

JAGA AVS® UNIT HEATER

AIR VENTURI SYSTEM INCLUDED

The Jaga unit heater is the master of air flow. Even in the biggest spaces.

Its secret weapon? The Air Venturi System, which immediately blends heated air with the ambient air.

The result: faster heating, better temperature distribution, lower energy consumption. Talk about great results!



jaga

PRESENTING JAGA AVS® UNIT HEATER



RESPECT
NATURE



JAGA UNIT HEATER FEATURING JAGA'S AIR VENTURI SYSTEM **AVS**®

NEW COLLECTION WITH EC MOTORS
UNIQUE AIR VENURI SYSTEM
EXTREMELY ENERGY EFFICIENT
FINE TUNING

FASTER HEATING UP

All Jaga unit heaters are equipped with our unique Air Venturi System as standard. The result is a lower exhaust temperature combined with an equal capacity which create a significant improvement in the heat carrying capacity and the temperature distribution. This system offers a number of additional and innovative control options.

LOWER ENERGY CONSUMPTION

The AVS® system facilitates improved temperature distribution, which means that the running times are reduced, saving energy.



LOW-H₂O HEAT EXCHANGER

Heat exchanger made from aluminium fins placed on mechanically expanded copper tubes, which are connected to steel collectors. The ideal combination of these materials guarantees optimum heat conductivity.

5 Sizes of heat exchangers with 2 or 3 rows of pipes.
Heat output from 4.5 up to 78.6 kiloWatts at ΔT 50.

ATTRACTIVE FINISH

A totally new construction with no visible screws or rivets. A high quality sandblasted grey lacquered (001) scratch resistant and dirt repellent finish. Aerodynamic exhaust made of satin black lacquered aluminium. Easy to install, left / right reversible.



ELECTRICITY CONSUMPTION UP TO 45% LOWER

- EC motors, highly efficient at any speed
- low-noise, up to -6 dB(A); generated by the single unit plastic HyBlade® fan combined with EC motor technology, with seamless operation of the motor and electronic switching
- low heat generation considerably extends the service life of the entire fan unit

SIMPLE INSTALLATION AND CONTROL

- 0-10 VDC variable control
- an expensive switching box for power supply control and/or frequency control is not necessary
- virtually maintenance free because the absence of carbon brushes



HEATED INDIRECTLY

- no exhaust fumes
- higher efficiency
- better control
- safer

NUMEROUS APPLICATIONS

Ideal for industrial spaces, sports halls, warehouses, garages, department stores, greenhouses, conservatories, exhibition halls, supermarkets, shopping centres, and any large spaces that are used only occasionally, and that need to be heated up quickly.

JAGA AVS® AIR VENTURI SYSTEM: GREATER DISTRIBUTION WITH THE SAME POWER

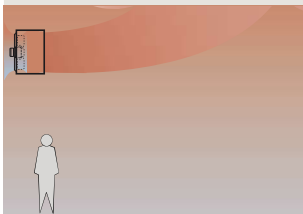
Jaga unit heaters are equipped with our unique Air Venturi System as standard. The result is a lower exhaust temperature combined for an equivalent heat output which create a significant improvement in the heat carrying capacity and the temperature distribution. The result: faster heating, better temperature distribution, lower energy consumption. Talk about great results!

Why AVS®?

The main problem with unit heaters in general is the heat accumulation at the roof or ceiling level especially in high level roof spaces. The temperature difference between the floor and the ceiling increases in proportion to the exhaust temperature of the unit heater. The higher the exhaust temperature the faster the heated air rises, pushing the cooler down to floor level. Consequently more energy will be required to heat up the floor area in order to create a comfortable temperature. Higher air flow, lower exhaust temperature or additional fans can soften up the problem, but result in a considerable increase in cost or more noise.

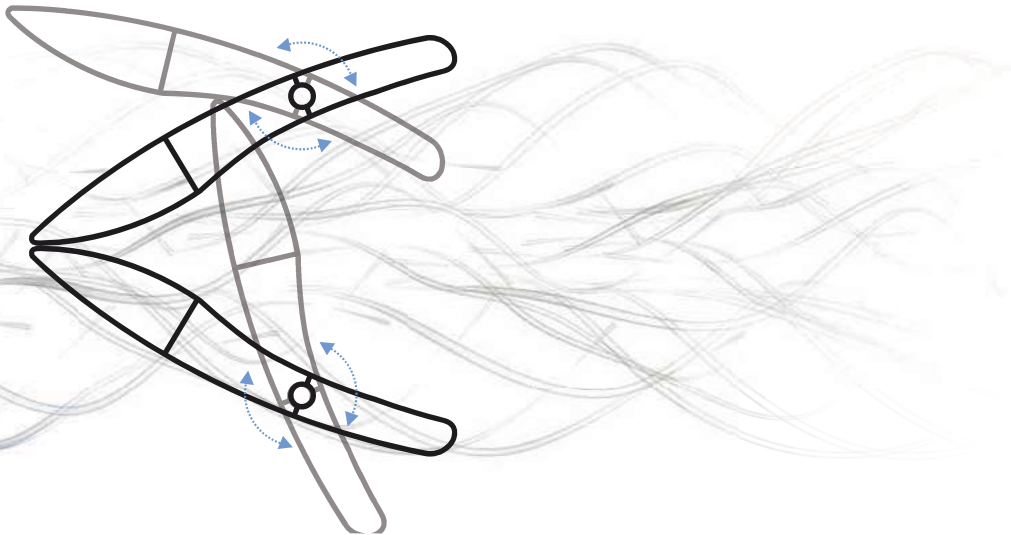
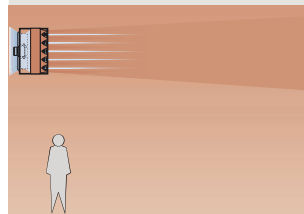
Standard unit heaters

Due to the higher air exhaust temperature the hot air will rise too quickly and the cooler air will consequently be pushed downwards.



The Jaga solution: Air Venturi System

With the Air Venturi System the air exhaust temperature is lower, which greatly reduces the up-draught giving you an even temperature, faster heating up and better energy efficiency.



JAGA AVS®: HOW DOES IT WORK

The Jaga AVS® is provided with Venturi-openings and aerodynamic adjustable exhaust louvers each of which can be adjusted separately. These adjustable louvers may be placed in a normal parallel position, but they may also be directed in pairs towards each other. In this position the exhaust opening will be reduced and due to the form of the adjustable louvers an underpressure will be created at the height of the Venturi-openings. This means that all of the ambient air will be drawn in and mixed with the heated exhaust air, resulting in a lower exhaust air temperature.

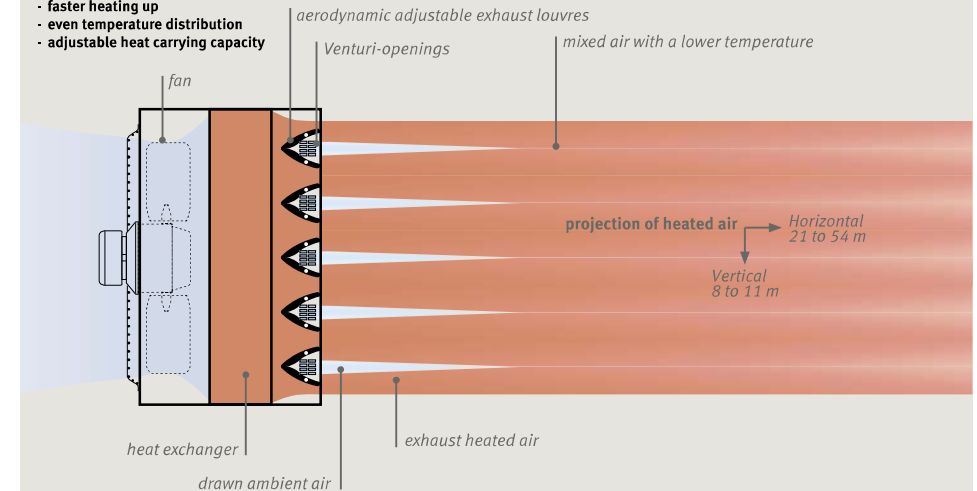
The ascending power of the air is reduced, resulting in more equal temperature. This also means that the space heats up faster.

The adjustable louvers in Venturi position

Both the exhaust direction and the heat carrying capacity are adjustable. By adding cooler ambient air the exhaust temperature will drop and a more stable air jet and larger heat carrying capacity will be obtained.

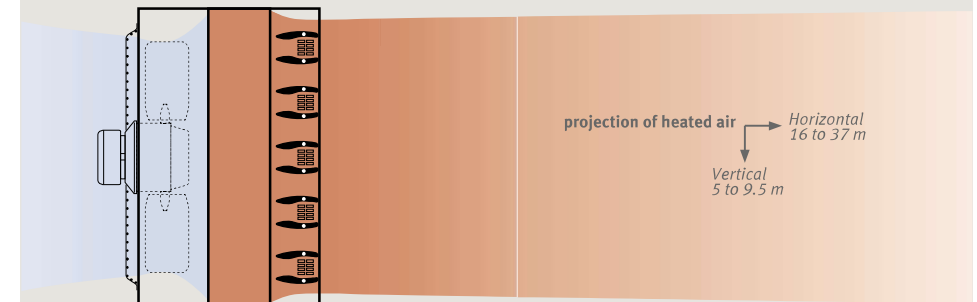
Advantages :

- higher comfort
- lower energy cost
- faster heating up
- even temperature distribution
- adjustable heat carrying capacity



The adjustable louvers in parallel position

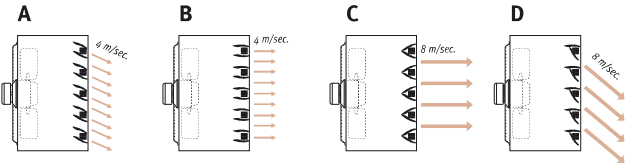
This is the normal position with typical standard unit heaters. Without special accessories it is almost impossible to adjust the air jet. Only the exhaust direction may slightly be adjusted by moving the slats.



AIR VENTURI SYSTEM®

POSITIONING

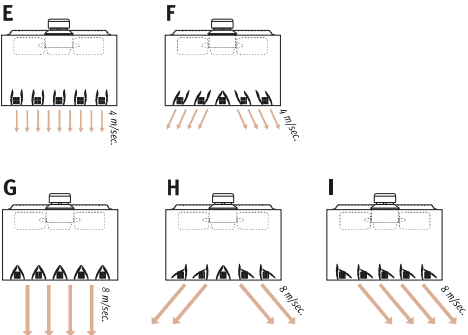
Wall mounting



HEIGHT	POSITION
2.5 to 3 m	B or C
3 to 4 m	A
> 4 m	D

Tested with unit heater 221.
For other types contact the Jaga technical department.

Ceiling design



HEIGHT	POSITION
H < Table	E or F
H = Table	G, H or I

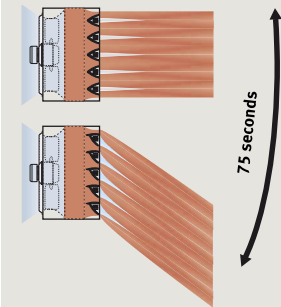
THE MODULATING AVS® VERSION

With the modulating AVS® version the exhaust louvers are linked in pairs and connected to a servo motor. This motor produces a continuous back and forth movement of the adjustable louvers. This creates turbulence and provides an even better temperature distribution. The angle of movement can easily be adjusted from 0 to 90°. A complete cycle takes around 150 seconds.

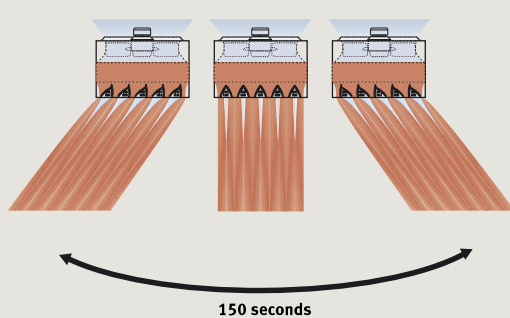
The modulating operation is integrated into the equipment and therefore cannot be delivered as an accessory.

Mini unit heater (code 021 and 031) are not available as a modulating version.

Wall mounting: position 45°

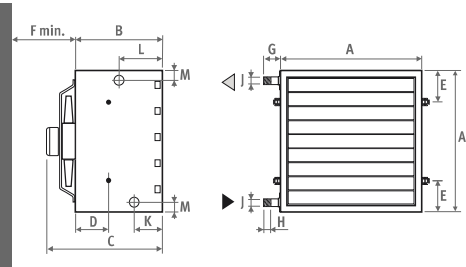


Ceiling mounting: position 90°



DIMENSIONS - HYDRAULIC CONNECTION

DIMENSIONS (in mm)

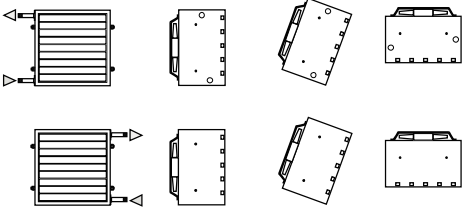


Mini unit heater										
Type	021	031	120	130	220	230	320	330	420	430
A	410	410	530	530	650	650	770	770	890	890
B	400	400	400	400	400	400	440	440	400	400
C	430	430	480	480	498	498	572	572	551	551
D	151	151	151	151	151	151	151	151	151	151
E	105	105	115	115	125	125	135	135	145	145
F	300	300	350	350	450	450	560	560	650	650
G	48	48	48	48	48	48	51	51	51	51
H	22	22	22	22	22	22	25	25	25	25
ø J*	G3/4"	G3/4"	G1"	G1"	G1"	G1"	G6/4"	G6/4"	G6/4"	G6/4"
K	129	129	129	129	129	129	129	129	129	129
L	198	198	198	198	198	198	198	198	198	198
M	45	45	45	45	45	45	52	52	52	52
kg	20	22	30	32	43	46	56	59	71	75

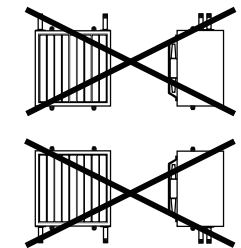
* BSP Male

HYDRAULIC CONNECTION

Correct

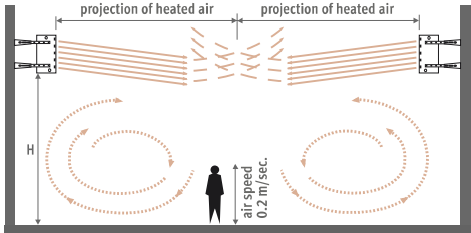


Incorrect



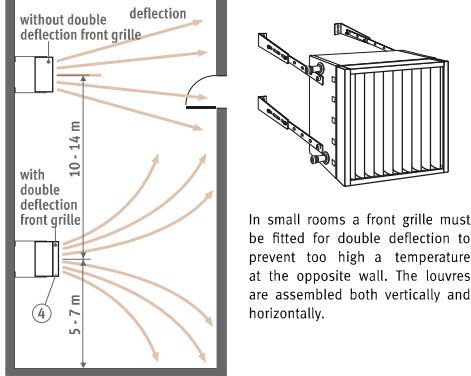
MOUNTING

Wall mounting



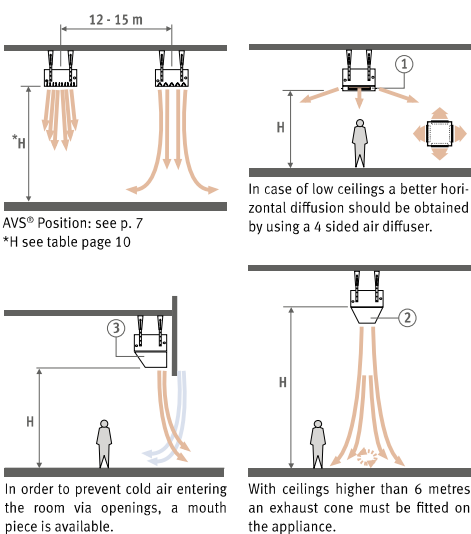
In order to maintain comfort, please avoid blowing heated air directly at people.

Plan view



In small rooms a front grille must be fitted for double deflection to prevent too high a temperature at the opposite wall. The louvers are assembled both vertically and horizontally.

Ceiling design



In order to prevent cold air entering the room via openings, a mouth piece is available.

With ceilings higher than 6 metres an exhaust cone must be fitted on the appliance.

AVS® UNIT HEATER WITH EC MOTOR

Type	control voltage	Output			Air exhaust temperature*			Revolutions	Air flow	Sound pressure	Hot air projection horizontal**		Hot air projection vertical**							
CODE	V	ΔT=50 kWatts	ΔT=30 kWatts	ΔT=12.5 kWatts	ΔT=50 °C	ΔT=30 °C	ΔT=12.5 °C	RPM	m³/h	dB(A)	H min.	with AVS® m	without AVS® m	H max.	H max.	H max.	H max.	H max.	4 sides open	2 sides open
Mini unit heater	UNIT.021/EC	10	7.3	4.4	1.8	35	21	21	1375	1470	42	21.0	16.0	8.0	5.5			2.5	5.0	10.0
		8	7.1	4.2	1.8	36	22	22	1220	1300	41	19.0	14.0	6.5	4.5			4.5	9.0	
		6	6.4	3.8	1.6	38	23	22	1020	1060	33	2.5	15.0	5.0	3.5			2.5	3.5	7.0
		4	5.5	3.3	1.4	41	25	23	775	770	26		11.0							
		2	4.5	2.7	1.1	44	26	23	575	540	22		8.0							
	UNIT.031/EC	10	9.6	5.8	2.4	42	25	23	1370	1290	43	19.0	14.0	7.5	5.0			2.5	4.5	9.0
		8	9.0	5.4	2.3	43	26	23	1230	1140	42		17.0	6.5	4.5			4.0	8.0	
		6	8.1	4.8	2.0	45	27	24	1030	930	34	2.5	14.0	5.0	3.5			3.0	6.5	
		4	6.5	3.9	1.6	49	28	24	780	660	27		10.0							
		2	5.3	3.2	1.3	54	32	25	570	450	23		7.0							
UNIT.121/EC	10	15.7	9.4	3.9	41	25	23	1390	2160	52	23.0	18.0	8.0	5.5	3.5	9.0	2.5	6.0	12.5	
	8	14.6	8.8	3.7	44	26	23	1230	1750	48	19.0	14.0	6.5	4.5		7.5		5.0	10.0	
	6	13.0	7.8	3.2	48	28	24	920	1380	40	2.5	15.0	5.0	3.5	3.5	6.0	2.5	4.0	8.0	
	4	10.7	6.4	2.7	51	30	25	650	1000	33		11.0								
	2	8.0	4.8	2.0	56	32	26	490	650	29		7.0								
UNIT.131/EC	10	20.1	12.0	5.0	50	29	25	1390	1990	53	22.0	16.0	7.5	5.0	3.0	8.5	2.5	6.0	11.5	
	8	19.3	11.6	4.8	53	31	25	1230	1740	49	19.0	14.0	6.5	4.5		7.5		5.0	10.0	
	6	16.7	10.0	4.2	58	34	26	920	1290	41	2.5	14.0	5.0	3.5	3.0	5.5	2.5	3.5	7.5	
	4	12.2	7.3	3.1	63	37	27	650	830	34		9.0								
	2	9.2	5.5	2.3	66	38	28	490	590	30		6.0								
UNIT.221/EC	10	30.4	18.2	7.6	39	23	22	1330	4640	51	37.0	28.0	10.0	6.0	4.5	11.0	2.5	11.0	21.5	
	8	28.6	17.2	7.2	41	25	23	1130	4050	45	33.0	25.0	8.5	5.0		9.5		10.0	18.5	
	6	26.4	15.8	6.6	43	25	23	910	3400	38	2.5	27.0	7.5	4.5	4.5	8.0	2.5	8.0	15.5	
	4	21.7	13.0	5.4	48	28	24	680	2320	31		19.0								
	2	18.0	10.8	4.5	53	31	25	500	1580	26		13.0								
UNIT.231/EC	10	36.7	22.0	9.2	44	26	23	1330	4400	53	35.0	27.0	9.5	5.5	4.0	10.5	2.5	10.5	20.0	
	8	34.6	20.8	8.6	47	28	24	1130	3710	47	30.0	23.0	8.0	5.0		9.0		9.0	17.0	
	6	31.1	18.7	7.8	51	30	25	910	2940	40	2.5	24.0	6.5	4.0	4.0	7.0	2.5	7.0	13.5	
	4	25.9	15.6	6.5	56	33	26	680	2100	33		17.0								
	2	21.2	12.7	5.3	62	36	27	500	1480	28		12.0								
UNIT.321/EC	10	40.2	24.1	10.0	40	24	23	910	6030	48	40.0	30.0	10.5	6.5	5.0	11.5	3.0	12.5	22.5	
	8	39.2	23.5	9.8	40	24	23	710	5600	40	37.0	28.0	10.0	6.0		10.5		11.5	21.0	
	6	36.0	21.6	9.0	43	26	23	520	4580	33	3.0	30.0	8.0	5.0	5.0	8.5	3.0	9.5	17.0	
	4	29.1	17.5	7.3	48	28	24	380	3060	28		20.0								
	2	22.5	13.5	5.6	54	32	25	290	1950	25		13.0								
UNIT.331/EC	10	51.7	31.0	12.9	48	28	24	910	5500	50	36.0	27.0	9.5	6.0	4.5	10.5	3.0	11.5	20.5	
	8	44.8	26.9	11.2	52	30	25	710	4130	42	27.0	21.0	7.0	4.5		8.0		8.5	15.5	
	6	35.6	21.4	8.9	56	33	26	520	2860	34	3.0	19.0	5.0	3.0	4.5	5.5	3.0	6.0	10.5	
	4	27.9	16.8	7.0	61	35	27	380	2010	29		13.0								
	2	24.8	14.9	6.2	63	36	27	290	1700	25		11.0								
UNIT.421/EC	10	65.2	39.1	16.3	41	25	23	850	9070	51	54.0	41.0	11.0	9.5	6	12.5	3.0	15.5	27.0	
	8	53.6	32.1	13.4	43	26	23	620	6760	42	40.0	31.0	8.5	7.0		9.5		11.5	20.0	
	6	44.2	26.5	11.1	46	27	24	460	5030	36	3.0	30.0	6.0	5.5	6	7.0	3.0	8.5	15.0	
	4	35.1	21.1	8.8	50	30	25	340	3380	32		20.0								
	2	29.7	17.8	7.4	56	32	26	250	2430	28		14.0								
UNIT.431/EC	10	78.6	47.2	19.7	48	28	24	850	8290	52	49.0	37.0	10.0	8.5	5.5	11.5	3.0	14.0	25.0	
	8	65.4	39.2	16.4	52	30	25	620	6060	43	36.0	27.0	7.5	6.5		8.5		10.5	18.0	
	6	53.6	32.2	13.4	55	32	26	460	4460	38	3.0	27.0	5.5	4.5	5.5	6.0	3.0	7.5	13.5	
	4	41.6	24.9	10.4	60	35	27	340	3030	33		18.0								
	2	32.3	19.4	8.1	66	38	28	250	2040	30		12.0								

* At the heat exchanger, before the AVS®-effect reduces the temperature.

OPTIONS FOR EC MOTOR

DELIVERY

Completely pre-assembled apparatus for mounting against wall or ceiling, supplied in sturdy cardboard packaging:
 - standard with Air Venturi System
 - 2 row or 3 row heat exchanger
 - casing in sandblast grey (001), fine texture metallic lacquer

ORDERING CODE

code type
UNIT . 021 /EC (standaard AVS®)
 fill in type (2 = 2 rows of pipes)
 (3 = 3 rows of pipes)

ORDERING CODE MODULATING

code type
UNIM . 221 /EC (modulating AVS®) see p. 8
 fill in type (2 = 2 rows of pipes)
 (3 = 3 rows of pipes)

fixed surcharge modulating

The modulating operation is integrated into the equipment and therefore cannot be delivered as an accessory. Mini unit heater (code 021 and 031) not available as a modulating version.

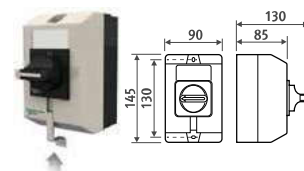
Wiring diagram available on request:

CODE

27200.20060001

ISOLATION SWITCH

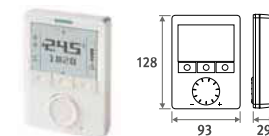
For use with all unit heater models. Pre-mounted to the side when ordered together with the unit heater
 - application: safe isolation of power during maintenance or replacement of parts
 - 1 switch per unit heater
 - ON/OFF function
 - lockable in off position for safety



Add to the code of the unit heater /LS
 Ex. UNIT.021/EC/LS

Isolation switch

THERMOSTATIC

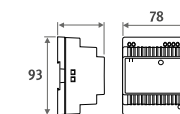
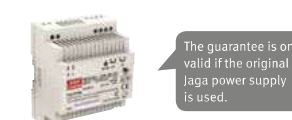


- automatic thermostat
- day / night and week program
- room regulator for one room
- automatic or manual changeover heating / cooling
- display with background lighting
- power supply 24 VDC
- output control 0-10 VDC
- valve control 0-10 VDC
- min. and max. temperature control

CODE

8751.050009

POWER SUPPLY FOR THERMOSTATIC 8751.050009



- for DIN-rail or wall mounting
- conformity: UL60950 - EN 60950 / Class 2
- output voltage 24 VDC
- input voltage 100 - 240 VAC
- screw connection
- LED indicator

CODE

Output Watts	Output current A
7990.050	31
	1.3

JAGA CLOCK THERMOSTAT



Automatic thermostat with day - night and week programme. Activators: auto / continuous. Batteries included

CODE

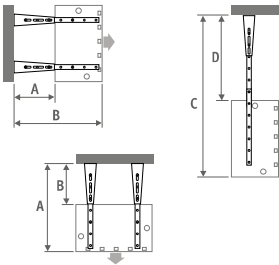
7990.073

BRACKET AND FIXING SET

WHICH BRACKETS AND FIXING SETS TO USE?

Without air inlet options

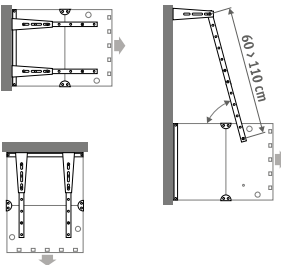
Set of brackets A



With 1 air inlet option

(not available with Mini unit heater)

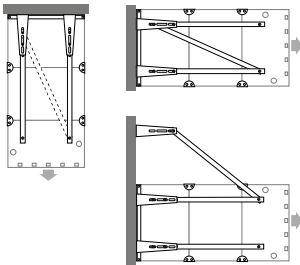
Set of brackets A + fixing set A



With 2 air inlet options

(not available with Mini unit heater)

Set of brackets B + fixing set B



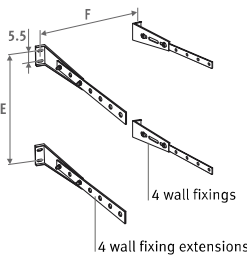
TYPE	A		B		C		D		E	F	G
	min.	max.	min.	max.	min.	max.	min.	max.			
000 (Mini)	360	670	770	1070	725	1325	315	1015	--	--	--
100	360	670	770	1070	835	1435	305	905	355	530	635
200	360	670	770	1070	945	1445	295	795	455	650	755
300	360	670	770	1070	1055	1455	285	685	555	770	875
400	360	670	770	1070	1165	1465	275	575	655	890	995

BRACKET AND FIXING SET

SET OF BRACKETS A

For unit heater without or with one air inlet option

- carrying capacity: 150 kg
- finish in the same colour as the unit heater (sandblast grey metallic, colour 001).
- includes screw bolts



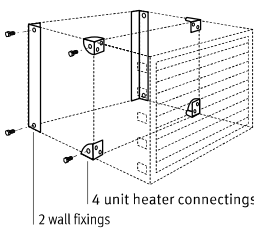
CODE

8376.010100

FIXING SET A

For mounting of 1 air inlet option

- finish in the same colour as the unit heater (sandblast grey metallic, colour 001).
- includes bolts M 8 x 16 Din 933
- includes spring washers M8 Din 127



CODE

8376.040001

Type

100

8376.040002

200

8376.040003

300

8376.040004

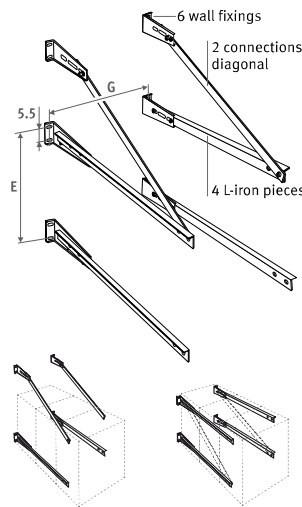
400

⚠ to use together with set of brackets A

SET OF BRACKETS B

For unit heater with two air inlet options

- finish in the same colour as the unit heater (sandblast grey metallic, colour 001).
- includes screw bolts



CODE

8376.030101

Type

100

8376.030102

200

8376.030103

300

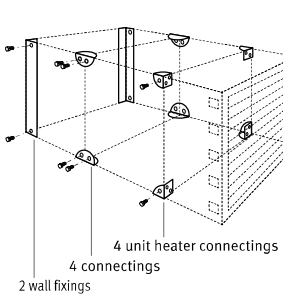
8376.030104

400

FIXING SET B

For mounting of 2 air inlet options

- finish in the same colour as the unit heater (sandblast grey metallic, colour 001).
- includes bolts M 8 x 16 Din 933
- includes spring washers M8 Din 127



CODE

8376.040101

Type

100

8376.040102

200

8376.040103

300

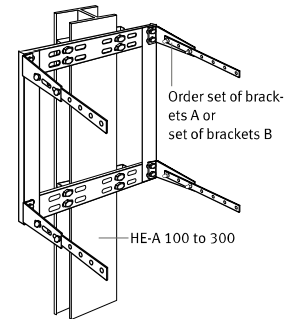
8376.040104

400

⚠ To use together with set of brackets B

FIXING ON METAL CONSTRUCTION

- finish in the same colour as the unit heater (sandblast grey metallic, colour 001).
- includes screw bolts



CODE

8376.050101

Type

100

8376.050102

200

8376.050103

300

8376.050104

400

⚠ To use together with set of brackets A or B

AIR EXHAUST OPTIONS

4- SIDED AVS® AIR DIFFUSER

- for horizontal air diffusion in case of low ceilings
- order together with the unit heater. The unit heater needs to be adjusted
- with this option the unit heater has no air exhaust grille
- will be delivered separately. Easy to mount and disassemble through quick-acting connection
- finish identical to the unit heater (sandblast grey, colour 001)
- aerodynamic angled louvres in satin black lacquered aluminium
- maximum height = 2.5 m bottom end of the appliance.



CODE	Type
8375.060100	(Mini) 000
8375.060101	100
8375.060102	200
8375.060103	300
8375.060104	400

EXHAUST CONE

- to obtain higher exhaust speed, which enables fixing at a high level
- order together with the unit heater. The unit heater needs to be adjusted
- will be delivered separately. Easy to mount and disassemble through quick-acting connection
- finish identical to the unit heater (sandblast grey, colour 001)



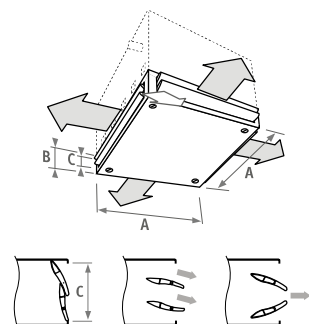
CODE	Type
8375.080101	100
8375.080102	200
8375.080103	300
8375.080104	400

EXHAUST MOUTH PIECE

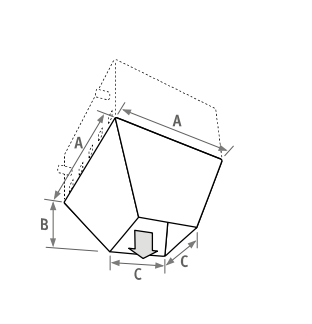
- prevent cold air entering the room door spaces etc...
- order together with the unit heater. The unit heater needs to be adjusted
- will be delivered separately. Easy to mount and disassemble through quick-acting connection
- finish identical to the unit heater (sandblast grey, colour 001)



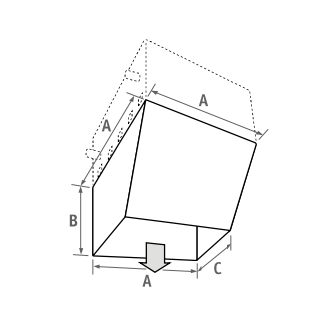
CODE	Type
8375.070101	100
8375.070102	200
8375.070103	300
8375.070104	400



Type	A	B	C	kg
000 (Mini)	410	188	138	7.2
100	530	188	138	9.2
200	650	188	138	11.8
300	770	188	138	14.6
400	890	188	138	17.7



Type	A	B	C	kg
100	530	433	220	8.2
200	650	461	320	10.7
300	770	558	370	14.8
400	890	642	430	18.9



Type	A	B	C	kg
100	530	545	105	9.7
200	650	600	180	17.3
300	770	725	190	24.0
400	890	1035	250	36.7

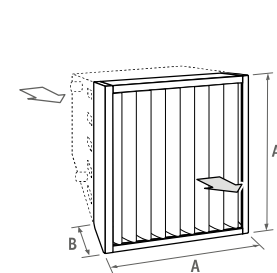
AIR EXHAUST OPTIONS

DOUBLE DEFLECTION FRONT GRILLE

- prevents too high a temperature developing at the opposite wall
- not suitable for use with the modulating version
- easy to mount through quick-acting connection at the top
- finish identical to the unit heater (sandblast grey, colour 001)
- aerodynamic angled louvres in satin black lacquered aluminium



CODE	Type
8375.110100	(Mini) 000
8375.110101	100
8375.110102	200
8375.110103	300
8375.110104	400



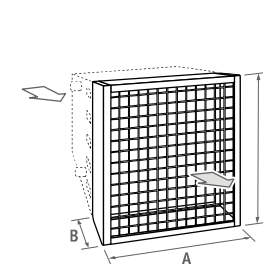
Type	A	B	kg
000 (Mini)	410	101	5.0
100	530	101	6.1
200	650	101	8.1
300	770	101	10.4
400	890	101	13.0

PROTECTION GRILLE FOR SPORT CENTERS

- easy to mount through quick-acting connection at the top
- not suitable for use with the modulating version
- finish identical to the unit heater (sandblast grey, colour 001)



CODE	Type
8375.100101	100
8375.100102	200
8375.100103	300
8375.100104	400

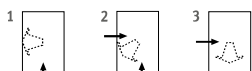
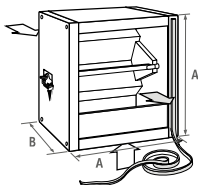


Type	A	B	kg
100	530	101	5.7
200	650	101	6.7
300	770	101	8.4
400	890	101	8.8

AIR INLET OPTIONS

! Air inlet options aren't suitable for Mini unit heaters.
For losses of air flow and/or capacity when use is made of extraction appliances: see graphs pages 234-236

AIR MIXING BOX



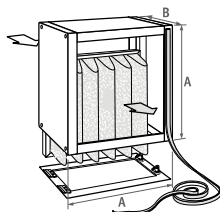
- unlacquered galvanised steel, or lacquered in the same colour as the unit heater (sand-blast grey, colour 001)
- manually adjusted

CODE (Galvanised)	Type
83750.010101	100
83750.010102	200
83750.010103	300
83750.010104	400

CODE (Lacquered)	Type
83751.010101	100
83751.010102	200
83751.010103	300
83751.010104	400

Type	A	B	kg
100	530	350	13.6
200	650	450	19.3
300	770	550	25.9
400	890	665	33.1

FILTER BOX WITH FILTER ELEMENT



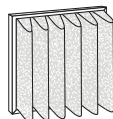
- unlacquered galvanised steel, or lacquered in the same colour as the unit heater (sand-blast grey, colour 001)
- when ordering a filter box it is recommended that a spare filter element is also ordered

CODE	Type
8375.140101	100
8375.140102	200
8375.140103	300
8375.140104	400

CODE	Type
83751.140101	100
83751.140102	200
83751.140103	300
83751.140104	400

Type	A	B	kg
100	530	345	18.1
200	650	450	22.4
300	770	550	26.7
400	890	665	31.9

FILTER ELEMENT

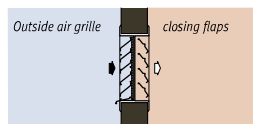
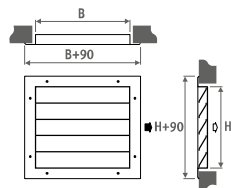


Caution! A dirty filter will reduce the output and the air flow of the unit heater.

- partly recyclable (dependent on the application of room)
- efficiency: Ashrae-tissue 90 %
- self-extinguishable in accordance to DIN 53438-1
- heat resistant up to 100 °C
- complies to classification G4 in accordance DIN EN 779

CODE	Type
8375.150101	100
8375.150102	200
8375.150103	300
8375.150104	400

OUTSIDE AIR GRILLE

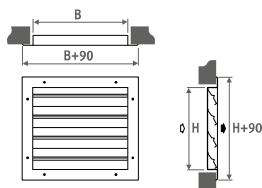


- protection against rain
- with fine structured metal anti-vermin grille
- galvanised

CODE	Type
8375.120101	100
8375.120102	200
8375.120103	300
8375.120104	400

Type	B	H	kg
100	400	350	4.30
200	600	355	5.80
300	600	510	7.60
400	800	510	9.40

AUTOMATIC CLOSING FLAPS FOR OUTSIDE AIR GRILLE



- galvanised with aluminium louvers.
- to prevent warm air from flowing out of a stationary ventilator.

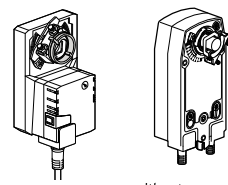
CODE	Type
8375.130101	100
8375.130102	200
8375.130103	300
8375.130104	400

Type	B	H	kg
100	400	345	2.80
200	600	355	3.60
300	600	510	4.40
400	800	510	5.20

ACCESSORIES AIR INLET OPTIONS

! Servo motor or thermostat for frost protection be assembled delivered. The servo motor has to be ordered together with the air mixing box. The frost protection thermostat has to be ordered together with the unit heater.

SERVO MOTORS "ON/OFF"



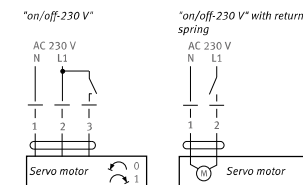
with return spring

- one size
- return spring: the mixing box or the shutter box will be closed automatically in case of a power cut (frost protection).

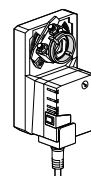
CODE

8383.2301
"on/off-230 V"

8383.2302
"on/off-230 V" with return spring



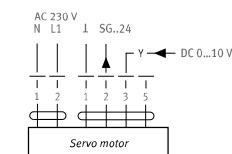
SERVO MOTOR "MODULATING"



- one size

CODE

8383.2303
"modulating-230 V"



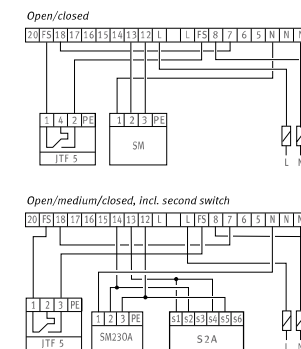
SWITCH BOXES FOR SERVO MOTORS 8383.2301



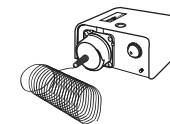
CODE

8351.0700001
open/closed

8351.0700002
open/medium/closed, incl. second switch



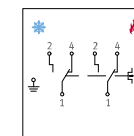
THERMOSTAT FOR FROST PROTECTION



- Thermostat for frost protection (from -10° up to +12°C)

CODE

8384.0001

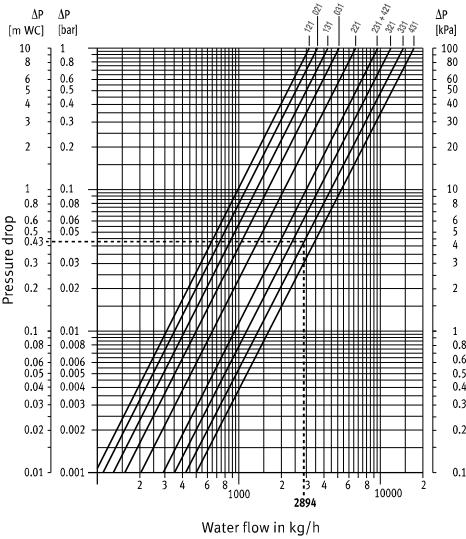


CORRECTION FACTORS

CORRECTION FACTORS (CF) AS A FUNCTION OF ΔT
[ΔT = average water temperature - room temperature]

ΔT	Factor	ΔT	Factor	ΔT	Factor
30	0.60	49	0.98	68	1.36
31	0.62	50	1.00	69	1.38
32	0.64	51	1.02	70	1.40
33	0.66	52	1.04	71	1.42
34	0.68	53	1.06	72	1.44
35	0.70	54	1.08	73	1.46
36	0.72	55	1.10	74	1.48
37	0.74	56	1.12	75	1.50
38	0.76	57	1.14	76	1.52
39	0.78	58	1.16	77	1.54
40	0.80	59	1.18	78	1.56
41	0.82	60	1.20	79	1.58
42	0.84	61	1.22	80	1.60
43	0.86	62	1.24	81	1.62
44	0.88	63	1.26	82	1.64
45	0.90	64	1.28	83	1.66
46	0.92	65	1.30	84	1.68
47	0.94	66	1.32	85	1.70
48	0.96	67	1.34	86	1.72

HYDRAULIC PRESSURE DROP



CALCULATION FOR OTHER TEMPERATURES

T_v = flow temperature
 T_r = return temperature
 T_l = room temperature
 Q_v = requested capacities

1. ΔT Calculation

$$\Delta T = \frac{T_v + T_r}{2}$$

correction factor Cf

2. Calculation theoretical output (Qf)

$$Q_f = \frac{Q_v}{Cf}$$

3. Choice unit heater
Select in table ΔT=50 a unit heater with an imaginary output of 29.76 kWatts (Qf). This unit heater will provide the requested output (Qv) of 25 kWatts at a water temperature $T_v - T_r$ (70°C/50°C) and a room temperature T_l (18°C).

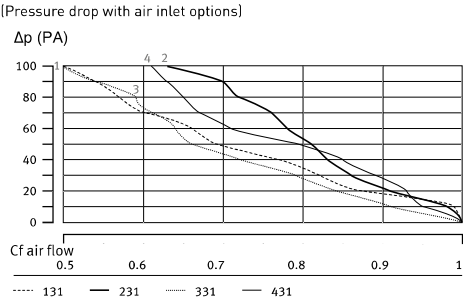
Calculation example

70 °C
50 °C
18 °C
25 kWatts

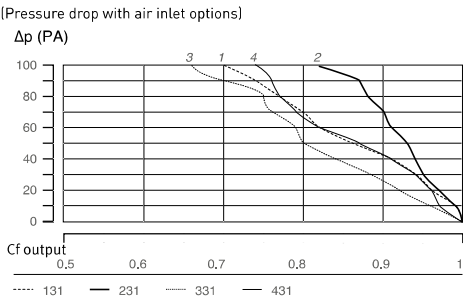
$$\Delta T = \frac{70^\circ C + 50^\circ C}{2} - 18^\circ C = 42$$

$$Q_f = \frac{25 \text{ kWatts}}{0.84} = 29.76 \text{ kWatts}$$

AIR FLOW / CORRECTION FACTOR FOR THE AIR FLOW

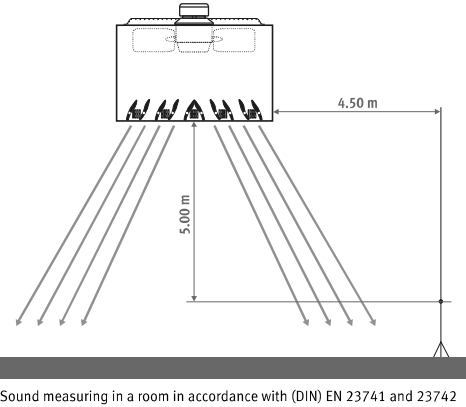


THERMAL OUTPUT / CORRECTION FACTORS FOR THE HEATING LOSS OF OUTPUT

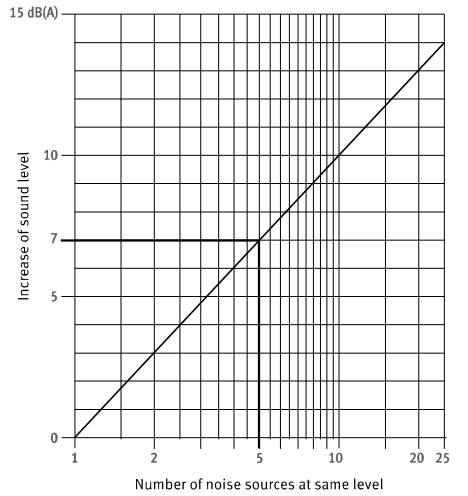


CORRECTION FACTORS SOUND

SOUND PRESSURE



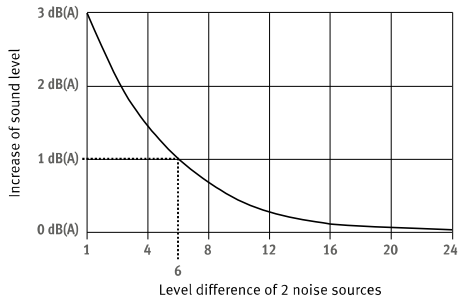
COMBINATION OF DIFFERENT NOISE SOURCES AT THE SAME SOUND LEVEL



Example:

- given: 5 sound sources of each 53 dB(A)
- asked: the total sound intensity
- the total sound intensity: 53 dB(A) + 7 dB(A) = 60 dB(A)

COMBINATION OF DIFFERENT NOISE SOURCES WITH DIFFERENT SOUND LEVELS



Example:

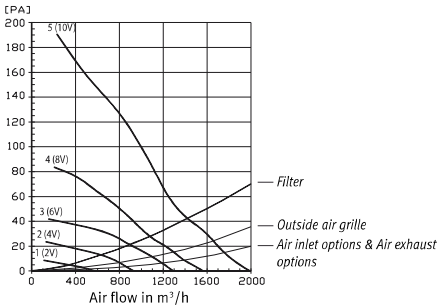
- given: 2 sound sources 53 dBA and 59 dB(A)
- difference = 6 dB(A)
- asked: the total sound intensity
- the total sound intensity : 59 dB(A) plus 1 dB(A) = 60 dB(A)

AIR FLOW WITH OPTIONS

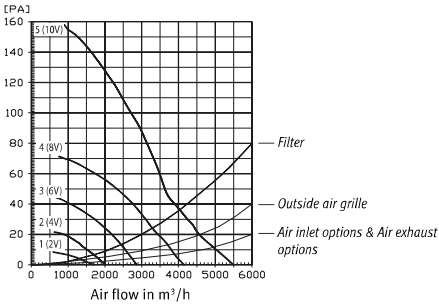
PARTS

UNIT HEATER WITH 2 ROWS OF PIPES

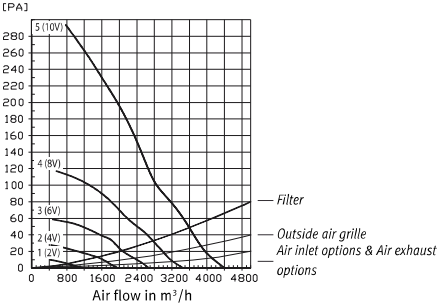
TYPE 121



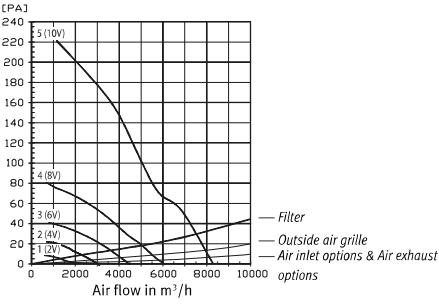
TYPE 221



TYPE 321

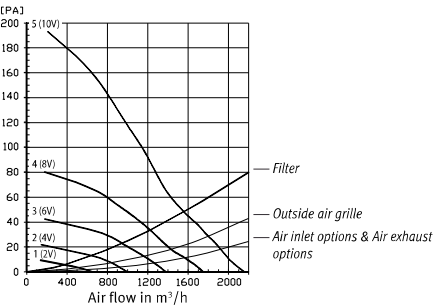


TYPE 421

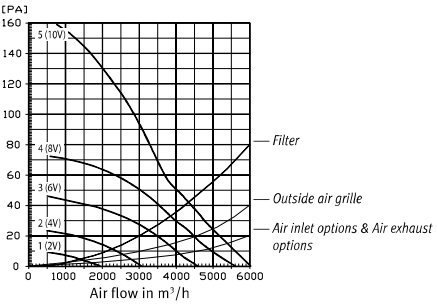


UNIT HEATER WITH 3 ROWS OF PIPES

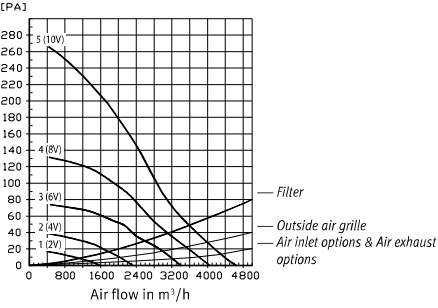
TYPE 131



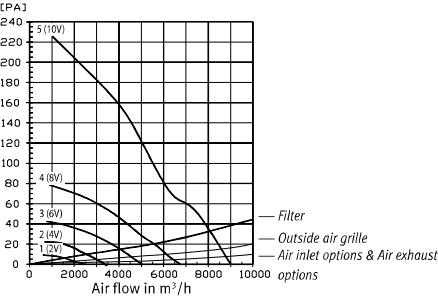
TYPE 231



TYPE 331



TYPE 431

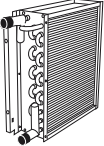


EC MOTORS 1 X 230V

CODE	Type	Electric power consumption	Current	Max. air inlet °C
		Watts	A	°C
24555.20000005	000	74	0.70	55
24502.02300101	100	77	0.73	50
24502.02300201	200	330	2.20	60
24502.02300301	300	375	1.80	55
24502.02300401	400	580	3.20	50

Motor with integrated thermocontact and fitted thermal box: insulation range B / IP 54

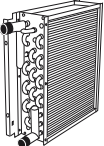
Low-H2O heat exchanger with 2 rows of pipes



CODE	Type	Water content
8393.010105	000	0.9
8393.010101	100	1.8
8393.010102	200	3.6
8393.010103	300	4.0
8393.010104	400	5.5

Working pressure max. 11 bar at 90 °C / pressure tested: 25 bar

Low-H2O heat exchanger with 3 rows of pipes



CODE	Type	Water content
8393.020105	000	1.3
8393.020101	100	2.6
8393.020102	200	4.2
8393.020103	300	5.8
8393.020104	400	8.9

Working pressure max. 11 bar at 90 °C / pressure tested: 25 bar

PRODUCT SPECIFICATION

Heat exchanger

The heat exchanger consists of fins of pure aluminium pressed on mechanically extended pure red copper pipes. These pipes are connected to two steel collectors for left same end connection (1" for type 000, 100 and 200 / 1½" for type 300 and 400).

Airvent 1/8" and drain plug 1/2" are included. Unit heater is deliverable in five sizes of heat exchangers: with two or three rows of pipes.

Pressure test: 25 bar

Working pressure: 11 bar with a maximum temperature of 90°C

The heat exchanger is not suitable for the use of steam as a heat conductor.

Ventilator motor

The EC motor is an EBM-Papst external motor integrated in one piece with a 1-10 VDC motor and a reduced noise level synthetic HyBlade® ventilator in one piece. Internal thermal contacts are provided to protect the motor: for type 000 and 100 an internal automatic safeguard, for type 200, 300 and 400 an external safeguard should be provided. These contacts can be connected to a Jaga safety switch fixed on the side of the casing. These thermal contacts can also be connected to a speed regulator.

EC motor:

- 230 V single-phase, 1-10 VDC
- Insulation Class B
- Degree of protection: IP 54

Casing

The casing is made of 1.25 mm thick galvanised steel plate, installed in such a way that screws and rivets are concealed.

The casing is lacquered in the colour sandblast grey 001. Other colours on demand.

The coating is a lightly structured and scratch resistant epoxy-polyester powder, sprayed electrostatically and baked at a temperature of 200 °C, thickness of +/- 125 µ. UV resistant due to ASTM G53.

Exhaust grille

The horizontally built-in air exhaust grille is made of satin-black coated, slightly coved, aluminium slats.

The unit heater is supplied with exhaust louvres set in Air Venturi position.

With the shape and positioning of the louvres, the adjustable Air Venturi System (AVS®) ensures the direct mixture of the heated air with the ambient air. As a result the space is heated quicker and the warm air is forced downwards instead of remaining at a high level. The modular AVS® version (optional) ensures an improved dispersal of the heated air by continuously moving the exhaust louvres. The louvres are in this case coupled to each other in pairs and operated by a servo motor.

The angle of movement can be set from 0 to 90° in a cycle of approx. 150 seconds

Manufacturer: Jaga

Type: Unit heater

Output in Watts, measured in accordance with EN 442.

Application

The unit heater is used for heating of conference facilities, supermarkets, greenhouses, conservatories, sports halls, factories and warehouses.

With a water system of 75/65/20°C AVS® unit heaters can guarantee a capacity of 8.0 to 78.6 kW. For smaller spaces, offices or shops there is a Mini version of the unit heater with a heating capacity of 4.5 to 9.6 kW.

The unit heater can be used for assembly against a wall, against the ceiling or on a metal truss by using strong brackets.

The unit heater can be used with 100% ambient air, with 100% outside air or with mixed air.

Accessories

- thermostat
 - clock thermostat
 - control for multiple rooms
 - power supply for wall mounting or DIN rail
 - servo motor "on/off" or "modulating"
 - switch boxes for servo motors
 - thermostat for frost protection
 - set of brackets A for mounting, without or with one air inlet option, against a wall / ceiling
 - set of brackets B for mounting, with two air inlet options, against a wall / ceiling
 - set of brackets for fixing on metal construction
 - fixing set A for mounting of 1 air inlet option, to use together with set of brackets A
 - fixing set B for mounting of 2 air inlet options, to use together with set of brackets B
 - 4-sided AVS® air diffuser for low ceilings: for larger hot air carrying. Mounting with quick-acting connections.
 - exhaust cone for assembly at a height of over 6 metres. Mounting with quick-acting connections.
 - exhaust mouth piece to prevent the entry of cold air at outer elements. Mounting with quick-acting connections.
 - double deflection front grille. Prevents too high temperatures on the opposite wall. Mounting with quick-acting connections.
 - filter box for protection against dust, etc.
- Filter element:
- self-extinguishing according to DIN 53438-1. Heat resistant to 100°C, (Ashrae 90%), complies the classification G4 according to DIN EN 779.
 - mixing and shutter boxes 90° and 180° open/medium/ closed, controlled by servo motor 230 V or 24 V
 - corner boxes, wall channel boxes, connection boxes and other air inlet options.

How to install

The building services engineer should choose the unit heater(s) taking account of:

- fitting height according to the dimension tables of the unit heater
- a heat output calculation according to the relevant standard
- tables of heat output and dimensions of the unit heater according to EN 442.
- the unit heater will be connected to a two pipe system, with a same end connection. The flow valve always has to be fitted to the top connection.

