for pressure sensor with control amplifier for frequency converter.

Control module

Electronic frequency converter (5 to 70 Hz) for setting the required fan speed.

Frequency converter

Frequency converter provided on site:
Permissible electronic limits (U_{peak} < 1000V; du/dt < 500 V/µsec).
For longer supply wires to the frequency converter, the use of a motor filter or a sinus filter is recommended.
Interference suppression filter according to EN 55011, class B, must be used.
As connecting wire between motor and frequency converter, shielded cables must be used.

Heater element
permissible operating pressure: 16 bar
Test pressure 30 bar

With extractable heat exchanger Cu/Al, pipes made of Cu with pressed-on, optimised, and profiled high-performance lamella, collector made of steel, for warm-water, hot-water, or steam operation.
Permissible operating pressure 16 bar, test pressure 30 bar.
Connections with inch system thread or flange and connecting flange

On request:
Heat exchanger: galvanised steel
Heat exchanger coated
Connectors with bleed and drain nozzle
Extractable frost protection frame

alternative:
Heater with extractable, multi-stage electrical air heater

for 3 x 400V, in its own housing
Non-glowing heating grating with low surface temperature.
Metal strip with built-in temperature controls wired ready for installation, additionally with safety temperature limiter.

Cooling element
permissible operating pressure: 16 bar
Test pressure 30 bar

With extractable exchanger Cu/Al, pipes made of Cu with pressed-on, optimised, and profiled high-performance lamellas, collector made of steel, for cold-water pump operation. Permissible operating pressure 16 bar, test pressure 30 bar.
Connections with inch system thread or flange and connecting flange.
Plastic mist eliminator and corrosion-resistant condensate basin with outlet chute on the side.

On request:
Exchanger (steel-galvanised design) completely galvanised in full immersion bath
Exchanger Cu/Al completely coated
Exchanger Cu/Cu
Collecting tank made of Cu
Connectors with bleed and drain nozzle

alternative: **Cooling element** (direct evaporator)	With extractable exchanger Cu/Al as direct evaporator. Plastic mist eliminator and corrosion-resistant condensate basin with outlet chute on the side.
Sleeve filter element	Sleeve filter grade G4, F5, F7, F9 extractable for inspection. Inspection door on operating side can be opened with regular tools, may be opened to the right or left, depending on order.
Sleeve filter – short element	Sleeve filter grade G4 extractable to side for inspection. Inspection door on operating side can be opened with regular tools, may be opened to the right or left, depending on order.
Short filter element	Filter frame with V-shaped, inserted, regenerative filter mat of grade G4. Filter frame extractable to side for inspection. Inspection door on operating side can be opened with regular tools, may be opened to the right or left, depending on order.
Combined mixing and filter element	Extractable filter frame with V-shaped, inserted, regenerative filter mat of **grade G4**. Filter frame extractable towards the side Inspection door on operating side can be opened with regular tools, may be opened to the right or left, depending on order. On request: With opposite coupled profile lamellas with plastic connection, linkage and control lever for manual or motor-supported operation.
Mixing/exhaust air element	Mixing air, exhaust air, or suction element with removable panel. On request: with inspection door On request: With opposite coupled profile lamellas with plastic connection, linkage and control lever for manual or motor-supported operation. On request: **Built-in mixing pockets** in mixing and exhaust air element. Mixing pockets made of galvanised steel sheets for mixing of circulating air and outside air. Uniform temperature distribution. On request: With opposite coupled profile lamellas with plastic connection, linkage and control lever for manual or motor-supported operation.
Exhaust air element	As mixing element with flaps, with opposite coupled profile lamellas with plastic connection. Linkage with control lever for manual or motor-supported operation.
Silencer element	With mineral fibre screen, material class A1 (non inflammable) according to DIN 4102, in galvanised steel sheet frame. Water-repellent, abrasion-resistant, cleanable surfaces. On request: with double-foil cover with perforated plate cover screens removable towards the side.
Vapour humidifier empty element (length variable according to the specifications of the manufacturer)	Humidifier chamber with basin made of corrosion-resistant material. Inside surfaces: Steel sheet, galvanised On request: with downward gradient and drain. Inspection hole Ø 150 mm with lighting.

Washer element made of plastic

Casing made of glass fibre reinforced plastic (polyester resin) in shell design with 6-8mm wall thickness, with laminated reinforcement for stabilisation against high pressure loads.
Equipped with supply system with float valve 3/4", stainless steel sealing fit, and plastic float, for operation with fully desalinated water.
Outlet and overflow chute made of PVC, nozzle holder with self-cleaning nozzles spraying against air-flow, consisting of distributor tube with perpendicular nozzle tubes and nozzles made of PP with quick clip lock, stainless steel cap, self-cleaning and largely clog-free.
Rectifier and mist eliminator made of PP-tv with the necessary holders and spacer profiles, completely removable, heat-resistant, dry-run protection. Basin bottom accessible, inclination all around towards the removal chute, may be emptied completely, easy-clean surface. All connectors are on the operating side. Inspection door double-walled with insulation with double-walled inspection hole.
On request:
Lighting splash-proof (glass fibre reinforced plastic, transparent), accessible from the outside, lighting 230 V/60 W, drain and overflow device made of PVC with inside siphon, thermometer, pressure gauge, pump housing made of stainless steel (KG 160 and up), pump motor with PTC thermistor, heat class CL F, degree of protection IP 55, suitable for speed controlled operation. Pump with complete piping on suction and pressure side, de-sludging system, darkening for inspection window.

KG 40-100:	Pump housing, rotor wheel and shaft made of stainless steel
KG 160-250:	Pump housing made of grey cast iron, rotor wheel and shaft made of stainless steel

Entering velocity max. 3.2 m/sec (speed with respect to connection cross-section). On request: Access path, automatic desalination, UV water treatment

Cross flow heat exchanger Type KGX

Cross flow heat exchanger KGX design horizontal (for air guide horizontal-horizontal) or vertical (for air guide horizontal-vertical).

Recuperative heat and cold recovery according to VDI 2071 with corrosion-resistant special aluminium plates.
Profiled exchanger plates made of special aluminium, sealed from each other with permanent elastic and temperature-resistant sealing compound.
On request, bypass flap integrated on the outside air side, with opposite coupled profile lamellas for power and rime protection control.
Condensate basin made of corrosion-resistant aluminium (optional stainless steel, min.1.4301) incl. drain 1 1/4". Outside air and exhaust air are separated.
For flow velocities of more than 2.0 m/s and a relative withdrawn air humidity of more than 50 %, a mist eliminator is generally provided.
On request:
Siphon with back-up protection and automatic filling supplied but not installed.

Cross flow heat exchanger Type KGXD

Cross flow heat exchanger KGXD with integrated bypass design horizontal or vertical for diagonal air guide.

Recuperative heat and cold recovery according to VDI 2071 with corrosion-resistant special aluminium plates.
Profiled exchanger plates made of special aluminium, sealed from each other with permanent elastic and temperature-resistant sealing compound.
Bypass flap on outside air side, with profiled, opposite lamellas for performance and rime protection control.
Condensate basin made of corrosion-resistant aluminium (optional stainless steel, min.1.4301) incl. drain 1 1/4". Outside air and exhaust air are separated.
For flow velocities of more than 2.0 m/s and a relative withdrawn air humidity of more than 50 %, a mist eliminator is generally provided.
On request:
Siphon with back-up protection and automatic filling supplied but not installed.

Cycle-connected system Type KVS
permissible operating pressure: 16 bar
Test pressure 30 bar

For heat recovery from withdrawn air. Casing design same as air conditioner

Cooling element:	with insertable heat exchanger for heat recovery for transmitting medium with antifreeze, connections with inch system thread, mist eliminator and condensate basin with outflow. At the withdrawn air side, a mist eliminator is built in in order to prevent damage to following aggregates by accumulating condensate.
Heater element:	with insertable heat exchanger Cu/Al for heat recovery for transmitting medium water with antifreeze. Connections with inch system thread.

Rotation heat exchanger type RWT

Condensation rotor for optimum utilisation of the **sensible thermal energy** in the exhaust air. Horizontal or vertical installation. Sturdy frame construction.
Low weight and easy accessibility of all device components.

Rotor material made of corrosion-resistant aluminium alloy, wound in wavy and straight position, for laminar airflow. For casing dimension larger than 2200 mm, frame and rotor mass separated, assembly on site.

Flush chamber to avoid overflow of the withdrawn air and supply air (if necessary).

Seal of rotor mass with surrounding, readjustable, and replaceable seals.

Rotor drive with continuously adjustable motor with reduction gear and V-belt around the rotor circumference. Controller for controlling the motor.

Enthalpy rotor for optimum utilisation of the **sensible and latent thermal energy** in the exhaust air. Horizontal or vertical installation. Sturdy frame construction. Low weight and easy accessibility of all device components.

Rotor material made of corrosion-resistant aluminium alloy with hygroscopic surface for humidity transmission, wound in wavy and straight position, for laminar airflow. For casing dimension larger than 2200 mm, frame and rotor mass separated, assembly on site.

Flush chamber to avoid overflow of the withdrawn air and supply air (if necessary).

Seal of rotor mass with surrounding, readjustable, and replaceable seals.

Rotor drive with continuously adjustable motor with reduction gear and V-belt around the rotor circumference. Controller for controlling the motor.

Tube heat exchanger Type WRT

Design:
Air circulation horizontal side by side and one above the other.
The frame of the heat exchanger is made of galvanised/coated steel sheets; the tubes are made of Cu with pressed-on, optimised and profiled high-performance lamellas made of aluminium.
The heat recovery chamber is made with a condensate basin made of corrosion-resistant aluminium.
The heat exchanger pipe can be cleaned from all sides.
In order to prevent damage to subsequent elements (due to condensate), a mist eliminator is installed in the exhaust air side.

Alternatively with internal bypass:
In order to prevent rime on the heat exchanger surfaces, the outside air can partially or entirely pass by the heat exchanger in the internal bypass.

Accessories

Device base frame made of galvanised, sturdy and surrounding steel sheet, attached to air conditioner or supplied separately. Height of 200 to 500mm. Insulated if desired.
alternative:
Open base frame 200mm with vertically adjustable feet. Height adjustable to 300mm.
Flexible canvas connector for suction or pressure side, 4-hole profile frame and potential equalisation.
Temperature resistant **flexible canvas connector** for suction or pressure side, 4-hole profile frame.
Replacement filter
Transport eyelet
Double-walled inspection hole Ø 150 mm
Lighting
Differential pressure gauge
Inclined tube manometer with/without switch contact
Air flow controller
Air volume measuring instrument
Repair switch
Belt protection
Differential pressure monitor
Potential equalisation (between housing and construction-side channel)

KG Standard		40	63	100	160	250
Fan element 	L W H	630 630 630	800 800 800	1000 1000 1000	1250 1250 1250	1600 1600 1600
Heater element (also KVS) 	L W H	300 630 630	300 800 800	340 1000 1000	340 1250 1250	340 1600 1600
Cooling element (also KVS) 	L W H	500/800* 630 630	500/800* 800 800	540/1000* 1000 1000	540/1000* 1250 1250	540/1000* 1600 1600
Washer element 	L W H	1000 630 880	1000 800 1050	1000 1000 1250	1000 1250 1500	1000 1600 1850
Mixing/exhaust air elem. 	L W H	460 630 630	630 800 800	830 1000 1000	910 1250 1250	1090 1600 1600
Mixing and filter element 	L W H	630 630 630	800 800 800	1000 1000 1000	1250 1250 1250	1600 1600 1600
Short filter element 	L W H	300 630 630	300 800 800	340 1000 1000	340 1250 1250	340 1600 1600
Sleeve filter element 	L W H	800 630 630	800 800 800	830 1000 1000	910 1250 1250	1090 1600 1600
Sleeve filter short elem. 	L W H	500 630 630	500 800 800	540 1000 1000	540 1250 1250	540 1600 1600
Silencer element Type 2 Type 3 Type 4 Type 5 	 L L L L W H	 800 1000 1250 1600 630 630	 800 1000 1250 1600 800 800	 910 1090 1390 1600 1000 1000	 910 1090 1390 1600 1250 1250	 910 1090 1390 1600 1600 1600
Empty element 	L W H	300/500 630 630	300/500 800 800	340/540 1000 1000	340/540 1250 1250	340/540 1600 1600
KGX 	L W H	630 630 630	800 800 800	1000 1000 1000	1250 1250 1250	1600 1600 1600
KGXD 	L W H	1000 630 1260	1250 800 1600	1600 1000 2000	2000 1250 2500	2500 1600 3200
Tube heat exchanger WRT 	L W H	500/800* 630 1260	500/1000* 800 1600	540/1000* 1000 2000	540/1250* 1250 2500	540/1600* 1600 3200
Rotation heat exchanger RWT 	L [1] W x H [2] W x H	400 1260/1000 1000/1260	400 1600/1250 1250/1600	400 2000/1600 1600/2000	400 2500/1900 1900/2500	440 3200/2200 2200/3200
Free-running fan wheel 	L W H I	630 630 630 300	800 800 800 300	1000 1000 1000 340	1250 1250 1250 340	1600 1600 1600 540
		I: Empty element required if suction is not over entire cross-section				

* vertical

[1] Vertical design - airflows side by side

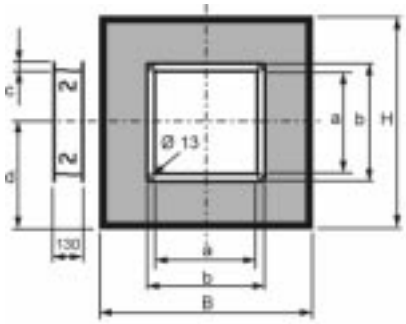
[2] Vertical design - airflows one above the other

Connection measures

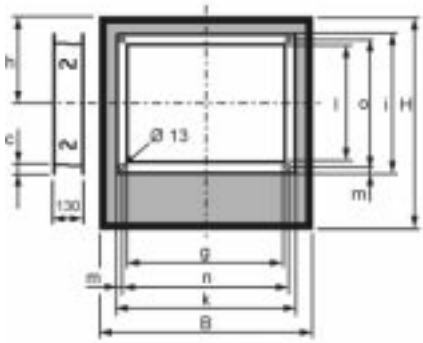
Flexible canvas connector for KG

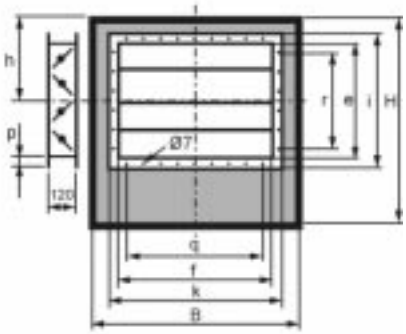
Louver damper for KG

pressure-side

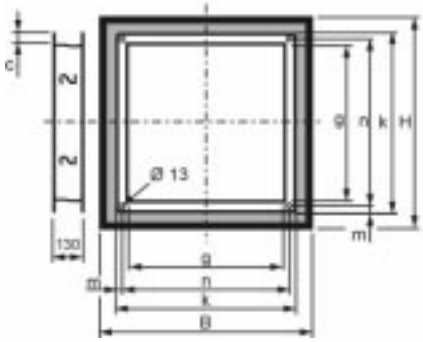


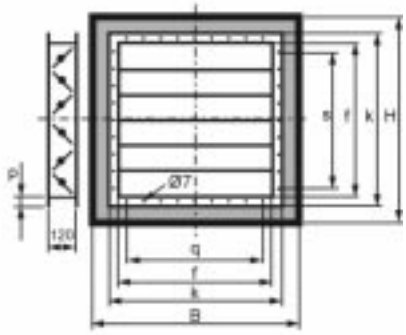
suction-side





suction-side over the whole cross section





Dimensions

KG	40	63	100	160	250
B	630	800	1000	1250	1600
H	630	800	1000	1250	1600
a	338	411	503	619	765
b	398	471	563	679	825
c	30	30	30	30	30
d	315	400	500	625	800
e	360	530	690	770	950
f	530	700	860	1110	1460
g	530	700	860	1110	1460
h	230	315	415	455	545
i	420	590	750	830	1010
k	590	760	920	1170	1520
l	360	530	690	770	950
m	13	13	13	13	13
n	564	734	894	1144	1494
o	394	564	724	804	984
p	30	30	30	30	30
q	1 x 170	2 x 170	3 x 170	6 x 170	8 x 170
r	2 x 170	3 x 170	4 x 170	4 x 170	5 x 170
s	3 x 170	4 x 170	5 x 170	6 x 170	8 x 170

Weights [kg]

KG Standard		40	63	100	160	250
Fan element without motor drive	Fan element with forward fan	45	70	125	179	335
	Fan element with backward fan	48	73	129	190	355
Heater element Cu/Al	Heater element empty	18	23	36	55	70
	Heater element type 1, complete	31	45	75	100	105
	Heater element type 2, complete	31	45	75	105	115
	Heater element type 3, complete	35	50	82	120	125
	Heater element type 4, complete	39	55	89	130	145
Heater KVS	Heater element type II, complete	55	80	120	175	185
	Heater element type III, complete	60	85	130	200	205
Heater element Cu/Al with frost-protection frame	Heater el. with frost-protection frame	28	33	46	65	80
	Heater element type 1, complete	41	55	85	120	165
	Heater element type 2, complete	41	55	85	120	165
	Heater element type 3, complete	45	60	92	130	185
	Heater element type 4, complete	49	65	99	140	205
Heater element steel, gal.	Heater element	28	33	46	65	80
	Heater element type 1, complete	60	93	143	219	349
	Heater element type 2, complete	80	127	196	301	536
	Heater element type 3, complete	85	136	212	364	802
	Heater element type 4, complete	129	208	319	543	802
Heater element steel, gal. with frost-protection frame	Heater el. with frost-protection frame	33	38	56	80	110
	Heater element type 1, complete	65	98	153	234	379
	Heater element type 2, complete	85	132	206	316	566
	Heater element type 3, complete	90	141	222	379	832
	Heater element type 4, complete	134	213	329	558	832
Washer element	Washer element complete	145	170	210	270	320
Cooling element	Cooling element	32	40	62	81	100
	Cooling element with mist eliminator	37	50	73	95	120
	Cooling element complete with direct evaporator Type A	60	82	127	170	240
	Cooler type 7 / direct evap. Type B	72	97	148	200	300
	Cooler type 8	78	104	158	215	330
	Cooler type 12					
Cooler KVS	Cooling element type II, complete	60	85	130	190	295
	Cooling element type III, complete	65	90	140	235	320
Mixing and filter element	Mixing and filter element	17	35	59	90	126
	Mixing and filter el., compl. with filter G4	24	46	75	110	162
Sleeve filter element	Sleeve filter with sleeve filter G4,F5, F7, F9	32	65	100	163	250
Mixing and exhaust air el.	Mixing and exhaust air element with 1 flap	17	35	59	90	126
		24	46	75	110	162
Silencer element	Silencer element complete type 2	49	60	126	171	249
	Silencer element complete type 3	58	72	152	206	298
	Silencer element complete type 4	70	87	182	247	356
	Silencer element complete type 5	93	116	234	319	459
Empty element*	Length 300/340 mm	18	23	36	55	70
	Length 500/540 mm	32	40	62	81	100
Cross flow heat exchanger	KGX	80	120	245	430	650
	KGXD	170	260	460	715	on request
Tube heat exchanger	WRT with internal bypass	on request				
Rotation heat exchanger	RWT	125	175	250	335	460
Base frame closed	Base frame per current m	5.1	5.1	5.1	5.1	5.1
open		3.0	3.0	3.0	3.0	3.0
Free-running fan wheel	with electric motor	86	158	233	398	584

* other lengths on request

Sleeve filter

Sleeve filter grade G4, F5, F7, F9, extractable for inspection.

Dimensions

KG Standard	40	63	100	160	250
Length [mm]	800	800	830	910	1090
Width [mm]	630	800	1000	1250	1600
Height [mm]	630	800	1000	1250	1600

The case dimensions are the same for all grades

Inspection door: As desired, right/left in air direction

Filter surfaces [m²]

Grade 40	63	100	160	250	
G4	1.5	2.6	4.4	7.3	12.3
F5	3.7	5.8	9.6	16.1	26.4
F7	4.3	7.3	11.4	18.8	31.6
F9	4.3	7.3	11.4	20.3	34.5

Note:
Change of extractable filter sleeves from the operating side via the double-walled inspection door with turn locks

Filter class classifications

DIN EN 779	G4	F5	F7	F9
DIN 24185	EU4	EU5	EU7	EU9

Final pressure differences

The recommended final pressure difference for sleeve filters is 400Pa.

Design:

for ambient temperature of the motor — up to 40°C and
for installation heights — up to 1000 m above see level

for ambient temperatures — over 40°C or
for installation heights — more than 1000 m above see level
the nominal power (NP) is decreased:

Ambient temperature	40°C	45°C	50°C	55°C
Reduction of the nominal power to	100% NP	95% NP	90% NP	85% NP

Installation height over sea level	2000 m	3000 m	4000 m
Reduction of the nominal power to	92 % NP	84 % NP	78 % NP

Increased heat class:

required for ambient temperatures over 55°C.

Note:

Variable speed motors are designed standard for direct start and direct switchover to stage 2 or 3.

Variable speed motors over 10 kW, relays for heavy starting recommended!

Motor protection:

On request: Motors with PTC thermistor or thermal contacts.

Maximum motor weights:

kW	1	2	3	4	5	7,5	9	12	15	20	30	40	50	70	90
kg	15	25	32	45	55	80	100	130	150	200	300	350	460	680	840

Maximum possible rated motor output (kW):

for installation in the fan element.

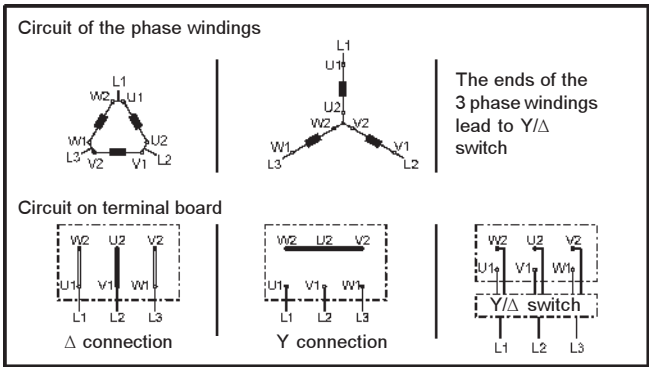
KG	max. exhaust variation	Size of motor	Speed [min^{-1}] / motors 400 V 1500	3000	1500 / 3000	1000 / 1500	750 / 1500	750 / 1000 / 1500	500 / 1000 / 1500	1500 EExeIIT3	3000 EExeIIT3
40	A / B / C	100	3.0	3.0	0.8 / 3.0	0.7 / 2.0	0.5 / 2.4	0.45 / 0.70 / 1.8	0.15 / 0.70 / 1.9	1.35	1.8
63	A / B / C	112	4.0	4.0	1.1 / 4.1	0.9 / 3.0	0.8 / 3.2	0.60 / 0.80 / 2.4	0.18 / 0.85 / 2.4	2.5	2.5
100	A / B / C	112	4.0	4.0	1.1 / 4.1	0.9 / 3.0	0.8 / 3.2	0.60 / 0.80 / 2.4	0.18 / 0.85 / 2.4	2.5	2.5
160	A / B [1)] C	160 90	15.0 1.5	11.0 2.2	3.0 / 12.0 0.5 / 2.0	3.5 / 12.0 0.3 / 1.0	3.0 / 12.0 0.3 / 1.4	1.50 / 2.00 / 6.5 0.20 / 0.30 / 0.9	0.60 / 2.60 / 6.6 - / - / -	10 2.5	10 2.5
250	A B C	180 132 112	22.0 7.5 4.0	22.0 7.5 4.0	6.0 / 24.0 2.0 / 8.0 1.1 / 4.1	6.0 / 19.0 17.7 / 5.0 0.9 / 3.0	5.0 / 18.0 1.4 / 6.0 0.8 / 3.2	3.50 / 5.50 / 15.5 1.00 / 1.50 / 4.4 0.60 / 0.80 / 2.4	1.50 / 5.50 / 16.0 0.40 / 1.80 / 4.4 0.18 / 0.85 / 2.4	17 6.5 3.6	15 5.5 3.3

[1)] KG 160 Standard with exhaust B, for HLZ fans or with spring vibration absorber only up to size 132.

For larger motor outputs: Design and delivery on request.
Delivery times ex factory according to delivery list.

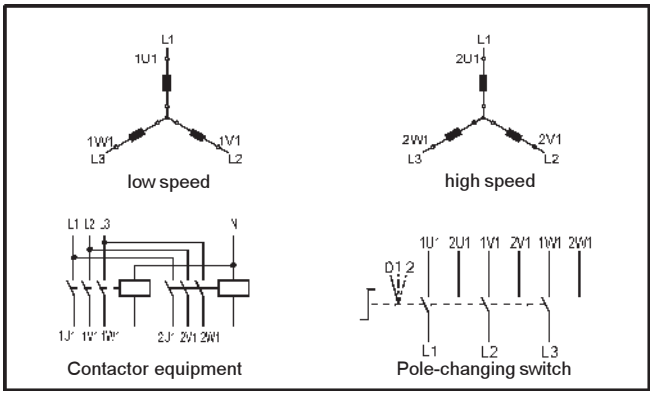
Circuit for 1 speed

Motors up to 2.2 kW are normally started directly, starting from 3 kW in star-delta connection.



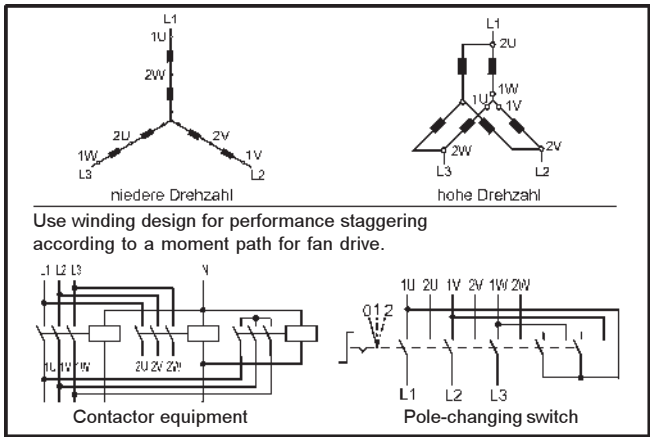
Circuit for 2 speeds
(2 separate windings)

Design e.g. for 1000/1500 min^{-1} or 750/1000 min^{-1}



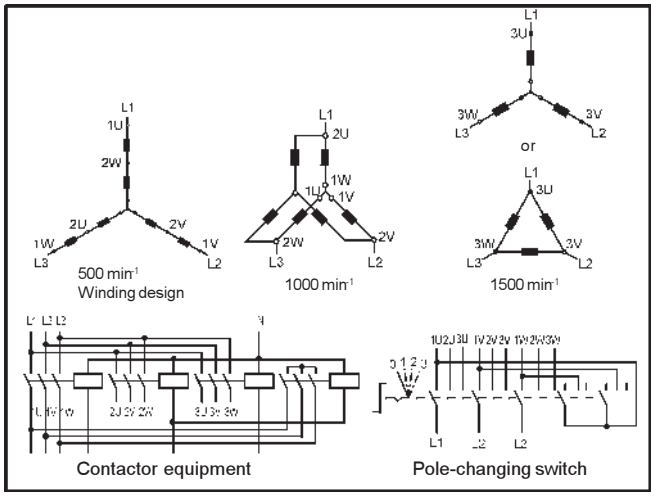
Circuit for 2 speeds in the ratio 1:2
(winding in Dahlander circuit)

Design e.g. for 1500/3000 min^{-1} or 750/1500 min^{-1}



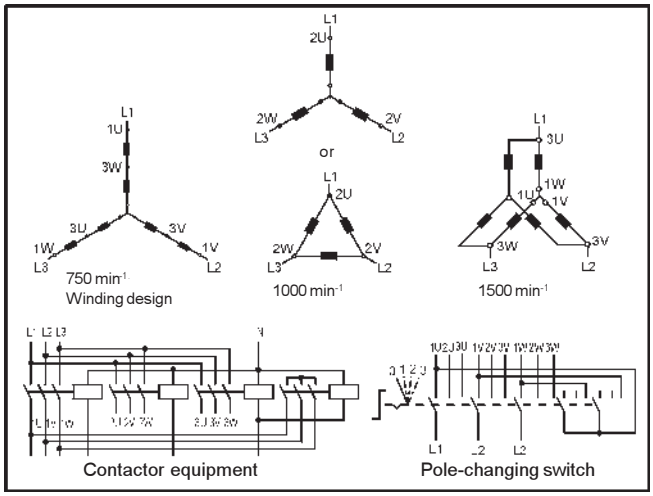
Circuit for 3 speeds
(2 separate windings, 1 in Dahlander circuit)

Design for fan drives 500/1000/1500 min^{-1} or 8/6/4-pole; 500/1000 min^{-1} in Dahlander circuit.



Circuit for 3 speeds
(2 separate windings, 1 in Dahlander circuit)

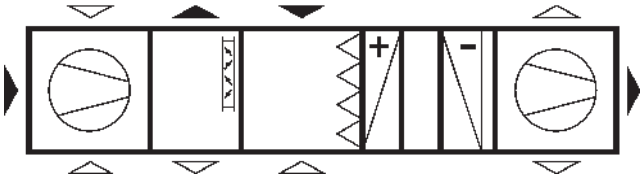
Design for fan drives 750/1000/1500 min^{-1} or 8/6/4-pole; 750/1500 min^{-1} in Dahlander circuit.



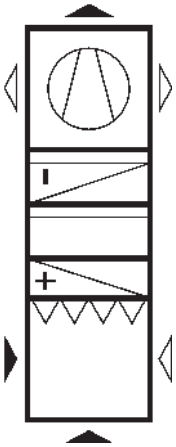
Combination examples KG Standard

Arrangement of equipment:

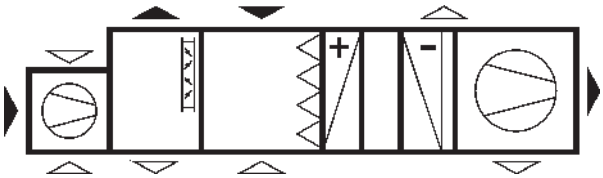
horizontal



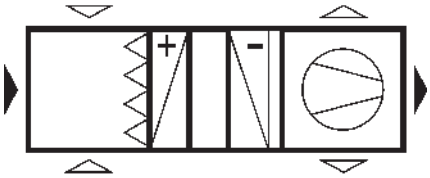
vertical



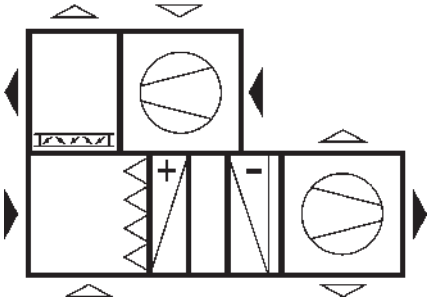
vertical, different sizes



horizontal side by side

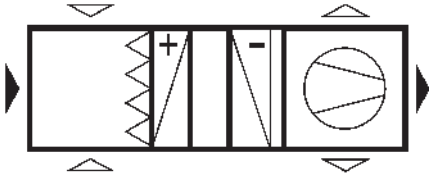


Front view

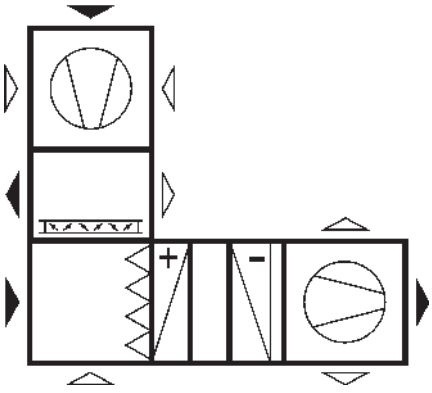


Top view

horizontal, angled

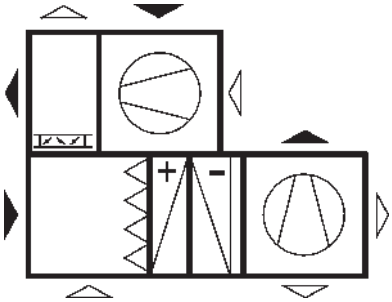


Front view

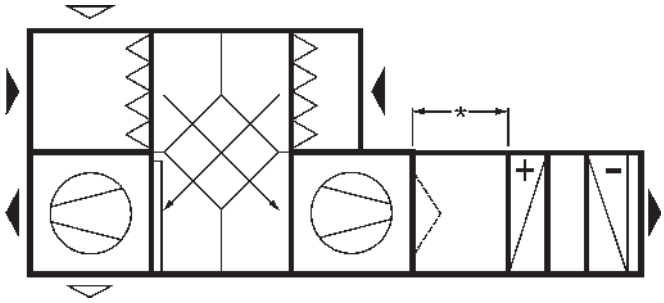


Top view

horizontal one above the other



horizontal, one above the other, with crossflow heat exchanger



*If components are located after the fan element, which require a uniform incident flow (heat exchanger, filter, etc.), then an empty element with flow distributor must be attached on the fan exit.

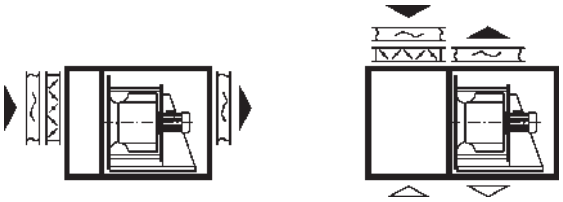
*For inspection purposes of the heat exchangers (in the examples shown, between heaters and coolers) it is recommended to provide empty elements that permit access to the installed elements from both sides.

Required empty element length

KG Standard	40	63	100	160	250
* mm	300	300	340	540	540

Combination examples

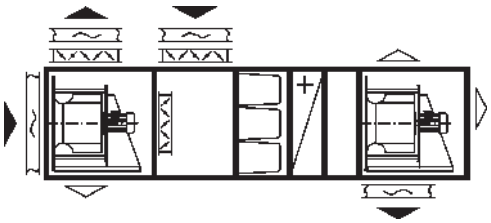
Withdrawn air device
(horizontal/vertical)



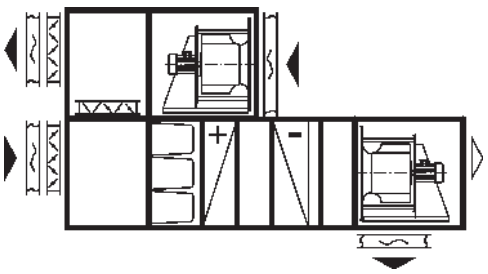
Supply air device

Partial air conditioner

Combined supply and withdrawn air device



Combined partial air conditioner
Arrangement of equipment on top of each other or side by side



Fan element

L 630
W 630
H 630

L 630
W 630
H 630

Heater element

L* 300/500
W 630
H 630

Cooling element

L 500
W 630
H 630
vertical L 800

Washer element

L 1000
W 630
H 880

Mixing and filter elem.

L 630
W 630
H 630

Mixing and exhaust air element

L 460
W 630
H 630

Short filter element

L 300
W 630
H 630

Sleeve filter element

L 800
W 630
H 630
Sl. fi. short L 500

Silencer element

L .....
W 630
H 630

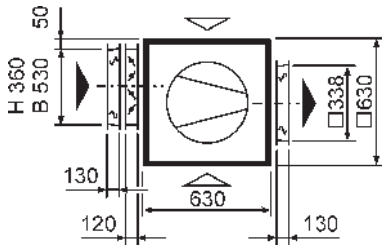
Empty element / vapour humidifier empty el.

L .....
W 630
H 630

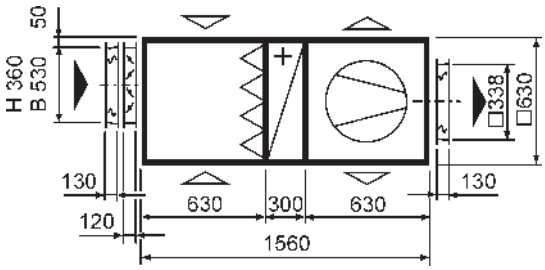
KGX

L 630
W 630
H 630

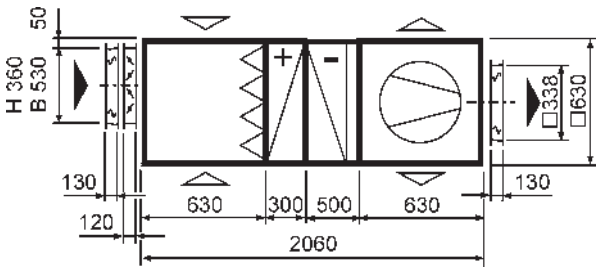
Withdrawn air device



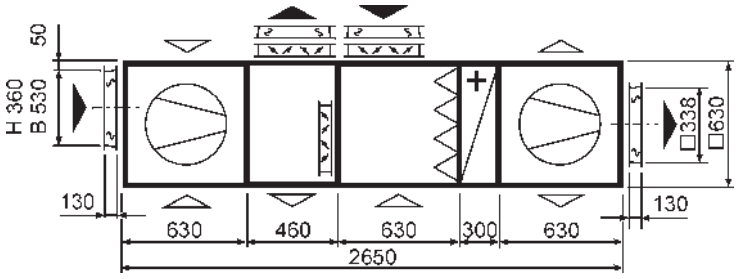
Supply air device



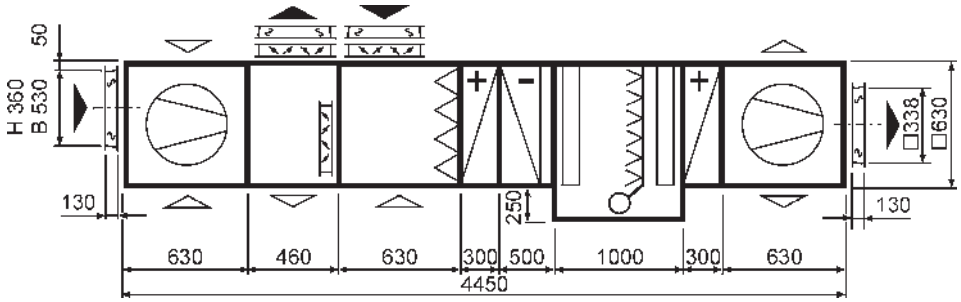
Partial air conditioner



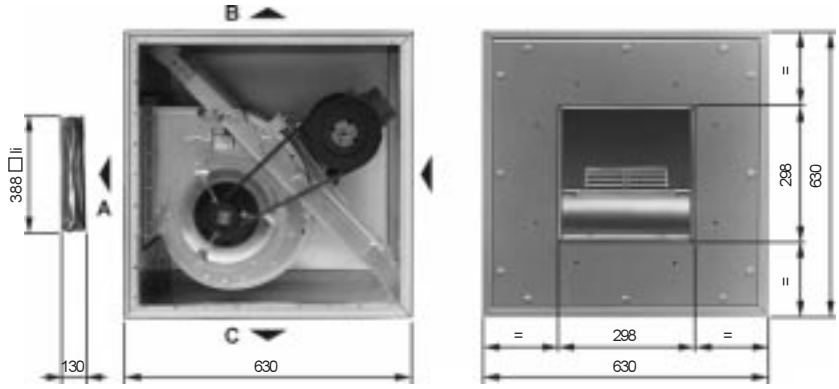
Combined supply and withdrawn air device



Combined climate control, supply and withdrawn air device

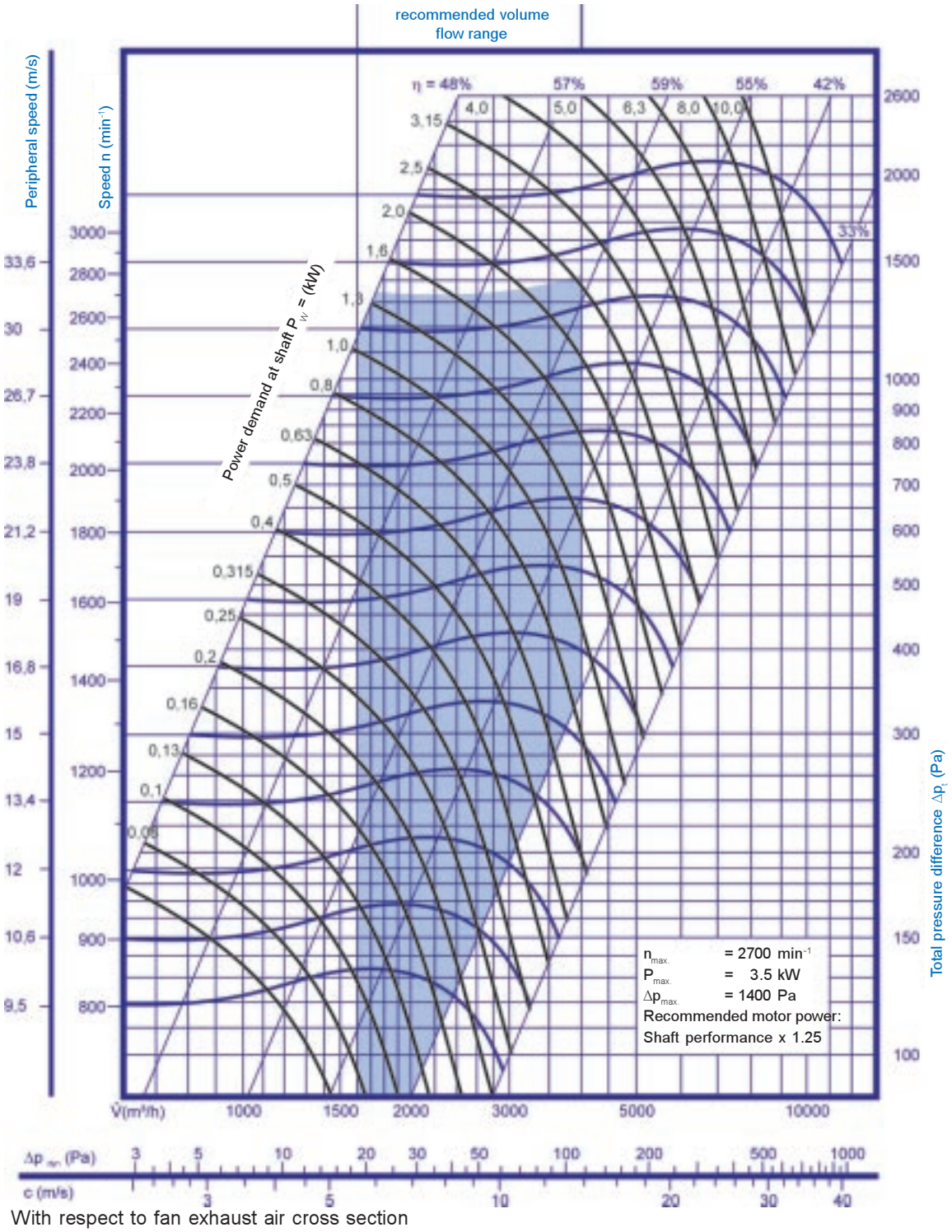


* with extractable frost protection frame L = 500



Fan diagram

Forward rotor blades



With respect to fan exhaust air cross section

Exhaust variation: A, B, C

Fan/motor: in sturdy diagonal construction with vibration absorbers, diagonal separated
Elastic connection between fan exhaust and casing

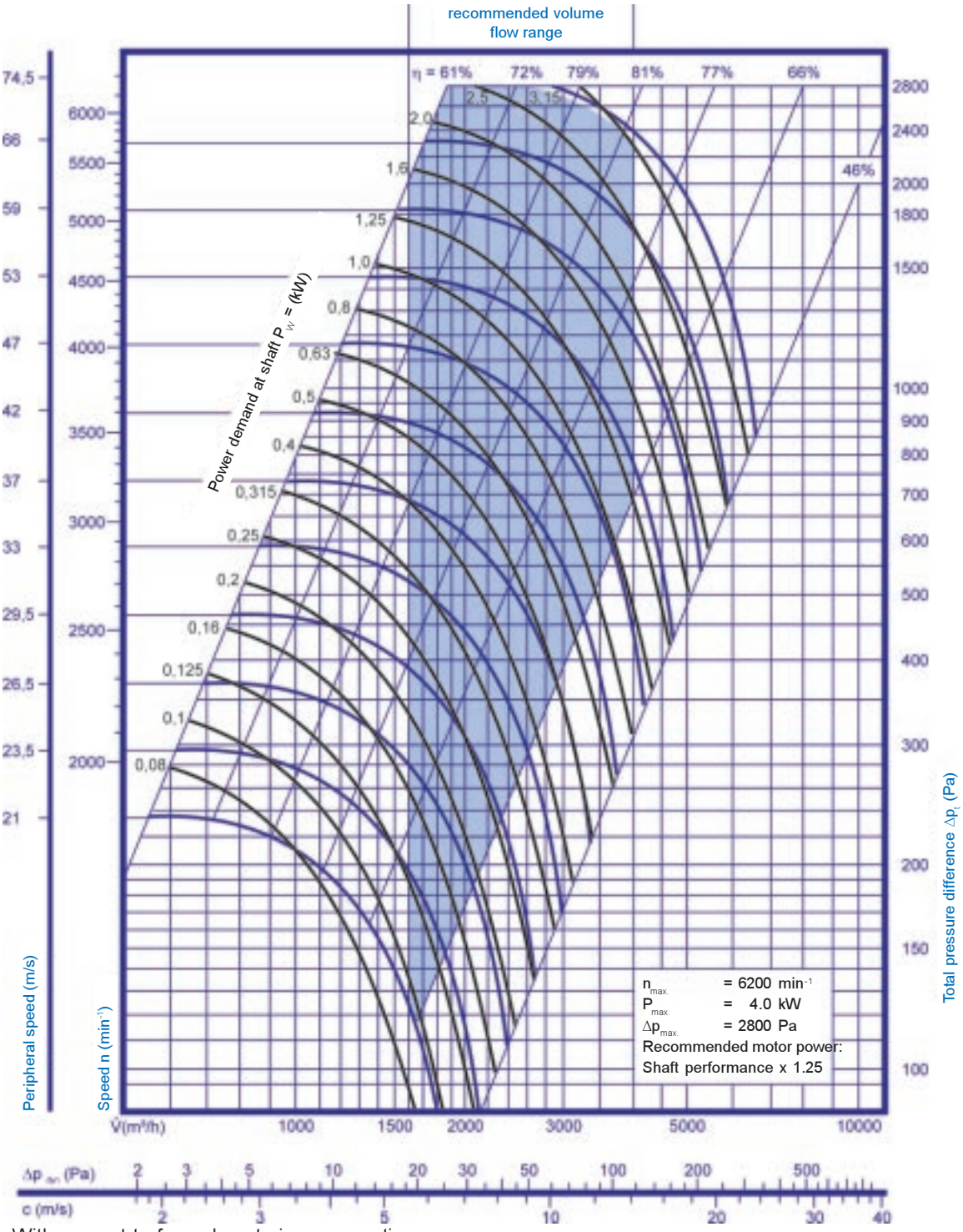
Inspection door: in air direction right, left, top, if desired bottom, with turn locks

Withdrawn air device: Construction such as fan element, flap arrangement in accordance with connection and suction variations

Flaps on the inside not possible

Fan diagram

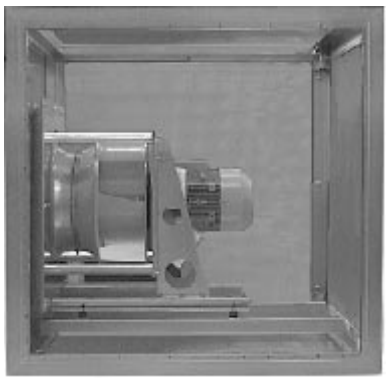
Backward rotor blades



With respect to fan exhaust air cross section

Free-running fan wheel KG 40 Standard

Description



Free-running fan wheel, unidirectional suction, with backward rotor blades, attached directly to the motor shaft.

Complete unit mounted on sturdy base frame with flexible vibration absorbers.

Rotor wheel statically and dynamically balanced. Complete motor protection with built-in PTC thermistors.

High fan efficiency even at low speed, almost without dynamic pressure ratios.

In connection with frequency converter, accurate adaptation to unit characteristics is possible.

Economical and energy-saving operation even under partial load conditions.

Low maintenance costs, no drive belt losses, no retightening required.

External pressure drops

Customer specification of the installation side pressure drops (e.g. duct system).

Internal pressure drops

The pressure drops of all components with respect to the volume flow (also fan element) are listed in the pressure drop tables of the individual chapters.
For components on the pressure-side, neither flow distributors nor incident flow elements are required, since the exhaust flows through the entire cross section.

Dynamic pressure drops

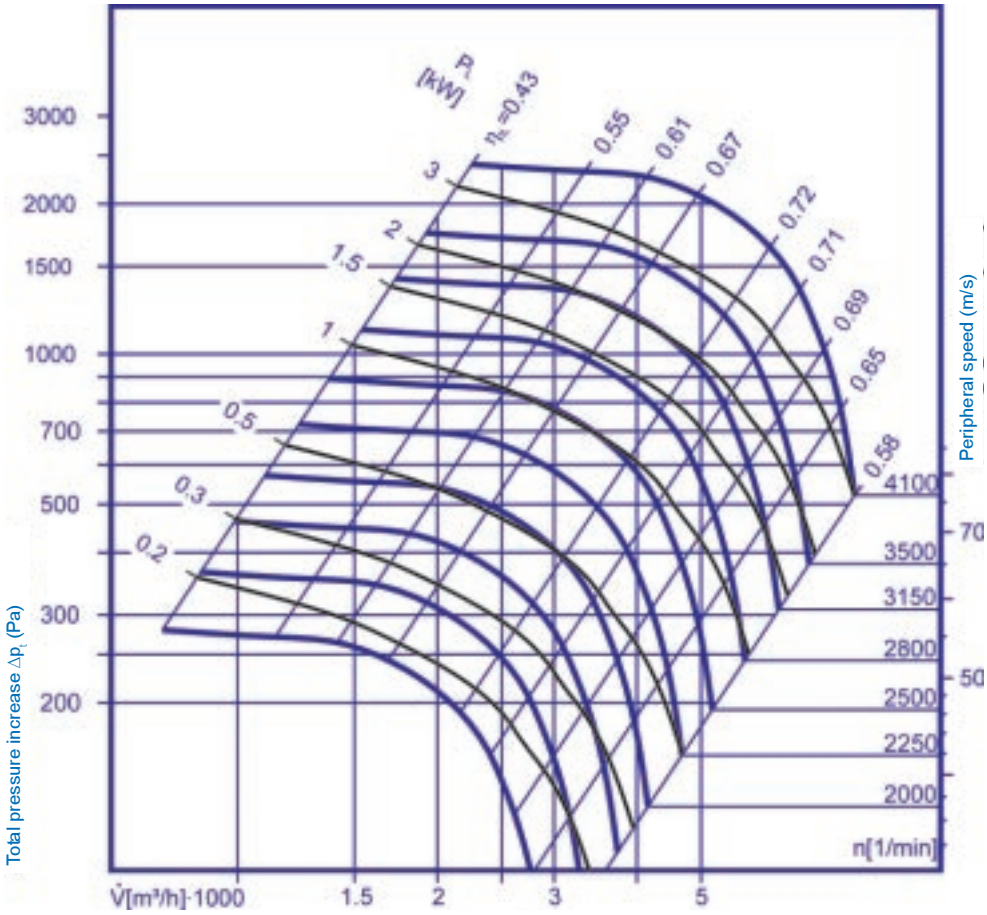
The dynamic pressure portions do not have to be considered in planning.

Performance data

KG size	Max. Air volume m^3/h	Total pressure increase to Pa	Operational data * Fan power kW	Operational data * Fan speed min^{-1}	Standard data * Motor power kW	Standard data * Motor speed min^{-1}	Standard data * Motor current A
KG 40	4000	500	0.86	2427	1.50	3000	3.40
		1000	1.73	2987	2.20	3000	4.65
		1500	2.70	3472	3.00	3000	6.10

* Fan speed is controlled by frequency converter (f ≥ 50Hz)

Fan diagram
Rotor wheel Ø 355 mm



Total sound power level L_W in [dB]

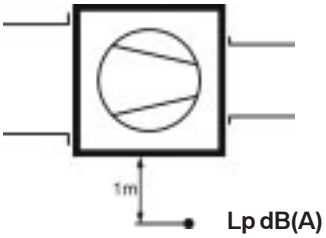
The accurate, device-specific sound data can be determined only for the specific order.

Lw [dB] = the computational total sound power of the fan on the suction/pressure-side.

		Total pressure increase Δp [Pa]					
	L_w	500	750	1000	1250	1500	2000
V̇ [m³/h]	2,000	87	91	93	95	97	99
	3,000	89	92	95	97	98	101
	4,000	90	94	96	98	100	102

Sound pressure level Lp dB(A)

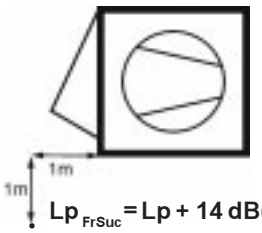
Lp dB(A) = sound pressure level at 1 m distance beside the fan element, measured in the free field with suction and pressure-side duct connection



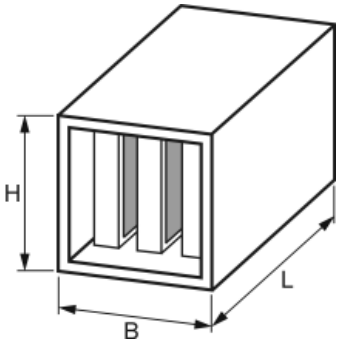
Forward rotor blades								
V̇ m³/h	n min⁻¹	Lp dB(A)	V̇ m³/h	n min⁻¹	Lp dB(A)	V̇ m³/h	n min⁻¹	Lp dB(A)
2,000	1120	41	3,000	1250	47	4,000	1400	53
	1400	45		1600	49		1800	54
	1800	51		2000	53		2240	56
	2240	56		2500	58		2800	61
Backward rotor blades								
V̇ m³/h	n min⁻¹	Lp dB(A)	V̇ m³/h	n min⁻¹	Lp dB(A)	V̇ m³/h	n min⁻¹	Lp dB(A)
2,000	2000	46	3,000	2800	46	4,000	3550	48
	2500	47		3550	54		4000	55
	3150	53		4000	58		4500	60
	4000	60		5000	62		5000	62
Free-running fan wheel Ø 355mm								
V̇ m³/h	n min⁻¹	Lp dB(A)	V̇ m³/h	n min⁻¹	Lp dB(A)	V̇ m³/h	n min⁻¹	Lp dB(A)
2,000	1900	47	3,000	2100	49	4,000	2375	50
	2350	51		2500	52		2750	54
	2650	53		2750	55		2900	56
	3300	57		3300	58		3400	60

Sound pressure level Lp dB(A) beside the fan element

With free suction or exhaust opening



Silencer element



Dimensions (mm)

Height H	Width B	Length L			
		Type 2	Type 3	Type 4	Type 5
630	630	800	1000	1250	1600

Insertion loss De dB(A)

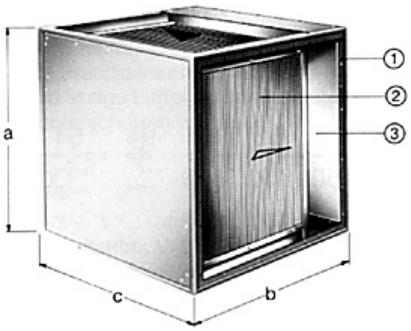
Type	Octave band (Hz)							
	63	125	250	500	1000	2000	4000	8000
2	6	12	20	20	22	16	12	11
3	7	14	24	25	26	20	14	13
4	8	17	30	32	34	25	18	17
5	9	21	37	37	41	29	21	19

For series connection of 2 silencers: $De = De_1 + De_2 - 3$ dB(A)

The accurate, device-specific heat recovery data can be determined only for the specific order.

Description KGX/KGXD

KGX air circulation horizontally/ vertically
KGXD air circulation diagonally



Hot air and cold air are led past each other in the cross current.

The heat recovery takes place via heat transmission from the hot to the cold air flow. The air flows are completely separated by aluminium plates.

- Heat recovery of up to over 80 %
- no moisture transmission
- no mobile parts, corrosion-resistant

① **Casing**
Design same as air conditioner

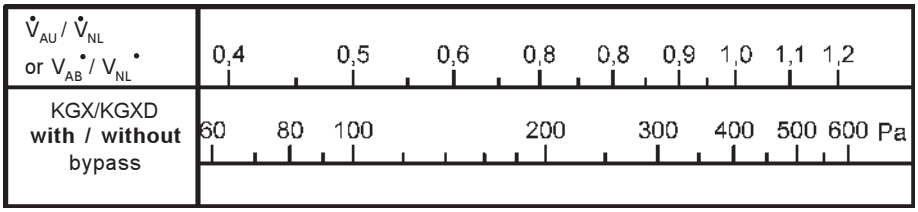
② **Heat exchanger**
Heat exchanger surfaces made of special corrosion-resistant aluminium plates.

③ **Internal bypass** (on request)
In order to prevent rime on the heat exchanger surfaces, the outside air can partially or entirely pass by the heat exchanger in the internal bypass.

Type	Nominal air volume $\dot{V}$ [m³/h]		Dimensions [mm]			Weight [kg]	Condensate connector
	without int. bypass	with int. bypass	a	b	c		R"
KGX 40	4,000	3,550	630	630	630	95	-
KGXD 40	4,000	3,550	630	630	1000	140	1 ¼"

Pressure drop Δp [Pa]

for KGX/KGXD
with or without internal bypass



Description RWT

RWT air circulation horizontally/vertically

A rotating storage capacity takes up heat from the withdrawn air stream and emits it to the outside air stream.

- Heat recovery of up to 80 %.
- Simple power control by adjusting the speed.
- With suitable rotor material, humidification of the supply air.
- Rime protection, defrosting device, pre-heating of air not required.
- Easy maintenance through inspection doors in the air incident flow elements.

Pressure drop Δp [Pa]

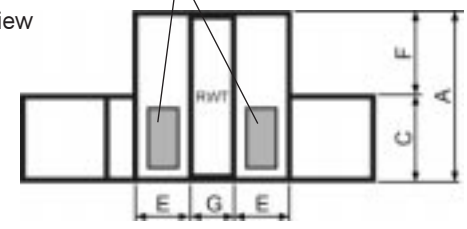
Volume flow $\dot{V}$ [m³/h]	1,500	2,000	2,500	3,000	3,500	4,000
Pressure drop Δp [Pa]	49	66	83	100	115	130

Dimensions

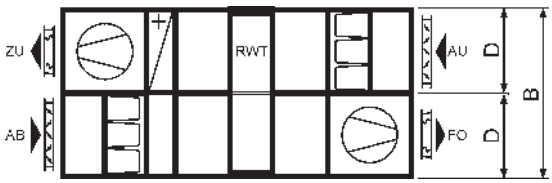
KG	A	B	C	D	E	F	G
40	1000	1260	630	630	370	630	400

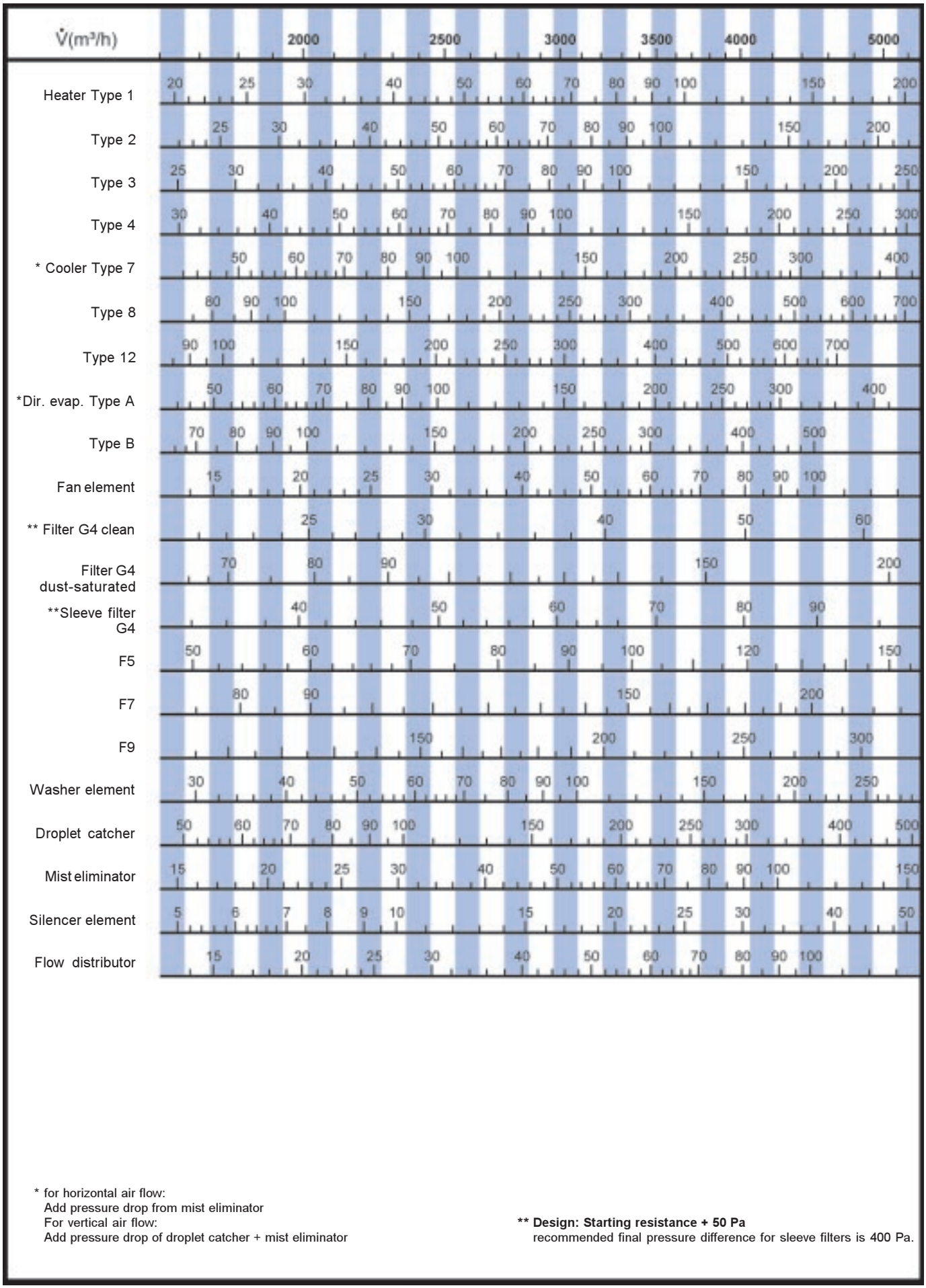
Air incident elements with inspection door

Front view



Top view

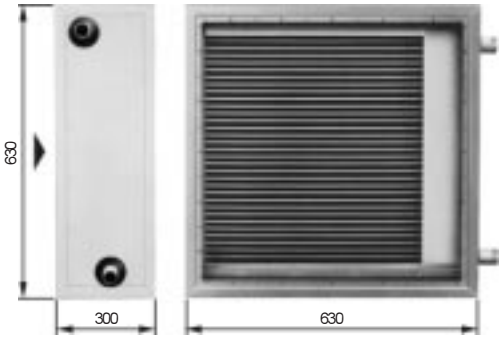




* for horizontal air flow:
Add pressure drop from mist eliminator
For vertical air flow:
Add pressure drop of droplet catcher + mist eliminator

**** Design: Starting resistance + 50 Pa**
recommended final pressure difference for sleeve filters is 400 Pa.

Heat exchanger for warm pump water PWW



Connections: in air direction right or left

Equipment:

Heat exchanger with Cu pipes and aluminium lamellas, collecting tank made of steel

Type	Connections	Water content
1	¾"	1.0 l
2	1"	1.5 l
3	1"	2.0 l
4	1"	2.5 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:

Heat exchanger with Cu pipes and corrosion-resistant aluminium lamellas

Heat exchanger with Cu pipes and Cu lamellas

Heat exchanger made of steel - galvanised

Heat exchanger for steam

Heat exchanger for hot oil

Electrical heating element etc.

Heat exchanger with bleed and drain connectors

Note:

Allow for sufficient room for extraction of the heat exchanger.

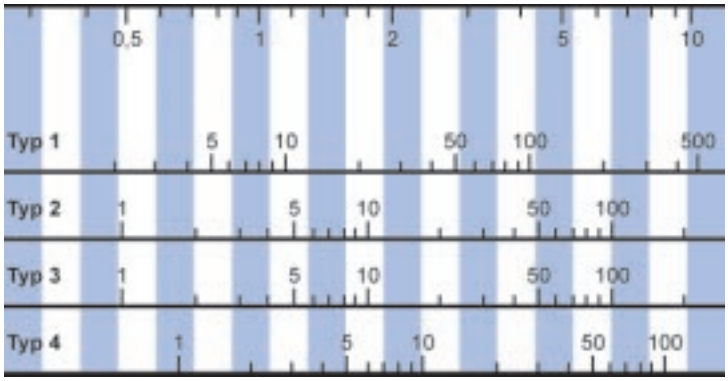
Water resistance (kPa)

Quantity of water $w = \frac{0.86 \cdot \dot{Q}}{\Delta t_w}$ (m³/h)

$\dot{Q}$ = Power in kW

$\Delta t_w = t_{WI} - t_{WO}$

Quantity of water w (m³/h)



Heater element

Type		1							
$\dot{V}$ (m³/h)		1 600		2 400		3 200		4 000	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
45/35	- 15	12.7	6	16.2	3	19.1	1	21.6	-1
	- 10	11.4	9	14.4	6	17.0	4	19.3	3
	- 5	10.1	12	12.8	10	15.0	8	17.0	7
	± 0	8.8	15	11.1	13	13.0	11	14.8	10
	+ 5	7.5	18	9.4	16	11.1	15	12.6	14
	+10	6.2	21	7.8	19	9.2	18	10.4	18
	+15	5.0	24	6.2	23	7.3	22	8.2	21
	+20	3.7	27	4.7	26	5.4	25	6.1	25
50/40	- 15	14.1	8	17.9	5	21.1	2	24.0	1
	- 10	12.7	11	16.1	8	19.1	6	21.7	5
	- 5	11.4	15	14.4	12	17.0	10	19.3	8
	± 0	10.1	18	12.8	15	15.1	13	17.1	12
	+ 5	8.8	21	11.1	18	13.1	17	14.8	16
	+10	7.5	24	9.5	21	11.1	20	12.6	19
	+15	6.2	27	7.9	25	9.2	24	10.5	23
	+20	5.0	29	6.3	28	7.4	27	8.3	26
60/40	- 15	14.3	9	18.0	5	21.2	3	24.0	1
	- 10	12.9	12	16.3	8	19.2	6	21.7	5
	- 5	11.6	15	14.6	12	17.2	10	19.4	8
	± 0	10.3	18	12.9	15	15.2	13	17.1	12
	+ 5	9.0	21	11.3	18	13.2	17	14.9	16
	+10	7.7	24	9.7	22	11.3	20	12.7	19
	+15	6.5	27	8.1	25	9.4	24	10.6	23
	+20	5.2	30	6.5	28	7.5	27	8.5	26
70/50	- 15	17.0	13	21.5	9	25.4	6	28.8	4
	- 10	15.6	16	19.8	12	23.3	10	26.4	8
	- 5	14.3	20	18.1	16	21.3	13	24.1	12
	± 0	13.0	23	16.4	19	19.3	17	21.8	15
	+ 5	11.7	26	14.7	23	17.3	20	19.6	19
	+10	10.4	29	13.1	26	15.3	24	17.3	23
	+15	9.1	32	11.4	29	13.4	27	15.2	26
	+20	7.8	35	9.8	32	11.5	31	13.0	30
70/55	- 15	18.2	15	23.1	11	27.3	8	31.0	6
	- 10	16.8	18	21.3	14	25.2	11	28.6	9
	- 5	15.4	22	19.6	18	23.2	15	26.3	13
	± 0	14.1	25	17.9	21	21.1	19	24.0	17
	+ 5	12.8	28	16.2	24	19.1	22	21.7	21
	+10	11.5	31	14.6	28	17.2	26	19.5	24
	+15	10.2	34	12.9	31	15.2	29	17.2	28
	+20	8.9	37	11.3	34	13.3	33	15.1	31
80/50	- 15	17.3	14	21.9	9	25.7	6	29.1	4
	- 10	16.0	17	20.2	13	23.7	10	26.8	8
	- 5	14.6	20	18.4	16	21.6	14	24.5	12
	± 0	13.3	23	16.8	20	19.6	17	22.2	16
	+ 5	12.0	26	15.1	23	17.7	21	19.9	19
	+10	10.7	29	13.4	26	15.7	24	17.7	23
	+15	9.4	32	11.8	30	13.8	28	15.5	26
	+20	8.2	35	10.2	33	11.9	31	13.3	30
80/60	- 15	19.7	18	25.0	13	29.5	9	33.5	7
	- 10	18.3	21	23.2	16	27.4	13	31.1	11
	- 5	16.9	24	21.5	20	25.4	17	28.8	15
	± 0	15.6	27	19.8	23	23.3	20	26.5	19
	+ 5	14.3	30	18.1	27	21.3	24	24.2	22
	+10	13.0	34	16.4	30	19.3	28	21.9	26
	+15	11.7	37	14.8	33	17.4	31	19.7	30
	+20	10.4	40	13.1	36	15.4	35	17.5	33
90/70	- 15	22.3	22	28.4	16	33.6	13	38.2	10
	- 10	20.9	25	26.6	20	31.5	17	35.8	14
	- 5	19.5	29	24.9	24	29.4	20	33.4	18
	± 0	18.2	32	23.1	27	27.3	24	31.0	22
	+ 5	16.8	35	21.4	30	25.3	28	28.7	26
	+10	15.5	38	19.7	34	23.3	31	26.4	29
	+15	14.2	41	18.1	37	21.3	35	24.2	33
	+20	12.9	44	16.4	41	19.3	38	21.9	37

Other operating conditions on request!

	2				3				4			
	1 600	2 400	3 200	4 000	1 600	2 400	3 200	4 000	1 600	2 400	3 200	4 000
	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C	$\dot{Q}$ kW / t_{AO} °C
	15.2 10	19.5 7	23.1 4	26.4 3	20.3 19	26.9 15	32.5 12	37.6 10	24.0 25	32.5 21	40.0 18	46.7 16
	13.6 13	17.4 10	20.7 7	23.6 6	18.3 21	24.1 17	29.2 15	33.7 13	21.6 26	29.2 23	35.9 20	41.9 18
	12.0 16	15.4 13	18.3 11	20.8 9	16.2 23	21.4 20	25.8 17	29.8 16	19.2 28	25.9 25	31.8 22	37.1 21
	10.5 18	13.4 16	15.9 14	18.1 13	14.2 25	18.7 22	22.6 20	26.0 18	16.8 30	22.7 27	27.8 24	32.4 23
	8.9 21	11.4 19	13.5 17	15.4 16	12.2 27	16.0 24	19.3 22	22.3 21	14.5 31	19.5 28	23.8 26	27.8 25
	7.4 23	9.5 21	11.2 20	12.7 19	10.2 29	13.4 26	16.1 25	18.6 23	12.2 32	16.3 30	20.0 28	23.2 27
	5.9 26	7.5 24	8.9 23	10.1 22	8.3 30	10.8 28	13.0 27	14.9 26	9.9 33	13.2 31	16.1 30	18.7 29
	4.5 28	5.7 27	6.6 26	7.5 26	6.4 32	8.2 30	9.9 29	11.3 28	7.7 34	10.1 33	12.3 32	14.2 31
	16.7 13	21.5 9	25.6 6	29.2 4	22.3 22	29.6 18	35.8 15	41.4 12	26.2 28	35.6 24	43.9 21	51.4 19
	15.1 16	19.4 12	23.1 10	26.4 8	20.2 24	26.8 20	32.4 17	37.5 15	23.8 30	32.3 26	39.8 24	46.5 21
	13.5 18	17.4 15	20.7 13	23.6 11	18.2 26	24.0 23	29.1 20	33.6 18	21.4 32	29.0 28	35.7 26	41.7 24
	12.0 21	15.4 18	18.3 16	20.8 15	16.1 28	21.3 25	25.8 23	29.8 21	19.1 33	25.8 30	31.7 28	37.0 26
	10.5 24	13.4 21	15.9 19	18.1 18	14.1 30	18.7 27	22.5 25	26.0 24	16.7 35	22.6 32	27.7 30	32.3 28
	8.9 26	11.4 24	13.6 22	15.4 21	12.2 32	16.0 29	19.3 28	22.3 26	14.4 36	19.4 34	23.8 32	27.7 30
	7.5 29	9.5 27	11.2 25	12.8 24	10.2 34	13.4 32	16.2 30	18.6 29	12.2 37	16.3 35	19.9 33	23.2 32
	6.0 31	7.6 30	9.0 28	10.2 28	8.3 36	10.8 34	13.0 32	15.0 31	9.9 39	13.2 37	16.1 35	18.7 34
	17.0 13	21.8 9	25.8 6	29.3 4	23.3 24	30.6 19	36.9 16	42.5 13	27.6 31	37.2 26	45.5 23	53.0 20
	15.4 16	19.7 12	23.3 10	26.5 8	21.2 26	27.8 21	33.5 18	38.5 16	25.2 33	33.8 28	41.4 25	48.2 23
	13.9 19	17.7 15	20.9 13	23.8 11	19.1 28	25.0 24	30.1 21	34.7 19	22.8 34	30.5 30	37.3 27	43.4 25
	12.3 22	15.7 18	18.5 16	21.0 15	17.1 30	22.3 26	26.8 24	30.8 22	20.4 36	27.3 32	33.3 29	38.6 27
	10.8 24	13.7 21	16.2 19	18.3 18	15.1 32	19.7 28	23.6 26	27.1 24	18.0 37	24.1 34	29.3 31	33.9 29
	9.3 27	11.7 24	13.8 23	15.7 21	13.1 34	17.0 31	20.4 29	23.3 27	15.7 39	20.9 35	25.3 33	29.3 31
	7.8 29	9.8 27	11.5 26	13.0 25	11.1 36	14.4 33	17.2 31	19.6 30	13.4 40	17.7 37	21.4 35	24.7 33
	6.3 32	7.9 30	9.2 29	10.4 28	9.1 37	11.8 35	14.0 33	16.0 32	11.0 41	14.5 38	17.5 36	20.2 35
	20.2 19	25.9 14	30.8 11	35.1 8	27.3 30	36.0 25	43.5 21	50.3 18	32.1 38	43.5 33	53.5 29	62.5 26
	18.6 21	23.9 17	28.3 14	32.3 12	25.2 32	33.2 27	40.1 24	46.3 21	29.7 40	40.2 35	49.3 32	57.6 29
	17.0 24	21.8 20	25.9 17	29.5 15	23.1 35	30.4 30	36.7 27	42.4 24	27.3 42	36.9 37	45.2 34	52.7 31
	15.5 27	19.8 23	23.4 21	26.7 19	21.0 37	27.7 32	33.4 29	38.5 27	24.9 44	33.6 39	41.2 36	48.0 34
	13.9 30	17.8 26	21.0 24	23.9 22	19.0 39	25.0 35	30.1 32	34.7 30	22.6 45	30.4 41	37.2 38	43.3 36
	12.4 33	15.8 29	18.7 27	21.2 25	17.0 41	22.3 37	26.9 34	30.9 32	20.3 47	27.2 43	33.2 40	38.6 38
	10.9 35	13.8 32	16.3 30	18.6 29	15.1 43	19.7 39	23.7 37	27.2 35	18.0 48	24.0 45	29.3 42	34.0 40
	9.4 38	11.9 35	14.0 33	15.9 32	13.1 45	17.1 41	20.5 39	23.5 38	15.7 49	20.9 46	25.4 44	29.5 42
	21.6 21	27.8 16	33.1 12	37.8 10	28.6 33	38.0 27	46.1 23	53.4 20	33.6 41	45.7 36	56.4 32	66.1 29
	19.9 24	25.7 19	30.6 16	34.9 14	26.5 35	35.2 30	42.7 26	49.4 23	31.1 43	42.3 38	52.2 34	61.1 31
	18.3 27	23.6 22	28.1 19	32.1 17	24.5 37	32.4 32	39.3 29	45.4 26	28.7 45	39.0 40	48.1 36	56.3 34
	16.8 29	21.6 25	25.6 23	29.3 21	22.4 39	29.7 35	35.9 32	41.6 29	26.4 46	35.8 42	44.0 39	51.5 36
	15.2 32	19.5 28	23.2 26	26.5 24	20.4 41	27.0 37	32.7 34	37.7 32	24.0 48	32.6 44	40.0 41	46.8 38
	13.7 35	17.5 31	20.8 29	23.7 27	18.4 44	24.3 40	29.4 37	33.9 35	21.7 50	29.4 46	36.1 43	42.2 41
	12.2 38	15.6 34	18.5 32	21.0 31	16.4 45	21.7 42	26.2 39	30.2 37	19.4 51	26.2 47	32.2 45	37.6 43
	10.7 40	13.6 37	16.2 35	18.4 34	14.5 47	19.1 44	23.0 42	26.5 40	17.2 52	23.1 49	28.3 47	33.0 45
	20.7 19	26.5 14	31.3 11	35.6 9	28.3 32	37.2 26	44.9 22	51.7 19	33.6 41	45.3 35	55.4 31	64.5 28
	19.1 22	24.4 17	28.8 14	32.8 12	26.2 34	34.4 29	41.4 25	47.7 22	31.2 43	41.9 37	51.2 33	59.6 30
	17.5 25	22.3 21	26.4 18	30.0 16	24.2 37	31.6 31	38.1 28	43.8 25	28.8 45	38.6 39	47.1 36	54.7 33
	16.0 28	20.3 24	24.0 21	27.2 19	22.1 39	28.9 34	34.7 30	39.9 28	26.4 46	35.3 41	43.0 38	50.0 35
	14.4 31	18.3 27	21.6 24	24.5 22	20.1 41	26.2 36	31.4 33	36.1 31	24.0 48	32.0 43	39.0 40	45.2 37
	12.9 33	16.3 30	19.2 27	21.7 26	18.0 43	23.5 38	28.2 36	32.3 33	21.6 49	28.8 45	35.0 42	40.5 39
	11.3 36	14.3 33	16.9 31	19.1 29	16.0 45	20.8 41	24.9 38	28.5 36	19.3 51	25.6 47	31.0 44	35.9 42
	9.8 38	12.4 36	14.5 34	16.4 32	14.0 46	18.2 43	21.7 40	24.8 39	16.9 52	22.4 48	27.1 45	31.3 44
	23.3 24	30.1 18	35.8 15	40.8 12	31.1 37	41.3 31	50.0 26	57.9 23	36.5 46	49.7 40	61.2 36	71.7 33
	21.7 27	27.9 21	33.2 18	38.0 16	29.0 39	38.4 33	46.6 29	53.9 26	34.1 48	46.3 42	57.0 38	66.7 35
	20.1 30	25.9 25	30.8 21	35.1 19	26.9 41	35.7 36	43.2 32	49.9 29	31.7 50	43.0 44	52.9 41	61.9 38
	18.5 33	23.8 28	28.3 25	32.3 23	24.9 44	32.9 38	39.8 35	46.0 32	29.3 51	39.7 46	48.8 43	57.1 40
	17.0 35	21.8 31	25.9 28	29.5 26	22.9 46	30.2 41	36.5 38	42.2 35	26.9 53	36.5 48	44.8 45	52.4 42
	15.4 38	19.8 34	23.5 31	26.7 29	20.9 48	27.5 43	33.3 40	38.4 38	24.6 55	33.3 50	40.9 47	47.7 45
	13.9 41	17.8 37	21.1 35	24.0 33	18.9 50	24.9 46	30.0 43	34.6 41	22.3 56	30.1 52	36.9 49	43.1 47
	12.4 43	15.9 40	18.8 38	21.4 36	16.9 52	22.3 48	26.8 45	30.9 43	20.1 58	27.0 54	33.1 51	38.5 49
	26.4 29	34.1 23	40.6 19	46.5 16	34.9 43	46.4 36	56.4 32	65.4 28	40.7 53	55.6 46	68.8 42	80.7 38
	24.8 32	32.0 26	38.1 22	43.5 19	32.8 45	43.6 39	52.9 35	61.3 31	38.3 55	52.3 49	64.6 45	75.7 41
	23.2 35	29.9 29	35.6 26	40.6 23	30.7 48	40.8 42	49.5 38	57.3 34	35.9 57	48.9 51	60.4 47	70.8 44
	21.6 38	27.8 32	33.1 29	37.8 27	28.6 50	38.0 44	46.1 40	53.4 37	33.5 59	45.6 53	56.3 49	66.0 46
	20.0 41	25.7 36	30.6 32	35.0 30	26.6 53	35.3 47	42.8 43	49.5 40	31.2 61	42.4 55	52.3 52	61.2 49
	18.4 43	23.7 39	28.2 36	32.2 33	24.6 55	32.6 49	39.5 46	45.7 43	28.9 62	39.2 58	48.3 54	56.5 51
	16.9 46	21.7 42	25.8 39	29.5 37	22.6 57	29.9 52	36.3 49	41.9 46	26.6 64	36.1 59	44.4 56	51.9 53
	15.4 49	19.7 45	23.5 42	26.7 40	20.7 59	27.3 54	33.0 51	38.2 49	24.3 66	32.9 61	40.5 58	47.3 56

Exchanger for cold pump water PKW / direct evaporator

Performance data for direct evaporator for cooling agent R134a, for other cooling agents on request.

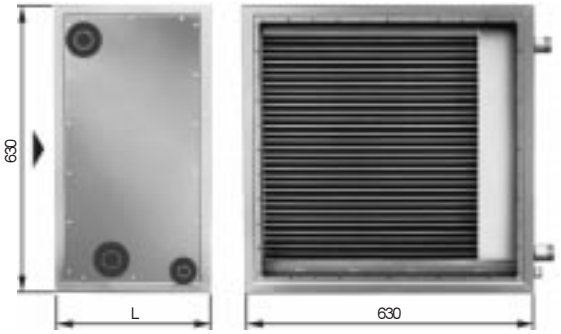


fig. Exchanger for cold water

Air direction: horizontal for type 7 and 8: L = 500 mm
horizontal for type 12 L = 630
vertical: L = 800 mm

Connections: in air direction right or left

Equipment:

Exchanger for cold water with Cu pipes and aluminium lamellas, collecting tank made of steel.

Direct evaporator with Cu pipes and aluminium lamellas, cooling agent distributor.

Mist eliminator, condensate basin with condensate connector on side, male thread 1¼", droplet catcher for air direction vertical.

Type	Connections	Contents
7	1¼"	4.0 l
8	1¼"	7.5 l
12	1¼"	10.0 l
A	DN 22 cooling agent inlet DN 28 cooling agent outlet	3.5 l
B	DN 22 cooling agent inlet DN 30 cooling agent outlet	5.0 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:
Exchanger for cold water with Cu pipes
and corrosion-resistant aluminium lamellas
Exchanger for cold water with Cu pipes and Cu lamellas
Exchanger for cold water made of steel - galvanised
Exchanger for cold water with bleed and drain connector

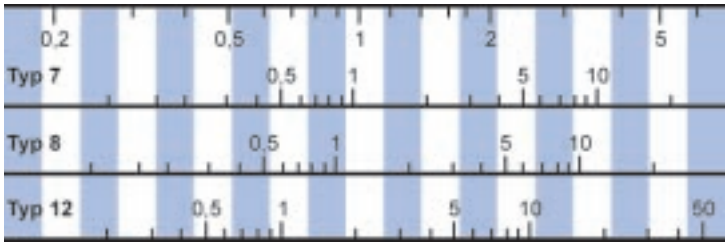
Note:
Allow for sufficient room for extraction of the exchanger.
Build in siphon on site with the condensate connector.

Water resistance (kPa)

Quantity of water $w = \frac{0.86 \cdot \dot{Q}}{\Delta t_W}$ (m³/h)

$\dot{Q}$ = Power in kW
$\Delta t_w = t_{WI} - t_{WO}$

Quantity of water w (m³/h)



$\dot{V}$ (m³/h)		1 600		2 400		3 200		4 000	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
		Exchanger for cold water type 7							
4/8	32	15.7	11.9	21.2	13.7	26.1	15.0	30.5	16.0
	28	13.2	11.4	17.8	12.9	21.8	14.0	25.3	14.9
	26	11.6	10.8	15.7	12.2	19.2	13.2	22.3	14.0
	25	10.9	10.5	14.6	11.9	17.9	12.8	10.8	13.6
5/10	32	14.0	13.1	18.9	14.7	23.1	16.0	26.9	16.9
	28	11.5	12.6	15.4	14.0	18.8	15.0	21.8	15.8
	26	9.9	12.0	13.3	13.3	16.2	14.2	18.8	14.9
	25	9.2	11.7	12.3	12.9	15.0	13.8	17.4	14.4
6/12	32	12.2	14.1	16.4	15.7	20.1	16.8	23.3	17.7
	28	9.8	13.6	13.0	14.9	15.8	15.8	18.3	16.5
	26	8.2	13.0	10.9	14.1	13.3	14.9	15.3	15.6
	25	7.5	12.7	9.9	13.7	12.0	14.5	13.9	15.0
		Type 8							
4/8	32	21.0	5.8	30.3	6.8	38.9	7.7	46.9	8.4
	28	18.1	5.9	25.9	6.8	33.4	7.6	40.0	8.3
	26	16.1	5.8	23.1	6.6	29.5	7.3	35.5	8.0
	25	15.1	5.8	21.7	6.6	27.7	7.2	33.3	7.8
5/10	32	19.4	7.1	27.8	8.1	35.5	8.9	42.7	9.7
	28	16.4	7.2	23.4	8.1	29.8	8.9	35.8	9.6
	26	14.4	7.1	20.5	7.9	26.1	8.6	31.3	9.2
	25	13.4	7.1	19.1	7.9	24.2	8.5	29.1	9.1
6/12	32	17.6	8.4	25.1	9.4	31.9	10.2	38.4	10.9
	28	14.6	8.5	20.7	9.4	26.3	10.1	31.4	10.8
	26	12.6	8.4	17.8	9.2	22.5	9.9	26.9	10.4
	25	11.6	8.4	16.3	9.1	20.6	9.7	24.6	10.3
		Type 12							
4/8	32	20.8	5.6	30.1	6.4	38.7	7.1	46.8	8.2
	28	18.0	5.6	25.9	6.4	33.2	7.0	40.1	8.0
	26	16.1	5.6	23.2	6.2	29.7	6.8	35.8	7.7
	25	15.2	5.6	21.8	6.2	27.9	6.7	33.7	7.2
5/10	32	19.4	7.1	27.8	7.8	35.7	8.5	43.1	9.0
	28	16.5	7.1	23.6	7.8	30.2	8.4	36.4	8.9
	26	14.6	7.0	20.8	7.7	26.6	8.2	32.1	8.7
	25	13.6	7.0	19.5	7.6	24.8	8.1	29.9	8.5
6/12	32	17.8	8.5	25.5	9.3	32.6	9.9	39.2	10.4
	28	14.9	8.6	21.2	9.2	27.1	9.8	32.5	10.3
	26	13.0	8.5	18.4	9.1	23.4	9.6	28.1	10.0
	25	12.0	8.5	17.0	9.1	21.6	9.5	26.0	9.9
Ev. temp. °C		**Direct evaporator type A**							
2.0	32	15.2	12.0	19.0	14.5	21.8	16.3	23.9	17.7
	28	13.4	10.9	16.8	13.1	19.2	14.7	21.1	15.9
	26	12.2	10.2	15.2	12.3	17.4	13.8	19.1	14.9
	25	11.6	9.9	14.4	11.9	16.5	13.3	18.1	14.3
5.0	32	13.7	13.3	17.2	15.5	19.8	17.1	21.7	18.3
	28	11.8	12.2	14.9	14.2	17.1	15.6	18.8	16.6
	26	10.6	11.6	13.3	13.4	15.3	14.6	16.8	15.6
	25	10.0	11.3	12.5	12.9	14.3	14.2	15.8	15.1
8.0	32	11.8	14.7	14.9	16.6	17.2	18.0	18.9	19.1
	28	10.0	13.8	12.6	15.4	14.5	16.6	15.9	17.5
	26	8.7	13.1	11.0	14.6	12.6	15.7	13.9	16.5
	25	8.1	12.8	10.2	14.2	11.7	15.2	12.9	16.0
		Type B							
2.0	32	17.5	9.4	22.8	11.7	26.8	13.4	30.0	14.8
	28	15.5	8.7	20.1	10.7	23.7	12.2	26.4	13.4
	26	14.1	8.1	18.3	10.0	21.5	11.4	24.0	12.6
	25	13.4	7.9	17.4	9.7	20.4	11.0	22.8	12.1
5.0	32	15.7	11.0	20.5	13.0	24.2	14.5	27.2	15.7
	28	13.7	10.3	17.8	12.0	21.0	13.3	23.5	14.4
	26	12.2	9.8	15.9	11.4	18.7	12.6	21.0	13.5
	25	11.5	9.6	15.0	11.0	17.6	12.2	19.7	13.1
8.0	32	13.6	12.8	17.8	14.4	21.1	15.7	23.6	16.7
	28	11.5	12.1	15.0	13.5	17.7	14.6	19.9	15.5
	26	10.0	11.6	13.1	12.9	15.5	13.9	17.3	14.7
	25	9.3	11.4	12.2	12.6	14.3	13.5	16.1	14.3

Air inlet state: 32°C / 40 % r.h., 28°C / 47 % r.h.
26°C / 49 % r.h., 25°C / 50 % r.h.
Note: min. evaporation temperature 2°C.

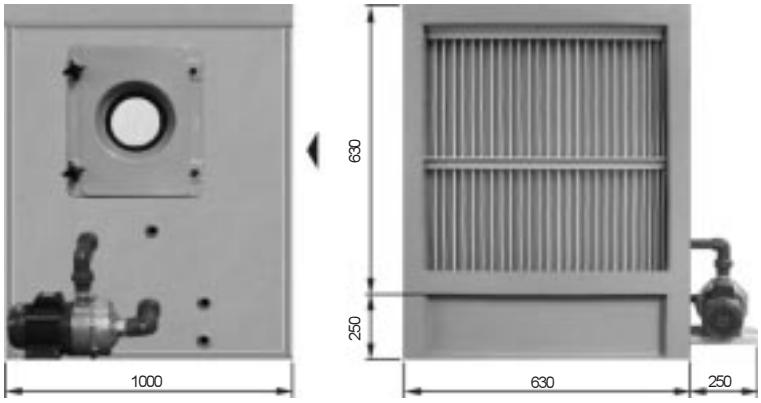
Washer / Vapour humidifier element KG 40 Standard

Washer element

Casing
Plastic (glass fibre reinforced plastic)

Inspection door and connections
in air direction right or left

Equipment
Block pump 1.1 kW, 230/400 V, Δ/Y; 4.8/2.8 A, 50 Hz;
Stainless steel pump
Nozzle holder with self-cleaning nozzles spraying against air flow
Washer basin with all-round inclination towards the drain connector
Pump with complete piping on suction and pressure side, dry-run protection for pump.
De-sludging system
Inspection door with inspection window
Flow rectifier
Mist eliminator
} temperature-resistant to 70°C, dismantable



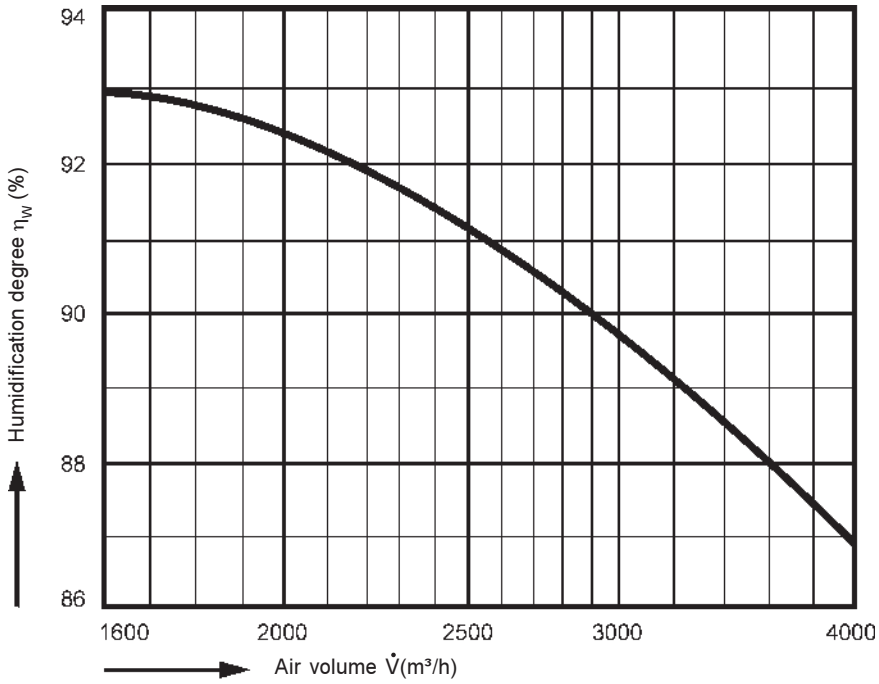
Inlet device, male thread 3/4", with float valve and float, overflow spout DN 40, outlet chute DN 40.
On request: lighting 230 V / 60 W, darkening for inspection window.
Drain and overflow device with siphon on the inside, thermometer, pressure gauge

Humidification degree η_w

$$\eta_w = \frac{x_2 - x_1}{x_s - x_1}$$

Index
x = water content of air
1 = air inlet
2 = air outlet
S = saturation state

with air temperature 20°C, density 1.2 kg/m³,
water pressure 2.6 bar, quantity of water 4000 l/h

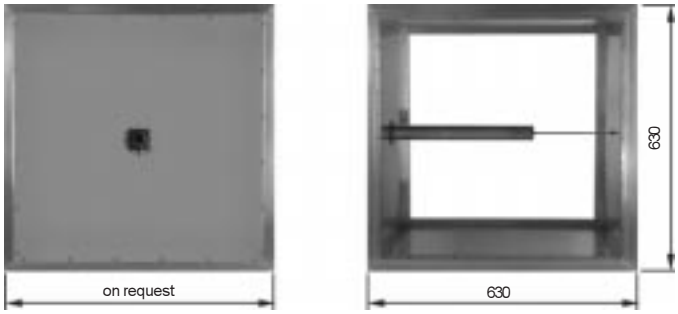


Vapour humidifier element

suitable for vapour lances of different manufacturers

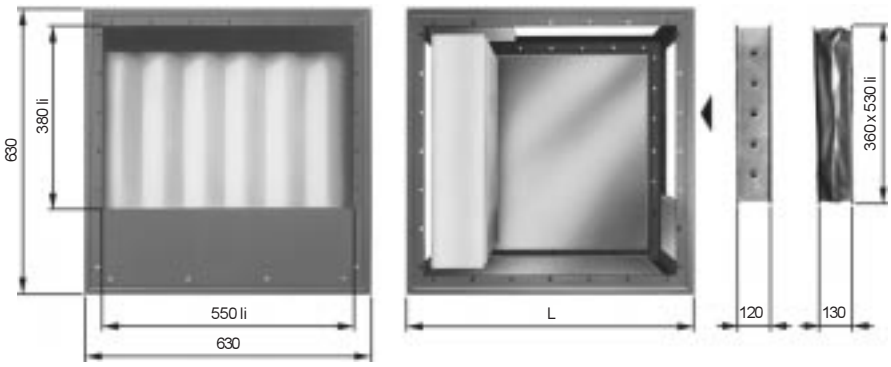
Design:
- Galvanised outer and inner surfaces,
- Inspection door
- Basin with drain 1¼" male thread made of corrosion-resistant material
- Length variable

On request:
- inspection hole Ø 150mm
- Inside light

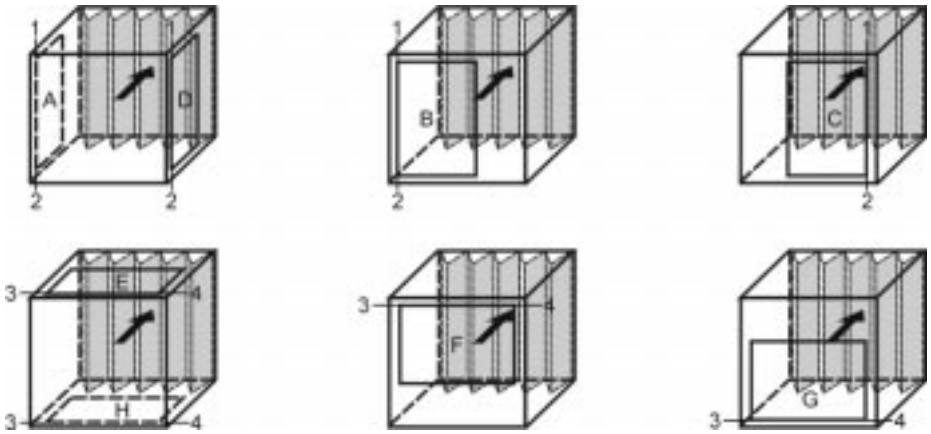


Filter/air mixture element combined L = 630 mm

Air mixture element/ exhaust air element L = 460 mm



Suction variations:



One external flap		Two external flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + B	1, 2
B	1, 2	A + C	1, 2
C	1, 2	A + D	1, 2
D	1, 2	B + D	1, 2
E	3, 4	C + D	1, 2
F	3, 4	E + F	3, 4
G	3, 4	E + G	3, 4
H	3, 4	E + H	3, 4
		F + H	3, 4
		G + H	3, 4

One internal flap		Two internal flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + C	1, 2
B	1, 2	A + D	1, 2
C	1, 2	B + D	1, 2
D	1, 2	E + G	3, 4
E	3, 4	E + G	3, 4
F	3, 4	F + H	3, 4
G	3, 4		
H	3, 4		

Drive torque for 1 flap 3 Nm (airtight flap according to DIN 1946: 10 Nm)

Inspection door:

in air direction right, left, top, bottom
required space for filter extraction: min. 0.65 m
for air mixture element/exhaust air element inspection door only on request in air direction right/left

Fan element

L 800
W 800
H 800

L 800
W 800
H 800

Heater element

L* 300/500
W 800
H 800

Cooling element

L 500
W 800
H 800
vertical L 800

Washer element

L 1000
W 800
H 1050

Mixing and filter element

L 800
W 800
H 800

Mixing and exhaust air element

L 630
W 800
H 800

Short filter element

L 300
W 800
H 800

Sleeve filter element

L 800
W 800
H 800
Sl. fi. short L 500

Silencer element

L .....
W 800
H 800

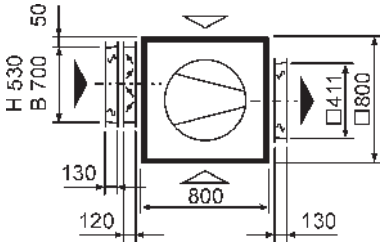
Empty element / vapour humidifier empty el.

L .....
W 800
H 800

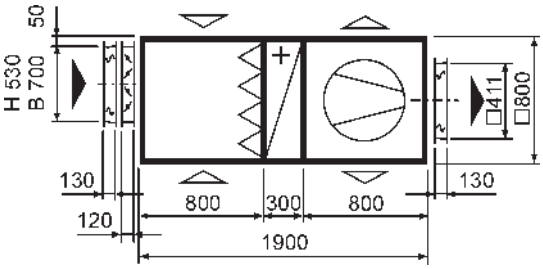
KGX

L 800
W 800
H 800

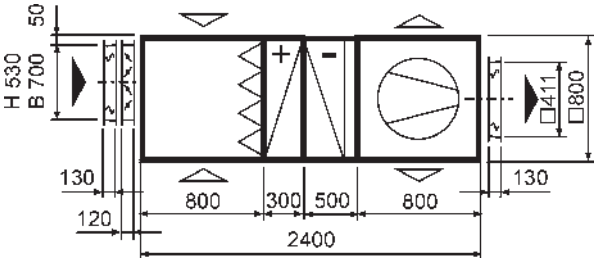
Withdrawn air device



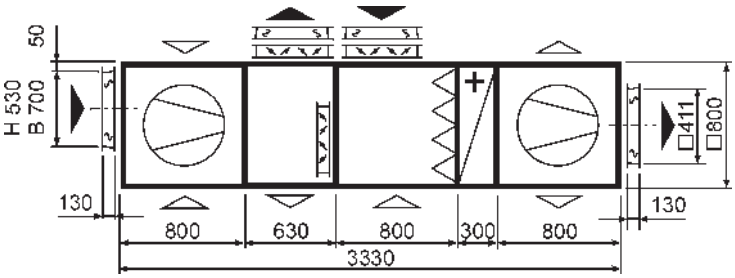
Supply air device



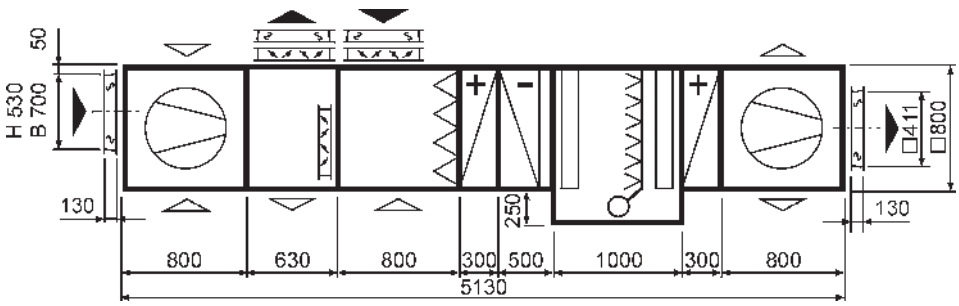
Partial air conditioner



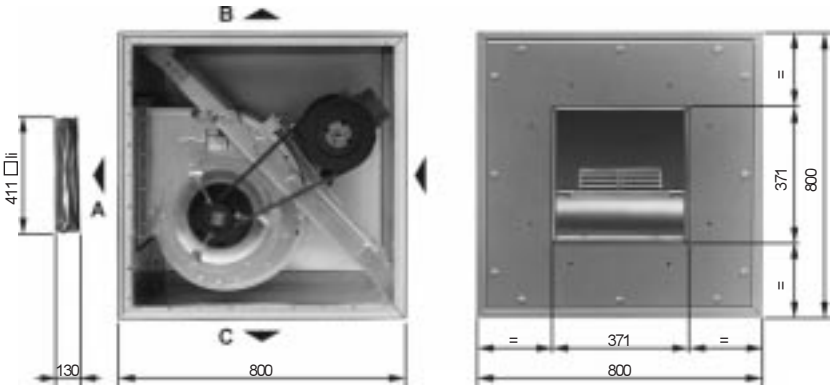
Combined supply and withdrawn air device



Combined climate control, supply and withdrawn air device

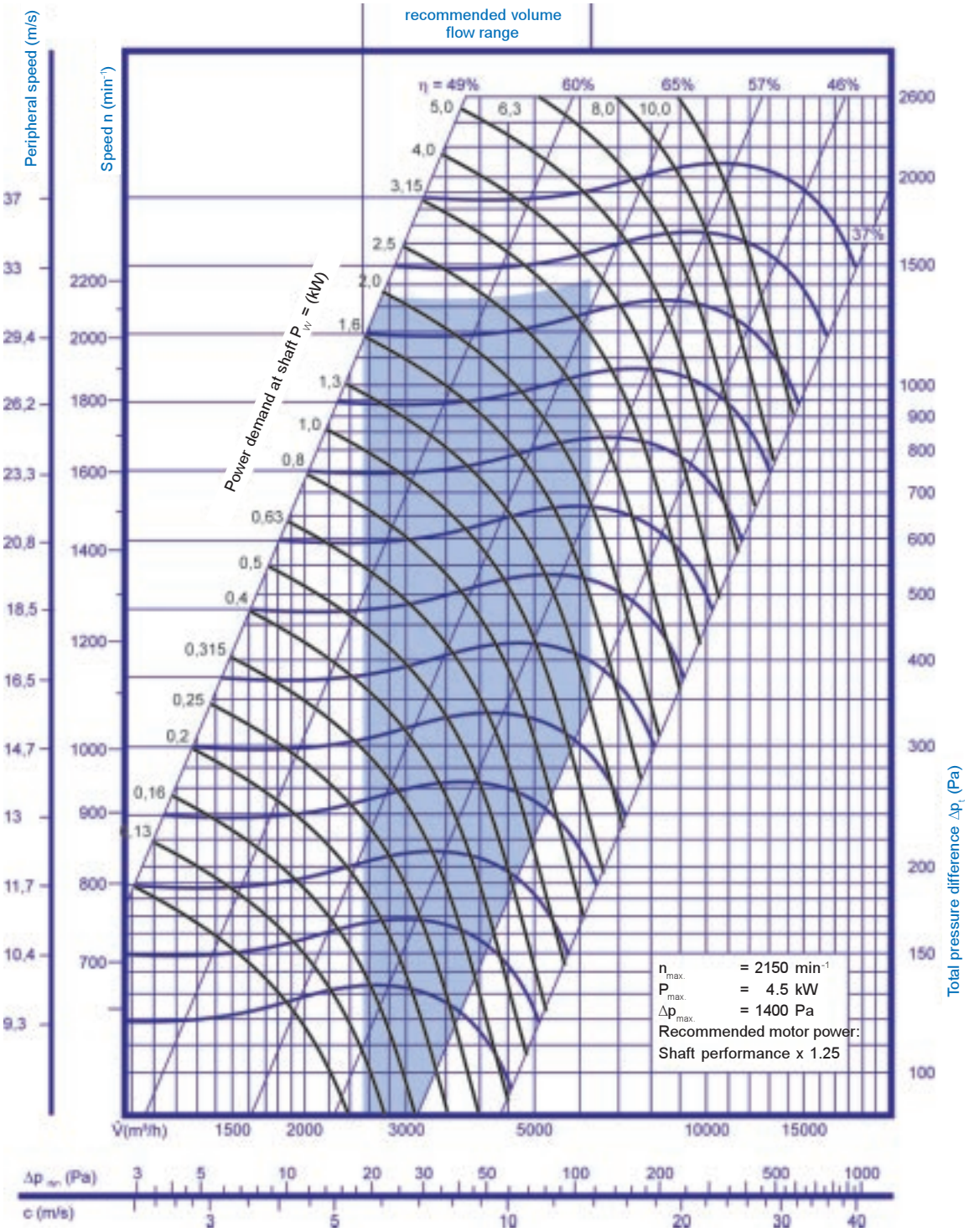


* with extractable frost-protection frame L = 500



Fan diagram

Forward rotor blades



With respect to fan exhaust air cross section

Exhaust variation: A, B, C

Fan/motor: in sturdy diagonal construction with vibration absorbers, diagonal separated
Elastic connection between fan exhaust and casing

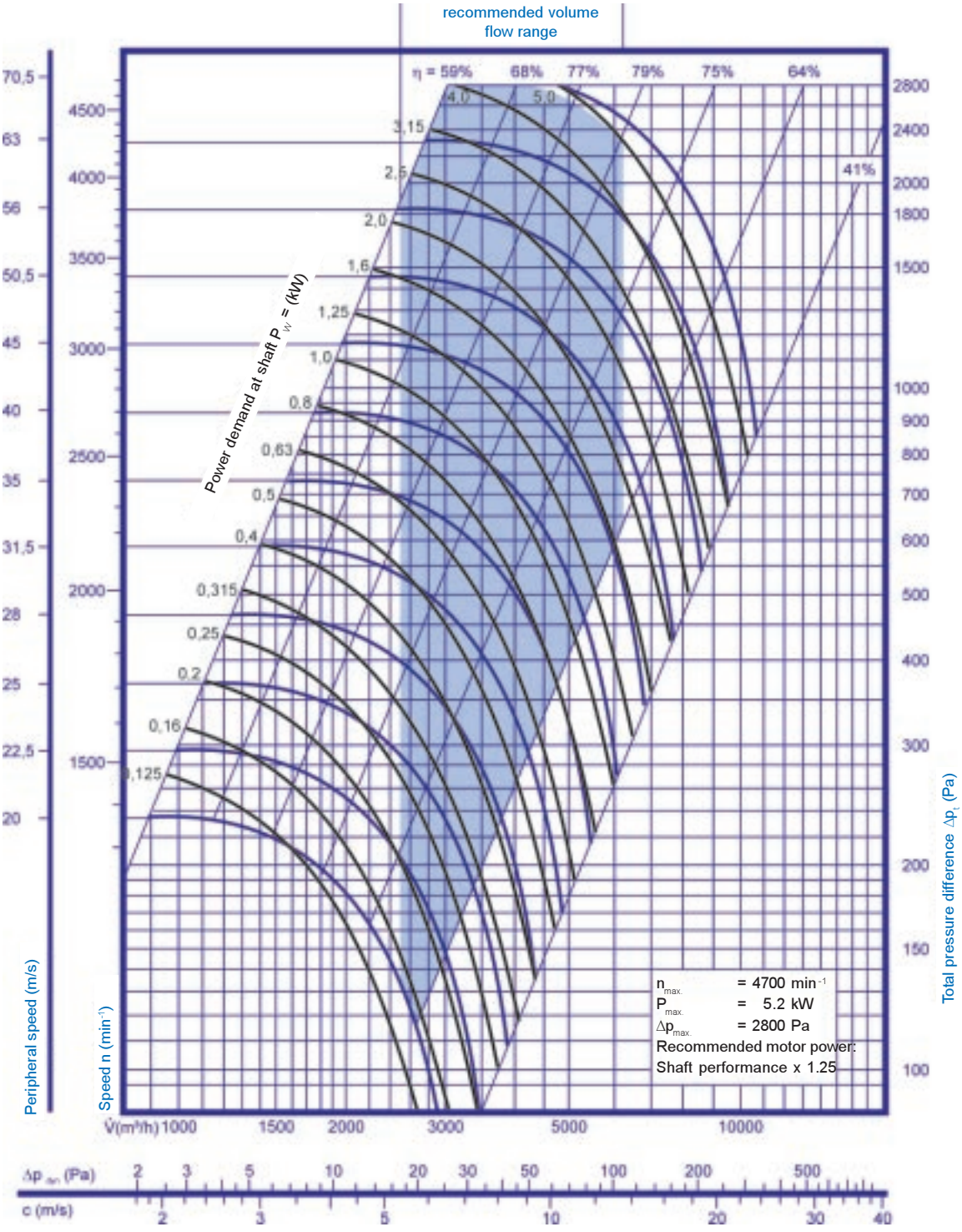
Inspection door: in air direction right, left, top, if desired bottom, with turn locks

Withdrawn air device: Construction such as fan element, flap arrangement in accordance with connection and suction variations

Flaps on the inside F possible only with exhaust A and motor output up to 4 kW

Fan diagram

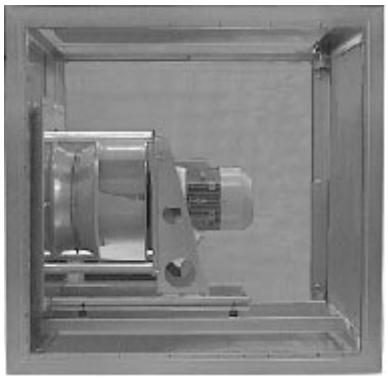
Backward rotor blades



With respect to fan exhaust air cross section

Free-running fan wheel KG 63 Standard

Description



Free-running fan wheel, unidirectional suction, with backward rotor blades, attached directly to the motor shaft.

Complete unit mounted on sturdy base frame with flexible vibration absorbers.

Rotor wheel statically and dynamically balanced. Complete motor protection with built-in PTC thermistors.

High fan efficiency even at low speed, almost without dynamic pressure ratios.

In connection with frequency converter, accurate adaptation to unit characteristics is possible.

Economical and energy-saving operation even under partial load conditions.

Low maintenance costs, no drive belt losses, no retightening required.

External pressure drops

Customer specification of the installation side pressure drops (e.g. duct system).

Internal pressure drops

The pressure drops of all components with respect to the volume flow (also fan element) are listed in the pressure drop tables of the individual chapters.
For components on the pressure-side, neither flow distributors nor incident flow elements are required, since the exhaust flows through the entire cross section.

Dynamic pressure drops

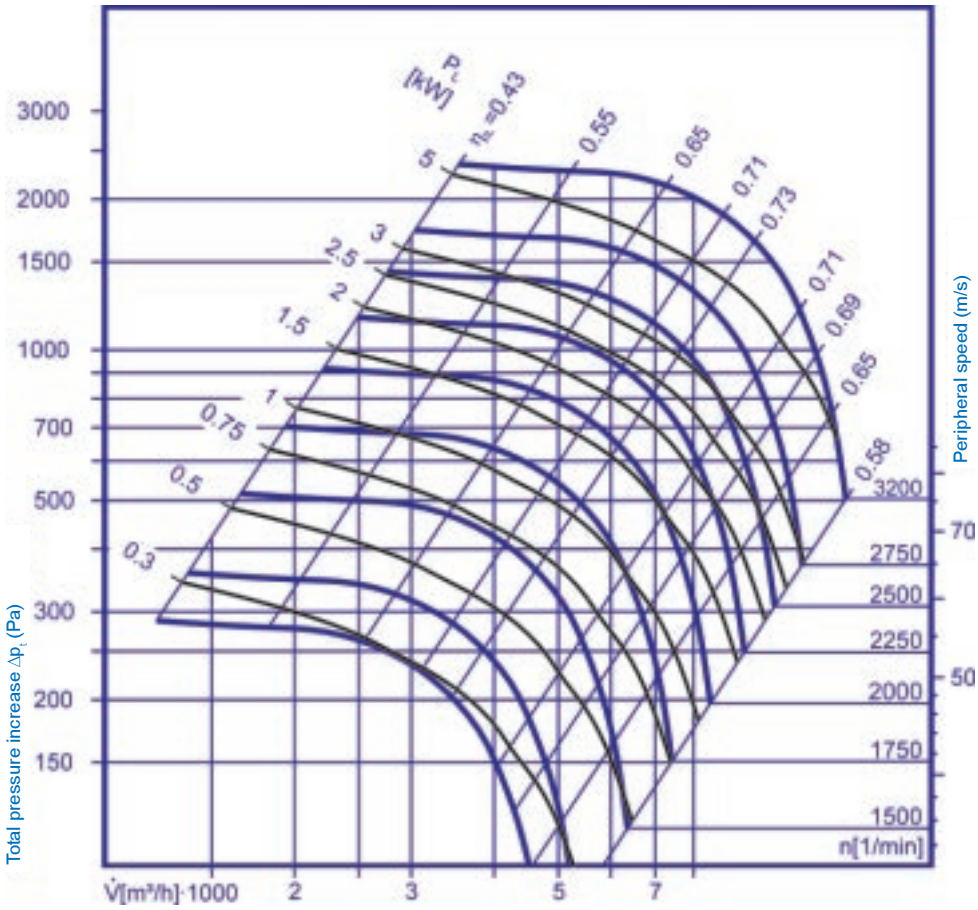
The dynamic pressure portions do not have to be considered in planning.

Performance data

KG size	Max. Air volume m^3/h	Total pressure increase to Pa	Operational data * Fan power kW	Operational data * Fan speed min^{-1}	Standard data * Motor power kW	Standard data * Motor speed min^{-1}	Standard data * Motor current A
KG 63	6300	500	1.34	1895	2,20	1500	5.20
		1000	2.71	2342	3,00	1500	6.80
		1500	4.25	2728	5,50	3000	11.30

* Fan speed is controlled by frequency converter (f ≥ 50Hz)

Fan diagram
Rotor wheel Ø 450 mm



Total sound power level L_W in [dB]

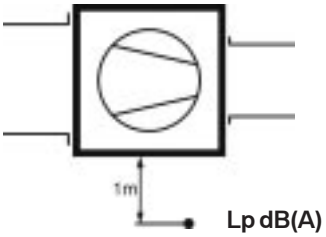
The accurate, device-specific sound data can be determined only for the specific order.

Lw [dB] = the computational total sound power of the fan on the suction/pressure-side.

		Total pressure increase Δp [Pa]					
	L_w	500	750	1000	1250	1500	2000
$\dot{V}$ [m³/h]	3,000	89	92	95	97	98	101
	4,500	90	94	96	98	100	102
	6,300	92	95	98	100	101	104

Sound pressure level Lp dB(A)

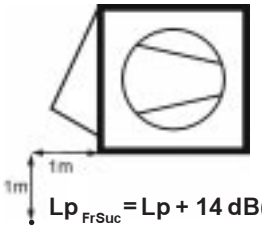
Lp dB(A) = sound pressure level at 1 m distance beside the fan element, measured in the free field with suction and pressure-side duct connection



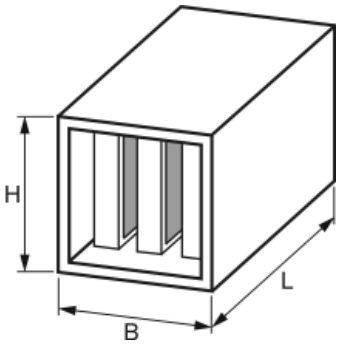
Forward rotor blades								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
3,000	800	37	4,500	900	44	6,300	1000	51
	1000	41		1120	45		1250	52
	1250	46		1400	48		1600	53
	1600	51		1600	53		2000	56
Backward rotor blades								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
3,00	2000	47	4,500	2000	44	6,300	2800	52
	2500	53		2500	52		3150	56
	3150	59		3150	57		3500	59
	4000	65		4000	63		4000	62
Free-running fan wheel Ø 450mm								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
3,000	1550	49	4,500	1600	50	6,300	1800	52
	1850	52		1900	54		2150	55
	2150	55		2150	56		2350	58
	2600	58		2600	60		2650	61

Sound pressure level Lp dB(A) beside the fan element

With free suction or exhaust opening



Silencer element



Dimensions (mm)

Height H	Width B	Length L			
		Type 2	Type 3	Type 4	Type 5
800	800	800	1000	1250	1600

Insertion loss De dB(A)

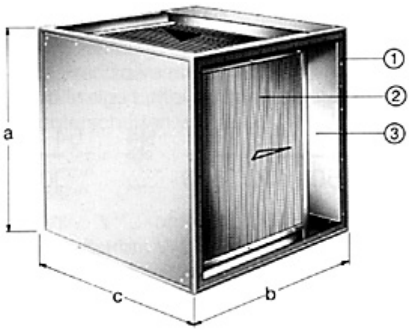
Type	Octave band (Hz)							
	63	125	250	500	1000	2000	4000	8000
2	6	12	20	20	22	16	12	11
3	7	14	24	25	26	20	14	13
4	8	17	30	32	34	25	18	17
5	9	21	37	37	41	29	21	19

For series connection of 2 silencers: $De = De_1 + De_2 - 3$ dB(A)

The accurate, device-specific heat recovery data can be determined only for the specific order.

Description KGX/KGXD

KGX air circulation horizontally/ vertically
KGXD air circulation diagonally



Hot air and cold air are led past each other in the cross current.

The heat recovery takes place via heat transmission from the hot to the cold air flow. The air flows are completely separated by aluminium plates.

- Heat recovery of up to over 80 %
- no moisture transmission
- no mobile parts, corrosion-resistant

① **Casing**
Design same as air conditioner

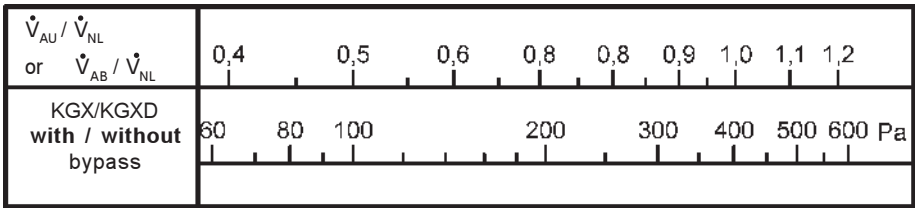
② **Heat exchanger**
Heat exchanger surfaces made of special corrosion-resistant aluminium plates.

③ **Internal bypass** (on request)
In order to prevent rime on the heat exchanger surfaces, the outside air can partially or entirely pass by the heat exchanger in the internal bypass.

Type	Nominal air volume $\dot{V}$ [m³/h]		Dimensions [mm]			Weight [kg]	Condensate connector
	without int.bypass	with int. bypass	a	b	c		R"
KGX 63	6,300	5,450	800	800	800	140	-
KGXD 63	6,300	5,450	800	800	1250	215	1 ¼"

Pressure drop Δp [Pa]

for KGX/KGXD
with or without internal bypass



Description RWT

RWT air circulation horizontally/vertically

A rotating storage capacity takes up heat from the withdrawn air stream and emits it to the outside air stream.

- Heat recovery of up to 80 %.
- Simple power control by adjusting the speed.
- With suitable rotor material, humidification of the supply air.
- Rime protection, defrosting device, pre-heating of air not required.
- Easy maintenance through inspection doors in the air incident flow elements.

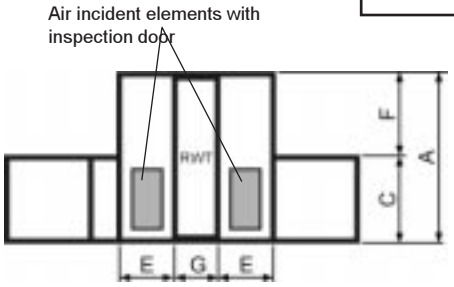
Pressure drop Δp [Pa]

Volume flow $\dot{V}$ [m³/h]	2,500	3,000	3,500	4,000	5,000	6,300
Pressure drop Δp [Pa]	50	60	70	80	102	130

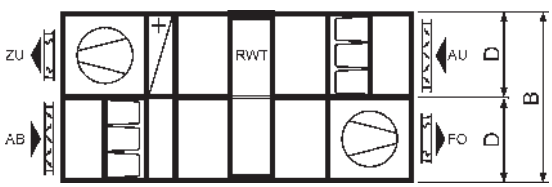
Dimensions

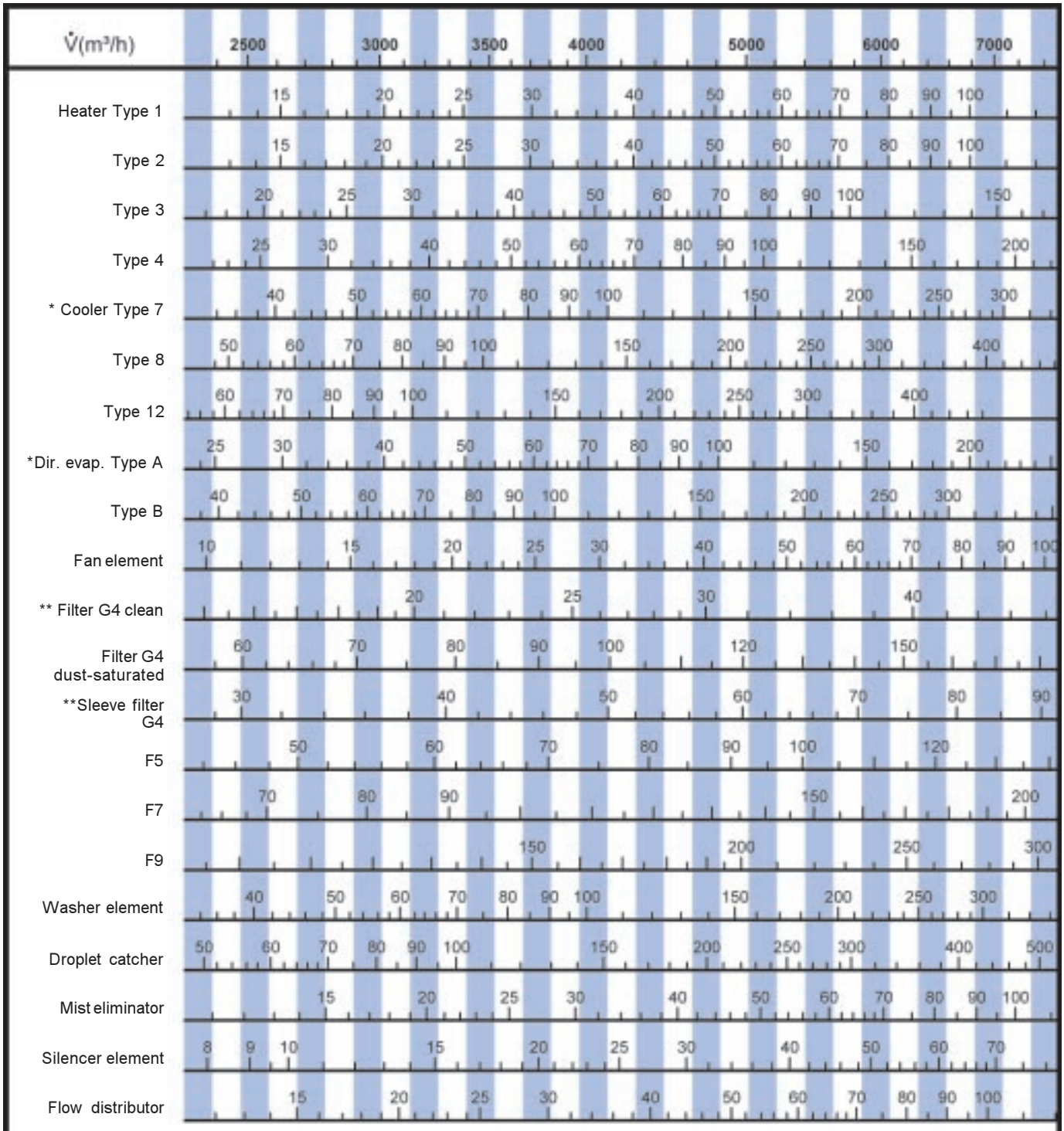
KG	A	B	C	D	E	F	G
63	1250	1600	800	800	450	500	400

Front view



Top view



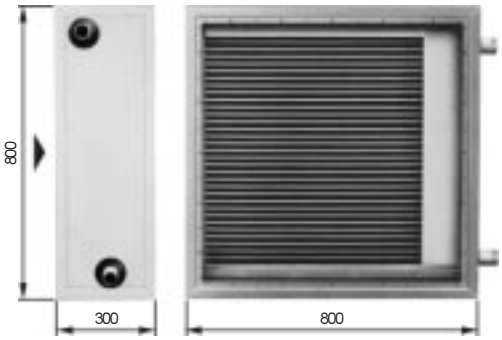


* for horizontal air flow:
Add pressure drop from mist eliminator
For vertical air flow:
Add pressure drop of droplet catcher + mist eliminator

**** Design: Starting resistance + 50 Pa**
recommended final pressure difference for sleeve filters is 400 Pa.

Heater element

Heat exchanger for warm pump water PWW



Connections: in air direction right or left

Equipment:

Heat exchanger with Cu pipes and aluminium lamellas, collecting tank made of steel

Type	Connections	Water content
1	DN 25	2.5 l
2	1¼"	3.5 l
3	1¼"	3.5 l
4	1¼"	5.5 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:

Heat exchanger with Cu pipes and corrosion-resistant aluminium lamellas

Heat exchanger with Cu pipes and Cu lamellas

Heat exchanger made of steel - galvanised

Heat exchanger for steam

Heat exchanger for hot oil

Electrical heating element etc.

Heat exchanger with bleed and drain connectors

Note:

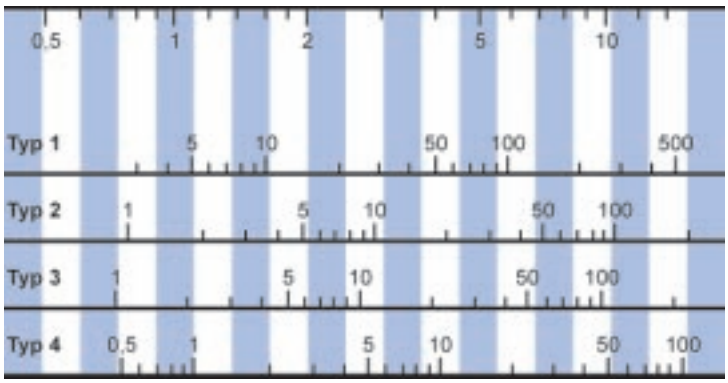
Allow for sufficient room for extraction of the heat exchanger.

Water resistance (kPa)

Quantity of water $w = \frac{0.86 \cdot \dot{Q}}{\Delta t_W}$ (m³/h)

$\dot{Q}$ = Power in kW
$\Delta t_w = t_{WI} - t_{WO}$

Quantity of water w (m³/h)



Typ		1							
V̇ (m³/h)		2 500		3 700		5 000		6 300	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
45/35	- 15	21.6	8	27.3	5	32.5	2	37.2	1
	- 10	19.4	11	24.5	8	29.2	6	33.3	4
	- 5	17.2	14	21.7	11	25.8	9	29.5	8
	± 0	15.0	17	19.0	14	22.6	13	25.7	11
	+ 5	12.9	20	16.3	18	19.3	16	22.0	15
	+10	10.8	23	13.6	21	16.1	19	18.4	18
	+15	8.7	25	11.0	24	13.0	23	14.8	22
	+20	6.7	28	8.4	27	9.9	26	11.2	25
50/40	- 15	23.7	10	30.0	7	35.8	4	41.0	2
	- 10	21.5	13	27.2	10	32.5	8	37.1	6
	- 5	19.3	16	24.4	13	29.1	11	33.3	10
	± 0	17.1	19	21.7	16	25.8	14	29.5	13
	+ 5	15.0	22	19.0	20	22.6	18	25.7	17
	+10	12.9	25	16.3	23	19.4	21	22.1	20
	+15	10.8	28	13.6	26	16.2	25	18.4	24
	+20	8.8	31	11.0	29	13.0	28	14.8	27
60/40	- 15	24.6	11	31.0	7	36.8	5	42.0	3
	- 10	22.3	14	28.1	11	33.4	8	38.1	6
	- 5	20.2	17	25.4	14	30.1	12	34.3	10
	± 0	18.0	20	22.6	17	26.8	15	30.5	14
	+ 5	15.9	23	19.9	20	23.6	18	26.8	17
	+10	13.7	26	17.2	24	20.3	22	23.1	21
	+15	11.6	29	14.5	27	17.2	25	19.5	24
	+20	9.5	31	11.9	30	14.0	28	15.8	28
70/50	- 15	28.9	16	36.6	11	43.6	8	49.7	6
	- 10	26.7	19	33.7	15	40.1	12	45.8	10
	- 5	24.5	22	30.9	18	36.8	15	42.0	13
	± 0	22.3	25	28.1	21	33.4	19	38.1	17
	+ 5	20.1	28	25.4	25	30.2	22	34.4	21
	+10	18.0	31	22.7	28	26.9	26	30.6	24
	+15	15.9	34	20.0	31	23.7	29	27.0	28
	+20	13.8	37	17.3	34	20.5	32	23.3	31
70/55	- 15	30.6	17	38.8	13	46.3	10	52.9	7
	- 10	28.3	21	35.9	16	42.8	13	49.0	11
	- 5	26.1	24	33.1	20	39.4	17	45.1	15
	± 0	23.9	27	30.3	23	36.1	20	41.2	18
	+ 5	21.7	30	27.5	26	32.8	24	37.4	22
	+10	19.6	33	24.8	30	29.5	27	33.7	26
	+15	17.5	36	22.1	33	26.3	31	30.0	29
	+20	15.4	39	19.4	36	23.1	34	26.3	33
80/50	- 15	29.9	17	37.7	12	44.8	9	51.1	7
	- 10	27.7	20	34.9	15	41.4	12	47.2	10
	- 5	25.5	23	32.0	19	38.0	16	43.3	14
	± 0	23.3	26	29.3	22	34.7	19	39.5	18
	+ 5	21.1	29	26.5	25	31.4	23	35.7	21
	+10	19.0	32	23.8	29	28.1	26	32.0	25
	+15	16.8	35	21.1	32	24.9	30	28.3	28
	+20	14.7	38	18.4	35	21.7	33	24.6	32
80/60	- 15	33.2	20	42.1	15	50.2	12	57.4	9
	- 10	31.0	23	39.2	19	46.8	15	53.4	13
	- 5	28.7	27	36.4	22	43.4	19	49.5	17
	± 0	26.5	30	33.6	25	40.0	22	45.7	20
	+ 5	24.3	33	30.8	29	36.7	26	41.9	24
	+10	22.2	36	28.0	32	33.4	29	38.1	28
	+15	20.1	39	25.3	35	30.1	33	34.4	31
	+20	18.0	42	22.7	38	26.9	36	30.7	35
90/70	- 15	37.4	25	47.5	19	56.8	15	65.0	12
	- 10	35.2	28	44.6	23	53.3	19	61.0	16
	- 5	32.9	31	41.7	26	49.9	22	57.0	20
	± 0	30.7	34	38.9	30	46.5	26	53.1	24
	+ 5	28.5	38	36.1	33	43.1	30	49.3	27
	+10	26.3	41	33.4	36	39.8	33	45.5	31
	+15	24.2	44	30.6	39	36.5	37	41.7	35
	+20	22.1	47	27.9	43	33.3	40	38.0	38

Other operating conditions on request!

2								3								4							
2 500		3 700		5 000		6 300		2 500		3 700		5 000		6 300		2 500		3 700		5 000		6 300	
$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
27.5	14	35.3	10	42.6	8	49.1	6	33.2	20	43.7	16	53.6	13	62.3	11	39.7	27	53.8	24	67.3	21	79.5	18
24.6	17	31.6	13	38.2	11	43.9	9	29.9	22	39.3	19	48.1	16	55.9	14	35.8	29	48.4	25	60.5	23	71.4	21
21.8	19	28.0	16	33.8	14	38.9	12	26.6	24	34.9	21	42.6	18	49.5	17	31.9	30	43.1	27	53.7	25	63.4	23
19.1	21	24.5	19	29.5	17	33.9	15	23.3	26	30.5	23	37.3	21	43.3	19	28.0	31	37.8	29	47.1	26	55.5	25
16.4	24	21.0	21	25.2	19	29.0	18	20.1	28	26.3	25	32.0	23	37.1	22	24.2	33	32.6	30	40.5	28	47.7	27
13.7	26	17.5	24	21.0	22	24.1	21	16.9	30	22.0	27	26.8	26	31.0	24	20.5	34	27.4	32	34.1	30	40.0	28
11.1	28	14.1	26	16.9	25	19.3	24	13.7	31	17.8	29	21.6	28	25.0	27	16.7	35	22.4	33	27.6	31	32.4	30
8.5	30	10.7	29	12.8	28	14.6	27	10.6	33	13.7	31	16.5	30	19.1	29	13.0	36	17.3	34	21.3	33	24.8	32
30.1	17	38.8	13	46.9	10	54.1	8	36.4	24	48.0	19	58.9	16	68.6	14	43.3	31	58.9	27	73.7	24	87.2	22
27.3	19	35.2	16	42.5	13	48.9	11	33.0	26	43.5	22	53.3	19	62.1	17	39.4	33	53.4	29	66.9	26	79.0	24
24.5	22	31.6	18	38.1	16	43.9	14	29.7	28	39.1	24	47.9	21	55.7	19	35.5	34	48.1	31	60.1	28	71.0	26
21.7	24	28.0	21	33.8	19	38.8	17	26.4	30	34.7	26	42.5	24	49.4	22	31.6	36	42.8	32	53.5	30	63.1	28
19.0	27	24.5	24	29.5	22	33.9	20	23.2	32	30.4	29	37.2	26	43.2	25	27.8	37	37.6	34	46.9	32	55.3	30
16.4	29	21.0	26	25.3	25	29.0	23	20.0	33	26.2	31	32.0	29	37.1	27	24.1	38	32.4	36	40.4	33	47.6	32
13.7	31	17.6	29	21.1	27	24.2	26	16.8	35	22.0	33	26.8	31	31.1	30	20.4	39	27.4	37	34.0	35	39.9	34
11.1	33	14.2	32	17.0	30	19.4	29	13.7	37	17.8	35	21.7	33	25.1	32	16.7	40	22.3	38	27.6	37	32.4	35
31.2	18	40.0	14	48.1	11	55.3	8	38.2	26	50.0	21	61.0	17	70.8	15	46.1	34	62.1	29	77.2	26	90.9	23
28.4	21	36.3	17	43.7	14	50.1	12	34.8	28	45.5	23	55.5	20	64.3	18	42.1	36	56.6	31	70.4	28	82.8	26
25.6	23	32.7	19	39.3	17	45.1	15	31.5	30	41.1	26	50.0	23	57.9	20	38.2	37	51.2	33	63.6	30	74.7	28
22.8	26	29.2	22	35.0	20	40.1	18	28.2	32	36.7	28	44.6	25	51.7	23	34.3	38	45.9	35	56.9	32	66.7	30
20.1	28	25.6	25	30.7	23	35.1	21	24.9	33	32.4	30	39.3	27	45.4	26	30.4	40	40.6	36	50.3	34	58.9	32
17.4	30	22.1	27	26.5	25	30.3	24	21.7	35	28.1	32	34.0	30	39.3	28	26.6	41	35.4	38	43.7	35	51.1	34
14.7	32	18.7	30	22.3	28	25.4	27	18.5	37	23.9	34	28.8	32	33.2	31	22.8	42	30.2	39	37.1	37	43.3	35
12.1	35	15.2	32	18.1	31	20.6	30	15.3	38	19.6	36	23.6	34	27.1	33	19.0	43	25.0	40	30.6	38	35.6	37
36.7	24	47.2	19	57.0	15	65.6	13	44.6	32	58.7	27	71.8	23	83.4	20	53.3	42	72.2	37	90.2	33	106.5	30
33.8	27	43.5	22	52.5	18	60.4	16	41.2	35	54.1	30	66.2	26	76.9	23	49.4	43	66.7	39	83.3	35	98.3	32
31.0	29	39.9	25	48.0	21	55.2	19	37.9	37	49.7	32	60.7	28	70.5	26	45.4	45	61.4	41	76.5	37	90.2	34
28.3	32	36.3	28	43.7	25	50.2	22	34.6	39	45.3	34	55.3	31	64.1	29	41.6	47	56.0	42	69.8	39	82.2	37
25.5	34	32.7	30	39.3	27	45.2	25	31.3	41	40.9	37	49.9	34	57.9	31	37.7	48	50.8	44	63.2	41	74.3	39
22.8	37	29.2	33	35.1	30	40.2	29	28.1	43	36.6	39	44.6	36	51.7	34	33.9	49	45.6	46	56.6	43	66.5	41
20.1	39	25.7	36	30.9	33	35.4	32	24.9	44	32.4	41	39.4	38	45.6	36	30.2	51	40.4	47	50.1	45	58.8	43
17.5	41	22.3	38	26.7	36	30.5	35	21.7	46	28.2	43	34.2	41	39.5	39	26.5	52	35.3	49	43.7	46	51.1	44
38.7	26	50.0	21	60.5	17	69.8	14	46.7	35	61.7	29	75.7	25	88.3	22	55.4	44	75.4	39	94.6	35	111.9	32
35.9	29	46.3	24	56.0	20	64.6	18	43.3	37	57.2	32	70.1	28	81.7	25	51.4	46	69.9	41	87.6	37	103.7	35
33.1	31	42.7	27	51.6	23	59.4	21	40.0	39	52.7	34	64.6	31	75.3	28	47.5	47	64.5	43	80.8	40	95.6	37
30.3	34	39.0	30	47.2	27	54.3	24	36.6	41	48.3	37	59.2	33	68.9	31	43.6	49	59.2	45	74.1	42	87.6	39
27.5	37	35.5	32	42.8	30	49.3	27	33.4	43	43.9	39	53.8	36	62.6	33	39.8	51	54.0	47	67.5	44	79.7	41
24.8	39	32.0	35	38.5	32	44.3	31	30.2	45	39.7	41	48.5	38	56.4	36	36.1	52	48.8	48	60.9	45	71.9	43
22.1	41	28.5	38	34.3	35	39.4	34	27.0	47	35.4	43	43.3	41	50.3	39	32.3	53	43.7	50	54.5	47	64.2	45
19.5	44	25.0	40	30.1	38	34.6	37	23.8	49	31.2	45	38.1	43	44.2	41	28.7	55	38.6	51	48.1	49	56.6	47
38.0	25	48.7	20	58.6	16	67.2	13	46.6	34	61.0	29	74.3	24	86.2	21	56.2	45	75.6	39	94.1	35	110.7	32
35.2	28	45.0	23	54.1	19	62.1	17	43.2	37	56.4	31	68.7	27	79.7	24	52.2	46	70.1	41	87.2	37	102.5	34
32.3	31	41.3	26	49.6	22	56.9	20	39.8	39	51.9	34	63.2	30	73.2	27	48.2	48	64.7	43	80.3	39	94.4	36
29.6	33	37.7	29	45.2	25	51.9	23	36.5	41	47.5	36	57.8	32	66.8	30	44.3	50	59.3	45	73.5	41	86.3	38
26.8	36	34.2	31	40.9	28	46.8	26	33.2	43	43.1	38	52.4	35	60.5	32	40.4	51	54.0	47	66.8	43	78.3	41
24.1	38	30.6	34	36.6	31	41.9	29	29.9	45	38.8	40	47.0	37	54.3	35	36.6	53	48.7	48	60.2	45	70.5	43
21.4	40	27.1	37	32.4	34	37.0	32	26.6	47	34.5	43	41.7	40	48.1	38	32.7	54	43.5	50	53.6	47	62.6	44
18.7	42	23.6	39	28.1	37	32.1	35	23.4	48	30.2	45	36.5	42	42.0	40	28.9	55	38.3	51	47.0	48	54.8	46
42.1	30	54.3	24	65.6	20	75.7	17	50.8	39	67.1	33	82.3	29	95.8	25	60.3	49	82.0	44	102.8	40	121.7	36
39.2	32	50.6	27	61.1	23	70.4	20	47.4	41	62.5	36	76.7	31	89.3	28	56.3	51	76.5	46	95.9	42	113.4	39
36.4	35	46.9	30	56.6	26	65.2	24	44.0	44	58.0	38	71.1	34	82.8	31	52.4	53	71.2	48	89.1	44	105.3	41
33.6	38	43.3	33	52.2	29	60.1	27	40.7	46	53.6	41	65.7	37	76.4	34	48.6	54	65.8	50	82.3	46	97.2	43
30.8	40	39.7	36	47.9	32	55.1	30	37.4	48	49.2	43	60.3	39	70.1	37	44.7	56	60.6	52	75.7	48	89.3	45
28.1	43	36.1	38	43.6	35	50.1	33	34.2	50	44.9	45	54.9	42	63.8	39	41.0	58	55.4	54	69.1	50	81.5	48
25.4	45	32.6	41	39.3	38	45.2	36	31.0	52	40.7	48	49.7	44	57.7	42	37.2	59	50.2	55	62.6	52	73.8	50
22.8	47	29.2	44	35.1	41	40.3	39	27.8	54	36.4	50	44.5	47	51.6	45	33.5	60	45.1	57	56.2	54	66.1	52
47.3	35	61.3	29	74.2	24	85.6	21	56.9	45	75.3	39	92.6	34	108.0	30	67.1	56	91.5	51	115.1	46	136.4	42
44.4	38	57.5	32	69.6	28	80.3	24	53.4	48	70.7	42	86.9	37	101.4	33	63.1	58	86.1	53	108.1	48	128.1	45
41.6	41	53.8	35	65.1	31	75.1	28	50.1	50	66.2	44	81.3	40	94.8	36	59.2	60	80.6	55	101.3	51	119.9	47
38.8	44	50.1	38	60.6	34	69.9	31	46.7	52	61.8	47	75.8	43	88.4	39	55.3	62	75.3	57	94.5	53	111.9	50
36.0	46	46.5	41	56.2	37	64.8	34	43.4	55	57.4	49	70.4	45	82.0	42	51.5	64	70.0	59	87.8	55	103.9	52
33.3	49	42.9	44	51.9	40	59.8	38	40.2	57	53.0	52	65.0	48	75.7	45	47.7	66	64.9	61	81.3	57	96.1	54
30.6	51	39.4	47	47.6	43	54.8	41	37.0	59	48.7	54	59.7	50	69.5	48	44.0	67	59.7	63	74.7	59	88.3	56
27.9	54	35.9	49	43.4	46	49.9	44	33.8	61	44.5	56	54.5	53	63.4	50	40.3	69	54.6	64	68.3	61	80.7	59

Exchanger for cold pump water PKW / direct evaporator

Performance data for direct evaporator for cooling agent R134a, for other cooling agents on request.

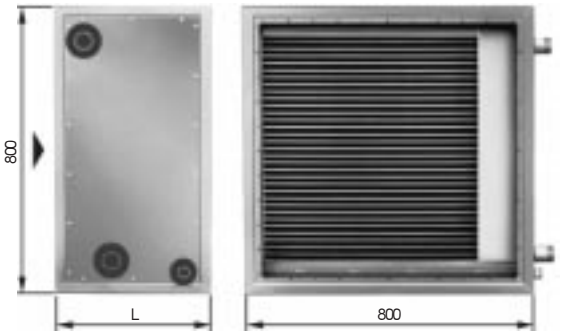


fig. Exchanger for cold water

Air direction: horizontal for type 7 and 8: L = 540
horizontal for type 12 L = 630
vertical: L = 840 mm

Connections: in air direction right or left

Equipment:

Exchanger for cold water with Cu pipes and aluminium lamellas, collecting tank made of steel.

Direct evaporator with Cu pipes and aluminium lamellas, cooling agent distributor.

Mist eliminator, condensate basin with condensate connector on side, male thread 1¼", droplet catcher for air direction vertical.

Type	Connections	Contents
7	1½"	8.5 l
8	1½"	14.0 l
12	1¼"	17.5 l
A	DN 28 cooling agent inlet DN 35 cooling agent outlet	5.0 l
B	DN 28 cooling agent inlet DN 35 cooling agent outlet	7.0 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:
Exchanger for cold water with Cu pipes
and corrosion-resistant aluminium lamellas
Exchanger for cold water with Cu pipes and Cu lamellas
Exchanger for cold water with bleed and drain connector

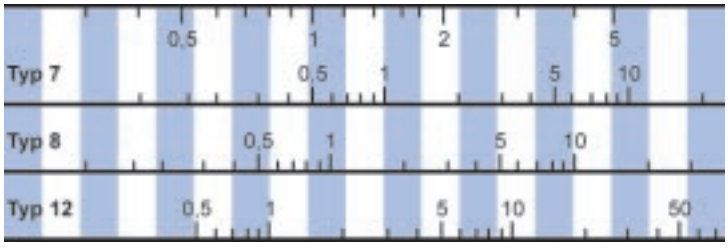
Note:
Allow for sufficient room for extraction of the exchanger.
Build in siphon on site with the condensate connector.

Water resistance (kPa)

Quantity of water $w = \frac{0.86 \cdot \dot{Q}}{\Delta t_w}$ (m³/h)

$\dot{Q}$ = Power in kW
$\Delta t_w = t_{WI} - t_{WO}$

Quantity of water w (m³/h)



V̇ (m³/h)		2 500		3 700		5 000		6 300	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
Exchanger for cold water type 7									
4/8	32	27.9	9.5	38.2	11.0	48.1	12.4	57.1	13.4
	28	23.7	9.2	32.3	10.6	40.5	11.7	47.9	12.7
	26	21.0	8.9	28.6	10.1	35.9	11.1	42.5	12.0
	25	19.6	8.7	26.7	9.9	33.6	10.8	39.7	11.6
5/10	32	25.2	10.7	34.4	12.2	43.2	13.5	51.1	14.5
	28	21.0	10.5	28.5	11.8	35.6	12.9	42.1	13.7
	26	18.3	10.1	24.8	11.3	31.0	12.3	36.6	13.0
	25	17.0	9.9	23.0	11.0	28.7	11.9	33.8	12.7
6/12	32	22.5	11.9	30.5	13.3	38.2	14.5	45.1	15.4
	28	18.3	11.7	24.6	12.9	30.7	13.9	36.1	14.7
	26	15.6	11.3	20.9	12.4	26.0	13.2	36.6	13.9
	25	14.2	11.1	19.1	12.1	23.7	12.9	27.9	13.5
Type 8									
4/8	32	33.1	5.9	47.1	6.8	61.2	7.7	74.3	8.6
	28	28.6	5.9	40.5	6.8	52.5	7.6	63.6	8.3
	26	25.6	5.8	36.2	6.6	46.8	7.3	56.7	8.0
	25	24.0	5.7	33.9	5.5	43.9	7.2	53.3	7.8
5/10	32	30.8	7.1	43.6	8.1	56.4	9.0	68.4	9.8
	28	26.2	7.1	36.9	8.0	47.6	8.8	57.6	9.6
	26	23.1	7.0	32.5	7.8	41.9	8.6	60.6	9.2
	25	21.5	7.0	30.3	7.7	39.1	8.4	47.2	9.0
6/12	32	28.2	8.3	39.8	9.3	51.4	10.1	62.1	10.9
	28	23.6	8.4	33.1	9.2	42.6	10.0	51.3	10.7
	26	20.5	8.2	28.7	9.0	36.8	9.8	44.3	10.4
	25	18.9	8.2	26.4	8.9	33.9	9.6	40.9	10.2
Type 12									
4/8	32	33.3	5.2	47.8	5.8	62.7	6.4	76.7	7.4
	28	28.9	5.2	41.4	5.8	54.1	6.3	66.0	7.3
	26	25.9	5.1	37.1	5.7	48.4	6.2	59.1	6.6
	25	24.4	5.1	34.9	5.6	45.6	6.1	55.6	6.5
5/10	32	31.2	6.5	44.6	7.2	58.2	7.8	71.1	8.3
	28	24.4	8.0	34.6	8.5	44.9	9.1	54.5	9.5
	26	21.3	7.9	30.1	8.5	39.1	8.9	47.5	9.3
	25	19.7	7.9	27.9	8.4	36.2	8.9	44.0	9.2
6/12	32	28.8	7.9	41.1	8.5	53.6	9.1	65.3	9.6
	28	24.4	8.0	34.6	8.5	44.9	9.1	54.5	9.5
	26	21.3	7.9	30.1	8.5	39.1	8.9	47.5	9.3
	25	19.7	7.9	27.9	8.4	36.2	8.9	44.0	9.2
Ev. temp. °C		**Direct evaporator type A**							
2.0	32	22.4	13.4	27.5	15.9	31.5	17.8	34.4	19.1
	28	19.8	12.2	24.2	14.4	27.7	16.0	30.3	17.2
	26	17.9	11.4	21.9	13.4	25.1	14.9	27.4	16.0
	25	17.0	11.0	20.8	12.9	23.8	14.4	26.0	15.4
5.0	32	20.2	14.6	24.9	16.8	28.5	18.5	31.3	19.7
	28	17.5	13.4	21.5	15.3	24.6	16.7	27.0	17.8
	26	15.6	12.6	19.2	14.4	22.0	15.7	24.1	16.7
	25	14.7	12.3	18.0	13.9	20.6	15.2	22.6	16.1
8.0	32	17.5	15.9	21.6	17.9	24.8	19.3	27.3	20.4
	28	14.8	14.8	18.2	16.4	20.9	17.6	22.9	18.5
	26	12.8	14.0	15.8	15.5	18.2	16.6	19.9	17.4
	25	11.9	13.7	14.7	15.1	16.8	16.1	18.5	16.9
Type B									
2.0	32	27.4	9.9	35.2	12.2	41.5	14.0	46.4	15.5
	28	24.2	9.1	31.0	11.1	36.5	12.7	40.8	14.0
	26	22.0	8.5	28.1	10.4	33.1	11.9	37.0	13.1
	25	20.9	8.3	26.7	10.0	31.4	11.5	35.1	12.6
5.0	32	24.6	11.5	31.7	13.4	37.5	15.0	42.0	16.3
	28	21.4	10.7	27.4	12.4	32.4	13.8	36.3	14.9
	26	19.1	10.1	24.5	11.7	28.9	13.0	32.4	14.0
	25	17.9	9.9	23.0	11.4	27.2	12.6	30.5	13.6
8.0	32	21.3	13.2	27.5	14.8	32.6	16.2	36.6	17.3
	28	18.0	12.4	23.2	13.8	27.4	15.0	30.8	15.9
	26	15.7	11.9	20.2	13.2	23.9	14.2	26.8	15.1
	25	14.5	11.7	18.7	12.9	22.1	13.9	24.8	14.7

Air inlet state: 32°C / 40 % r.h., 28°C / 47 % r.h.
26°C / 49 % r.h., 25°C / 50 % r.h.

Note: min. evaporation temperature 2°C.

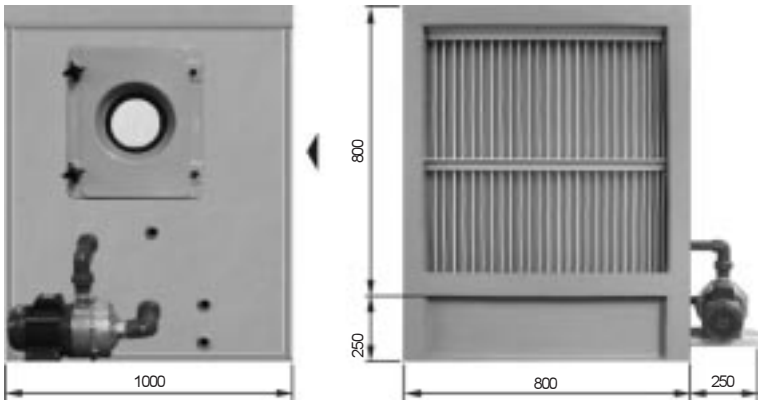
Washer / Vapour humidifier element KG 63 Standard

Washer element

Casing
Plastic (glass fibre reinforced plastic)

Inspection door and connections
in air direction right or left

Equipment
Block pump 1,1 kW, 230/400 V, Δ/Y; 4,8/2,8 A, 50 Hz;
Stainless steel pump
Nozzle holder with self-cleaning nozzles spraying against air flow
Washer basin with all-round inclination towards the drain connector
Pump with complete piping on suction and pressure side, dry-run protection for pump.
De-sludging system
Inspection door with inspection window
Flow rectifier
Mist eliminator
} temperature-resistant to 70°C, dismantable



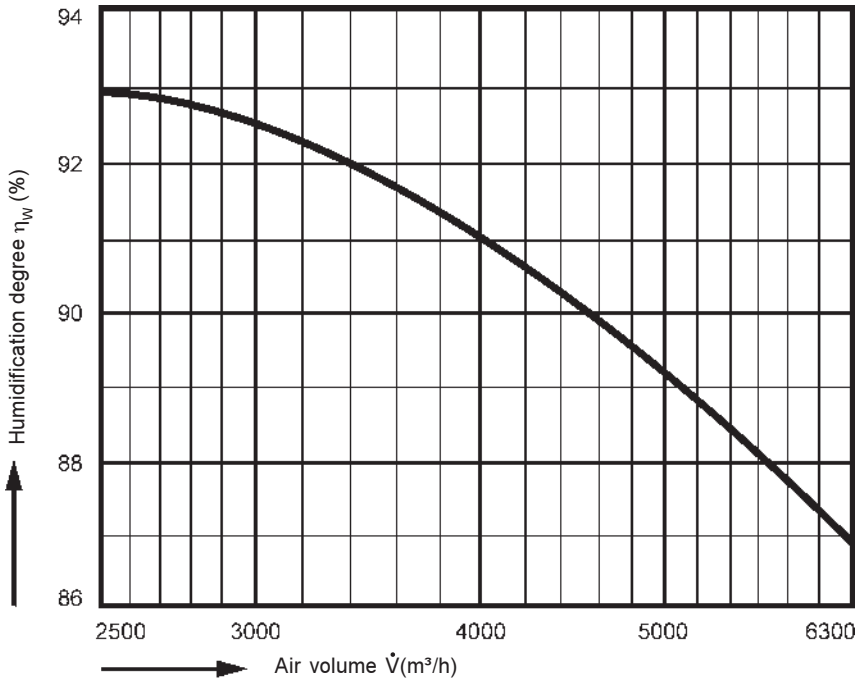
Inlet device, male thread 3/4", with float valve and float, overflow spout DN 40, outlet chute DN 40.
On request: lighting 230 V / 60 W, darkening for inspection window.
Drain and overflow device with siphon on the inside, thermometer, pressure gauge

Humidification degree η_W

$$\eta_W = \frac{x_2 - x_1}{x_s - x_1}$$

Index
x = water content of air
1 = air inlet
2 = air outlet
S = saturation state

with air temperature 20°C, density 1.2 kg/m³,
water pressure 2.1 bar, quantity of water 6000 l/h

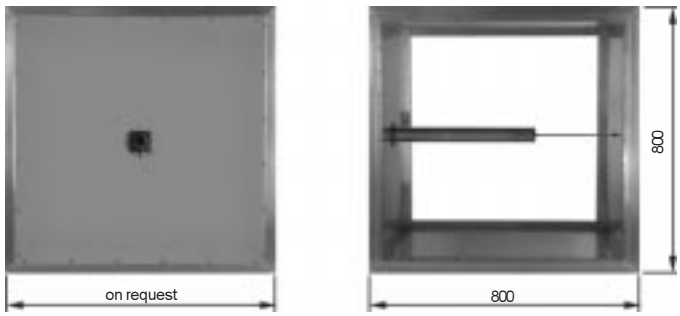


Vapour humidifier element

suitable for vapour lances of different manufacturers

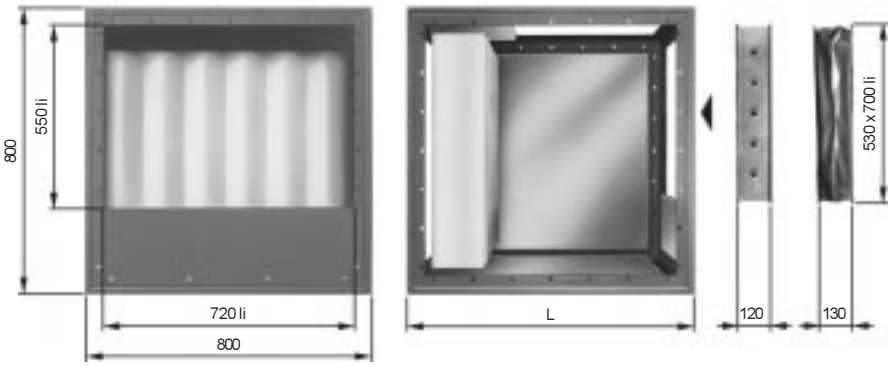
Design:
- Galvanised outer and inner surfaces,
- Inspection door
- Basin with drain 1¼" male thread made of corrosion-resistant material
- Length variable

On request:
- inspection hole Ø 150mm
- Inside light

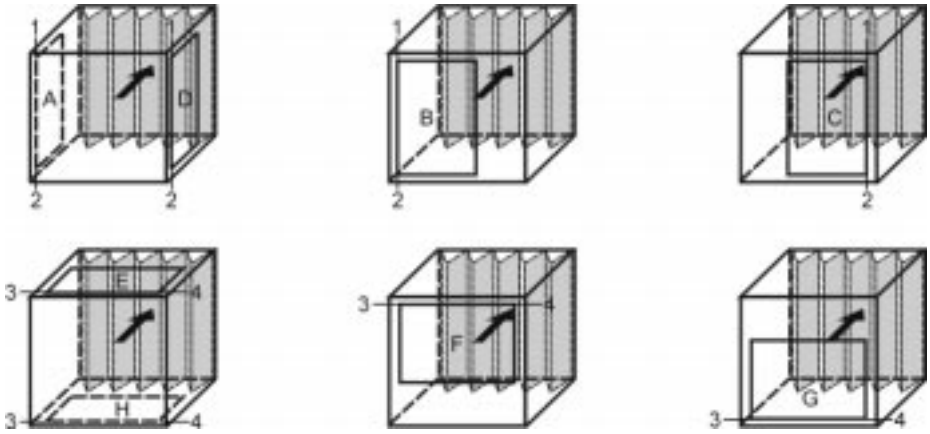


Filter/air mixture element combined L = 800 mm

Air mixture element/ exhaust air element L = 630 mm



Suction variations:



One external flap		Two external flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + B	1, 2
B	1, 2	A + C	1, 2
C	1, 2	A + D	1, 2
D	1, 2	B + D	1, 2
E	3, 4	C + D	1, 2
F	3, 4	E + F	3, 4
G	3, 4	E + G	3, 4
H	3, 4	E + H	3, 4
		F + H	3, 4
		G + H	3, 4

One internal flap		Two internal flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + C	1, 2
B	1, 2	A + D	1, 2
C	1, 2	B + D	1, 2
D	1, 2	E + G	3, 4
E	3, 4	E + G	3, 4
F	3, 4	F + H	3, 4
G	3, 4		
H	3, 4		

Drive torque for 1 flap 4 Nm (airtight flap according to DIN 1946: 15 Nm)

Inspection door:

in air direction right, left, top, bottom
required space for filter extraction: min. 0.8 m
for air mixture element/exhaust air element inspection door only on request in air direction right/left

Fan element

L 1000
W 1000
H 1000

L 1000
W 1000
H 1000

Heater element

L* 340/500
W 1000
H 1000

Cooling element

L 540
W 1000
H 1000
vertical L 1000

Washer element

L 1000
W 1000
H 1250

Mixing and filter el.

L 1000
W 1000
H 1000

Mixing and exhaust air element

L 830
W 1000
H 1000

Short filter element

L 340
W 1000
H 1000

Sleeve filter element

L 830
W 1000
H 1000
Sl. fi. short L 540

Silencer element

L .....
W 1000
H 1000

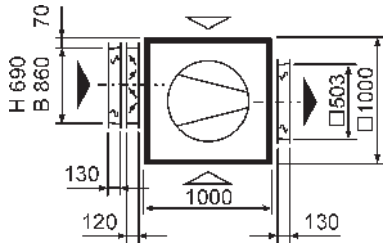
Empty element / vapour humidifier empty element

L .....
W 1000
H 1000

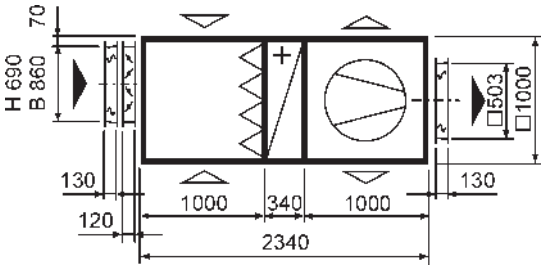
KGX

L 1000
W 1000
H 1000

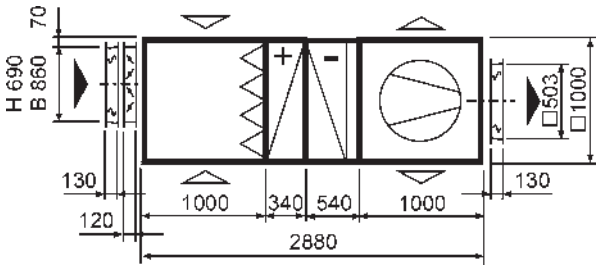
Withdrawn air device



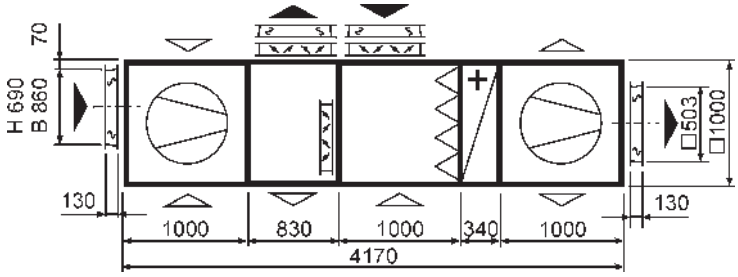
Supply air device



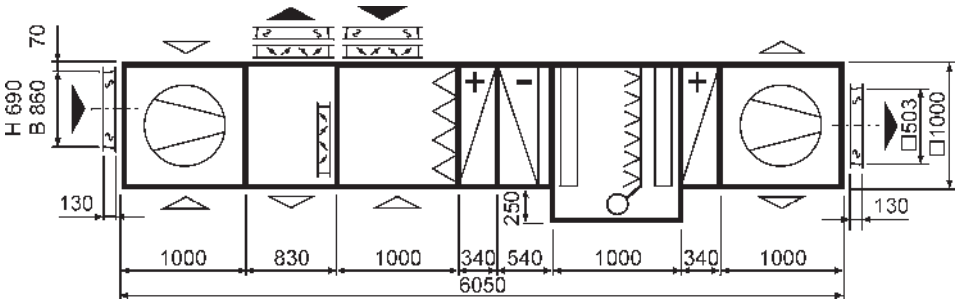
Partial air conditioner



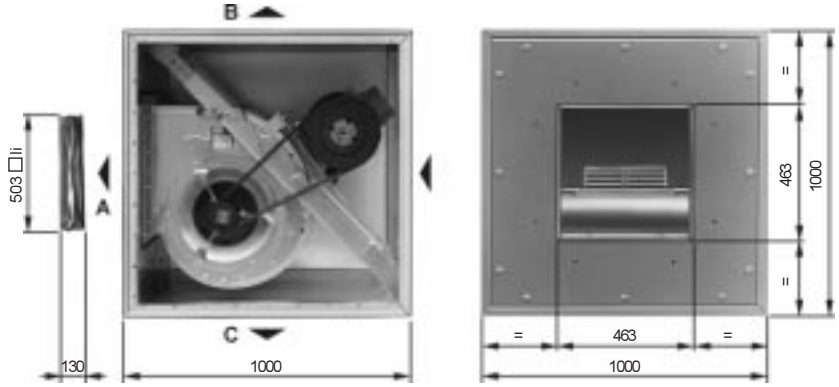
Combined supply and withdrawn air device



Combined climate control, supply and withdrawn air device

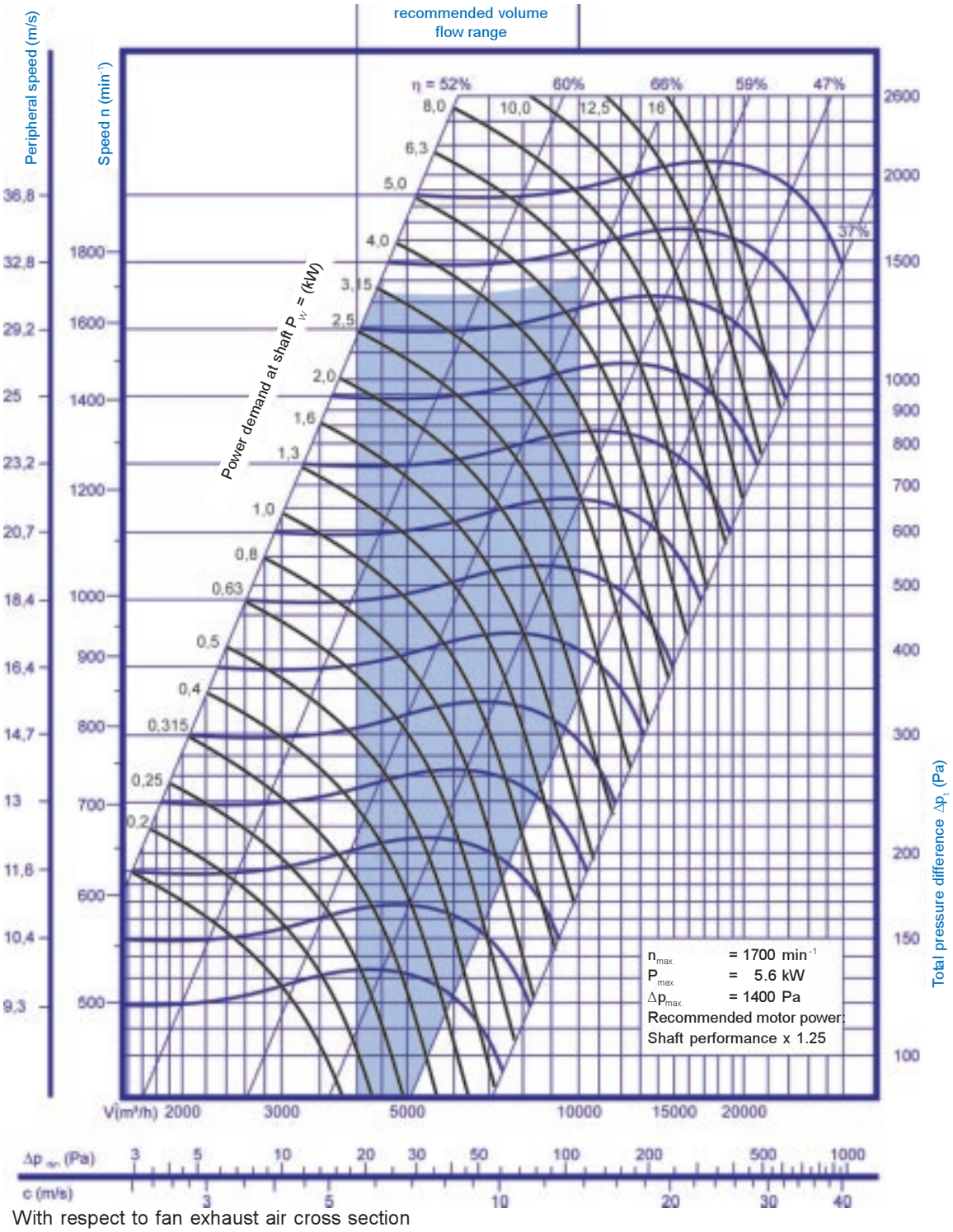


* with extractable frost protection frame L = 500



Fan diagram

Forward rotor blades



With respect to fan exhaust air cross section

Exhaust variation: A, B, C

Fan/motor: in sturdy diagonal construction with vibration absorbers, diagonal separated
Elastic connection between fan exhaust and casing

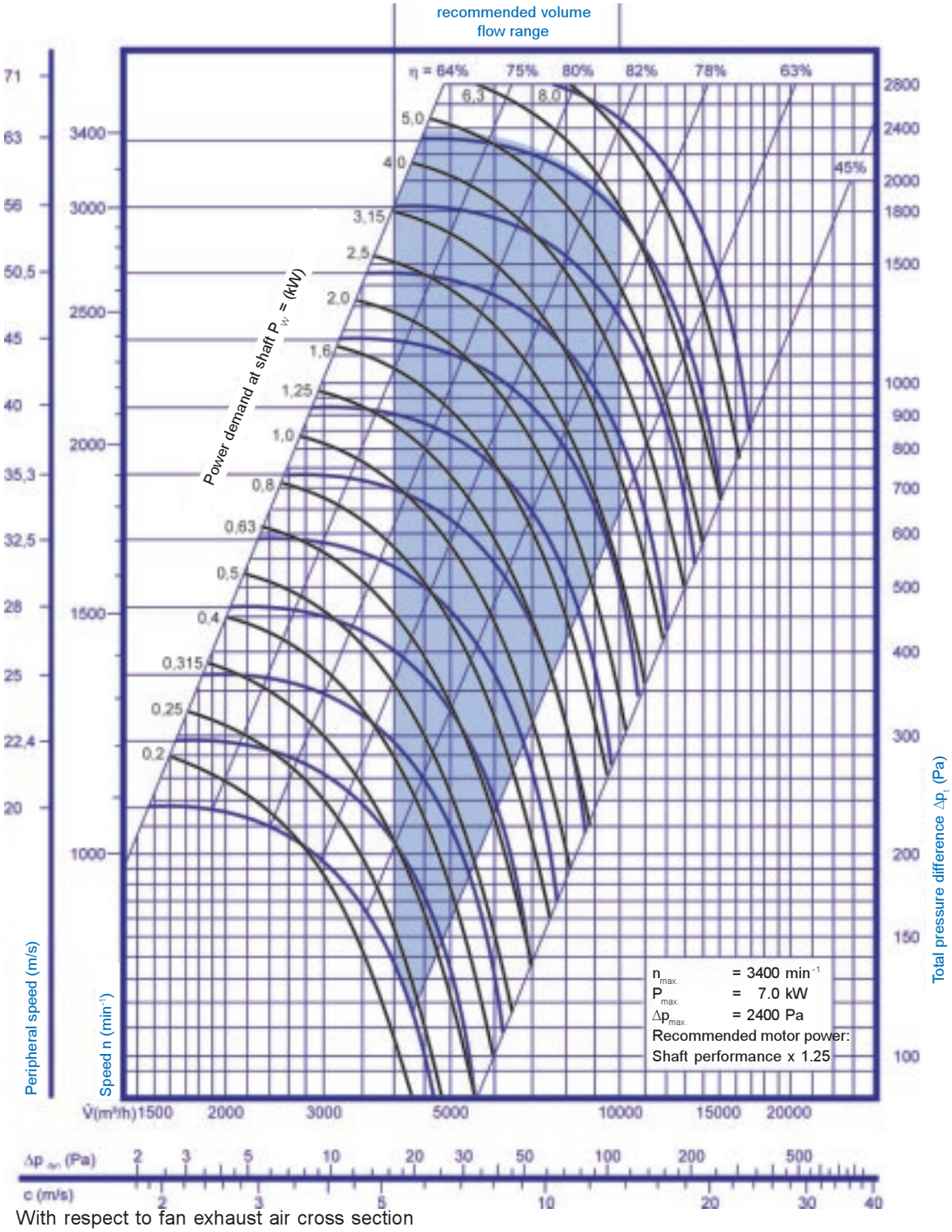
Inspection door: in air direction right, left, top, if desired bottom, with turn locks

Withdrawn air device: Construction such as fan element, flap arrangement in accordance with connection and suction variations

Flaps on the inside F possible only with exhaust A

Fan diagram

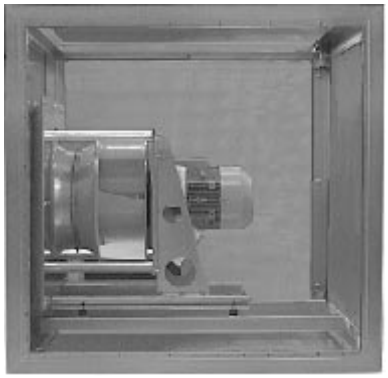
Backward rotor blades



With respect to fan exhaust air cross section

Free-running fan wheel KG 100 Standard

Description



Free-running fan wheel, unidirectional suction, with backward rotor blades, attached directly to the motor shaft.

Complete unit mounted on sturdy base frame with flexible vibration absorbers.

Rotor wheel statically and dynamically balanced. Complete motor protection with built-in PTC thermistors.

High fan efficiency even at low speed, almost without dynamic pressure ratios.

In connection with frequency converter, accurate adaptation to unit characteristics is possible.

Economical and energy-saving operation even under partial load conditions.

Low maintenance costs, no drive belt losses, no retightening required.

External pressure drops

Customer specification of the installation side pressure drops (e.g. duct system).

Internal pressure drops

The pressure drops of all components with respect to the volume flow (also fan element) are listed in the pressure drop tables of the individual chapters.
For components on the pressure-side, neither flow distributors nor incident flow elements are required, since the exhaust flows through the entire cross section.

Dynamic pressure drops

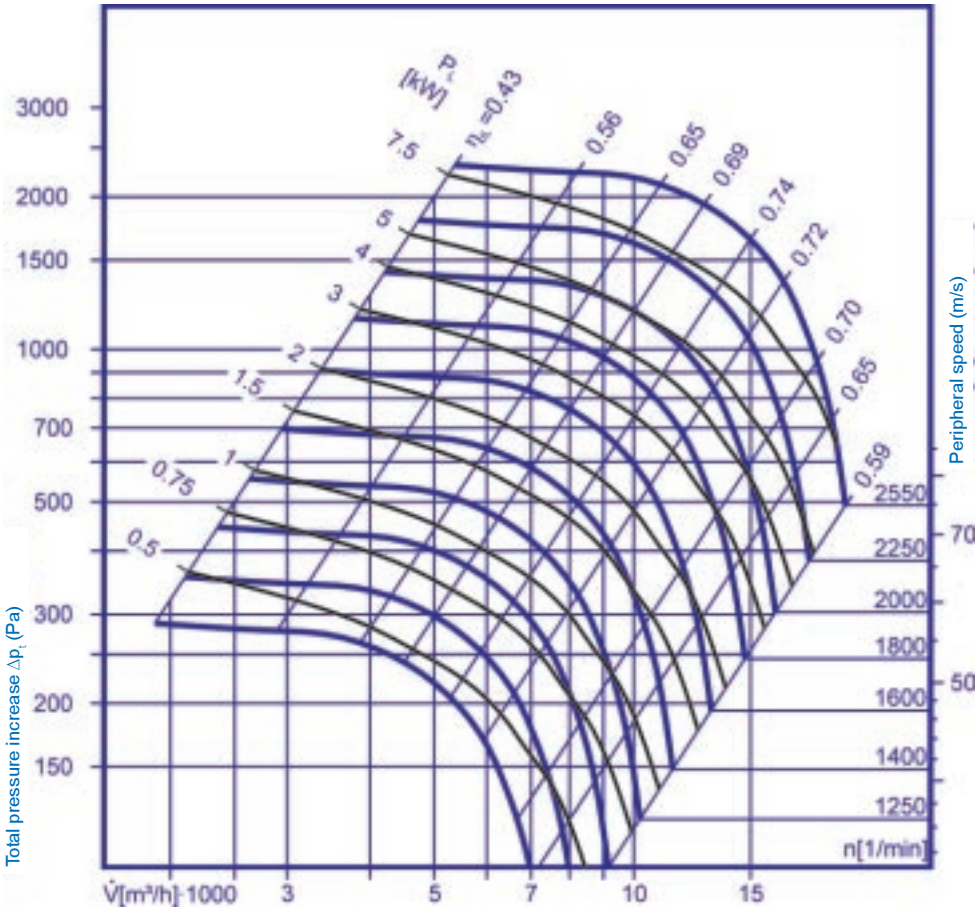
The dynamic pressure portions do not have to be considered in planning.

Performance data

KG size	Max. air volume m³/h	Total pressure increase to Pa	Operational data * Fan power kW	Fan speed min⁻¹	Standard data * Motor power kW	Motor Speed min⁻¹	Motor current A
KG 100	10000	500	2.13	1542	3.00	1500	6.80
		1000	4.26	1896	5.50	1500	11.40
		1500	6.64	2203	7.50	1500	15.40

* Fan speed is controlled by frequency converter (f ≥ 50Hz)

Fan diagram
Rotor wheel Ø 560 mm



Total sound power level L_W in [dB]

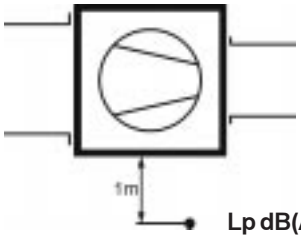
The accurate, device-specific sound data can be determined only for the specific order.

Lw [dB] = the computational total sound power of the fan on the suction/pressure-side.

		Total pressure increase Δp [Pa]					
	L_w	500	750	1000	1250	1500	2000
$\dot{V}$ [m³/h]	5,000	91	94	97	99	101	103
	7,500	92	96	98	100	102	104
	10,000	94	98	100	102	104	106

Sound pressure level Lp dB(A)

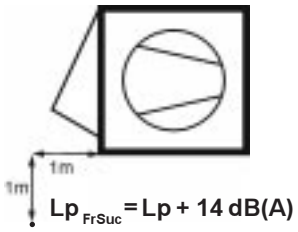
Lp dB(A) = sound pressure level at 1 m distance beside the fan element, measured in the free field with suction and pressure-side duct connection



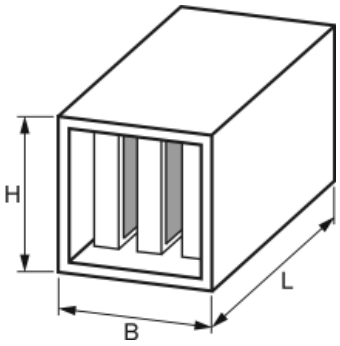
Forward rotor blades								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
5,000	630	38	7,500	710	45	10,000	800	52
	860	42		900	46		1000	52
	1000	46		1120	49		1250	53
	1250	51		1400	54		1600	57
Backward rotor blades								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
5,000	1400	45	7,500	1800	50	10,000	2250	53
	1800	51		2240	55		2500	58
	2240	57		2800	61		2800	60
	2800	63		3150	64		3150	62
Free-running fan wheel Ø 560mm								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
5,000	1000	51	7,500	1350	52	10,000	2000	54
	1500	54		1550	56		2100	58
	1700	57		1700	58		2250	60
	2100	61		2100	62		2400	64

Sound pressure level Lp dB(A) beside the fan element

With free suction or exhaust opening



Silencer element



Dimensions (mm)

Height H	Width B	Length L			
		Type 2	Type 3	Type 4	Type 5
1000	1000	910	1900	1390	1600

Insertion loss De dB(A)

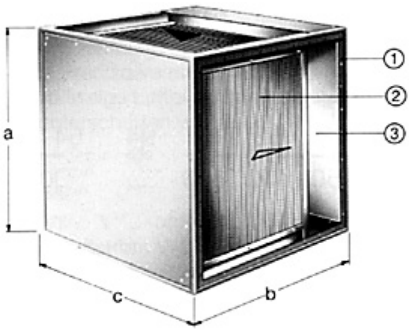
Type	Octave band (Hz)							
	63	125	250	500	1000	2000	4000	8000
2	6	12	20	20	22	16	12	11
3	7	14	24	25	26	20	14	13
4	8	17	30	32	34	25	18	17
5	9	21	37	37	41	29	21	19

For series connection of 2 silencers: $De = De_1 + De_2 - 3$ dB(A)

The accurate, device-specific heat recovery data can be determined only for the specific order.

Description KGX/KGXD

KGX air circulation horizontally/ vertically
KGXD air circulation diagonally



Hot air and cold air are led past each other in the cross current.

The heat recovery takes place via heat transmission from the hot to the cold air flow. The air flows are completely separated by aluminium plates.

- Heat recovery of up to over 80 %
- no moisture transmission
- no mobile parts, corrosion-resistant

① **Casing**
Design same as air conditioner

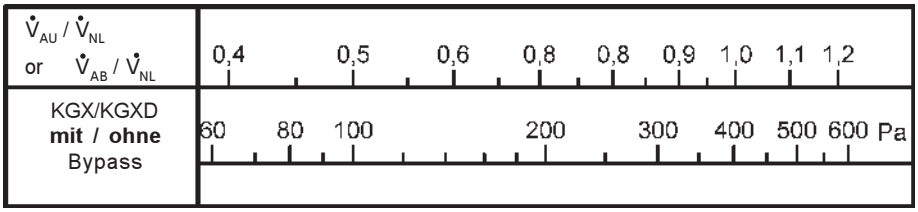
② **Heat exchanger**
Heat exchanger surfaces made of special corrosion-resistant aluminium plates.

③ **Internal bypass** (on request)
In order to prevent rime on the heat exchanger surfaces, the outside air can partially or entirely pass by the heat exchanger in the internal bypass.

Type	Nominal air volume $\dot{V}$ [m³/h]		Dimensions [mm]			Weight [kg]	Condensate connector
	without int. bypass	with int. bypass	a	b	c		R"
KGX 100	10,000	9,250	1000	1000	1000	260	-
KGXD 100	10,000	9,250	1000	1000	1600	460	1 ¼"

Pressure drop Δp [Pa]

for KGX/KGXD
with or without internal bypass



Description RWT

RWT air circulation horizontally/vertically

A rotating storage capacity takes up heat from the withdrawn air stream and emits it to the outside air stream.

- Heat recovery of up to 80 %.
- Simple power control by adjusting the speed.
- With suitable rotor material, humidification of the supply air.
- Rime protection, defrosting device, pre-heating of air not required.
- Easy maintenance through inspection doors in the air incident flow elements.

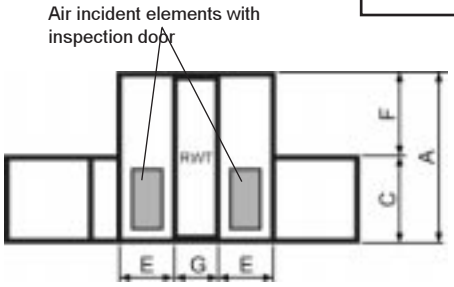
Pressure drop Δp [Pa]

Volume flow $\dot{V}$ [m³/h]	4,000	5,000	6,000	7,000	8,000	10,000
Pressure drop Δp [Pa]	44	55	66	77	90	110

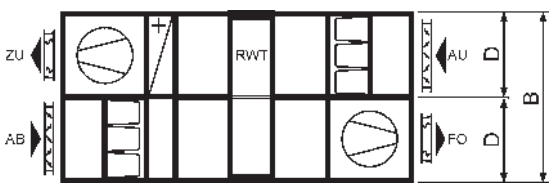
Dimensions

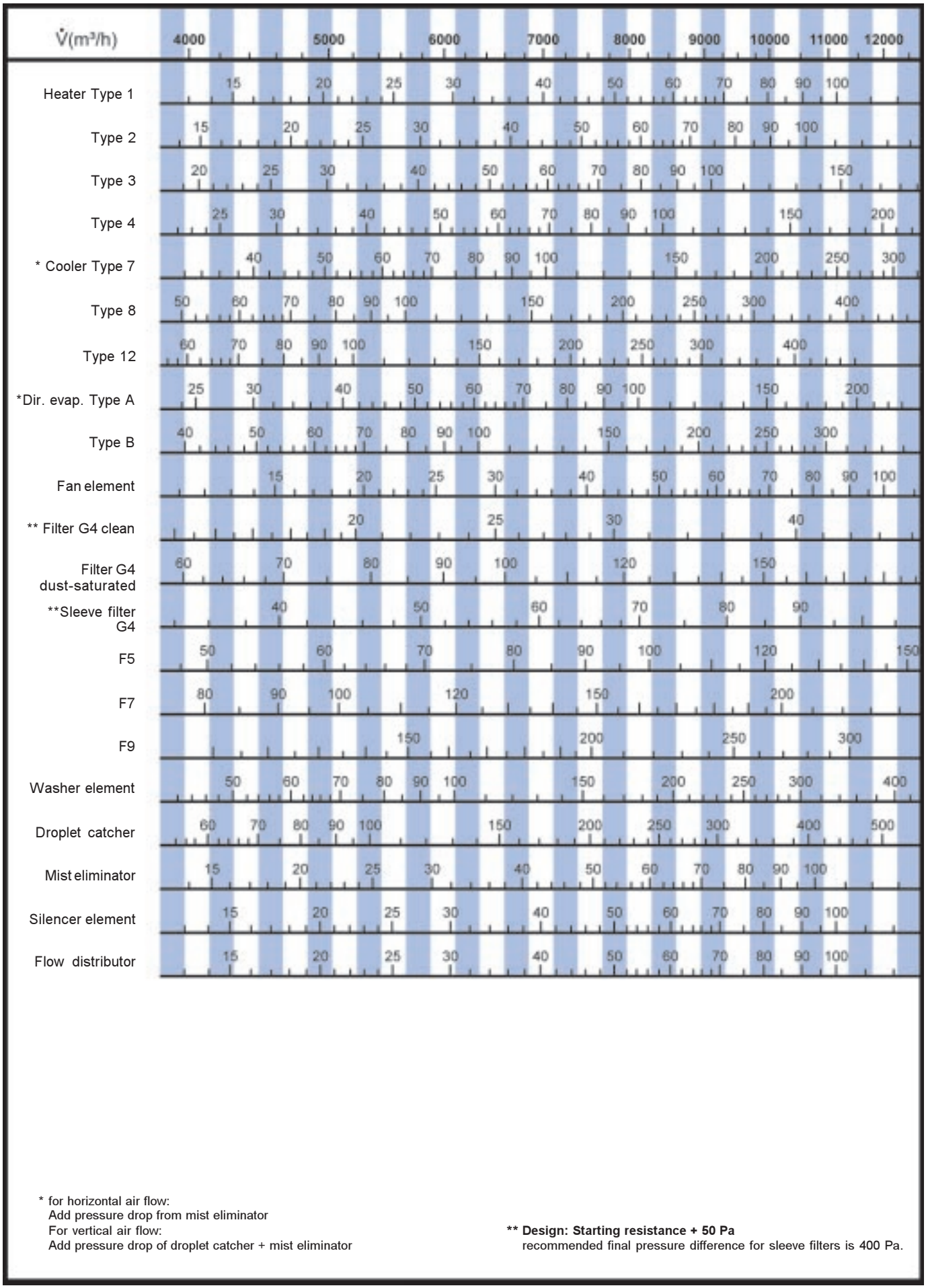
KG	A	B	C	D	E	F	G
100	1600	2000	1000	1000	600	540	400

Front view



Top view

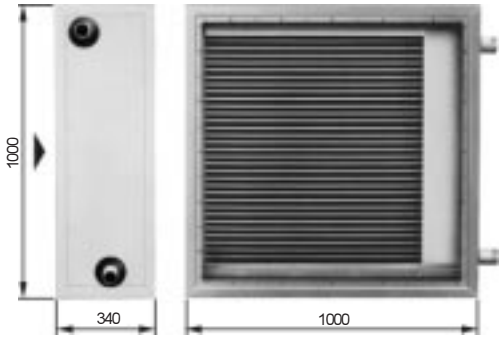




* for horizontal air flow:
Add pressure drop from mist eliminator
For vertical air flow:
Add pressure drop of droplet catcher + mist eliminator

**** Design: Starting resistance + 50 Pa**
recommended final pressure difference for sleeve filters is 400 Pa.

Heat exchanger for warm pump water PWW



Connections: in air direction right or left

Equipment:

Heat exchanger with Cu pipes and aluminium lamellas, collecting tank made of steel, alternatively copper

Type	Connections	Water content
1	DN 25	3.5 l
2	1½"	5.5 l
3	1½"	7.5 l
4	1½"	9.5 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:

Heat exchanger with Cu pipes and corrosion-resistant aluminium lamellas

Heat exchanger with Cu pipes and Cu lamellas

Heat exchanger made of steel completely galvanised in full immersion bath

Heat exchanger for steam

Heat exchanger for hot oil

Heat exchanger with bleed and drain connectors

Note:

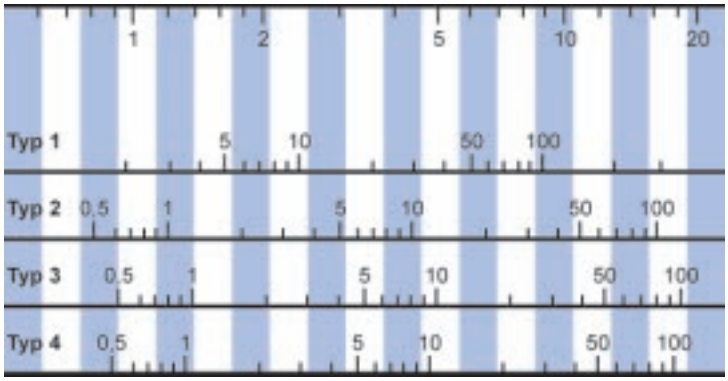
Allow for sufficient room for extraction of the heat exchanger.

Water resistance (kPa)

Quantity of water $w = \frac{0{,}86 \cdot \dot{Q}}{\Delta t_W}$ (m³/h)

$\dot{Q}$ = Power in kW
$\Delta t_w = t_{WE} - t_{WO}$

Quantity of water w (m³/h)



Heater element

Type		1							
$\dot{V}$ (m³/h)		4 000		6 300		8 000		10 000	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
45/35	- 15	35.3	8	45.0	5	53.3	3	60.7	1
	- 10	31.7	11	40.4	8	47.8	6	54.4	5
	- 5	28.1	14	35.8	11	42.4	10	48.2	8
	± 0	24.6	17	31.3	15	37.0	13	42.0	12
	+ 5	21.1	20	26.9	18	31.7	16	36.0	15
	+ 10	17.7	23	22.5	21	26.5	20	30.0	19
	+ 15	14.3	26	18.1	24	21.3	23	24.1	22
	+ 20	10.9	28	13.8	27	16.2	26	18.3	26
50/40	- 15	38.8	11	49.6	7	58.8	4	66.9	3
	- 10	35.2	14	44.9	10	53.2	8	60.6	6
	- 5	31.6	17	40.3	14	47.7	11	54.3	10
	± 0	28.0	20	35.8	17	42.3	15	48.1	14
	+ 5	24.6	23	31.3	20	37.0	18	42.1	17
	+ 10	21.1	25	26.9	23	31.7	22	36.0	20
	+ 15	17.7	28	22.5	26	26.5	25	30.1	24
	+ 20	14.3	31	18.2	29	21.4	28	24.2	27
60/40	- 15	40.2	12	51.1	8	60.4	5	68.6	3
	- 10	36.6	15	46.5	11	54.8	9	62.3	7
	- 5	33.0	18	41.9	14	49.4	12	56.0	10
	± 0	29.5	21	37.4	17	44.0	15	49.9	14
	+ 5	26.0	24	32.9	21	38.7	19	43.8	18
	+ 10	22.5	26	28.4	24	33.4	22	37.8	21
	+ 15	19.1	29	24.0	27	28.2	25	31.8	24
	+ 20	15.7	32	19.6	30	23.0	29	25.9	28
70/50	- 15	47.3	16	60.4	12	71.4	9	81.2	7
	- 10	43.7	20	55.7	15	65.8	12	74.8	10
	- 5	40.1	23	51.0	18	60.3	16	68.5	14
	± 0	36.5	26	46.4	22	54.9	19	62.3	17
	+ 5	33.0	29	41.9	25	49.5	23	56.2	21
	+ 10	29.5	31	37.4	28	44.1	26	50.1	25
	+ 15	26.0	34	33.0	31	38.9	29	44.1	28
	+ 20	22.6	37	28.6	34	33.7	33	38.1	31
70/55	- 15	50.0	18	64.0	13	75.9	10	86.4	8
	- 10	46.3	21	59.3	17	70.2	14	80.0	12
	- 5	42.7	24	54.6	20	64.7	17	73.6	15
	± 0	39.1	27	50.0	23	59.2	21	67.3	19
	+ 5	35.6	30	45.4	27	53.8	24	61.2	23
	+ 10	32.1	33	40.9	30	48.4	28	55.0	26
	+ 15	28.6	36	36.5	33	43.1	31	49.0	30
	+ 20	25.2	39	32.1	36	37.9	34	43.0	33
80/50	- 15	49.0	17	62.3	13	73.5	9	83.5	7
	- 10	45.4	21	57.6	16	67.9	13	77.1	11
	- 5	41.7	24	52.9	19	62.4	16	70.8	14
	± 0	38.1	27	48.3	23	56.9	20	64.5	18
	+ 5	34.6	30	43.8	26	51.5	23	58.4	22
	+ 10	31.1	33	39.3	29	46.2	27	52.3	25
	+ 15	27.6	35	34.8	32	40.9	30	46.2	29
	+ 20	24.1	38	30.4	35	35.6	33	40.2	32
80/60	- 15	54.3	21	69.5	16	82.3	12	93.7	10
	- 10	50.6	24	64.7	19	76.7	16	87.3	14
	- 5	47.0	27	60.0	23	71.1	19	80.9	17
	± 0	43.4	30	55.4	26	65.6	23	74.6	21
	+ 5	39.8	33	50.8	29	60.1	26	68.4	25
	+ 10	36.3	36	46.3	32	54.8	30	62.2	28
	+ 15	32.8	39	41.8	36	49.4	33	56.1	32
	+ 20	29.4	42	37.4	39	44.2	37	50.1	35
90/70	- 15	61.2	26	78.5	20	93.1	16	106.1	13
	- 10	57.5	29	73.7	23	87.4	20	99.5	17
	- 5	53.8	32	68.9	27	81.7	23	93.1	21
	± 0	50.2	35	64.2	30	76.2	27	86.7	24
	+ 5	46.6	38	59.6	33	70.7	30	80.4	28
	+ 10	43.1	41	55.1	37	65.2	34	74.2	32
	+ 15	39.6	44	50.6	40	59.9	37	68.1	35
	+ 20	36.1	47	46.1	43	54.5	41	62.0	39

Other operating conditions on request!

	2								3								4							
	4 000		6 300		8 000		10 000		4 000		6 300		8 000		10 000		4 000		6 300		8 000		10 000	
	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
	44.1	14	57.4	10	68.7	8	78.7	6	56.1	22	75.1	18	91.6	15	106.4	13	64.9	28	89.1	24	110.6	22	130.1	19
	39.6	17	51.4	13	61.5	11	70.5	9	50.5	24	67.5	20	82.2	18	95.5	16	58.5	30	80.3	26	99.5	24	117.0	22
	35.1	19	45.5	16	54.4	14	62.3	12	44.9	36	60.0	23	73.0	20	84.7	18	52.2	31	71.5	28	88.6	26	104.1	24
	30.7	22	39.7	19	47.5	17	54.3	15	39.4	28	52.5	25	63.9	22	74.1	21	46.0	32	62.9	29	77.8	27	91.3	26
	26.3	24	34.0	21	40.6	19	46.4	18	34.0	29	45.2	27	54.9	25	63.6	23	39.9	33	54.4	31	67.2	29	78.8	28
	22.0	26	28.4	24	33.8	22	38.6	21	28.7	31	38.0	28	46.1	27	53.3	25	33.8	35	46.0	32	56.7	31	66.3	29
	17.7	28	22.8	26	27.1	25	30.8	24	23.4	32	30.9	30	37.3	29	43.0	28	27.8	36	37.7	34	46.3	32	54.0	31
	13.5	30	17.3	29	20.4	28	23.2	27	18.1	34	23.8	32	28.6	31	32.9	30	21.8	36	29.4	35	35.9	34	41.8	33
	48.5	17	63.2	13	75.8	10	86.9	8	61.4	26	82.3	21	100.5	18	116.9	16	70.6	32	97.3	28	120.9	25	142.4	23
	44.0	20	57.2	16	68.5	13	78.6	11	55.7	28	74.7	24	91.1	21	105.9	19	64.3	33	88.4	30	109.8	27	129.2	25
	39.5	22	51.3	19	61.4	16	70.4	14	50.1	30	67.1	26	81.9	23	95.1	21	58.0	35	79.6	32	98.8	29	116.2	27
	35.0	25	45.5	21	54.4	19	62.3	17	44.6	31	59.7	28	72.7	26	84.4	24	51.8	36	71.0	33	88.0	31	103.5	29
	30.6	27	39.7	24	47.5	22	54.3	21	39.2	33	52.3	30	63.7	28	73.9	26	45.6	38	62.5	35	77.4	33	90.9	31
	26.3	29	34.0	26	40.6	25	46.5	24	33.9	35	45.1	32	54.8	30	63.5	28	39.6	39	54.1	36	66.9	34	78.4	33
	22.0	31	28.4	29	33.9	28	38.7	26	28.6	36	37.9	34	46.0	32	53.5	31	33.6	40	45.8	38	56.5	36	66.1	35
	17.8	33	22.9	31	27.2	30	31.0	29	23.3	38	30.9	35	37.3	34	43.1	33	27.7	41	37.5	39	46.2	37	54.0	36
	50.2	18	64.9	14	77.4	11	88.4	8	64.8	28	86.2	23	104.7	20	121.3	17	75.8	35	103.5	31	127.9	27	150.0	25
	45.6	21	58.9	17	70.2	14	80.2	12	59.1	30	78.5	25	95.3	22	110.3	20	69.4	37	94.6	33	116.7	29	136.8	27
	41.1	23	53.0	19	63.1	17	72.0	15	53.5	32	70.9	28	86.0	25	99.5	22	63.0	38	85.8	34	105.7	31	123.8	29
	36.7	26	47.2	22	56.1	20	64.0	18	47.9	34	63.5	30	76.8	27	88.8	25	56.7	40	77.0	36	94.9	33	110.9	31
	32.2	28	41.4	25	49.2	23	56.0	21	42.5	35	56.1	32	67.8	29	78.2	27	50.5	41	68.4	38	84.1	35	98.2	33
	27.9	30	35.7	27	42.3	25	48.2	24	37.0	37	48.7	34	58.8	31	67.8	30	44.4	42	59.9	39	73.4	37	85.6	35
	23.6	32	30.1	30	35.6	28	40.4	27	31.6	38	41.5	35	49.9	33	57.4	32	38.2	43	51.4	40	62.8	38	73.1	37
	19.3	34	24.5	32	28.8	31	32.7	30	26.2	40	34.2	37	41.0	35	47.1	34	32.1	44	42.9	41	52.2	40	60.6	38
	59.1	24	76.7	19	91.8	15	105.1	13	75.3	35	100.8	30	122.8	26	142.6	23	87.3	43	119.8	38	148.6	34	174.7	31
	54.5	27	70.7	22	84.5	19	96.7	16	69.6	37	93.0	32	113.3	28	131.5	26	80.9	45	110.9	40	137.4	36	161.5	34
	50.0	29	64.7	25	77.3	22	88.5	19	64.0	39	85.4	34	104.0	31	120.6	28	74.5	46	102.1	42	126.4	39	148.4	36
	45.5	32	58.9	28	70.2	25	80.3	23	58.5	41	77.9	36	94.8	33	109.8	31	68.3	48	93.4	44	115.5	41	135.5	38
	41.0	34	53.1	30	63.2	28	72.3	26	53.0	43	70.5	39	85.6	36	99.2	33	62.1	49	84.8	45	104.7	42	122.8	40
	36.7	37	47.3	33	56.3	30	64.3	29	47.6	45	63.2	41	76.6	38	88.7	36	56.0	51	76.3	47	94.1	44	110.2	42
	32.3	39	41.6	36	49.5	33	56.5	32	42.2	46	55.9	43	67.7	40	78.3	38	50.0	52	67.8	48	83.5	46	97.7	44
	28.0	41	36.0	38	42.7	36	48.7	35	36.9	48	48.7	44	58.9	42	68.0	40	43.9	53	59.5	50	73.1	47	85.4	46
	62.5	26	81.5	21	97.7	17	112.2	15	78.6	37	105.7	32	129.2	28	150.4	25	90.2	45	124.4	40	154.89	36	182.6	33
	57.8	29	75.4	24	90.4	21	103.7	18	72.9	39	98.0	34	119.7	30	139.3	28	83.8	47	115.5	42	143.7	39	169.3	36
	53.3	32	69.4	27	83.2	24	95.4	21	67.3	41	90.4	37	110.4	33	128.3	30	77.5	48	106.7	44	132.6	41	156.2	38
	48.8	34	63.5	30	76.0	27	87.2	25	61.8	43	82.8	39	101.1	36	117.5	33	71.2	50	98.0	46	121.8	43	143.4	40
	44.3	37	57.7	33	69.0	30	79.1	28	56.3	45	75.4	41	92.0	38	106.9	36	65.1	52	89.5	48	111.0	45	130.6	42
	40.0	39	51.9	35	62.1	33	71.1	31	50.9	47	68.1	43	83.0	40	96.3	38	59.0	53	81.0	49	100.4	47	118.1	44
	35.6	41	46.2	38	55.2	35	63.2	34	45.6	49	60.9	45	74.1	42	86.0	40	53.0	54	72.7	51	90.0	48	105.7	46
	31.4	44	40.6	40	48.4	38	55.4	37	40.3	50	53.7	47	65.3	45	75.7	43	47.1	55	64.4	52	79.6	50	93.4	48
	61.1	26	79.0	20	94.1	16	107.6	14	78.9	37	105.0	31	127.6	27	147.7	24	92.5	46	126.2	41	156.0	37	182.9	33
	56.5	28	72.9	23	86.9	19	99.2	17	73.2	39	97.3	34	118.1	30	136.6	27	86.0	48	117.2	43	144.7	39	169.6	36
	51.9	31	67.0	26	79.7	22	90.9	20	67.6	42	89.6	36	108.7	32	125.7	30	79.6	50	108.4	45	133.6	41	156.4	38
	47.4	33	61.1	29	72.6	25	82.8	23	62.0	43	82.1	38	99.4	35	114.9	32	73.3	51	99.6	47	122.6	43	143.5	40
	43.0	36	55.2	31	65.6	28	74.7	26	56.4	45	74.6	41	90.2	37	104.2	35	67.0	53	90.9	48	111.7	45	130.6	42
	38.6	38	49.4	34	58.6	31	66.7	29	50.9	47	67.2	43	81.1	39	93.6	37	60.8	54	82.2	50	101.0	47	117.8	44
	34.2	40	43.7	37	51.7	34	58.8	32	45.5	49	59.8	44	72.1	42	83.0	40	54.6	55	73.7	51	90.3	48	105.2	46
	29.8	42	38.0	39	44.9	37	51.0	35	40.1	50	52.5	46	63.1	44	72.6	42	48.5	56	65.1	53	79.6	50	92.6	48
	67.8	30	88.4	24	105.9	20	121.5	17	85.6	42	115.0	36	140.5	32	163.4	28	98.4	50	135.6	45	168.8	41	198.8	38
	63.2	33	82.3	27	98.6	23	113.0	21	79.9	44	107.2	38	130.9	34	152.2	31	92.0	52	126.7	47	157.5	43	185.5	40
	58.6	35	76.3	30	91.3	26	104.7	24	74.3	46	99.6	41	121.5	37	141.2	34	85.6	54	117.9	49	146.4	45	172.3	42
	54.1	38	70.3	33	84.2	30	96.4	27	68.7	48	92.0	43	112.2	39	130.4	37	79.4	56	109.2	51	135.5	48	159.4	45
	49.6	40	64.5	36	77.1	33	88.3	30	63.2	50	84.6	45	103.1	42	119.7	39	73.3	57	100.6	53	124.7	50	146.6	47
	45.2	43	58.7	38	70.1	35	80.3	33	57.8	52	77.2	47	94.0	44	109.1	42	67.2	59	92.1	55	114.1	51	134.0	49
	40.9	45	53.0	41	63.2	38	72.3	36	52.2	54	70.0	49	85.1	46	98.7	44	61.2	60	83.7	56	103.6	53	121.6	51
	36.6	48	47.3	44	56.4	41	64.5	39	47.2	55	62.8	51	76.3	49	88.3	47	55.2	62	75.4	58	93.1	55	109.2	53
	76.3	36	99.8	29	119.8	25	137.6	21	95.6	48	128.8	42	157.7	37	183.8	34	109.1	57	151.6	52	188.4	47	222.2	44
	71.7	38	93.6	32	112.4	28	129.1	25	89.9	51	121.0	45	148.1	40	172.5	37	102.7	59	142.0	54	177.0	50	208.8	46
	67.1	41	87.6	35	105.1	31	120.6	28	84.2	53	113.3	47	138.7	43	161.5	39	96.4	61	133.2	56	165.9	52	195.7	49
	62.5	44	81.6	38	97.8	34	112.3	32	78.6	55	105.8	49	129.3	45	150.5	42	90.1	63	124.5	58	154.9	54	182.7	51
	58.0	46	75.7	41	90.7	37	104.1	35	73.2	57	98.3	52	120.1	48	139.8	45	84.0	65	115.9	60	144.1	56	169.9	54
	53.6	49	69.8	44	83.7	40	95.9	38	67.7	59	90.9	54	111.0	50	129.1	48	77.9	67	107.4	62	133.5	59	157.2	56
	49.2	51	64.1	47	76.7	43	87.9	41	62.4	61	83.6	56	102.1	53	118.6	50	71.9	68	99.0	64	123.0	60	144.7	58
	44.9	54	58.4	49	69.8	46	80.0	44	57.1	63	76.4	58	93.2	55	108.2	53	66.0	70	90.7	65	112.6	62	132.4	60

Exchanger for cold pump water PKW / direct evaporator

Performance data for direct evaporator for cooling agent R134a, for other cooling agents on request.

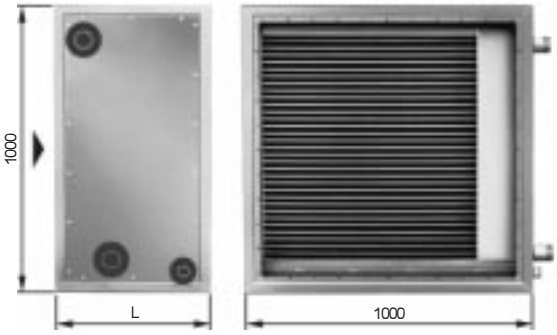


fig. Exchanger for cold water

Air direction: horizontal for type 7 and 8: L = 540
horizontal for type 12: L = 830
vertical: L = 1000mm

Connections: in air direction right or left

Equipment:

Exchanger for cold water with Cu pipes and aluminium lamellas, collecting tank made of steel.

Direct evaporator with Cu pipes and aluminium lamellas, cooling agent distributor.

Mist eliminator, condensate basin with condensate connector on side, male thread 1¼", droplet catcher for air direction vertical.

Type	Connections	Contents
7	2"	15 l
8	2"	24 l
12	1½"	30 l
A	DN 28 cooling agent inlet DN 35 cooling agent outlet	8 l
B	DN 28 cooling agent inlet DN 42 cooling agent outlet	12 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:

Exchanger for cold water with Cu pipes and corrosion-resistant aluminium lamellas

Exchanger for cold water with Cu pipes and Cu lamellas

Exchanger for cold water with bleed and drain connector

Note:

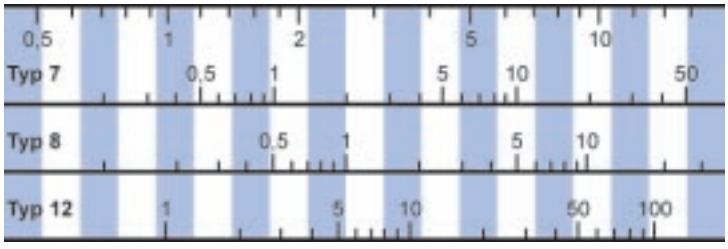
Allow for sufficient room for extraction of the exchanger.
Build in siphon on site with the condensate connector.

Water resistance (kPa)

Quantity of water $w = \frac{0{,}86 \cdot \dot{Q}}{\Delta t_W}$ (m³/h)

$\dot{Q}$ = Power in kW
$\Delta t_w = t_{WI} - t_{WO}$

Quantity of water w (m3/h)



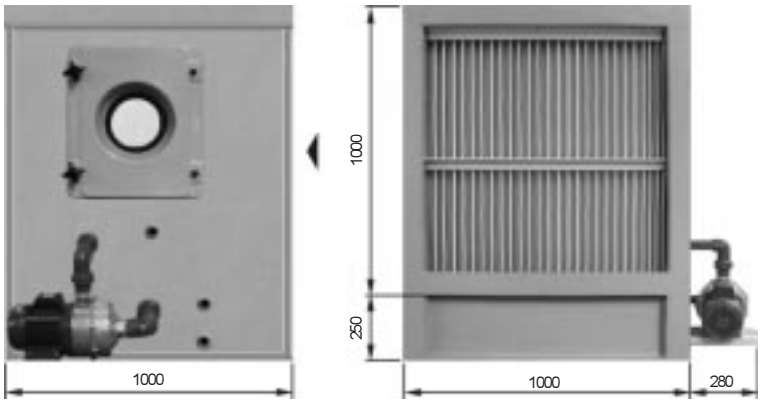
V̇ (m³/h)		4 000		6 000		8 000		10 000	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
		Exchanger for cold water type 7							
4/8	32	43.7	10.2	60.1	11.9	74.6	13.2	87.8	14.3
	28	37.2	9.8	51.0	11.3	63.1	12.4	74.0	13.3
	26	33.1	9.3	45.4	10.7	56.2	11.7	65.9	12.5
	25	31.1	9.1	42.6	10.4	52.7	11.4	61.8	12.2
5/10	32	40.0	11.4	54.8	13.0	67.8	14.2	79.7	15.2
	28	33.4	11.0	45.6	12.4	56.3	13.5	66.0	14.3
	26	29.3	10.5	40.0	11.8	49.4	12.8	57.8	13.5
	25	27.3	10.3	37.2	11.5	45.9	12.4	53.8	13.1
6/12	32	36.1	12.5	49.3	14.0	60.9	15.2	71.4	16.1
	28	29.5	12.1	40.1	13.4	49.4	14.4	57.8	15.2
	26	25.4	11.6	34.5	12.8	42.5	13.7	49.7	14.4
	25	23.4	11.4	31.7	12.5	39.0	13.3	45.6	13.9
		Type 8							
4/8	32	52.1	6.1	74.7	7.2	95.7	8.1	115.3	8.9
	28	44.9	6.2	64.1	7.1	81.8	7.9	98.3	8.7
	26	39.9	6.1	56.9	6.9	72.7	7.7	87.3	8.3
	25	37.5	6.0	53.5	6.8	68.2	7.5	81.9	8.2
5/10	32	48.0	7.4	68.6	8.5	87.5	9.3	105.1	10.1
	28	40.7	7.5	57.8	8.4	73.5	9.2	88.0	9.9
	26	35.7	7.3	50.7	8.2	64.4	8.9	77.1	9.6
	25	33.3	7.3	47.1	8.1	59.8	8.8	71.6	9.4
6/12	32	43.7	8.7	62.0	9.7	78.9	10.5	94.6	11.3
	28	36.3	8.7	51.2	9.7	64.8	10.5	77.4	11.1
	26	31.2	8.6	44.0	9.5	55.6	10.2	66.4	10.7
	25	28.7	8.6	40.4	9.4	51.1	10.0	60.9	10.6
		Type 12							
4/8	32	53.8	5.0	78.4	5.6	101.6	6.1	123.7	7.1
	28	46.8	5.0	68.0	5.6	87.9	6.1	106.7	7.0
	26	42.0	4.9	60.9	5.5	78.8	5.9	95.6	6.4
	25	39.5	4.9	57.4	5.4	74.2	5.9	90.1	6.3
5/10	32	50.4	6.3	73.3	6.9	94.8	7.5	115.2	8.0
	28	43.4	6.3	62.8	6.9	80.9	7.4	98.1	7.9
	26	38.5	6.3	55.6	6.8	71.8	7.3	87.0	7.7
	25	36.0	6.3	52.1	6.8	67.2	7.2	81.4	7.6
6/12	32	46.9	7.7	67.9	8.3	87.6	8.8	106.3	9.2
	28	39.7	7.7	57.2	8.3	73.6	8.7	89.1	9.2
	26	34.7	7.7	50.0	8.2	64.3	8.6	77.8	9.0
	25	32.3	7.7	46.4	8.2	59.7	8.6	72.2	8.9
Ev. temp. °C		**Direct evaporator type A**							
2.0	32	36.8	13.1	45.6	15.7	52.0	17.4	56.9	18.8
	28	32.4	11.9	40.1	14.1	45.7	15.7	50.0	16.9
	26	29.4	11.1	36.4	13.2	41.4	14.6	45.3	15.7
	25	27.9	10.7	34.5	12.7	39.3	14.1	43.0	15.1
5.0	32	33.1	14.3	41.2	16.6	47.1	18.2	51.6	19.4
	28	28.6	13.1	35.6	15.1	40.7	16.5	44.6	17.5
	26	25.5	12.4	31.8	14.2	36.3	15.5	39.7	16.4
	25	24.0	12.0	29.9	13.7	34.1	14.9	37.3	15.9
8.0	32	28.7	15.7	35.8	17.7	41.0	19.1	45.0	20.1
	28	24.2	14.5	30.1	16.2	34.5	17.4	37.8	18.3
	26	21.0	13.8	26.2	15.3	30.0	16.4	32.9	17.2
	25	19.5	13.5	24.3	14.9	27.8	15.9	30.5	16.7
		Type B							
2.0	32	44.3	9.8	57.4	12.1	67.4	13.9	75.2	15.2
	28	39.1	8.9	50.6	11.0	59.4	12.6	66.2	13.8
	26	35.5	8.4	45.9	10.3	53.8	11.8	60.0	12.9
	25	33.7	8.1	43.6	10.0	51.1	11.4	56.9	12.4
5.0	32	39.8	11.3	51.8	13.3	60.9	14.9	68.1	16.1
	28	34.5	10.5	44.8	12.3	52.7	13.7	58.9	14.7
	26	30.8	10.0	40.0	11.6	47.0	12.9	52.5	13.9
	25	29.0	9.8	37.6	11.3	44.2	12.5	49.4	13.4
8,0.	32	34.5	13.0	44.9	14.7	52.9	16.1	59.3	17.1
	28	29.1	12.3	37.8	13.8	44.6	14.9	49.9	15.8
	26	25.4	11.8	33.0	13.1	38.8	14.1	43.4	15.0
	25	23.5	11.6	30.5	12.8	35.9	13.8	40.2	14.5

Air inlet state: 32°C / 40 % r.h., 28°C / 47 % r.h.
26°C / 49 % r.h., 25°C / 50 % r.h.

Note: min. evaporation temperature 2°C.

Washer / Vapour humidifier element KG 100 Standard

Washer element



Casing
Plastic (glass fibre reinforced plastic)

Inspection door and connections
in air direction right or left

Equipment
Block pump 1,85 kW, 230/400 V, Δ/Y; 8,1/4,7 A, 50 Hz;
Stainless steel pump
Nozzle holder with self-cleaning nozzles spraying against air flow
Washer basin with all-round inclination towards the drain connector
Pump with complete piping on suction and pressure side, dry-run protection for pump.
De-sludging system
Inspection door with inspection window
Flow rectifier
Mist eliminator
} temperature-resistant to 70°C, dismantable

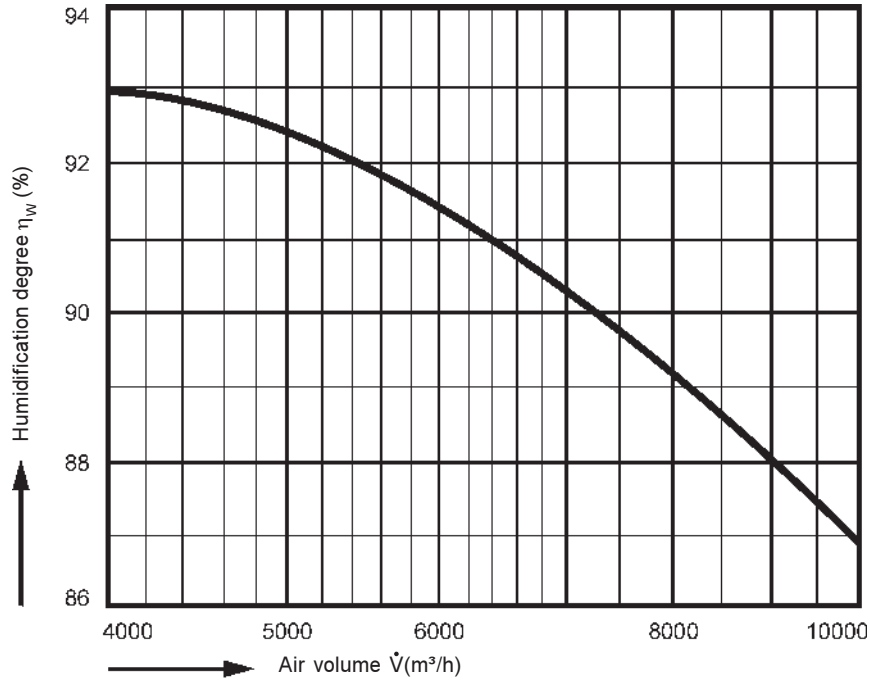
Inlet device, male thread 3/4", with float valve and float, overflow spout DN 40, outlet chute DN 40.
On request: lighting 230 V / 60 W, darkening for inspection window.
Drain and overflow device with siphon on the inside, thermometer, pressure gauge

Humidification degree η_W

$$\eta_W = \frac{x_2 - x_1}{x_s - x_1}$$

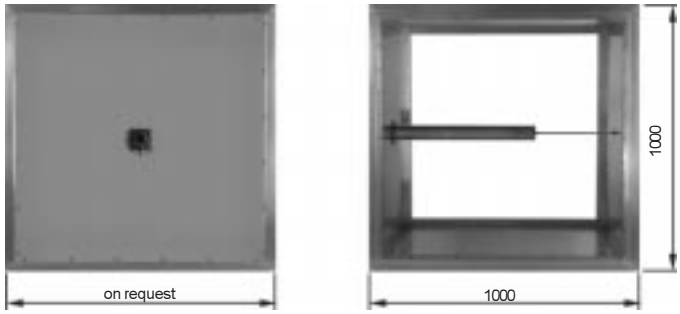
Index
x = water content of air
1 = air inlet
2 = air outlet
S = saturation state

with air temperature 20°C, density 1.2 kg/m³, water pressure 2.0 bar, quantity of water 9500 l/h



Vapour humidifier element

suitable for vapour lances of different manufacturers

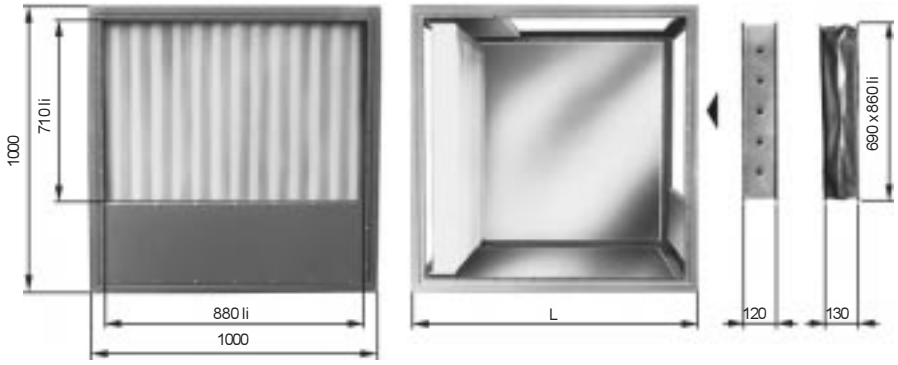


Design:
- Galvanised outer and inner surfaces,
- Inspection door
- Basin with drain 1¼", male thread made of corrosion-resistant material
- Length variable

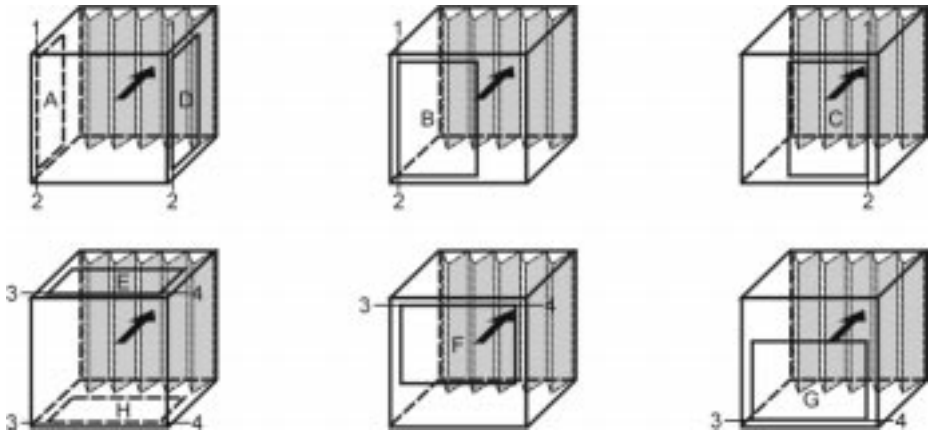
On request:
- inspection hole Ø 150mm
- Inside light

Filter/air mixture element combined L = 1000 mm

Air mixture element/ exhaust air element L = 830 mm



Suction variations:



One external flap		Two external flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + B	1, 2
B	1, 2	A + C	1, 2
C	1, 2	A + D	1, 2
D	1, 2	B + D	1, 2
E	3, 4	C + D	1, 2
F	3, 4	E + F	3, 4
G	3, 4	E + G	3, 4
H	3, 4	E + H	3, 4
		F + H	3, 4
		G + H	3, 4

One internal flap		Two internal flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + C	1, 2
B	1, 2	A + D	1, 2
C	1, 2	B + D	1, 2
D	1, 2	E + G	3, 4
E	3, 4	E + G	3, 4
F	3, 4	F + H	3, 4
G	3, 4		
H	3, 4		

Drive torque for 1 flap 4 Nm (airtight flap according to DIN 1946: 18 Nm)

Inspection door:

in air direction right, left, top, bottom
required space for filter extraction: min. 0,5 m
for air mixture element/exhaust air element inspection door only on request in air direction right/left

Fan element

L 1250
W 1250
H 1250

L 1250
W 1250
H 1250

Heater element

L* 340/500
W 1250
H 1250

Cooling element

L 540
W 1250
H 1250
vertical L 1000

Washer element

L 1000
W 1250
H 1500

Mixing and filter el.

L 1250
W 1250
H 1250

Mixing and exhaust air element

L 910
W 1250
H 1250

Short filter element

L 340
W 1250
H 1250

Sleeve filter element

L 910
W 1250
H 1250
Sl. fi. short L 540

Silencer element

L .....
W 1250
H 1250

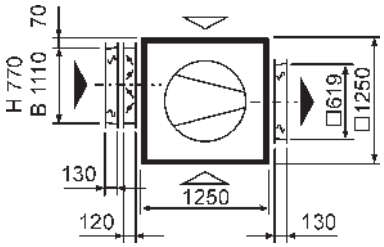
Empty element / vapour humidifier empty el.

L .....
W 1250
H 1250

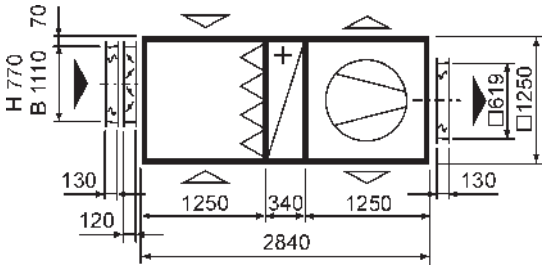
KGX

L 1250
W 1250
H 1250

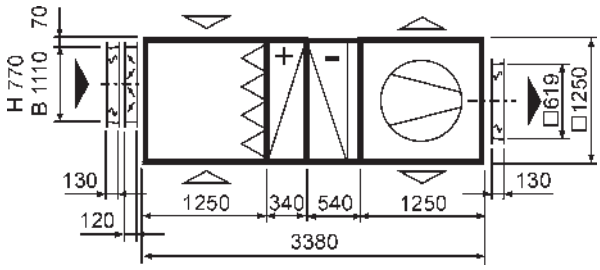
Withdrawn air device



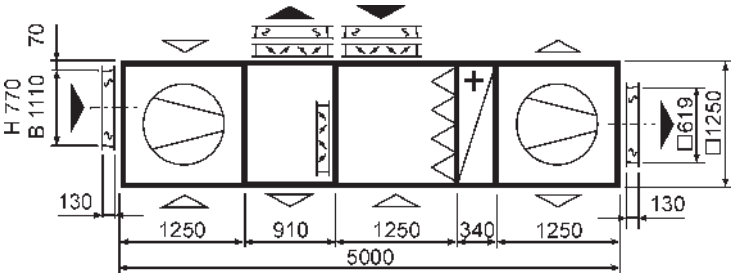
Supply air device



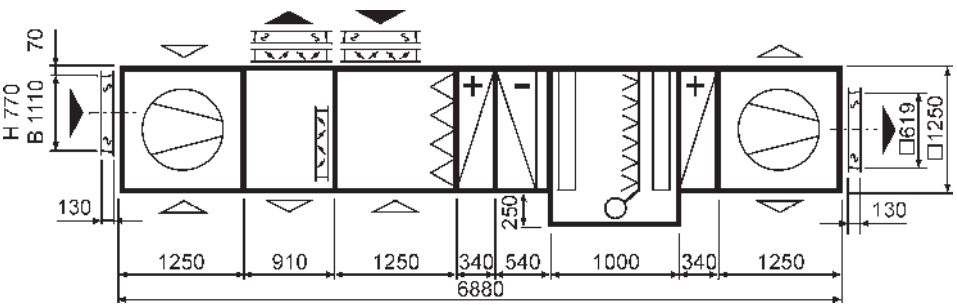
Partial air conditioner



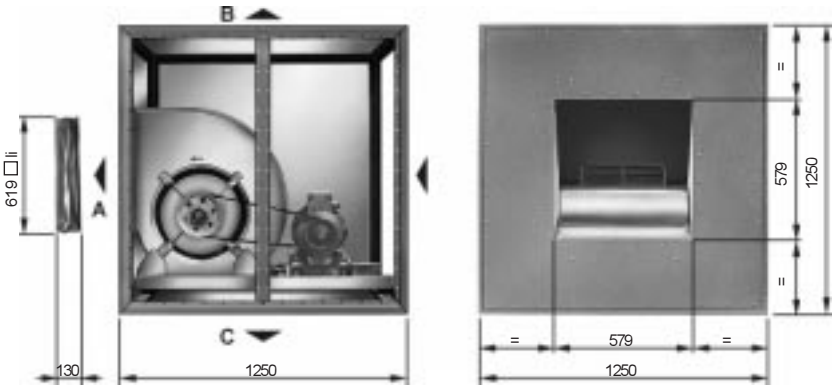
Combined supply and withdrawn air device



Combined climate control, supply and withdrawn air device

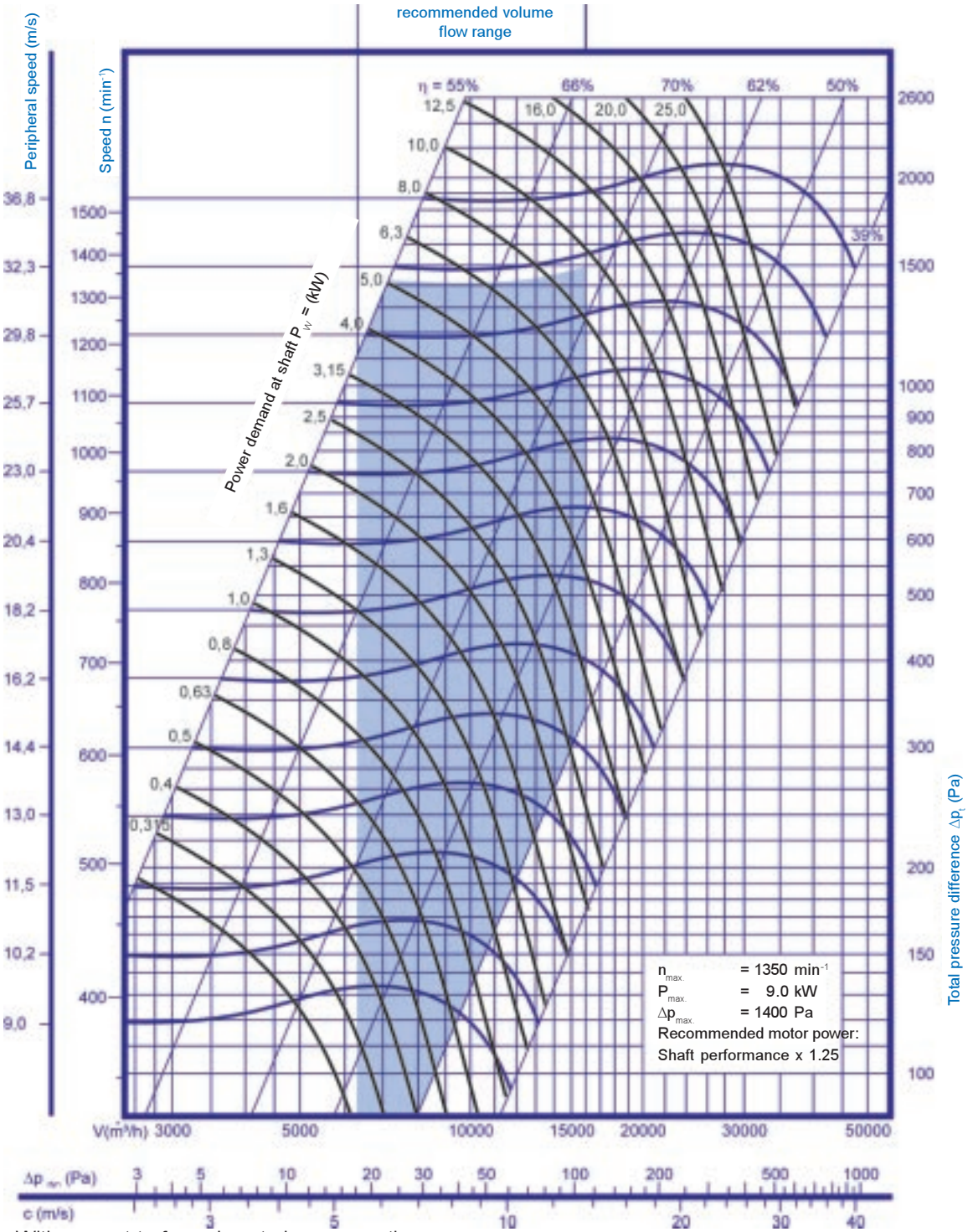


* with extractable frost protection frame L = 500



Fan diagram

Forward rotor blades



With respect to fan exhaust air cross section

Exhaust variation: A, B, C

Fan/motor: mounted on sturdy base frame
Base frame with vibration absorbers, flexibly mounted
Elastic connection between fan exhaust and casing

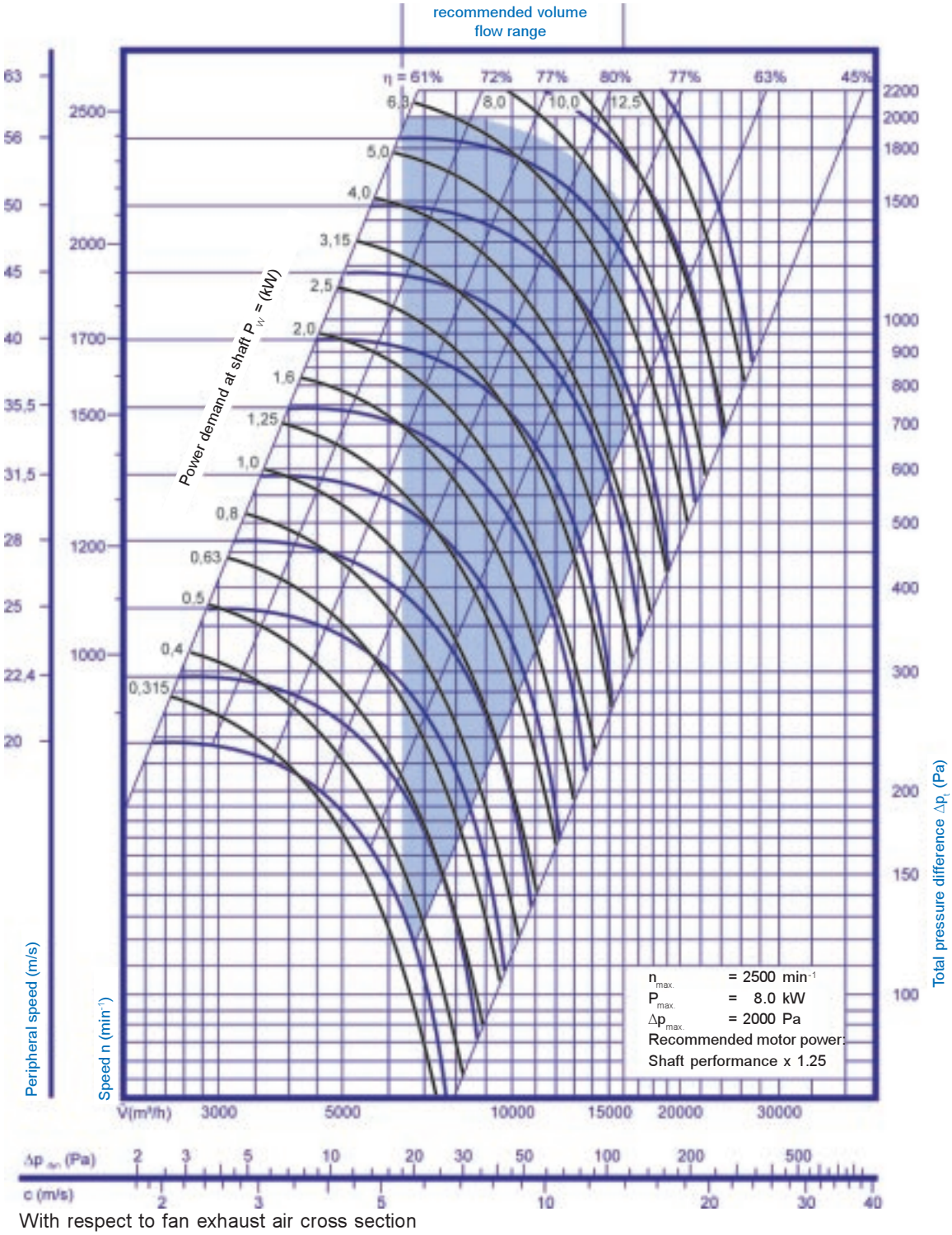
Inspection door: in air direction right, left, with turn locks

Withdrawn air device: Construction such as fan element, flap arrangement in accordance with connection and suction variations

Flaps on the inside E and F possible

Fan diagram

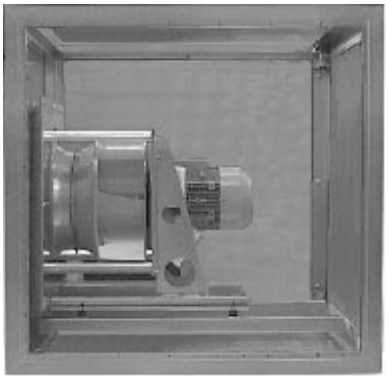
Backward rotor blades



With respect to fan exhaust air cross section

Free-running fan wheel KG 160 Standard

Description



Free-running fan wheel, unidirectional suction, with backward rotor blades, attached directly to the motor shaft.

Complete unit mounted on sturdy base frame with flexible vibration absorbers.

Rotor wheel statically and dynamically balanced. Complete motor protection with built-in PTC thermistors.

High fan efficiency even at low speed, almost without dynamic pressure ratios.

In connection with frequency converter, accurate adaptation to unit characteristics is possible.

Economical and energy-saving operation even under partial load conditions.

Low maintenance costs, no drive belt losses, no retightening required.

External pressure drops

Customer specification of the installation side pressure drops (e.g. duct system).

Internal pressure drops

The pressure drops of all components with respect to the volume flow (also fan element) are listed in the pressure drop tables of the individual chapters.
For components on the pressure-side, neither flow distributors nor incident flow elements are required, since the exhaust flows through the entire cross section.

Dynamic pressure drops

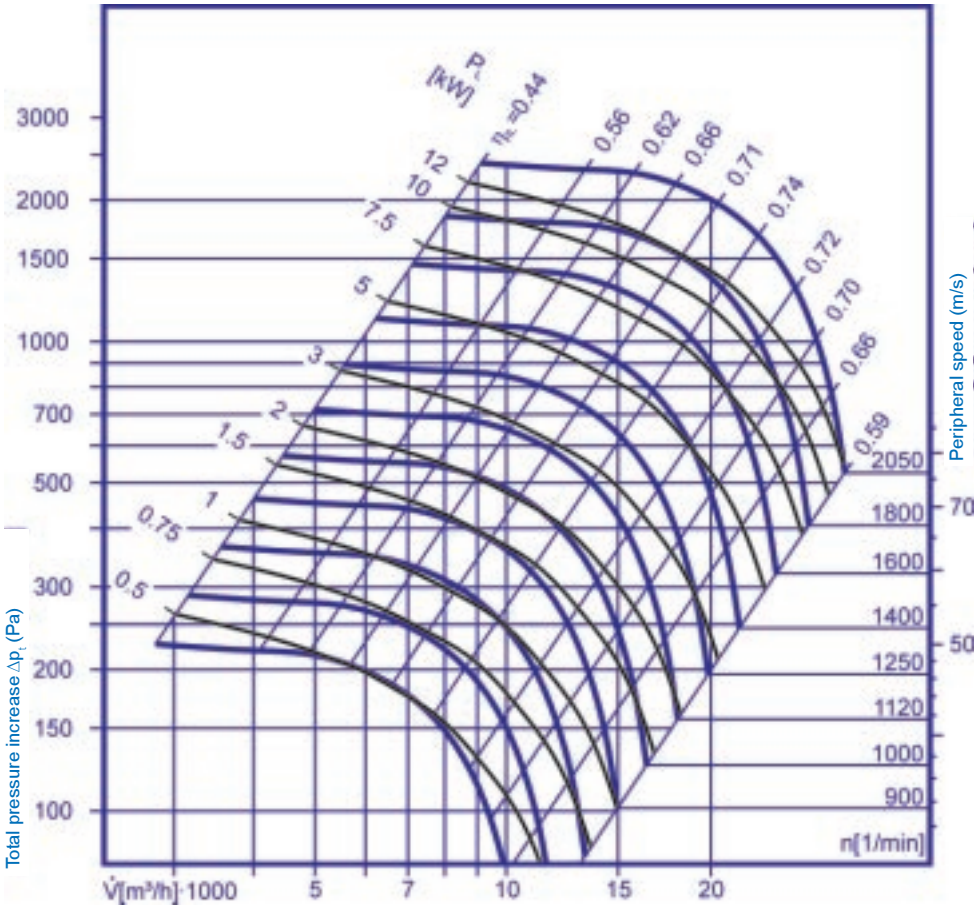
The dynamic pressure portions do not have to be considered in planning.

Performance data

KG Size	Max. air volume m³/h	Total pressure increase to Pa	Operational data * Fan power kW	Fan Speed min⁻¹	Standard data * Motor power kW	Motor Speed min⁻¹	Motor current A
KG 160	16000	500	3.32	1207	4.00	1000	9.70
		1000	6.76	1493	7.50	1500	15.40
		1500	10.58	1736	15.00	1500	28.50

* Fan speed is controlled by frequency converter (f ≥ 50Hz)

Fan diagram
Rotor wheel Ø 710 mm



Total sound power level L_W in [dB]

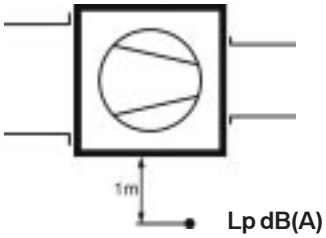
The accurate, device-specific sound data can be determined only for the specific order.

Lw [dB] = the computational total sound power of the fan on the suction/pressure-side.

		Total pressure increase Δp [Pa]					
	L_w	500	750	1000	1250	1500	2000
$\dot{V}$ [m³/h]	8,000	93	97	99	101	103	105
	12,000	95	98	101	103	104	106
	16,000	96	100	102	104	106	108

Sound pressure level Lp dB(A)

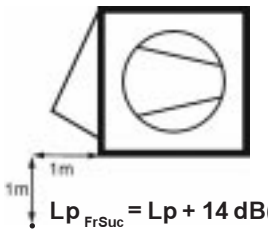
Lp dB(A) = sound pressure level at 1 m distance beside the fan element, measured in the free field with suction and pressure-side duct connection



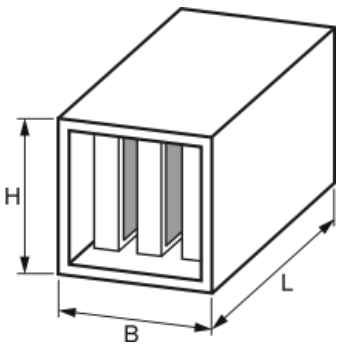
Forward rotor blades								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
8,000	500	37	12,000	560	45	16,000	630	51
	630	41		710	46		800	51
	800	46		900	49		1000	52
	1000	51		1120	53		1250	56
Backward rotor blades								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
8,000	1000	45	12,000	1400	49	16,000	1600	45
	1250	47		1600	52		1800	53
	1600	53		1800	55		2000	57
	2000	59		2240	60		2240	60
Free-running fan wheel Ø 710mm								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
8,000	1000	53	12,000	1000	55	16,000	1200	56
	1200	57		1200	58		1350	60
	1300	59		1300	61		1500	62
	1650	63		1650	64		1700	66

Sound pressure level Lp dB(A) beside the fan element

With free suction or exhaust opening



Silencer element



Dimensions (mm)

Height H	Width B	Length L			
		Type 2	Type 3	Type 4	Type 5
1250	1250	910	1090	1390	1600

Insertion loss De dB(A)

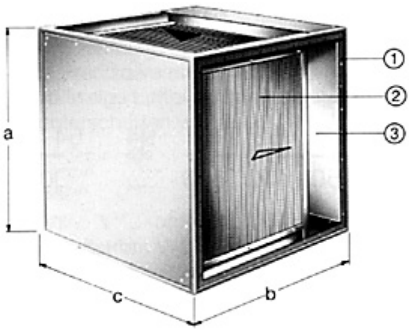
Type	Octave band (Hz) 63	125	250	500	1000	2000	4000	8000
2	6	12	20	20	22	16	12	11
3	7	14	24	25	26	20	14	13
4	8	17	30	32	34	25	18	17
5	9	21	37	37	41	29	21	19

For series connection of 2 silencers: $De = De_1 + De_2 - 3$ dB(A)

The accurate, device-specific heat recovery data can be determined only for the specific order.

Description KGX/KGXD

KGX air circulation horizontally/ vertically
KGXD air circulation diagonally



Hot air and cold air are led past each other in the cross current.

The heat recovery takes place via heat transmission from the hot to the cold air flow. The air flows are completely separated by aluminium plates.

- Heat recovery of up to over 80 %
- no moisture transmission
- no mobile parts, corrosion-resistant

① **Casing**
Design same as air conditioner

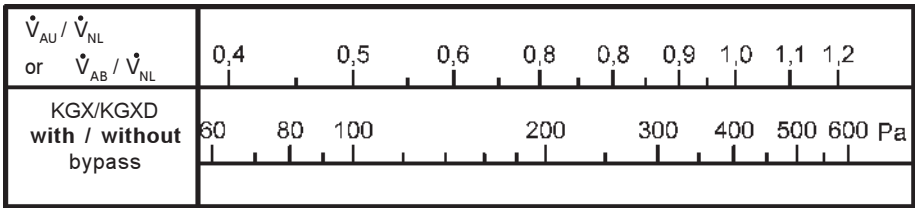
② **Heat exchanger**
Heat exchanger surfaces made of special corrosion-resistant aluminium plates.

③ **Internal bypass** (on request)
In order to prevent rime on the heat exchanger surfaces, the outside air can partially or entirely pass by the heat exchanger in the internal bypass.

Type	Nominal air volume $\dot{V}$ [m³/h]		Dimensions [mm]			Weight [kg]	Condensate connector
	without int. bypass	with int. bypass	a	b	c		R"
KGX 160	16,000	14,000	1250	1250	1250	485	-
KGXD 160	16,000	14,000	1250	1250	2000	750	1 ¼"

Pressure drop Δp [Pa]

for KGX/KGXD
with or without internal bypass



Description RWT

RWT air circulation horizontally/vertically

A rotating storage capacity takes up heat from the withdrawn air stream and emits it to the outside air stream.

- Heat recovery of up to 80 %.
- Simple power control by adjusting the speed.
- With suitable rotor material, humidification of the supply air.
- Rime protection, defrosting device, pre-heating of air not required.
- Easy maintenance through inspection doors in the air incident flow elements.

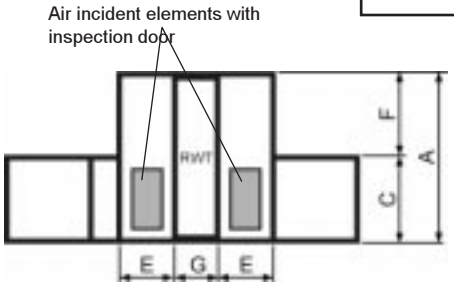
Pressure drop Δp [Pa]

Volume flow $\dot{V}$ [m³/h]	6,400	8,000	10,000	12,000	14,000	16,000
Pressure drop Δp [Pa]	56	72	90	105	125	145

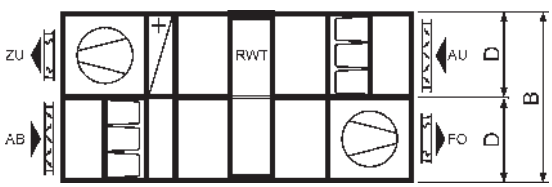
Dimensions

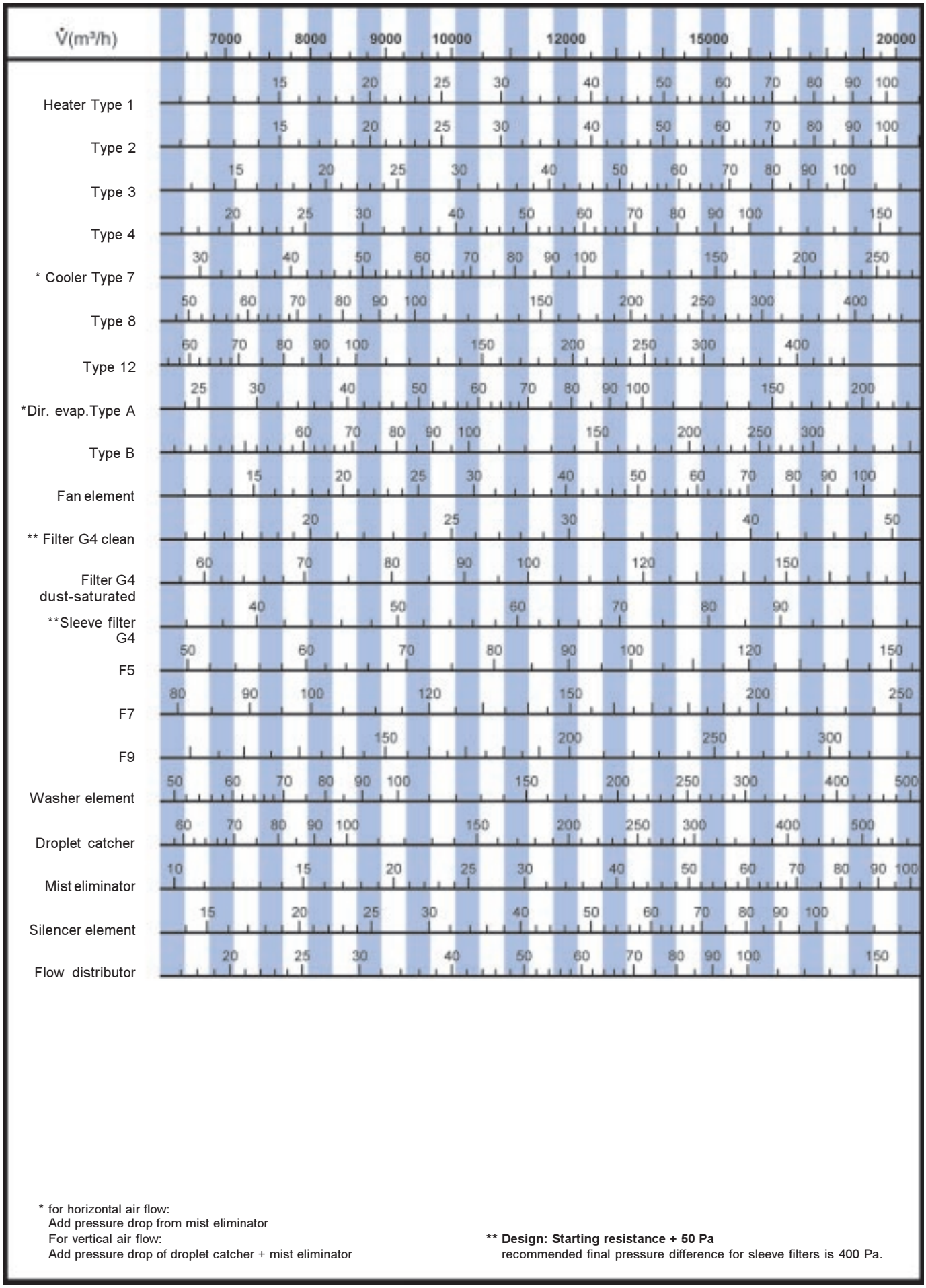
KG	A	B	C	D	E	F	G
160	1900	2500	1250	1250	650	540	400

Front view



Top view



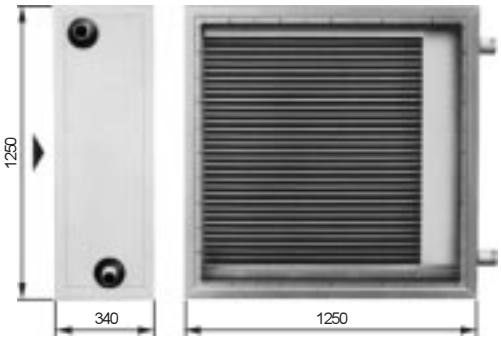


* for horizontal air flow:
Add pressure drop from mist eliminator
For vertical air flow:
Add pressure drop of droplet catcher + mist eliminator

** **Design: Starting resistance + 50 Pa**
recommended final pressure difference for sleeve filters is 400 Pa.

Heater element

Heat exchanger for warm pump water PWW



Connections: in air direction right or left

Equipment:

Heat exchanger with Cu pipes and aluminium lamellas, collecting tank made of steel, alternatively copper

Type	Connections	Water content
1	1½"	8.0 l
2	1½"	10.0 l
3	2"	15.0 l
4	2"	16.0 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:

Heat exchanger with Cu pipes and corrosion-resistant aluminium lamellas

Heat exchanger with Cu pipes and Cu lamellas

Heat exchanger made of steel completely galvanised in full immersion bath

Heat exchanger for steam

Heat exchanger for hot oil

Heat exchanger with bleed and drain connectors

Note:

Allow for sufficient room for extraction of the heat exchanger.

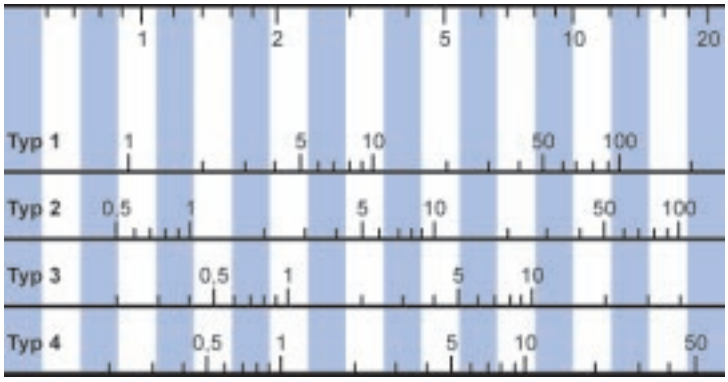
Water resistance (kPa)

Quantity of water $w = \frac{0{,}86 \cdot \dot{Q}}{\Delta t_W}$ (m³/h)

$\dot{Q}$ = Power in kW

$\Delta t_w = t_{WE} - t_{WO}$

Quantity of water w (m³/h)



Type		1							
V̇ (m³/h)		6 300		9 500		12 800		16 000	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
45/35	- 15	58.3	10	74.8	6	89.3	3	101.6	2
	- 10	52.4	12	67.2	9	80.1	7	91.2	5
	- 5	46.5	15	59.7	12	71.1	10	80.9	9
	± 0	40.8	18	52.3	15	62.2	14	70.8	12
	+ 5	35.1	21	44.9	19	53.4	17	60.7	16
	+ 10	29.5	24	37.7	22	44.8	20	50.8	19
	+ 15	23.9	26	30.5	24	36.2	23	41.0	23
	+ 20	18.4	29	23.4	27	27.7	27	31.3	26
50/40	- 15	64.0	12	82.2	8	98.2	5	111.9	4
	- 10	58.0	15	74.6	11	89.0	9	101.4	7
	- 5	52.2	18	67.0	14	79.9	12	91.0	11
	± 0	46.4	21	59.5	18	71.0	16	80.8	14
	+ 5	40.7	23	52.2	21	62.2	19	70.7	18
	+ 10	35.0	26	44.9	24	53.4	22	60.7	21
	+ 15	29.5	29	37.7	27	44.8	25	50.9	24
	+ 20	24.0	31	30.6	30	36.3	29	41.1	28
60/40	- 15	66.8	13	85.5	9	101.7	6	115.6	4
	- 10	60.9	16	77.8	12	92.5	10	105.1	8
	- 5	55.0	19	70.2	15	83.5	13	94.8	11
	± 0	49.2	22	62.8	19	74.5	16	84.5	15
	+ 5	43.5	25	55.4	22	65.7	20	74.4	18
	+ 10	37.8	27	48.0	25	56.9	23	64.4	22
	+ 15	32.1	30	40.8	28	48.2	26	54.5	25
	+ 20	26.5	33	33.5	31	39.6	29	44.7	28
70/50	- 15	78.3	18	100.5	13	119.8	10	136.4	8
	- 10	72.3	21	92.8	16	110.5	13	125.8	11
	- 5	66.4	24	85.1	20	101.4	17	115.3	15
	± 0	60.6	27	77.6	23	92.3	20	105.0	18
	+ 5	54.8	30	70.1	26	83.4	24	94.8	22
	+ 10	49.1	33	62.7	29	74.6	27	84.7	25
	+ 15	43.4	35	55.4	32	65.8	30	74.7	29
	+ 20	37.8	38	48.2	35	57.2	33	64.8	32
70/55	- 15	82.4	20	106.0	15	127.7	11	144.4	9
	- 10	76.4	23	98.3	18	117.4	15	133.7	13
	- 5	70.4	26	90.6	21	108.2	18	123.2	16
	± 0	64.6	29	83.0	25	99.1	22	112.8	20
	+ 5	58.8	32	75.5	28	90.1	25	102.6	23
	+ 10	53.1	35	68.1	31	81.2	29	92.5	27
	+ 15	47.4	37	60.8	34	72.5	32	82.4	30
	+ 20	41.8	40	53.6	37	63.8	35	72.5	34
80/50	- 15	81.5	19	104.2	14	124.0	11	140.9	8
	- 10	75.5	22	96.5	17	114.7	14	130.3	12
	- 5	69.5	25	88.8	21	105.5	18	119.8	16
	± 0	63.7	28	81.2	24	96.4	21	109.4	19
	+ 5	57.9	31	73.7	27	87.4	25	99.2	23
	+ 10	52.1	34	66.3	30	78.5	28	89.0	26
	+ 15	46.4	37	58.9	33	69.7	31	78.9	30
	+ 20	40.7	39	51.6	36	61.0	34	68.9	33
80/60	- 15	89.6	23	115.3	17	137.7	14	156.9	11
	- 10	83.6	26	107.5	21	128.3	17	146.2	15
	- 5	77.6	29	99.8	24	119.1	21	135.6	18
	± 0	71.8	32	92.2	27	109.9	24	125.2	22
	+ 5	65.9	35	84.7	30	100.9	28	114.9	26
	+ 10	60.2	38	77.2	34	92.0	31	104.7	29
	+ 15	54.5	41	69.9	37	83.2	34	94.6	32
	+ 20	48.9	43	62.6	40	74.5	38	84.6	36
90/70	- 15	100.8	27	129.9	21	155.3	17	177.1	14
	- 10	94.7	31	122.0	25	145.9	21	166.3	18
	- 5	88.7	34	114.3	28	136.5	24	155.6	22
	± 0	82.8	37	106.6	31	127.3	28	145.1	25
	+ 5	76.9	40	99.0	35	118.2	31	134.7	29
	+ 10	71.1	43	91.5	38	109.2	35	124.4	33
	+ 15	65.4	46	84.1	41	100.3	38	114.2	36
	+ 20	59.7	49	76.7	44	91.5	42	104.2	40

Other operating conditions on request!

	2								3								4							
	6 300		9 500		12 800		16 000		6 300		9 500		12 800		16 000		6 300		9 500		12 800		16 000	
	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
	73.0	16	95.6	12	115.4	9	132.5	7	91.3	23	123.1	19	151.7	16	176.4	14	102.3	28	141.0	24	176.3	22	207.2	19
	65.6	18	85.9	14	103.7	12	119.0	10	82.1	25	110.7	22	136.3	19	158.5	17	92.2	30	126.9	26	158.5	23	186.2	21
	58.4	21	76.4	17	92.1	15	105.7	13	73.2	27	98.5	24	121.1	21	140.7	19	82.2	31	113.1	28	141.0	25	165.5	23
	51.3	23	66.9	20	80.7	18	92.5	16	64.3	29	86.4	26	106.1	23	123.2	22	72.4	32	99.4	29	123.8	27	145.1	25
	44.2	25	57.6	22	69.4	20	79.5	19	55.6	30	74.5	27	91.4	25	106.0	24	62.7	33	85.8	31	106.7	29	125.0	27
	37.2	27	48.5	25	58.3	23	66.7	22	46.9	32	62.8	29	76.8	27	89.0	26	53.1	35	72.5	32	89.9	30	105.1	29
	30.4	29	39.4	27	47.2	26	54.0	25	38.4	33	51.1	31	62.4	29	72.1	28	43.6	35	59.2	33	73.2	32	85.4	31
	23.5	31	30.4	30	36.3	29	41.4	28	29.8	34	39.5	33	48.1	31	55.4	30	34.1	36	46.0	35	56.7	33	65.9	32
	79.9	19	104.8	14	126.8	11	145.7	9	99.7	27	134.8	23	166.3	19	193.6	17	111.7	32	154.0	28	192.8	25	226.9	23
	72.6	21	95.1	17	115.0	14	132.0	12	90.5	29	122.4	25	150.8	22	175.6	20	101.3	33	139.9	30	175.0	27	205.9	25
	65.3	24	85.5	20	103.3	17	118.6	15	81.6	31	110.1	27	135.6	24	157.7	22	91.3	35	126.0	32	157.5	29	185.1	27
	58.1	26	76.1	22	91.8	20	105.4	18	72.7	32	98.0	29	120.6	26	140.2	25	81.5	36	112.3	33	140.2	31	164.7	29
	51.1	28	66.7	25	80.5	23	92.3	21	63.9	34	86.0	31	105.8	29	122.9	27	71.8	38	98.7	35	123.1	32	144.5	31
	44.1	30	57.5	28	69.3	26	79.4	24	55.3	36	74.2	33	91.1	31	105.8	29	62.3	39	85.4	36	106.3	34	124.6	33
	37.2	32	48.4	30	58.2	28	66.7	27	46.7	37	62.6	34	76.7	33	88.9	31	52.8	40	72.2	37	89.6	36	104.9	34
	30.3	34	39.4	32	47.3	31	54.1	30	38.3	38	51.0	36	62.4	35	72.2	34	43.4	41	59.1	39	73.1	37	85.4	36
	84.1	20	109.7	16	132.1	12	151.4	10	105.7	29	141.9	25	174.1	21	202.0	18	119.2	35	163.3	31	203.2	27	238.2	24
	76.8	23	100.0	18	120.3	15	137.8	13	96.6	31	129.4	27	158.6	23	183.9	21	109.0	37	149.2	32	185.4	29	217.1	27
	69.5	25	90.4	21	108.7	18	124.4	16	87.5	33	117.1	29	143.3	26	166.1	24	99.0	38	135.2	34	167.8	31	196.2	29
	62.3	28	80.9	24	97.2	21	111.1	19	78.6	35	104.9	31	128.3	28	148.5	26	89.1	40	121.3	36	150.3	33	175.6	31
	55.1	30	71.5	27	85.8	24	98.0	23	69.7	37	92.9	33	113.3	30	131.0	28	79.2	41	107.6	37	133.1	35	155.3	33
	48.1	32	62.2	29	74.5	27	85.0	25	60.9	38	80.9	35	98.6	32	113.8	31	69.5	42	94.0	39	116.0	36	135.1	35
	41.1	34	53.0	31	63.3	30	72.2	28	52.2	40	69.0	37	83.9	34	96.7	33	59.7	43	80.5	40	99.0	38	115.1	36
	34.1	36	43.8	34	52.2	32	59.4	31	43.5	41	57.2	38	69.3	36	79.6	35	50.0	44	67.0	41	82.1	39	95.1	38
	98.1	26	128.5	21	155.1	17	178.0	14	122.6	37	165.4	31	203.6	27	236.7	24	137.5	43	189.4	38	236.6	34	278.0	31
	90.7	29	118.7	24	143.2	20	164.2	18	113.5	39	152.9	33	188.0	30	218.5	27	127.3	45	175.2	40	218.7	36	256.8	33
	83.4	31	109.0	27	131.4	23	150.7	21	104.4	41	140.5	36	172.6	32	200.6	30	117.3	46	161.2	42	201.0	38	235.9	36
	76.1	34	99.4	29	119.8	26	137.3	24	95.5	43	128.3	38	157.5	35	182.8	32	107.4	48	147.4	44	183.6	40	215.2	38
	69.0	36	90.0	32	108.3	29	124.1	27	86.6	44	116.2	40	142.5	37	165.3	35	97.7	49	133.7	45	166.3	42	194.8	40
	61.9	39	80.6	35	97.0	32	111.0	30	77.9	46	104.3	42	127.7	39	148.0	37	88.0	51	120.2	47	149.3	44	174.7	42
	54.9	41	71.4	37	85.8	35	98.1	33	62.2	48	92.5	44	113.1	41	130.9	39	78.4	52	106.8	48	132.4	46	154.7	44
	48.0	43	62.2	40	74.6	38	85.3	36	60.6	49	80.7	46	98.5	43	113.9	41	68.9	53	93.5	50	115.7	47	134.9	45
	102.7	28	134.9	23	163.3	19	187.7	16	127.6	39	172.9	33	213.6	29	249.0	26	142.2	45	197.1	40	247.1	36	291.1	33
	95.2	31	125.1	26	151.3	22	173.9	19	118.4	41	160.4	36	198.0	32	230.7	29	132.1	47	182.9	42	229.2	38	269.9	36
	87.9	33	115.4	29	139.5	25	160.3	23	109.4	43	148.0	38	182.6	34	212.7	32	122.1	48	168.9	44	211.5	41	249.0	38
	80.7	36	105.8	31	127.9	28	146.9	26	100.4	45	135.8	40	167.4	37	194.9	34	112.3	50	155.1	46	194.1	43	228.3	40
	73.5	38	96.3	34	116.4	31	133.6	29	91.6	47	123.7	42	152.4	39	177.4	37	102.5	52	141.5	48	176.9	45	207.9	42
	66.4	41	87.0	37	105.0	34	120.5	32	82.9	48	111.8	44	137.7	41	160.1	39	93.0	53	128.1	49	159.9	46	187.8	44
	59.5	43	77.8	39	93.8	37	107.6	35	74.3	50	100.1	46	123.0	43	143.0	41	83.5	54	114.8	51	143.1	48	168.0	46
	52.6	45	68.6	42	82.7	39	94.8	38	65.8	51	88.5	48	108.6	46	126.1	44	74.1	55	101.6	52	126.5	50	148.3	48
	102.7	28	133.9	22	161.2	18	184.6	16	129.0	39	173.0	33	212.2	29	246.2	26	145.4	46	199.1	41	247.8	36	290.3	33
	95.2	31	124.0	25	149.2	22	170.9	19	119.7	41	160.4	36	196.6	32	227.9	29	135.1	48	184.9	43	229.7	39	269.0	35
	87.8	33	114.3	28	137.4	25	157.3	22	110.6	43	148.0	38	181.2	34	209.9	31	125.0	50	170.7	45	211.9	41	247.9	38
	80.6	36	104.7	31	125.7	28	143.8	25	101.6	45	135.7	40	165.9	36	192.0	34	115.0	51	156.8	46	194.4	43	227.1	40
	73.3	38	95.2	34	114.2	30	130.5	28	92.6	47	123.5	42	150.8	39	174.4	36	105.1	53	143.0	48	176.9	44	206.5	42
	66.2	41	85.7	36	102.8	33	117.3	31	83.8	49	111.4	44	135.8	41	156.9	39	95.3	54	129.2	50	159.7	46	186.1	44
	59.1	43	76.4	39	91.4	36	104.3	34	75.0	50	99.4	46	121.0	43	139.6	41	85.5	55	115.6	51	142.5	48	165.9	46
	52.0	45	67.1	41	80.1	39	91.3	37	66.2	52	87.5	48	106.2	45	122.3	43	75.8	56	102.0	52	125.4	49	145.7	47
	111.8	32	146.9	26	177.6	22	204.1	19	139.0	44	188.3	38	232.4	33	270.7	30	155.1	50	214.7	45	269.0	41	316.8	37
	104.4	35	137.0	29	165.6	25	190.2	22	129.8	46	175.7	40	216.7	36	252.4	33	144.9	52	200.5	47	251.0	43	295.4	40
	97.0	37	127.2	32	153.7	28	176.6	25	120.6	48	163.2	42	201.2	38	234.3	35	134.9	54	186.4	49	233.3	45	274.4	42
	89.7	40	117.6	35	142.0	31	163.1	29	111.8	50	151.0	45	186.0	41	216.4	38	125.1	56	172.6	51	215.8	47	253.7	44
	82.5	42	108.1	38	130.5	34	149.7	32	103.0	52	138.9	47	171.0	43	198.8	40	115.4	57	158.9	53	198.5	49	233.3	47
	75.4	45	98.7	40	119.1	37	136.6	35	94.2	53	126.9	49	156.1	45	181.4	43	105.7	59	145.5	55	181.5	51	213.1	49
	68.4	47	89.4	43	107.8	40	123.5	38	85.6	55	115.1	51	141.4	48	164.2	45	96.2	60	132.1	56	164.6	53	193.1	51
	61.5	49	80.2	45	96.6	43	110.7	41	77.1	57	103.4	53	126.9	50	147.2	48	86.8	61	118.9	58	148.0	55	173.4	53
	125.3	38	164.9	31	199.8	26	229.9	23	154.9	50	210.6	44	260.5	39	304.0	35	172.1	57	239.2	52	300.5	47	354.5	44
	117.7	41	154.9	34	187.7	30	215.9	26	145.7	53	197.9	46	244.7	42	285.5	38	161.9	59	224.9	54	282.4	50	333.1	46
	110.3	43	145.1	37	175.7	33	202.1	30	136.6	55	185.4	49	229.2	44	267.3	41	152.0	61	210.9	56	264.7	52	312.0	49
	103.0	46	135.4	40	163.9	36	188.5	33	127.7	57	173.1	51	213.9	47	249.3	44	142.1	63	197.0	58	247.1	54	291.2	51
	95.8	48	125.9	43	152.3	39	175.0	36	118.8	59	161.0	53	198.8	49	231.6	46	132.4	65	183.4	60	229.8	56	270.7	53
	88.7	51	116.4	46	140.8	42	161.7	39	110.1	61	149.0	56	183.8	52	214.1	49	122.8	67	169.9	62	212.8	58	250.4	56
	81.6	53	107.1	48	129.4	45	148.6	42	101.5	63	137.2	58	169.1	54	196.9	51	113.3	68	156.6	64	195.9	60	230.4	58
	74.6	56	97.8	51	118.2	48	135.7	46	92.9	64	125.5	60	154.5	56	179.8	54	104.0	70	143.4	65	179.2	62	210.7	60

Exchanger for cold pump water PKW / direct evaporator

Performance data for direct evaporator for cooling agent R134a, for other cooling agents on request.

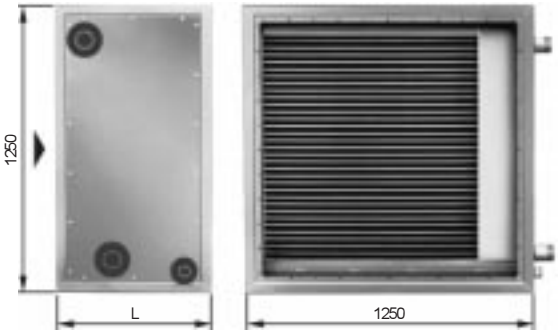


fig. Exchanger for cold water

Air direction: horizontal: L = 540 for types 7 and 8,
L = 830 for type 12
vertical: L = 1000 mm

Connections: in air direction right or left

Equipment:

Exchanger for cold water with Cu pipes and aluminium lamellas, collecting tank made of steel.

Direct evaporator with Cu pipes and aluminium lamellas, cooling agent distributor.

Mist eliminator, condensate basin with condensate connector on side, male thread 1¼", droplet catcher for air direction vertical.

Type	Connections	Contents
7	2.5"	25 l
8	2.5"	42 l
12	2"	55
A	DN 28 cooling agent inlet DN 48 cooling agent outlet	14 l
B	DN 28 cooling agent inlet DN 48 cooling agent outlet	20 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:

Exchanger for cold water with Cu pipes

and corrosion-resistant aluminium lamellas

Exchanger for cold water with Cu pipes and Cu lamellas

Exchanger for cold water with bleed and drain connector

Note:

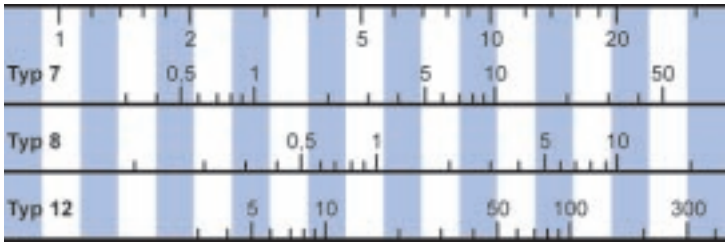
Allow for sufficient room for extraction of the exchanger.
Build in siphon on site with the condensate connector.

Water resistance (kPa)

Quantity of water $w = \frac{0{,}86 \cdot \dot{Q}}{\Delta t_W}$ (m³/h)

$\dot{Q}$ = Power in kW
$\Delta t_w = t_{WE} - t_{WO}$

Quantity of water w (m³/h)



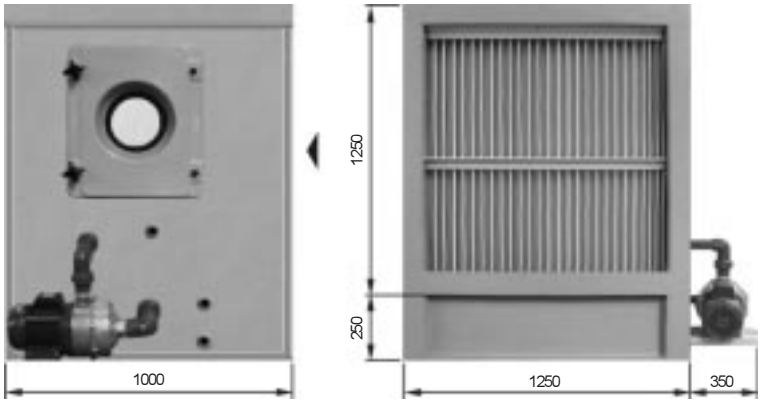
$\dot{V}$ (m³/h)		6 300		9 500		12 800		16 000	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
Exchanger for cold water type 7									
4/8	32	69.4	10.0	96.0	11.7	120.2	13.0	141.5	14.1
	28	59.0	9.6	81.3	11.1	101.6	12.3	119.3	13.2
	26	52.5	9.2	72.4	10.6	90.4	11.6	106.1	12.4
	25	49.3	9.0	67.9	10.3	84.8	11.3	99.5	12.0
5/10	32	63.3	11.2	87.3	12.8	109.1	14.1	128.2	15.1
	28	53.0	10.8	72.6	12.3	90.5	13.3	106.1	14.2
	26	46.4	10.4	63.7	11.7	79.3	12.7	92.9	13.4
	25	43.2	10.2	59.2	11.4	73.6	12.3	86.3	13.0
6/12	32	57.1	12.3	78.4	13.9	97.8	15.0	114.7	16.0
	28	46.7	12.0	63.8	13.3	79.2	14.3	92.6	15.1
	26	40.1	11.5	54.7	12.7	67.9	13.6	79.4	14.3
	25	36.9	11.3	50.2	12.4	62.3	13.2	72.8	13.9
Type 8									
4/8	32	83.8	5.5	121.8	6.4	158.5	7.1	192.1	7.8
	28	72.3	5.6	104.6	6.4	135.6	7.1	163.9	7.8
	26	64.3	5.6	92.9	6.3	120.4	6.9	145.4	7.5
	25	60.3	5.5	87.1	6.2	112.8	6.9	136.2	7.4
5/10	32	77.1	6.8	111.5	7.7	144.6	8.5	174.6	9.1
	28	65.5	6.9	94.1	7.8	121.5	8.5	146.3	9.1
	26	57.4	6.9	82.3	7.6	106.1	8.3	127.7	8.8
	25	53.3	6.8	76.4	7.6	98.4	8.2	118.4	8.7
6/12	32	69.9	8.1	100.6	9.0	129.8	9.7	156.3	10.4
	28	58.1	8.2	82.9	9.1	106.5	9.8	127.8	10.4
	26	49.8	8.2	71.0	8.9	91.1	9.6	109.1	10.1
	25	45.6	8.2	65.1	8.9	83.3	9.5	99.7	9.9
Type 12									
4/8	32	85.4	4.8	125.4	5.4	164.3	5.9	200.2	6.9
	28	74.4	4.8	108.9	5.3	142.4	5.9	173.2	6.8
	26	66.8	4.8	97.7	5.3	127.8	5.7	155.4	6.1
	25	63.0	4.7	92.1	5.2	120.5	5.7	146.5	6.0
5/10	32	80.3	6.1	117.6	6.7	153.8	7.2	187.2	7.7
	28	69.2	6.1	101.0	6.6	131.7	7.1	159.9	7.6
	26	61.5	6.1	89.7	6.6	117.0	7.0	142.0	7.4
	25	57.7	6.1	84.0	6.5	109.6	6.9	133.0	7.3
6/12	32	74.9	7.4	109.3	8.0	142.8	8.5	173.5	8.9
	28	63.7	7.4	92.5	8.0	120.4	8.4	146.0	8.9
	26	55.9	7.4	81.1	7.9	105.5	8.3	127.9	8.7
	25	51.9	7.4	75.4	7.9	98.1	8.3	118.8	8.6
Ev. temp. °C		**Direct evaporator type A**							
2.0	32	58.3	13.0	72.7	15.6	83.4	17.4	91.2	18.8
	28	51.4	11.8	64.0	14.1	73.3	15.7	80.2	16.9
	26	46.6	11.0	58.0	13.1	66.4	14.6	72.7	15.7
	25	44.2	10.7	55.0	12.7	63.0	14.1	62.9	15.2
5.0	32	52.5	14.2	65.7	16.5	75.5	18.2	82.8	19.4
	28	45.4	13.1	56.7	15.0	65.2	16.5	71.5	17.5
	26	40.5	12.3	50.6	14.2	58.1	15.5	63.7	16.4
	25	38.1	12.0	47.6	13.7	54.6	15.0	59.9	15.9
8.0	32	45.5	15.6	57.1	17.6	65.7	19.1	72.1	20.2
	28	38.3	14.5	48.0	16.2	55.2	17.4	60.6	18.3
	26	33.4	13.8	41.8	15.3	48.1	16.4	52.7	17.2
	25	30.9	13.5	38.7	14.9	44.5	15.9	48.8	16.7
Type B									
2.0	32	71.2	9.4	93.1	11.7	110.2	13.6	123.4	14.9
	28	62.8	8.6	82.0	10.7	97.1	12.3	108.6	13.5
	26	57.0	8.1	74.4	10.0	88.0	11.5	98.4	12.7
	25	54.1	7.9	70.6	9.7	83.5	11.1	93.4	12.2
5.0	32	63.9	11.0	83.8	13.0	99.5	14.6	111.6	15.8
	28	55.4	10.3	72.6	12.0	86.1	13.4	96.5	14.5
	26	49.5	9.8	64.8	11.4	76.8	12.7	86.1	13.6
	25	46.6	9.6	60.9	11.1	72.3	12.3	80.9	13.2
8.0	32	55.3	12.8	72.7	14.5	86.5	15.8	97.1	16.9
	28	46.7	12.1	61.3	13.5	72.8	14.7	81.7	15.6
	26	40.7	11.7	53.4	12.9	63.4	14.0	71.2	14.8
	25	37.7	11.4	49.5	12.6	58.8	13.6	65.9	14.4

Air inlet state: 32°C / 40 % r.h., 28°C / 47 % r.h.
26°C / 49 % r.h., 25°C / 50 % r.h.

Note: min. evaporation temperature 2°C.

Washer / Vapour humidifier element KG 160 Standard

Washer element



Casing
Plastic (glass fibre reinforced plastic)

Inspection door and connections
in air direction right or left

Equipment
Block pump 2,2 kW, 230/400 V, Δ/Y; 8,5/4,9 A, 50 Hz;
Pump housing made of grey cast iron;
Rotor wheel and shaft made of stainless steel
Nozzle holder with self-cleaning nozzles spraying against air flow
Washer basin with all-round inclination towards the drain connector
Pump with complete piping on suction and pressure side, dry-run protection for pump.
De-sludging system
Inspection door with inspection window
Flow rectifier
Mist eliminator
} temperature-resistant to 70°C, dismantable

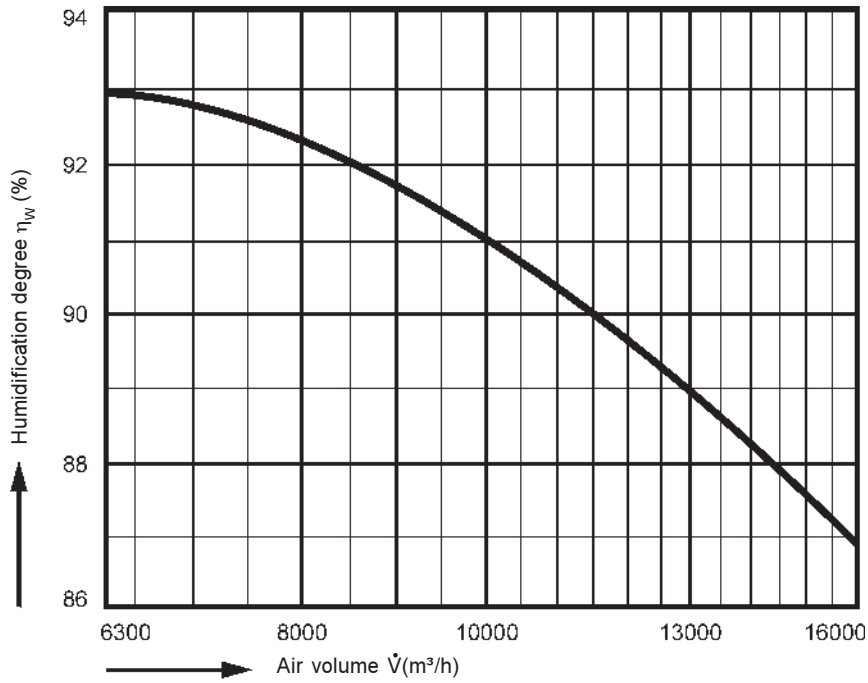
Inlet device, male thread 3/4", with float valve and float, overflow spout DN 40, outlet chute DN 40.
On request: lighting 230 V / 60 W, darkening for inspection window.
Drain and overflow device with siphon on the inside, thermometer, pressure gauge

Humidification degree η_W

$$\eta_W = \frac{x_2 - x_1}{x_s - x_1}$$

x = water content of air
Index 1 = air inlet
2 = air outlet
S = saturation state

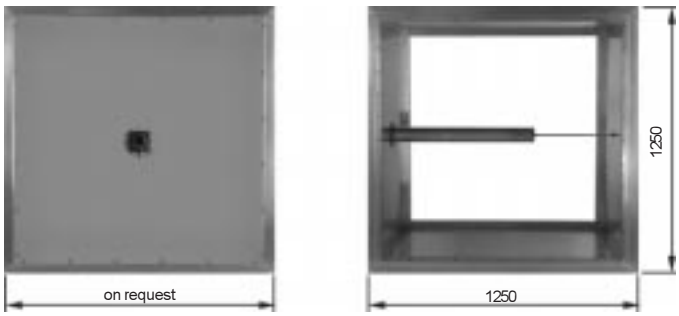
with air temperature 20°C, density 1.2 kg/m³, water pressure 2.3 bar, quantity of water 15100 l/h



Vapour humidifier element

suitable for vapour lances of different manufacturers

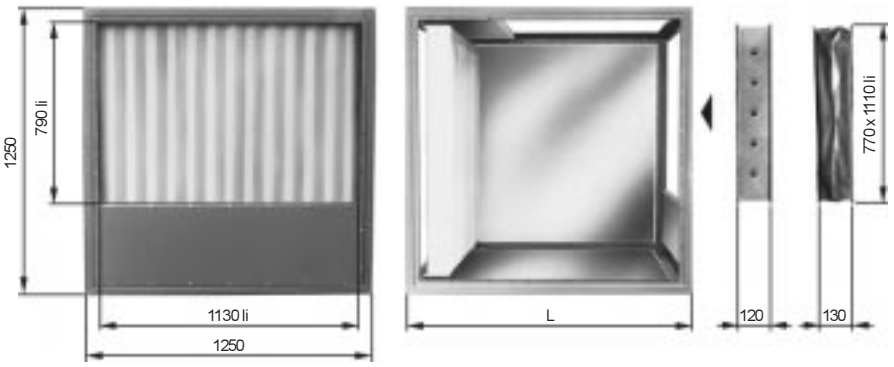
Design:
- Galvanised outer and inner surfaces,
- Inspection door
- Basin with drain 1¼" male thread made of corrosion-resistant material
- Length variable



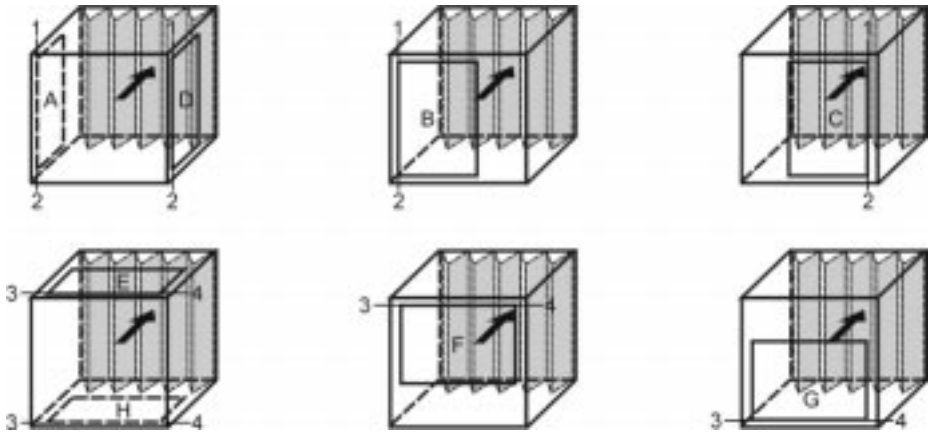
On request:
- inspection hole Ø 150mm
- Inside light

Filter/air mixture element combined **L = 1250 mm**

Air mixture element/ exhaust air element **L = 910 mm**



Suction variations:



One external flap		Two external flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + B	1, 2
B	1, 2	A + C	1, 2
C	1, 2	A + D	1, 2
D	1, 2	B + D	1, 2
E	3, 4	C + D	1, 2
F	3, 4	E + F	3, 4
G	3, 4	E + G	3, 4
H	3, 4	E + H	3, 4
		F + H	3, 4
		G + H	3, 4

One internal flap		Two internal flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + C	1, 2
B	1, 2	A + D	1, 2
C	1, 2	B + D	1, 2
D	1, 2	E + G	3, 4
E	3, 4	E + G	3, 4
F	3, 4	F + H	3, 4
G	3, 4		
H	3, 4		

Drive torque for 1 flap 6 Nm (airtight flap according to DIN 1946: 34 Nm)

Inspection door:

in air direction right or left
erforderlicher Platz für Filterauszug: min. 0.7 m
for air mixture element/exhaust air element inspection door only on request in air direction right/left

Fan element

L 1600
W 1600
H 1600

L 1600
W 1600
H 1600

Heater element

L* 340/500
W 1600
H 1600

Cooling element

L 540
W 1600
H 1600
vertical L 1000

Washer element

L 1000
W 1600
H 1850

Mixing and filter el.

L 1600
W 1600
H 1600

Mixing and exhaust air element

L 1090
W 1600
H 1600

Short filter element

L 340
W 1600
H 1600

Sleeve filter element

L 1090
W 1600
H 1600
Sl. fi. short L 540

Silencer element

L
W 1600
H 1600

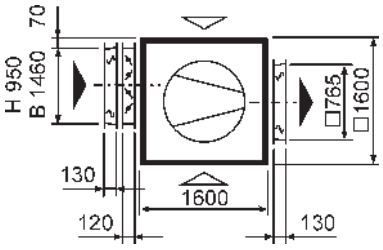
Empty element / vapour humidifier empty element

L .....
W 1600
H 1600

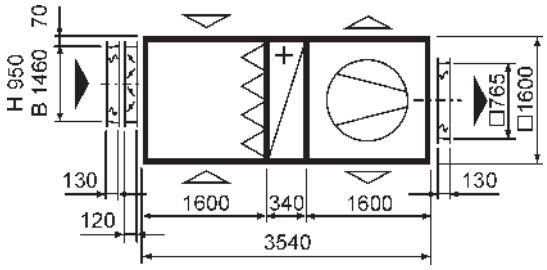
KGX

L 1600
W 1600
H 1600

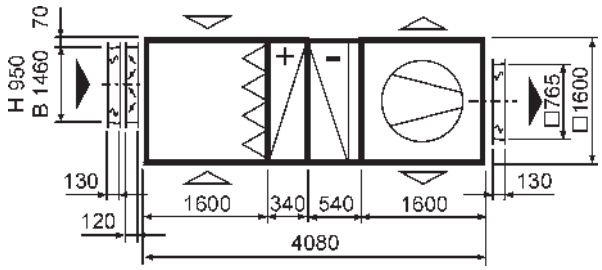
Withdrawn air device



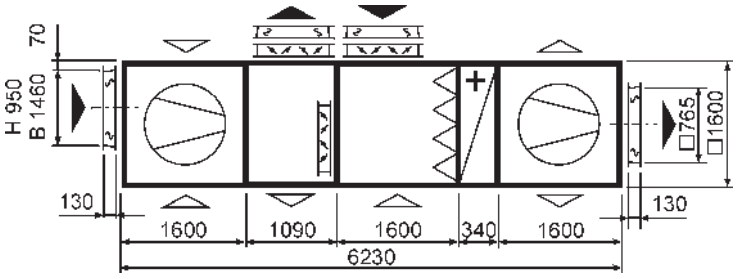
Supply air device



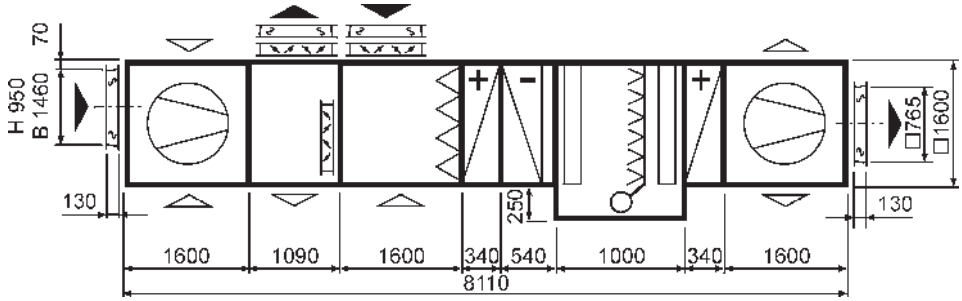
Partial air conditioner



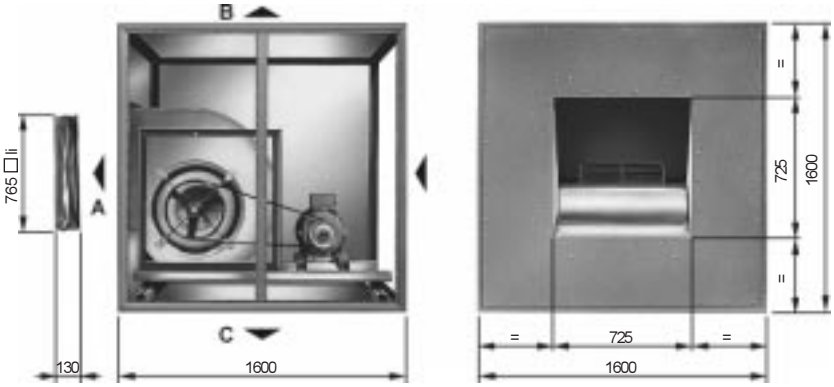
Combined supply and withdrawn air device



Combined climate control, supply and withdrawn air device

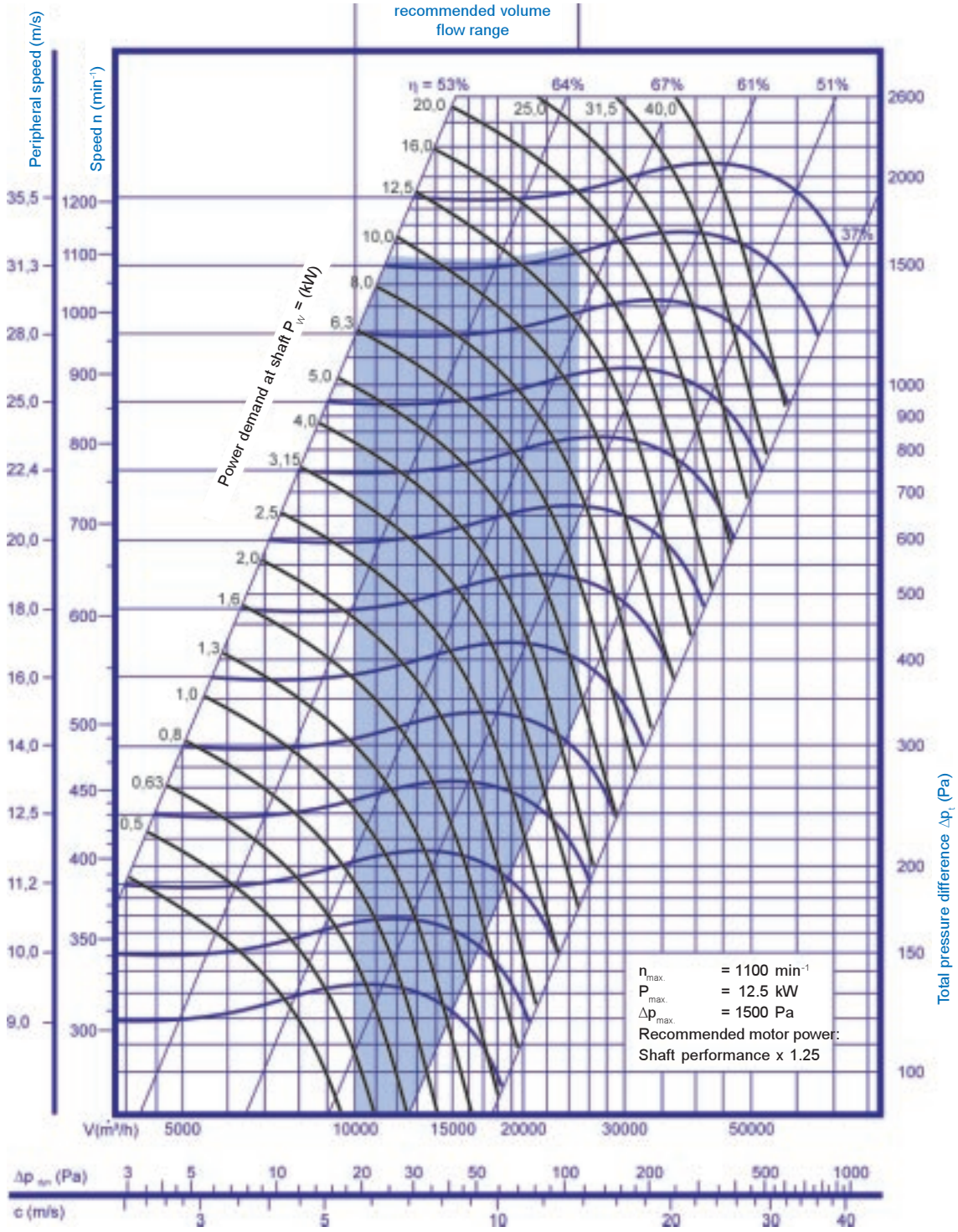


* with extractable frost protection frame L = 500



Fan diagram

Forward rotor blades



With respect to fan exhaust air cross section

Exhaust variation: A, B, C

Fan/motor: mounted on sturdy base frame
Base frame with vibration absorbers, flexibly mounted
Elastic connection between fan exhaust and casing

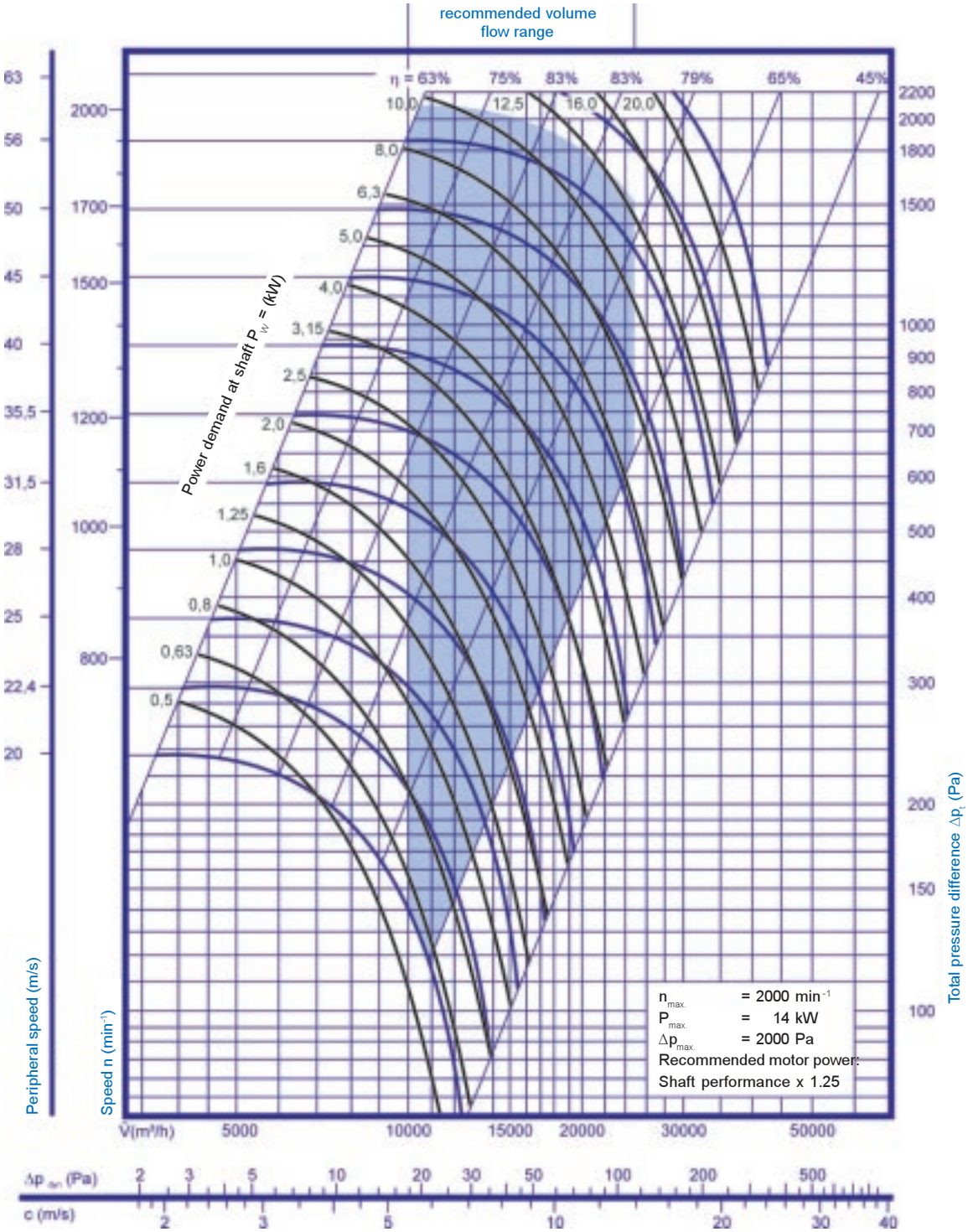
Inspection door: in air direction right, left, with turn locks

Withdrawn air device: Construction such as fan element, flap arrangement in accordance with connection and suction variations

Flaps on the inside E and F possible

Fan diagram

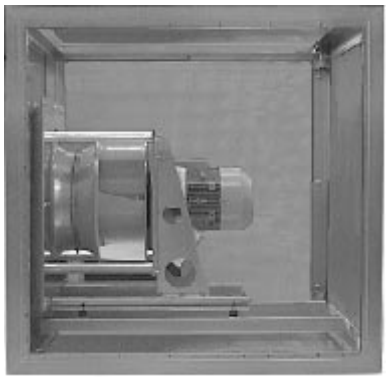
Backward rotor blades



With respect to fan exhaust air cross section

Freilaufendes Ventilatorrad KG 250 Standard

Description



Free-running fan wheel, unidirectional suction, with backward rotor blades, attached directly to the motor shaft.

Complete unit mounted on sturdy base frame with flexible vibration absorbers.

Rotor wheel statically and dynamically balanced. Complete motor protection with built-in PTC thermistors.

High fan efficiency even at low speed, almost without dynamic pressure ratios.

In connection with frequency converter, accurate adaptation to unit characteristics is possible.

Economical and energy-saving operation even under partial load conditions.

Low maintenance costs, no drive belt losses, no retightening required.

External pressure drops

Customer specification of the installation side pressure drops (e.g. duct system).

Internal pressure drops

The pressure drops of all components with respect to the volume flow (also fan element) are listed in the pressure drop tables of the individual chapters.
For components on the pressure-side, neither flow distributors nor incident flow elements are required, since the exhaust flows through the entire cross section.

Dynamic pressure drops

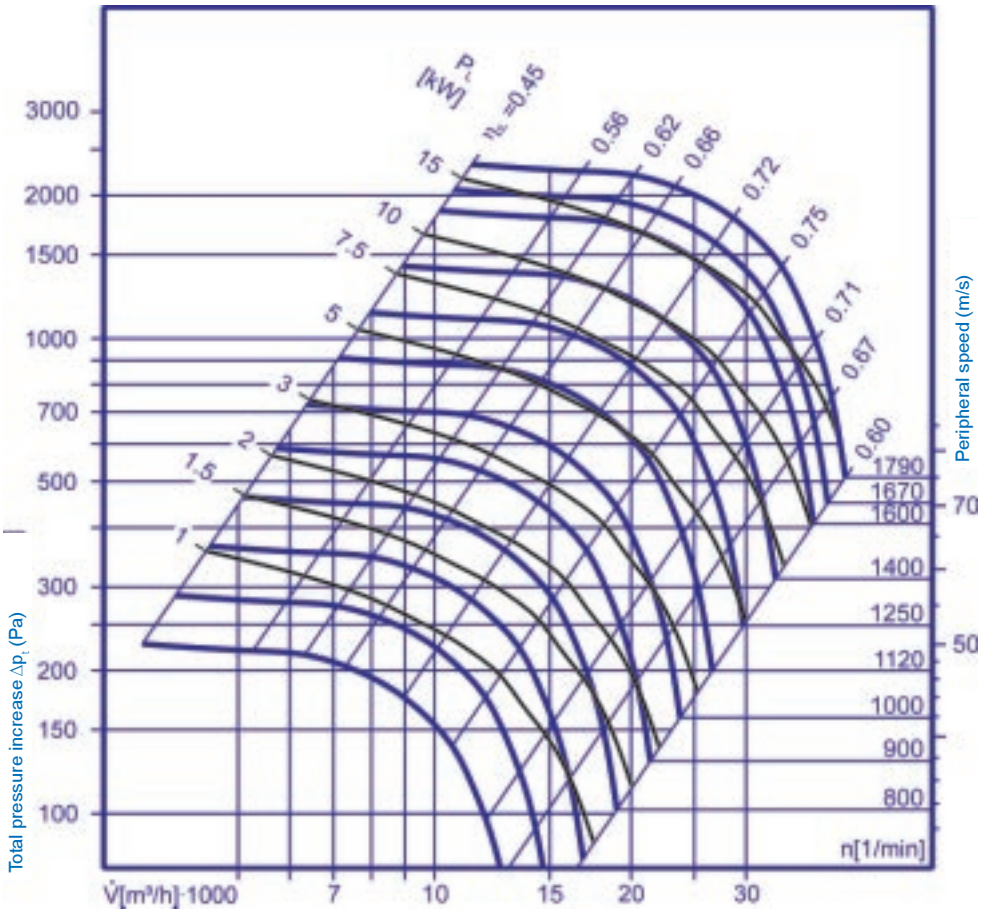
The dynamic pressure portions do not have to be considered in planning.

Performance data

KG size	Max. air volume m³/h	Total pressure increase to Pa	Operational data * Fan power kW	Operational data * Fan speed min⁻¹	Standard data * Motor power kW	Standard data * Motor speed min⁻¹	Standard data * Motor current A
KG 250	25000	500 1000 1500	5.61 10.24 15.74	1205 1429 1626	7.50 15.00 18.50	1000 1500 1500	17.50 28.50 35.00

* Fan speed is controlled by frequency converter (f ≥ 50Hz)

Fan diagram
Rotor wheel Ø 900 mm



Total sound power level L_W in [dB]

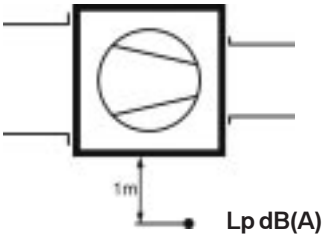
The accurate, device-specific sound data can be determined only for the specific order.

Lw [dB] = the computational total sound power of the fan on the suction/pressure-side.

		Total pressure increase Δp [Pa]					
	L_w	500	750	1000	1250	1500	2000
$\dot{V}$ [m³/h]	15000	95	99	101	103	105	107
	20000	97	101	103	105	106	109
	25000	98	101	104	106	107	110

Sound pressure level Lp dB(A)

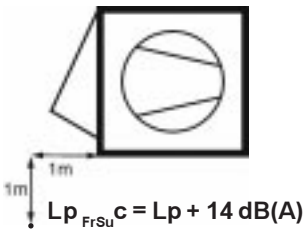
Lp dB(A) = sound pressure level at 1 m distance beside the fan element, measured in the free field with suction and pressure-side duct connection



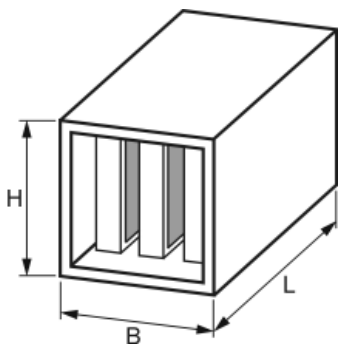
Forward rotor blades								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
15,000	400	45	20,000	450	51	25,000	500	55
	500	46		560	51		630	56
	630	50		710	53		800	57
	800	55		900	58		1000	60
Backward rotor blades								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
15,000	1120	53	20,000	1120	53	25,000	1400	57
	1400	58		1400	58		1600	61
	1800	65		1800	64		1800	64
	2000	68		2000	66		2000	66
Free-running fan wheel Ø 900mm								
$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)	$\dot{V}$ m³/h	n min⁻¹	Lp dB(A)
15,000	950	55	20,000	1050	57	25,000	1200	58
	1100	59		1200	61		1300	61
	1200	61		1300	63		1400	64
	1450	65		1500	66		1600	67

Sound pressure level Lp dB(A) beside the fan element

With free suction or exhaust opening



Silencer element



Dimensions (mm)

Height H	Width B	Length L			
		Type 2	Type 3	Type 4	Type 5
1600	1600	910	1090	1390	1600

Insertion loss De dB(A)

Type	Octave band (Hz)							
	63	125	250	500	1000	2000	4000	8000
2	6	12	20	20	22	16	12	11
3	7	14	24	25	26	20	14	13
4	8	17	30	32	34	25	18	17
5	9	21	37	37	41	29	21	19

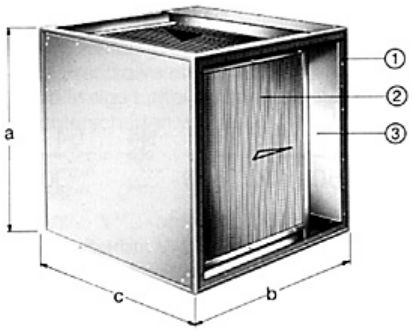
For series connection of 2 silencers: $De = De_1 + De_2 - 3$ dB(A)

Heat recovery KG 250 Standard

The accurate, device-specific heat recovery data can be determined only for the specific order.

Description KGX/KGXD

KGX air circulation horizontally/ vertically
KGXD air circulation diagonally



Hot air and cold air are led past each other in the cross current.

The heat recovery takes place via heat transmission from the hot to the cold air flow. The air flows are completely separated by aluminium plates.

- Heat recovery of up to over 80 %
- no moisture transmission
- no mobile parts, corrosion-resistant

① **Casing**
Design same as air conditioner

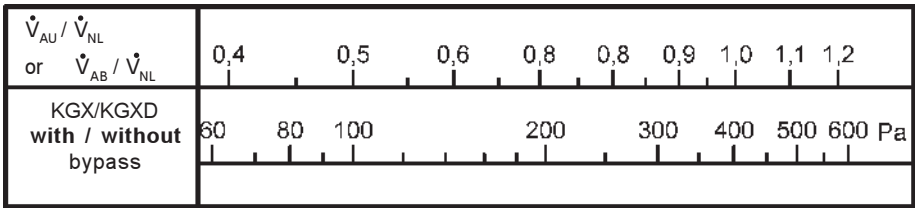
② **Heat exchanger**
Heat exchanger surfaces made of special corrosion-resistant aluminium plates.

③ **Internal bypass** (on request)
In order to prevent rime on the heat exchanger surfaces, the outside air can partially or entirely pass by the heat exchanger in the internal bypass.

Type	Nominal air volume $\dot{V}$ [m³/h]		Dimensions [mm]			Weight [kg]	Condensate connector
	without int. bypass	with int. bypass	a	b	c		R"
KGX 250	25,000	22,000	1600	1600	1040	970	-
KGXD 250	25,000	22,000	1600	1600	2400	1380	1 ¼"

Pressure drop Δp [Pa]

for KGX/KGXD
with or without internal bypass



Description RWT

RWT air circulation horizontally/vertically

A rotating storage capacity takes up heat from the withdrawn air stream and emits it to the outside air stream.

- Heat recovery of up to 80 %.
- Simple power control by adjusting the speed.
- With suitable rotor material, humidification of the supply air.
- Rime protection, defrosting device, pre-heating of air not required.
- Easy maintenance through inspection doors in the air incident flow elements.

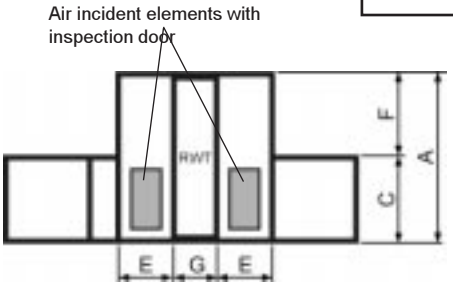
Pressure drop Δp [Pa]

Volume flow $\dot{V}$ [m³/h]	10,000	13,000	16,000	19,000	22,000	25,000
Pressure drop Δp [Pa]	55	71	90	105	120	140

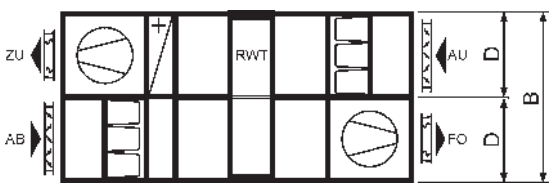
Dimensions

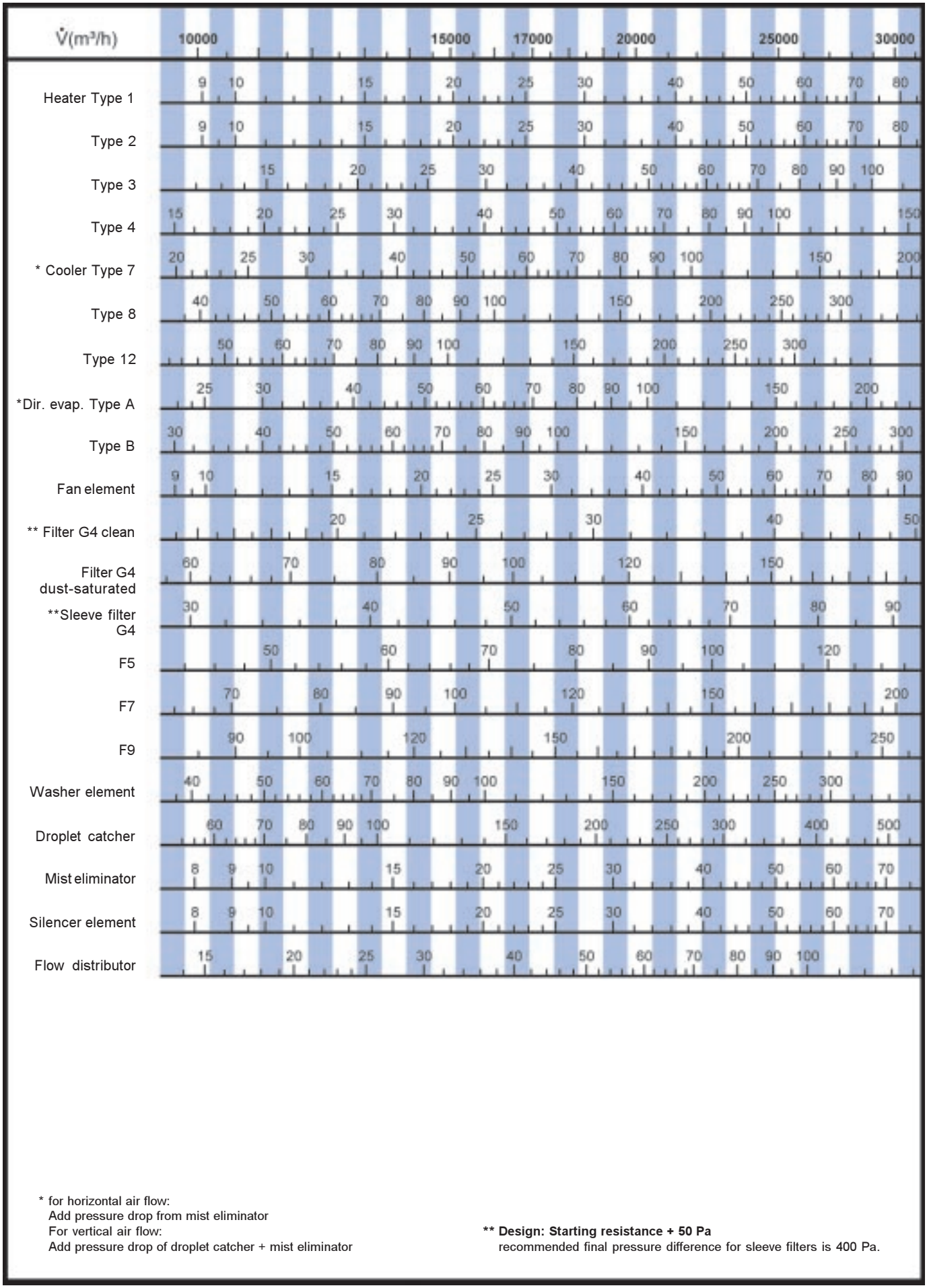
KG	A	B	C	D	E	F	G
250	2200	3200	1600	1600	600	540	440

Front view



Top view

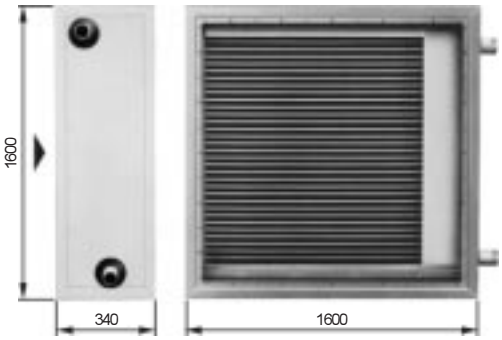




* for horizontal air flow:
Add pressure drop from mist eliminator
For vertical air flow:
Add pressure drop of droplet catcher + mist eliminator

**** Design: Starting resistance + 50 Pa**
recommended final pressure difference for sleeve filters is 400 Pa.

Heat exchanger for warm pump water PWW



Connections: in air direction right or left

Equipment:

Heat exchanger with Cu pipes and aluminium lamellas, collecting tank made of steel, alternatively copper

Type	Connections	Water content
1	1½"	12 l
2	1½"	16 l
3	2"	25 l
4	2"	25 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:

Heat exchanger with Cu pipes and corrosion-resistant aluminium lamellas

Heat exchanger with Cu pipes and Cu lamellas

Heat exchanger made of steel completely galvanised in full immersion bath

Heat exchanger for steam

Heat exchanger for hot oil

Heat exchanger with bleed and drain connectors

Note:

Allow for sufficient room for extraction of the heat exchanger.

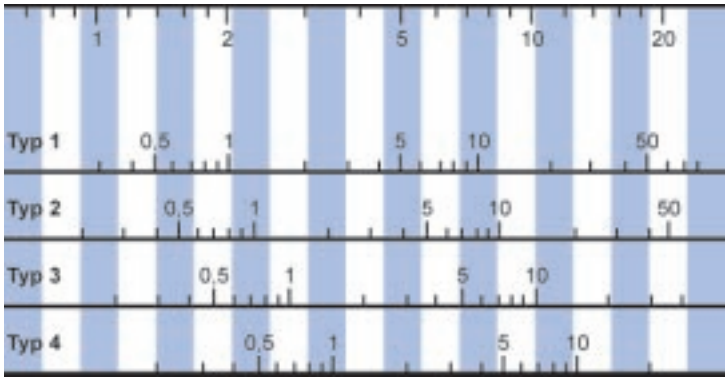
Water resistance (kPa)

Quantity of water $w = \frac{0.86 \cdot \dot{Q}}{\Delta t_W}$ (m³/h)

$\dot{Q}$ = Power in kW

$\Delta t_w = t_{WI} - t_{WO}$

Quantity of water w (m³/h)



Heater element

Type		1							
$\dot{V}$ (m³/h)		10 000		15 000		20 000		25 000	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
45/35	- 15	97.8	11	125.6	7	149.2	5	170.1	3
	- 10	87.7	14	112.6	10	133.7	8	152.3	6
	- 5	77.7	16	99.7	13	118.3	11	134.7	10
	± 0	67.9	19	87.0	16	103.1	14	117.4	13
	+ 5	58.2	22	74.4	19	88.1	18	100.2	16
	+ 10	48.7	24	62.1	22	73.4	21	83.3	20
	+ 15	39.2	27	49.8	25	58.8	24	66.7	23
	+ 20	29.8	29	37.8	28	44.4	27	50.2	26
50/40	- 15	107.6	14	138.5	9	164.7	7	187.9	5
	- 10	97.5	16	125.4	13	149.0	10	169.9	8
	- 5	87.5	19	112.4	16	133.5	13	152.2	12
	± 0	77.6	22	99.6	19	118.3	17	134.7	15
	+ 5	67.8	24	87.0	22	103.2	20	117.5	18
	+ 10	58.2	27	74.5	24	88.3	23	100.5	22
	+ 15	48.7	29	62.2	27	73.6	26	83.7	25
	+ 20	39.3	32	50.1	30	59.1	29	67.1	28
60/40	- 15	110.9	14	141.9	10	168.0	7	191.0	5
	- 10	100.8	17	128.8	13	152.4	11	173.2	9
	- 5	90.8	20	115.9	16	137.0	14	155.6	12
	± 0	80.9	23	103.1	19	121.8	17	138.2	16
	+ 5	71.2	25	90.5	22	106.7	20	121.0	19
	+ 10	61.5	28	78.0	25	91.9	23	104.0	22
	+ 15	51.9	30	65.7	28	77.2	26	87.2	25
	+ 20	42.4	33	53.4	31	62.6	29	70.6	28
70/50	- 15	130.9	20	168.0	15	199.5	11	227.2	9
	- 10	120.7	23	154.8	18	183.7	15	209.2	13
	- 5	110.6	25	141.8	21	168.1	18	191.3	16
	± 0	100.7	28	128.9	24	152.7	21	173.7	19
	+ 5	90.8	31	116.1	27	137.5	25	156.3	23
	+ 10	81.1	34	103.5	30	122.4	28	139.1	26
	+ 15	71.5	36	91.1	33	107.6	31	122.1	29
	+ 20	61.9	39	78.7	36	92.9	34	105.3	33
70/55	- 15	138.6	22	178.7	17	212.6	13	242.7	11
	- 10	128.4	25	165.4	20	196.7	17	224.4	14
	- 5	118.2	28	152.2	23	181.0	20	206.5	18
	± 0	108.2	30	139.2	26	165.5	23	188.7	21
	+ 5	98.4	33	126.4	29	150.2	27	171.2	25
	+ 10	88.6	36	113.8	32	135.1	30	153.9	28
	+ 15	79.0	38	101.3	35	120.1	33	136.8	31
	+ 20	69.4	41	88.9	38	105.4	36	119.9	34
80/50	- 15	135.1	21	172.7	16	204.4	12	232.4	10
	- 10	124.9	24	159.5	19	188.6	15	214.3	13
	- 5	114.8	27	146.4	22	173.0	19	196.5	17
	± 0	104.8	29	133.5	25	157.6	22	178.8	20
	+ 5	94.9	32	120.7	28	142.3	25	161.4	23
	+ 10	85.1	35	108.0	31	127.3	28	144.2	27
	+ 15	75.4	37	95.5	34	112.3	32	127.1	30
	+ 20	65.7	40	83.0	37	97.5	35	110.1	33
80/60	- 15	150.5	25	193.8	19	230.4	16	262.9	13
	- 10	140.2	28	180.4	23	214.5	19	244.6	16
	- 5	130.0	31	167.2	26	198.7	22	226.5	20
	± 0	120.0	34	154.2	29	183.1	26	208.7	23
	+ 5	110.1	36	141.3	32	167.7	29	191.1	27
	+ 10	100.3	39	128.6	35	152.6	32	173.7	30
	+ 15	90.6	42	116.0	38	137.5	35	156.5	34
	+ 20	81.0	44	103.6	41	122.7	38	139.5	37
90/70	- 15	169.7	30	219.1	24	260.9	20	298.0	17
	- 10	159.3	33	205.6	27	244.8	23	279.5	20
	- 5	149.1	36	192.3	30	228.9	27	261.3	24
	± 0	138.9	39	179.1	34	213.1	30	243.2	27
	+ 5	128.9	42	166.1	37	197.6	33	225.5	31
	+ 10	119.1	45	153.3	40	182.3	36	207.9	34
	+ 15	109.3	47	140.6	43	167.1	40	190.5	38
	+ 20	99.7	50	128.1	46	152.1	43	173.3	41

Other operating conditions on request!

2								3								4							
10 000		15 000		20 000		25 000		10 000		15 000		20 000		25 000		10 000		15 000		20 000		25 000	
$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
126.3	18	166.5	14	201.0	12	231.7	10	151.5	25	205.1	21	252.0	18	294.2	16	164.2	29	226.3	25	281.2	22	331.1	20
113.4	21	149.4	17	180.2	14	207.6	12	136.5	27	184.7	23	226.7	21	264.5	19	148.0	30	203.6	27	252.7	24	297.4	22
100.7	23	132.5	19	159.7	17	183.9	15	121.8	29	164.5	25	201.8	23	235.3	21	131.9	31	181.2	28	224.7	26	264.2	24
88.2	25	115.9	22	139.5	20	160.5	18	107.2	30	144.6	27	177.2	25	206.4	23	116.1	33	159.1	30	197.0	28	231.4	26
75.9	27	99.4	24	119.6	22	137.4	21	92.8	32	124.9	29	152.9	27	177.9	25	100.4	34	137.3	31	169.7	29	199.0	28
63.7	29	83.2	26	99.9	25	114.6	23	78.6	33	105.5	30	128.9	29	149.8	27	85.0	35	115.7	32	142.7	31	167.1	29
51.6	30	67.2	28	80.4	27	92.1	26	64.5	34	86.3	32	105.1	31	121.9	29	69.6	36	94.3	34	116.0	32	135.5	31
39.6	32	51.3	30	61.2	29	69.9	28	50.5	35	67.1	33	81.5	32	94.3	31	54.3	36	73.1	35	89.4	33	104.1	33
138.5	22	183.0	17	221.2	14	255.2	12	165.5	29	224.2	25	275.8	22	322.3	19	179.0	32	247.3	29	307.8	26	363.0	23
125.6	24	165.8	20	200.3	17	231.0	15	150.2	31	203.6	27	250.4	24	292.5	22	162.7	34	224.5	30	279.3	28	329.1	26
112.9	26	148.8	22	179.7	20	207.1	18	135.4	32	183.4	29	225.3	26	263.1	24	146.7	35	202.1	32	251.2	30	295.8	28
100.3	28	132.1	25	159.4	22	183.6	21	120.8	34	163.4	31	200.6	28	234.1	26	130.8	37	180.0	34	223.4	31	262.9	30
87.9	30	115.6	27	139.3	25	160.4	23	106.5	35	143.8	32	176.3	30	205.6	28	115.2	38	158.2	35	196.1	33	230.5	31
75.7	32	99.3	29	119.5	27	137.5	26	92.2	37	124.3	34	152.2	32	177.3	31	99.8	39	136.6	36	169.1	35	198.5	33
63.6	34	83.3	31	100.0	30	114.9	29	78.2	38	105.1	36	128.5	34	149.4	33	84.5	40	115.3	38	142.4	36	166.8	35
51.7	36	67.3	34	80.7	32	92.5	31	64.3	39	86.0	37	104.9	36	121.8	35	69.4	41	94.2	39	115.9	37	135.5	36
144.6	23	189.5	19	227.9	15	262.1	13	176.5	32	237.7	27	291.0	24	338.8	21	191.0	36	261.3	31	323.3	28	379.4	25
131.7	26	172.4	21	207.1	18	237.9	16	161.4	34	217.1	29	265.5	26	309.0	23	174.6	37	238.5	33	294.7	30	345.5	27
118.9	28	155.4	24	186.5	21	214.1	19	146.5	35	196.8	31	240.4	28	279.5	26	158.4	39	215.9	35	266.4	32	312.0	29
106.3	30	138.6	26	166.2	23	190.6	21	131.8	37	176.7	33	215.5	30	250.4	28	142.4	40	193.6	36	238.5	33	279.0	31
93.8	32	122.1	28	146.1	26	167.4	24	117.3	38	156.8	35	191.0	32	221.6	30	126.5	41	171.5	38	210.8	35	246.2	33
81.4	34	105.7	30	126.2	28	144.4	27	102.8	40	137.0	37	166.6	34	193.0	32	110.8	42	149.6	39	183.4	37	213.8	35
69.2	35	89.4	33	106.5	31	121.7	29	88.4	41	117.4	38	142.4	36	164.7	34	95.0	43	127.8	40	156.2	38	181.7	36
56.9	37	73.2	35	87.0	33	99.1	32	74.0	42	97.8	40	118.3	38	136.4	36	79.3	44	105.9	41	129.0	39	149.6	38
169.3	30	223.0	24	269.0	21	309.9	18	203.8	39	275.9	34	338.8	30	395.4	27	220.5	43	303.6	39	377.0	35	443.7	32
156.3	32	205.7	27	247.9	24	285.5	21	188.8	41	255.2	36	313.2	32	365.4	30	204.2	45	280.7	41	348.3	37	409.6	34
143.5	35	188.6	30	227.2	26	261.5	24	173.9	43	234.8	38	288.0	35	335.7	32	188.1	47	258.1	42	320.0	39	376.1	36
130.8	37	171.7	32	206.7	29	237.7	27	159.2	45	214.7	40	263.0	37	306.5	34	172.2	48	235.9	44	292.0	41	342.9	38
118.3	39	155.1	35	186.4	32	214.3	29	144.7	46	194.8	42	238.4	39	277.6	37	156.4	50	213.8	46	264.4	43	310.2	40
105.9	41	138.6	37	166.4	34	191.1	32	130.3	48	175.1	44	214.1	41	249.0	39	140.8	51	192.1	47	237.1	44	277.8	42
93.7	43	122.3	39	146.6	37	168.2	35	116.1	49	155.6	46	189.9	43	220.7	41	125.3	52	170.5	49	210.0	46	245.7	44
81.5	45	106.1	41	127.0	39	145.5	38	102.0	51	136.3	47	166.0	45	192.6	43	110.0	53	149.0	50	183.2	48	213.9	46
177.9	32	235.4	27	284.8	23	328.9	20	211.2	41	287.2	36	353.9	32	414.0	29	228.4	46	316.3	41	394.4	37	465.6	34
164.8	35	218.0	29	263.7	26	304.4	23	196.1	43	266.6	38	328.2	34	383.9	32	212.1	48	293.4	43	365.7	39	431.5	37
152.0	37	200.9	32	242.8	28	280.2	26	181.3	45	246.2	40	303.0	37	354.2	34	196.1	49	270.9	45	337.4	42	397.8	39
139.3	39	184.3	35	222.2	31	256.3	29	166.6	47	226.1	42	278.1	39	324.9	37	180.2	51	248.7	47	309.5	43	364.7	41
126.8	41	167.3	37	201.9	34	232.8	32	152.2	49	206.2	44	253.5	41	296.0	39	164.6	52	226.8	48	281.9	45	332.0	43
114.5	43	150.8	39	181.9	36	209.6	34	137.9	50	186.6	46	229.2	43	267.4	41	149.1	53	205.1	50	254.7	47	299.7	45
102.3	45	134.5	42	162.1	39	186.6	37	123.8	52	167.3	48	205.2	45	239.3	43	133.8	55	183.7	51	227.8	49	267.8	47
90.2	47	118.4	44	142.5	41	163.9	40	109.9	53	148.1	50	181.4	47	211.4	45	118.7	56	162.6	53	201.2	50	236.3	48
176.2	32	230.9	26	277.6	22	319.0	19	215.4	42	290.0	36	355.0	32	413.3	29	232.8	47	318.5	41	393.9	37	462.1	34
163.1	34	213.5	28	256.5	25	294.6	22	200.2	44	269.3	39	329.3	35	383.1	31	216.4	48	295.5	43	365.0	39	427.9	36
150.2	36	196.4	31	235.6	27	270.5	25	185.2	46	248.7	41	303.9	37	353.3	34	200.1	50	272.7	45	336.5	41	394.1	38
137.5	39	179.4	34	215.1	30	246.7	28	170.4	48	228.4	43	278.7	39	323.8	36	183.9	52	250.2	47	308.3	43	360.7	40
124.9	41	162.6	36	194.7	33	223.1	30	155.7	49	208.3	45	253.9	41	294.7	39	168.0	53	227.9	48	280.4	45	327.6	42
112.3	43	146.0	38	174.6	35	199.8	33	141.1	51	188.3	47	229.2	43	265.8	41	152.1	54	205.8	50	252.7	47	294.9	44
99.9	45	129.5	41	154.6	38	176.7	36	126.6	52	168.5	48	204.7	45	237.1	43	136.3	55	183.8	51	225.2	48	262.3	46
87.6	46	113.1	43	134.7	40	153.8	39	112.1	54	148.8	50	180.4	47	208.5	45	120.5	56	161.9	52	197.8	50	230.0	48
193.4	36	255.7	30	309.1	26	356.8	23	230.3	46	313.8	40	385.4	36	450.7	33	249.0	51	344.3	46	429.1	42	506.2	39
180.3	39	238.2	33	287.9	29	332.2	26	215.3	48	292.3	43	359.7	39	420.4	35	232.7	53	321.5	48	400.3	44	471.9	41
167.4	41	221.0	36	267.0	32	307.9	29	200.4	50	271.8	45	334.3	41	390.6	38	216.6	55	298.9	50	371.9	46	438.2	43
154.7	43	204.0	38	246.3	35	283.9	32	185.7	52	251.7	47	309.3	43	361.2	41	200.7	56	276.6	52	343.9	48	405.0	45
142.1	46	187.3	41	225.9	37	260.3	35	171.2	54	231.7	49	284.6	46	332.2	43	185.0	58	254.6	53	36.2	50	372.1	48
129.7	48	170.7	43	205.8	40	236.9	38	156.9	56	212.1	51	260.2	48	303.5	45	169.5	59	232.9	55	288.9	52	339.7	50
117.5	50	154.3	45	185.9	42	213.8	40	142.7	57	192.6	53	236.1	50	275.2	48	154.2	61	211.4	57	261.9	54	307.6	51
105.3	52	138.1	48	166.2	45	191.0	43	128.7	59	173.3	55	212.2	52	247.1	50	139.0	62	190.1	58	235.2	55	275.9	53
216.8	42	287.7	36	348.5	31	402.8	28	256.1	53	349.2	47	431.0	42	504.8	39	276.4	58	383.8	53	479.6	49	566.9	45
203.7	45	270.1	39	327.1	34	378.0	31	241.0	55	328.4	49	405.1	45	474.3	41	260.1	60	360.9	55	450.7	51	532.5	48
190.7	48	252.7	41	306.0	37	353.5	34	226.1	57	307.9	52	379.6	47	444.4	44	244.0	62	338.3	57	422.2	53	498.7	50
178.0	50	235.6	44	285.2	40	329.3	37	211.4	59	287.7	54	354.5	50	414.8	47	228.1	64	316.0	59	394.1	55	465.3	52
165.4	52	218.8	47	264.6	43	305.5	40	196.9	61	267.7	56	329.7	52	385.6	49	212.5	66	294.0	61	366.5	57	432.3	54
152.9	54	202.1	49	244.3	46	281.9	43	182.5	63	248.0	58	305.2	54	356.8	51	197.1	67	272.3	63	339.1	59	399.8	57
140.6	57	185.7	52	224.3	48	258.7	46	168.4	65	228.5	60	281.0	57	328.4	54	181.8	69	250.9	64	312.1	61	367.7	59
128.5	59	169.4	54	204.5	51	235.7	48	154.4	66	209.2	62	257.1	59	300.2	56	166.7	70	2229.6	66	285.4	63	336.0	60

Exchanger for cold pump water PKW / direct evaporator

Performance data for direct evaporator for cooling agent R134a, for other cooling agents on request.

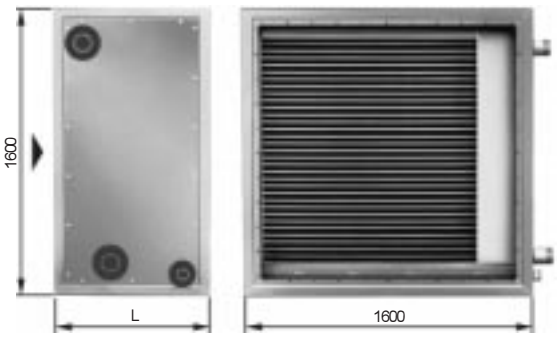


fig. Exchanger for cold water

Air direction: horizontal for type 7 and 8: L = 540
horizontal for type 12 L = 830
vertical: L = 1000 mm

Connections: in air direction right or left

Equipment:

Exchanger for cold water with Cu pipes and aluminium lamellas, collecting tank made of steel.

Direct evaporator with Cu pipes and aluminium lamellas, cooling agent distributor.

Mist eliminator, condensate basin with condensate connector on side, male thread 1¼", droplet catcher for air direction vertical.

Type	Connections	Contents
7	3"	44 l
8	3"	75 l
12	2"	96
A	DN 35 cooling agent inlet DN 60 cooling agent outlet	42 l
B	DN 42 cooling agent inlet DN 60 cooling agent outlet	59 l

Permissible operating pressure: 16 bar
Test pressure 30 bar

on request:

Exchanger for cold water with Cu pipes

and corrosion-resistant aluminium lamellas

Exchanger for cold water with Cu pipes and Cu lamellas

Exchanger for cold water with bleed and drain connector

Note:

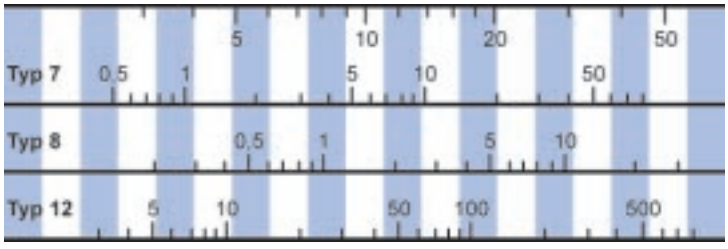
Allow for sufficient room for extraction of the exchanger.
Build in siphon on site with the condensate connector.

Water resistance (kPa)

Quantity of water $w = \frac{0.86 \cdot \dot{Q}}{\Delta t_w}$ (m³/h)

$\dot{Q}$ = Power in kW
$\Delta t_w = t_{WI} - t_{WO}$

Quantity of water w (m³/h)



$\dot{V}$ (m³/h)		10 000		15 000		20 000		25 000	
t_{WI} / t_{WO} °C / °C	t_{AI} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C	$\dot{Q}$ kW	t_{AO} °C
Exchanger for cold water type 7									
4/8	32	107.7	10.6	147.7	12.4	183.1	13.7	215.0	14.8
	28	91.8	10.1	125.4	11.7	155.0	12.8	181.8	13.7
	26	81.9	9.6	111.9	11.0	138.4	12.1	162.3	12.9
	25	77.0	9.4	105.2	10.7	130.1	11.7	152.5	12.5
5/10	32	99.0	11.7	135.3	13.4	167.4	14.7	196.4	15.7
	28	83.0	11.3	113.0	12.7	139.4	13.8	163.2	14.6
	26	73.1	10.8	99.5	12.1	122.7	13.0	143.6	13.8
	25	68.1	10.5	92.7	11.7	114.4	12.7	133.9	13.4
6/12	32	89.9	12.8	122.7	14.4	151.5	15.6	177.5	16.5
	28	73.9	12.3	100.3	13.7	123.5	14.7	144.3	15.5
	26	64.0	11.8	86.7	13.0	106.7	13.9	124.7	14.6
	25	59.0	11.6	80.0	12.7	98.4	13.5	114.9	14.2
Type 8									
4/8	32	129.1	6.5	184.3	7.6	235.2	8.6	282.6	9.5
	28	111.2	6.5	158.1	7.5	201.1	8.4	241.1	9.2
	26	99.2	6.3	140.9	7.3	179.3	8.1	214.9	8.8
	25	93.2	6.2	132.4	7.2	168.4	7.9	201.8	8.6
5/10	32	119.4	7.7	169.9	8.9	216.1	9.8	259.1	10.7
	28	101.4	7.7	143.4	8.8	181.9	9.6	217.6	10.4
	26	89.3	7.6	126.2	8.5	159.9	9.3	191.3	9.9
	25	83.2	7.5	117.6	8.4	149.0	9.1	178.1	9.7
6/12	32	109.2	8.9	154.7	10.1	196.3	11.0	234.9	11.8
	28	90.9	9.0	128.1	10.0	161.9	10.8	193.2	11.5
	26	78.7	8.8	110.7	9.7	139.8	10.4	166.7	11.0
	25	72.6	8.7	102.0	9.6	128.8	10.3	153.5	10.8
Type 12									
4/8	32	137.0	4.6	200.8	5.1	261.8	5.5	320.0	6.0
	28	119.5	4.6	174.8	5.0	227.3	5.5	277.4	5.9
	26	107.3	4.5	157.0	5.0	204.1	5.4	249.1	5.8
	25	101.3	4.5	148.1	4.9	192.5	5.3	235.0	5.7
5/10	32	129.1	5.8	188.9	6.3	245.8	6.8	300.1	7.2
	28	111.5	5.8	162.6	6.3	211.0	6.7	257.1	7.1
	26	99.2	5.8	144.6	6.2	187.7	6.6	228.7	7.0
	25	93.1	5.8	135.7	6.2	176.0	6.6	214.4	6.9
6/12	32	120.7	7.1	176.2	7.6	228.9	8.1	279.2	8.5
	28	102.9	7.1	149.7	7.6	193.8	8.0	235.8	8.4
	26	90.5	7.1	131.5	7.6	170.2	7.9	207.0	8.3
	25	84.2	7.2	122.4	7.5	158.4	7.9	192.6	8.2
Ev. temp. °C		**Direct evaporator type A**							
2.0	32	91.1	13.2	112.9	15.9	128.6	17.7	140.5	19.1
	28	79.9	12.0	98.8	14.3	112.3	16.0	122.6	17.2
	26	72.2	11.3	89.1	13.4	101.2	14.9	110.4	16.1
	25	68.4	10.9	84.3	13.0	95.7	14.4	104.4	15.5
5.0	32	80.8	14.6	100.1	16.9	113.8	18.6	124.3	19.9
	28	69.6	13.4	86.0	15.4	97.6	16.9	106.5	18.0
	26	61.9	12.7	76.3	14.5	86.6	15.9	94.4	16.9
	25	58.1	12.3	71.6	14.1	81.2	15.3	88.4	16.3
8.0	32	69.2	16.0	85.5	18.1	97.1	19.6	105.9	20.7
	28	58.0	14.8	71.5	16.6	81.1	17.9	88.3	18.8
	26	48.3	14.0	59.4	15.6	67.3	16.7	73.2	17.6
	25	46.6	13.8	57.2	15.3	64.8	16.3	70.5	17.2
Type B									
2.0	32	110.1	9.8	143.0	12.2	168.0	14.0	187.6	15.5
	28	96.9	9.1	125.4	11.2	147.1	12.8	164.1	14.0
	26	87.7	8.5	113.3	10.5	132.7	12.0	147.9	13.2
	25	83.1	8.3	107.4	10.1	125.7	11.6	140.0	12.7
5.0	32	97.8	11.5	126.9	13.6	148.9	15.2	166.2	16.5
	28	84.6	10.8	109.3	12.6	128.0	14.0	142.7	15.1
	26	75.3	10.3	97.2	11.9	113.7	13.2	126.7	14.2
	25	70.8	10.0	91.3	11.6	106.7	12.8	118.7	13.8
8.0	32	83.9	13.3	108.6	15.1	127.2	16.5	141.8	17.6
	28	70.6	12.6	91.1	14.1	106.5	15.3	118.5	16.3
	26	61.4	12.1	79.1	13.4	92.3	14.5	102.7	15.4
	25	56.8	11.8	73.1	13.1	85.3	14.1	94.8	15.0

Air inlet state: 32°C / 40 % r.h., 28°C / 47 % r.h.
26°C / 49 % r.h., 25°C / 50 % r.h.

Note: min. evaporation temperature 2°C.

Washer / Vapour humidifier element KG 250 Standard

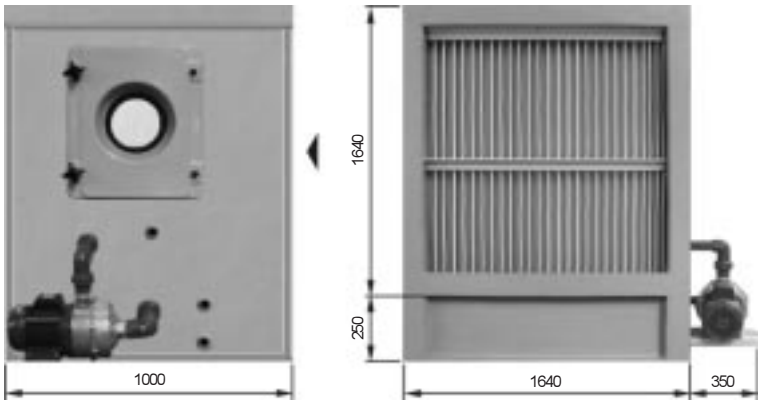
Washer element

Casing
Plastic (glass fibre reinforced plastic)

Inspection door and connections
in air direction right or left

Equipment
Block pump 4.0 kW, 230/400 V, Δ, 8.5 A,
50 Hz; Pump housing made of grey cast iron;
Rotor wheel and shaft made of stainless steel
Nozzle holder with self-cleaning nozzles spraying against air flow
Washer basin with all-round inclination towards the drain connector
Pump with complete piping on suction and pressure side, dry-run protection for pump.
De-sludging system
Inspection door with inspection window
Flow rectifier
Mist eliminator
} temperature-resistant to 70°C, dismantable

Inlet device, male thread 3/4", with float valve and float, overflow spout DN 40, outlet chute DN 40.
On request: lighting 230 V / 60 W, darkening for inspection window.
Drain and overflow device with siphon on the inside, thermometer, pressure gauge

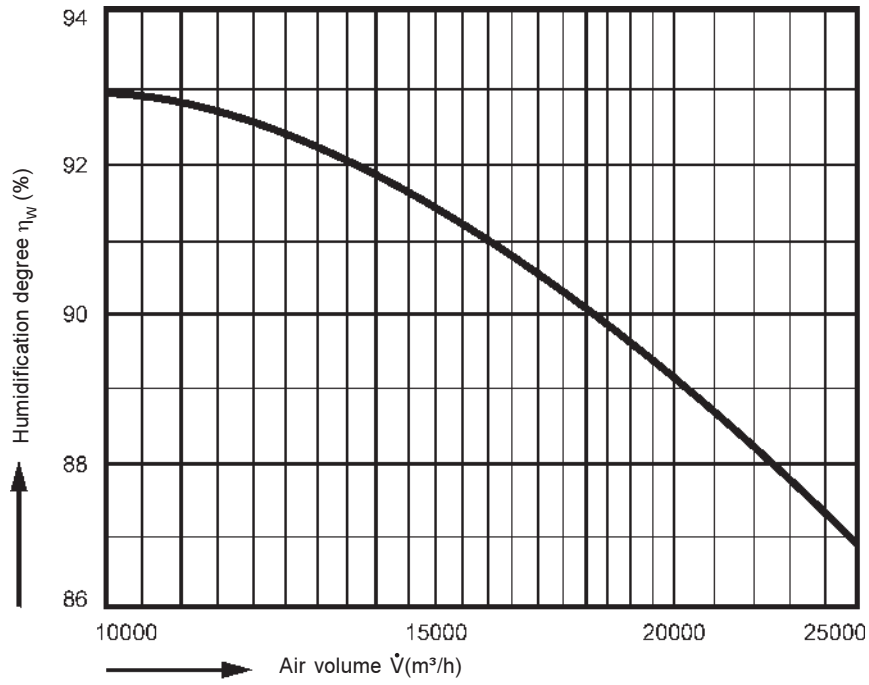


Humidification degree η_W

$$\eta_W = \frac{x_2 - x_1}{x_s - x_1}$$

Index
x = water content of air
1 = air inlet
2 = air outlet
S = saturation state

with air temperature 20°C, density 1.2 kg/m³, water pressure 2.3 bar, quantity of water 15100 l/h

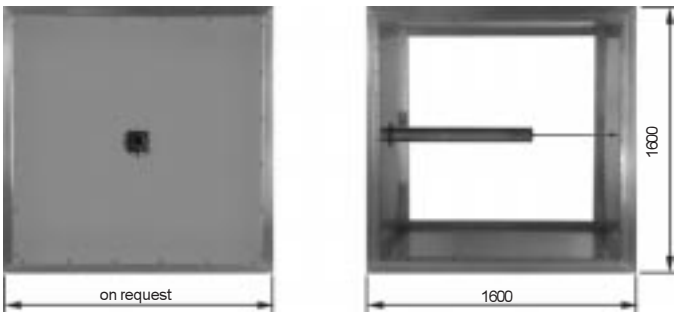


Vapour humidifier element

suitable for vapour lances of different manufacturers

Design:
- Galvanised outer and inner surfaces,
- Inspection door
- Basin with drain 1¼" male thread made of corrosion-resistant material
- Length variable

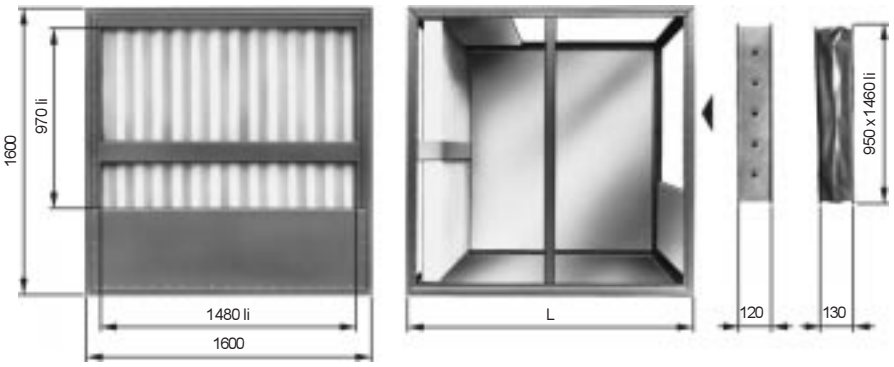
On request:
- inspection hole Ø 150mm
- Inside light



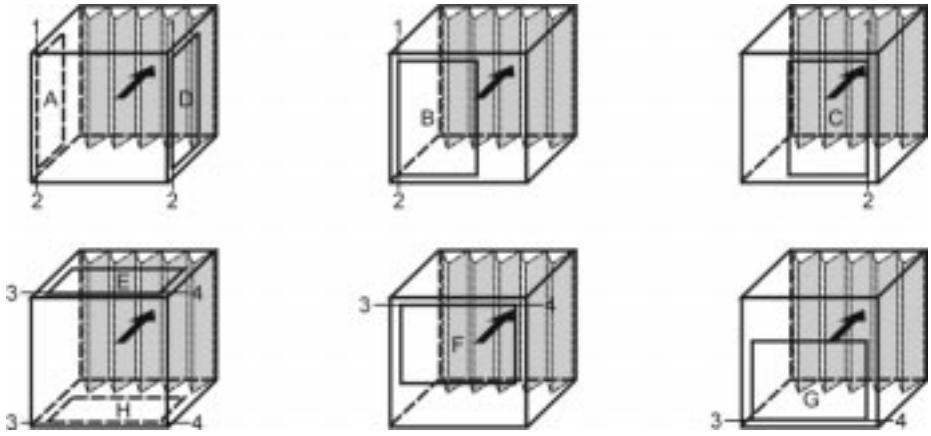
Connection and suction variations KG 250 Standard

Filter/air mixture element combined L = 1600 mm

Air mixture element/ exhaust air element L = 1090 mm



Suction variations:



One external flap		Two external flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + B	1, 2
B	1, 2	A + C	1, 2
C	1, 2	A + D	1, 2
D	1, 2	B + D	1, 2
E	3, 4	C + D	1, 2
F	3, 4	E + F	3, 4
G	3, 4	E + G	3, 4
H	3, 4	E + H	3, 4
		F + H	3, 4
		G + H	3, 4

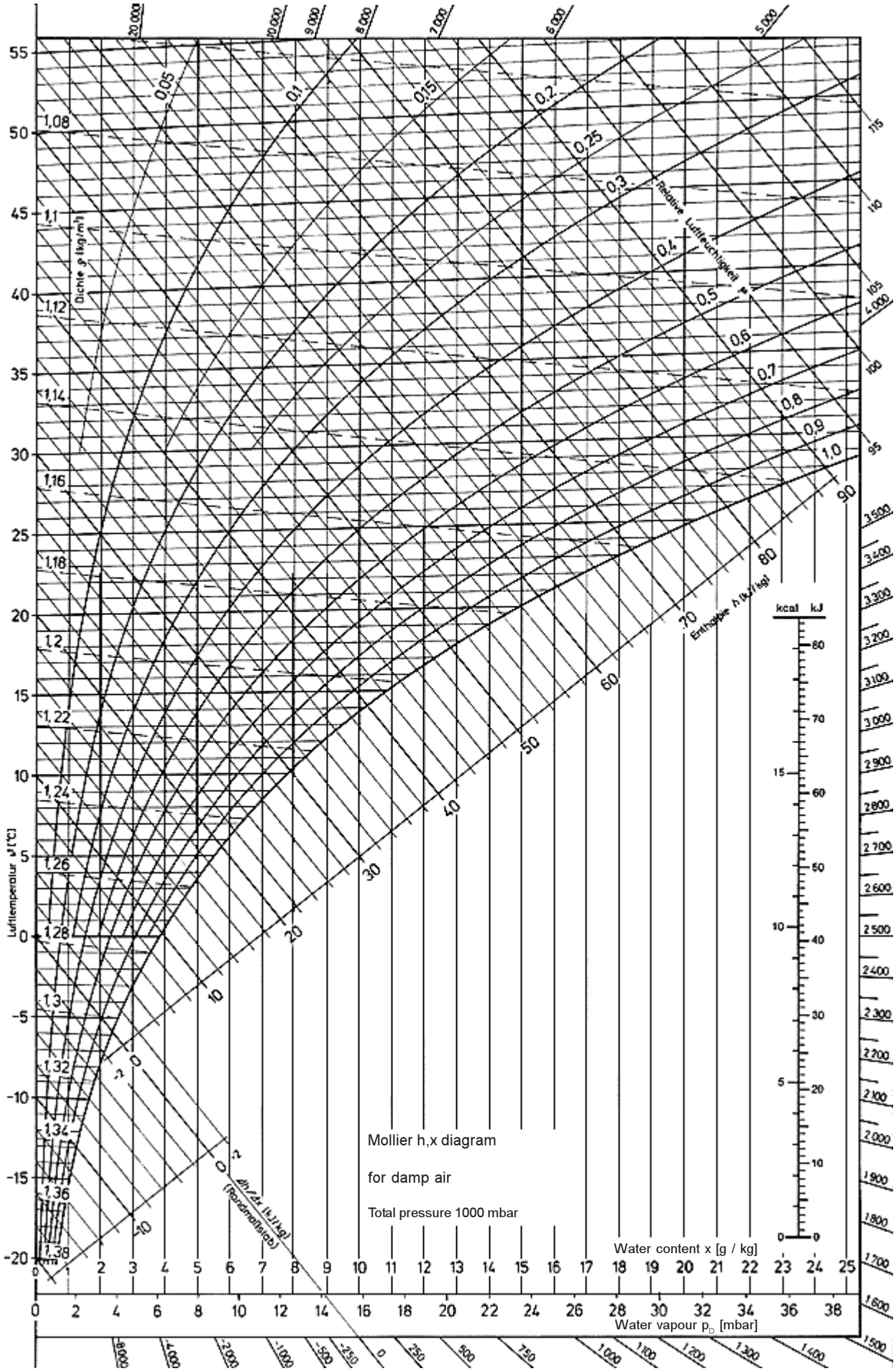
One internal flap		Two internal flaps joined with linkage.	
Flap arrangement	Flap drive	Flap arrangement	Flap drive
A	1, 2	A + C	1, 2
B	1, 2	A + D	1, 2
C	1, 2	B + D	1, 2
D	1, 2	E + G	3, 4
E	3, 4	E + G	3, 4
F	3, 4	F + H	3, 4
G	3, 4		
H	3, 4		

Drive torque for 1 flap 6 Nm (airtight flap according to DIN 1946: 54 Nm)

Inspection door:

in air direction right or left
required space for filter extraction: min. 0.8 m
for air mixture element/exhaust air element inspection door only on request in air direction right/left

h, x diagram


Mollier h,x diagram
for damp air
Total pressure 1000 mbar
Water content x [g / kg]
Water vapour p_D [mbar]
Luftlemperatur ϑ [°C]
Enthalpie h [kJ/kg]
Dichte ρ [kg/m³]
Relative Luftfeuchtigkeit
kcal kJ