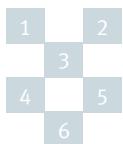


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JAGA AVS-Unit heater

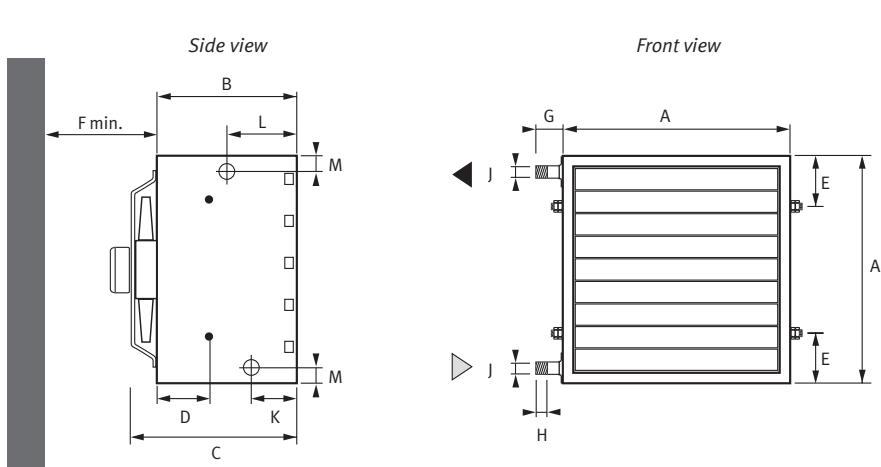


1. UH with 4-sided AVS air diffuser
2. a Ziehl-Abegg external motor
3. UH with exhaust cone
4. UH with set of brackets A
5. UH with safety switch
6. Mini UH



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Jaga AVS® Unit heater Dimensions



Type	021	031	120	130	220	230	320	330	420	430
Outside dimensions	A	41.0	41.0	53.0	53.0	65.0	65.0	77.0	77.0	89.0
	B	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
	C	43.5	43.5	44.0	44.0	44.6	44.6	45.2	45.2	46.5
Installation	D	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1
	E	10.5	10.5	11.5	11.5	12.5	12.5	13.5	13.5	14.5
	F	30.0	30.0	35.0	35.0	45.0	45.0	56.0	56.0	65.0
Connections	G	4.8	4.8	4.8	4.8	4.8	4.8	5.1	5.1	5.1
	H	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.5	2.5
	ØJ	G1"	G1"	G1"	G1"	G1"	G6/4"	G6/4"	G6/4"	G6/4"
	K	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
	L	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
	M	4.5	4.5	4.5	4.5	4.5	4.5	5.2	5.2	5.2
Weight	kg	20.0	22.0	30.0	32.0	43.0	46.0	56.0	59.0	71.0
										75.0

Dimensions in cm

Jaga AVS®: Air Venturi System

Lower exhaust temperature with an equal capacity

The stepless Venturi System can be adjusted continuously and is incorporated as standard in each Jaga AVS. The result is a direct mixture of the heated air with the ambient air. The exhaust air temperature drops and the heat carrying capacity increases, without any loss of output.

How it works::

The Jaga AVS® is provided with Venturi-openings and aerodynamic formed exhaust adjustable louvres each of which can be adjusted continuously and separately. These adjustable louvres 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 louvres an underpressure will be created at the height of the Venturi-openings.

The result is that the entire ambient air will be equal and at a low speed be drawn and immediately mixed with the exhaust air, which results in a cooler exhaust temperature.

The ascending power of the air will be reduced strongly, resulting in more equal temperature and a faster heating up of the room will be obtained.

Advantages:

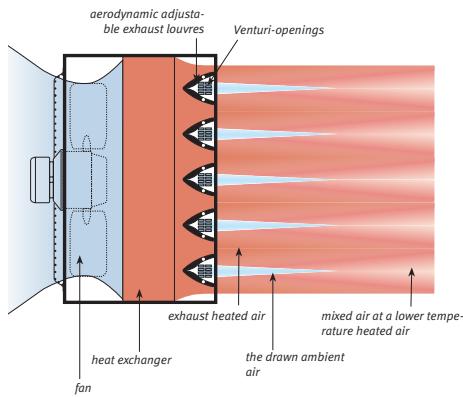
- higher comfort
- lower energy cost
- faster heating up speed
- equal temperature
- adjustable heat carrying capacity

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 of cost or a higher noise level.

The adjustable louvres in Venturi position

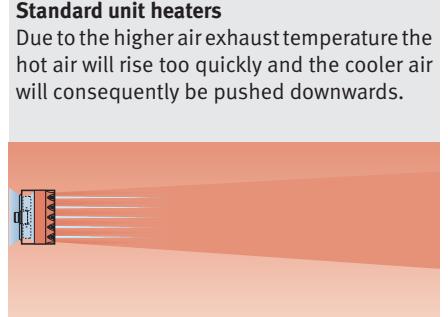


Not only the exhaust direction but also the heat carrying capacity may be adjusted. By adding cooler ambient air the exhaust temperature will drop and a more stable air jet and larger heat carrying capacity will be obtained.

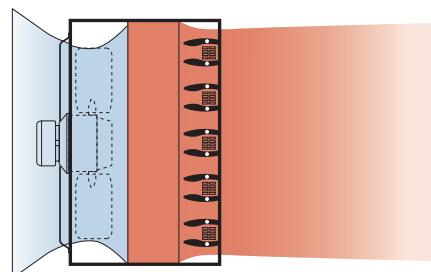


Standard unit heaters

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



The adjustable louvres in parallel position



This is the normal position with common 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.

The Jaga-AVS: Air Venturi System ®

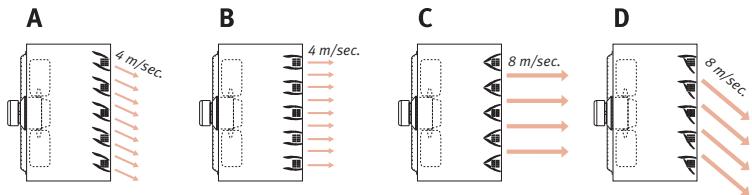
Due to the Air Venturi System the air exhaust temperature is lower, which reduces strongly the ascending power of the air. An even temperature, faster heating up and higher efficiency results.



Unit heater

Jaga Air Venturi System_positions

Wall mounting

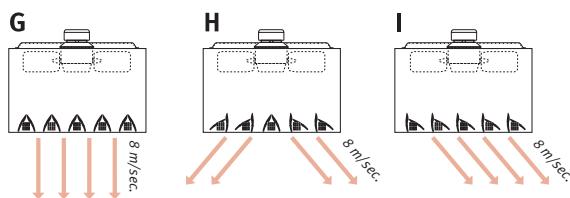
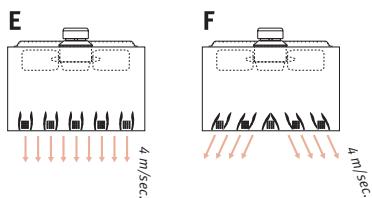


adjusting AVS	
Height	Position
2.5 up to 3 m	B or C
3 up to 4 m	A
> 4 m	D

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

Unit heater

Ceiling mounting



adjusting AVS	
Height	Position
H < Table	E or F
H = Table	G, H or I

see table of price and output page 239 up to 242.

The modulating AVS® version

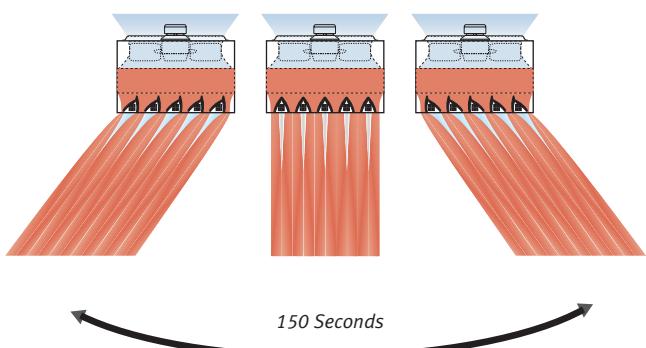
With the modulating AVS-version the exhaust louvres are linked in pairs and connected with a servo-motor. This motor produces a continuous back and forth movement of the adjustable louvres. The air turbulation thus created provides

an even better temperature distribution. The movement angle may be easily adjusted from 0 to 90°. A complete cycle takes around 150 seconds.

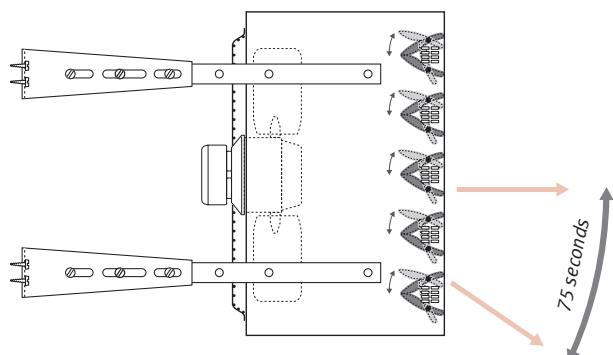
! The modulating operation is integrated into the equipment and therefore can not be delivered as an accessory.

Mini LV not available in the modulating version.

Ceiling mounting: position 90°

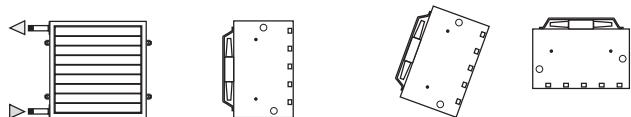


Wall mounting: position 45°

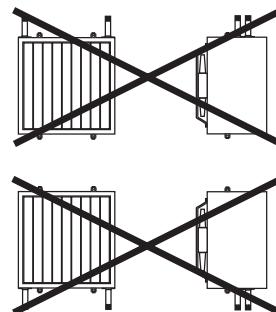


Jaga AVS® Unit heater_Hydraulic connection

good

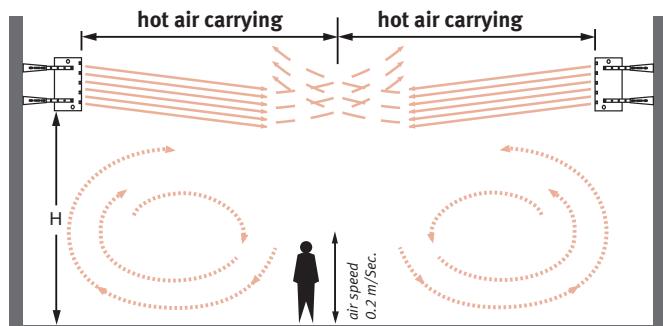


Incorrect

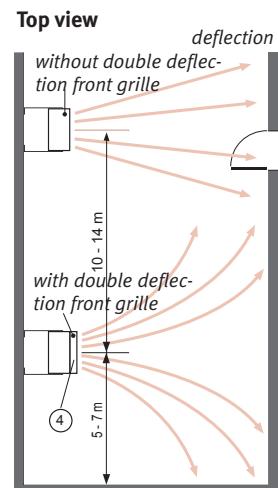
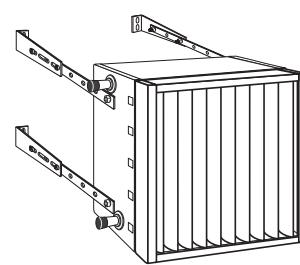


Unit heater

General Wall mounting

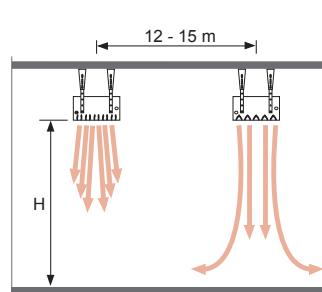


In order to maintain a comfortable feeling, please avoid exhausting heated air directly at people.

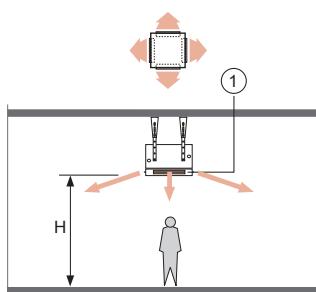


In small rooms a front grille must be fitted for double deflection to prevent a too high temperature at the opposite wall. The louvres are assembled both vertically and horizontally.

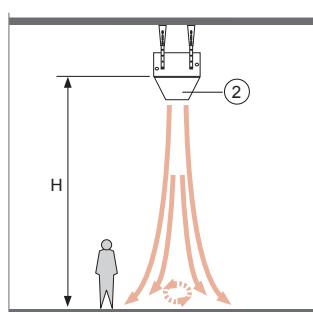
Ceiling design



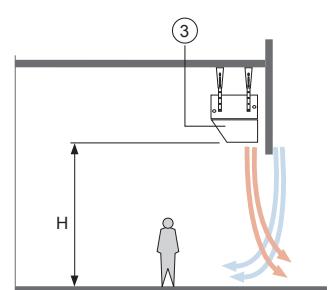
Position AVS: see page 236. 152.



In case of low ceilings a better horizontal diffusion should be obtained by using a 4 sided air diffuser.



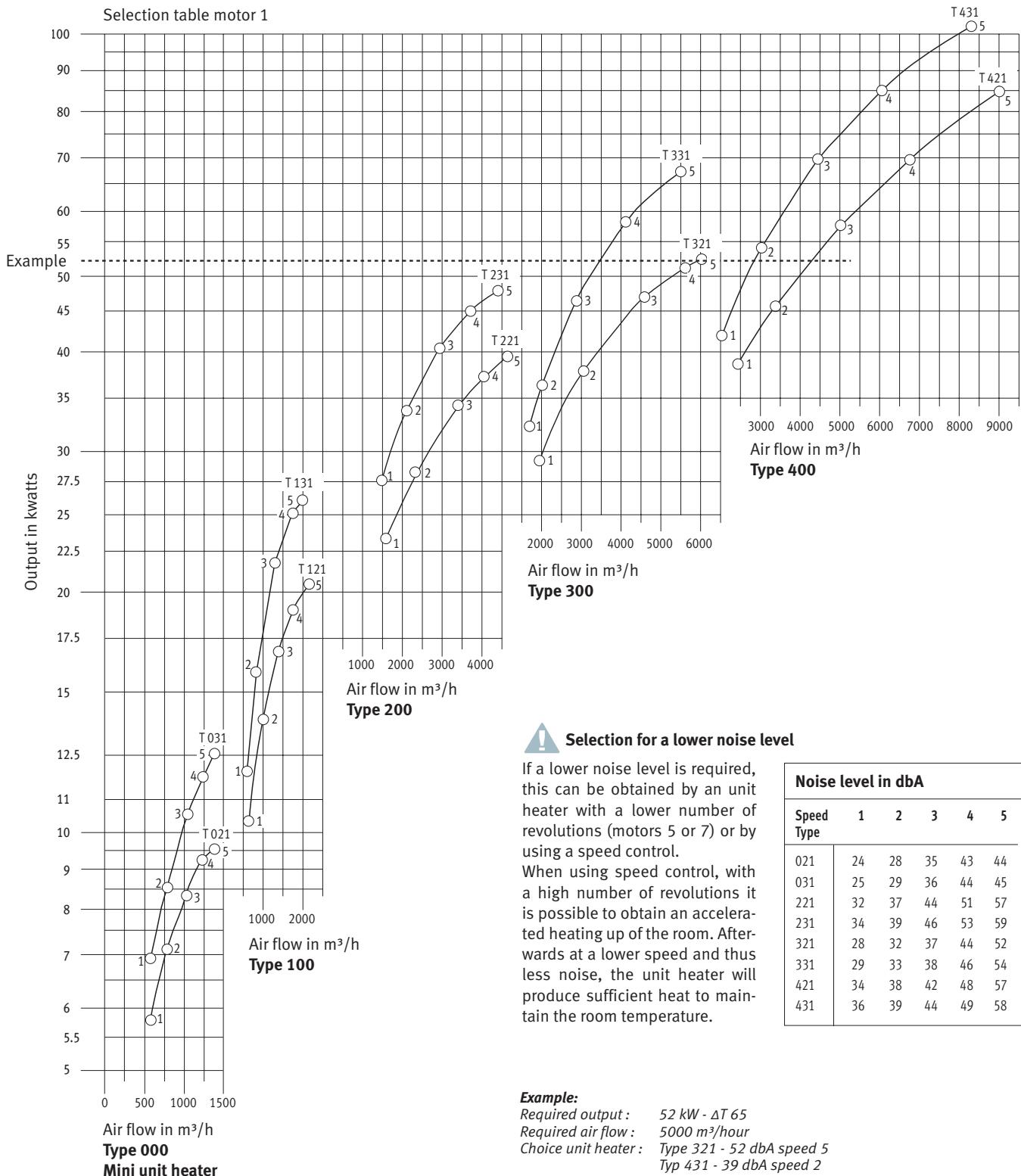
With very high ceilings an outlet cone must be fitted on the appliance. (Higher than 6 metres).



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

H see table of outputs

Jaga AVS® Unit heater _ Selection table



⚠ Selection for a lower noise level

If a lower noise level is required, this can be obtained by an unit heater with a lower number of revolutions (motors 5 or 7) or by using a speed control. When using speed control, with a high number of revolutions it is possible to obtain an accelerated heating up of the room. Afterwards at a lower speed and thus less noise, the unit heater will produce sufficient heat to maintain the room temperature.

Noise level in dbA					
Speed Type	1	2	3	4	5
021	24	28	35	43	44
031	25	29	36	44	45
221	32	37	44	51	57
231	34	39	46	53	59
321	28	32	37	44	52
331	29	33	38	46	54
421	34	38	42	48	57
431	36	39	44	49	58



Jaga Mini Unit heater _ 230 V mono

Model Type
ORDERING CODE STANDARD:UNIT.021

Type		Output			Air exhaust-temperature			Revolutions	Air flow	The noise level	Hot air carrying			Hot air carrying is an approximative value for free drawing and exhausting air Tl ca. 15 à 20K over the room temperature.					
		Tv 80	Tv 70	Tv 55	at the heat exchanger, before the AVS-effect makes the temperature drop Tl 15°					at 5m	Horizontal standard	Vertical standard	air diffuser						
		Tr 60	Tr 55	Tr 45	Tl 15°						↓ H min with AVS	↓ H max							
		Tl 20	Tl 15	Tl 15	ΔT=50 ΔT=42.5 ΔT=35			ΔT=50	ΔT=42.5	ΔT=35	↑ H without AVS	↑ H max	4 sides open	2 sides open					
	Speed	kwatts	kwatts	kwatts	C°	C°	C°	RPM	m³/u	dBA	m	m	m	m	m	m	m		
UNIT 021 646,90	5	7,3	6,2	5,1	35	32	25	1375	1470	44	21.0	16.0	8.0	5.5	2.5	5.0	10.0		
	4	7,1	6,0	5,0	36	34	26	1220	1300	43	19.0	14.0	6.5	4.5		4.5	9.0		
	3	6,4	5,4	4,5	38	35	27	1020	1060	35	2.5	15.0	12.0	5.0	3.5	2.5	3.5		
	2	5,5	4,7	3,9	41	38	30	775	770	28		11.0	8.0						
	1	4,5	3,8	3,2	44	41	32	575	540	24		8.0	6.0						
UNIT 031 708,90	5	9,6	8,2	6,7	42	39	30	1370	1290	45	19.0	14.0	7.5	5.0	2.5	4.5	9.0		
	4	9,0	7,7	6,3	43	40	31	1230	1140	44	17.0	12.0	6.5	4.5		4.0	8.0		
	3	8,1	6,9	5,7	45	42	33	1030	930	36	2.5	14.0	10.0	5.0	3.5	2.5	3.0		
	2	6,5	5,5	4,6	49	44	35	780	660	29		10.0	7.0						
	1	5,3	4,5	3,7	54	49	39	570	450	25		7.0	5.0						

Standard delivery

Fully preassembled equipment in colour 001 sandblast grey metallic
Including manual AVS-system
Not included safety switch.

Options

Fixing with set of brackets A p. 160
4-sided AVS air diffuser: p. 162
Double deflection front grille: p. 163
Switch boxes: p. 165

Connection options

CODE	Description
.../SS	Fitted safety switch 1 x 230 V at the side

Example: UNIT. 021/SS



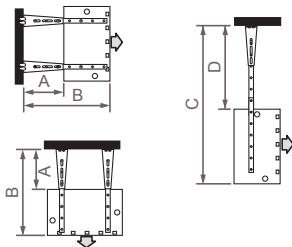
Unit heater

Jaga AVS® Unit heater_Brackets and Fixing set

Witch brackets and fixing set to use?

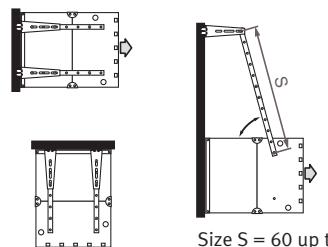
Without air inlet options

Set of brackets A



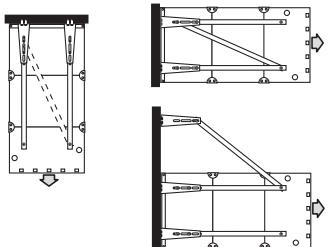
With 1 air inlet options

set of bracket A + Mounting set A



With 2 air inlet options

set of bracket B + Mounting set B



Unit heater

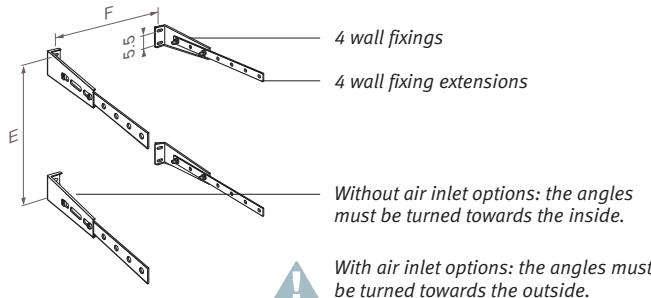
Size	A min.	A max.	B min.	B max.	C min.	C max.	D min.	D max.	E	F	G
000(Mini)	36	67	77	107	72.5	132.5	31.5	101.5
100	36	67	77	107	83.5	143.5	30.5	90.5	35.5	53	63.5
200	36	67	77	107	94.5	144.5	29.5	79.5	45.5	65	75.5
300	36	67	77	107	105.5	145.5	28.5	68.5	55.5	77	87.5
400	36	67	77	107	116.5	146.5	27.5	57.5	65.5	89	99.5

Dimensions E, F, G: see the drawings of the set of brackets.

Dimensions in cm

set of bracket A

For unit heater without or with one air inlet option.



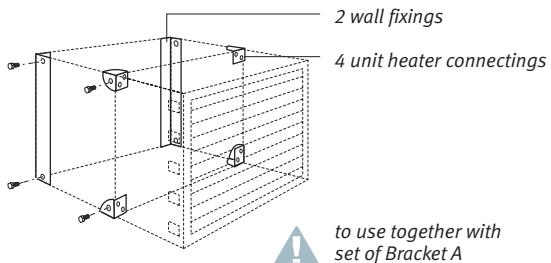
With air inlet options: the angles must be turned towards the outside.

Size	CODE
identical for all sizes	8376.010100

- Carrying capacity: 150 kg
- Finish in the same colour as the unit heater (sandblast grey metallic, colour 001).
- inclusive screw bolts

Fixing set A

For mounting of 1 air inlet option



to use together with set of Bracket A

Size	CODE
100	8376.040001
200	8376.040002
300	8376.040003
400	8376.040004

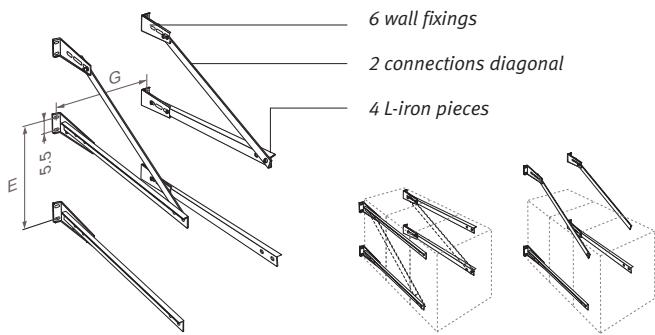
- Finish in the same colour as the unit heater (sandblast grey metallic, colour 001).
- incl. bolts M 8 x 16 Din 933
- incl. spring washers M8 Din 127



Jaga AVS® Unit heater

Set of brackets B

For unit heater with two air inlet options.



Size	CODE
100	8376.030101
200	8376.030102
300	8376.030103
400	8376.030104

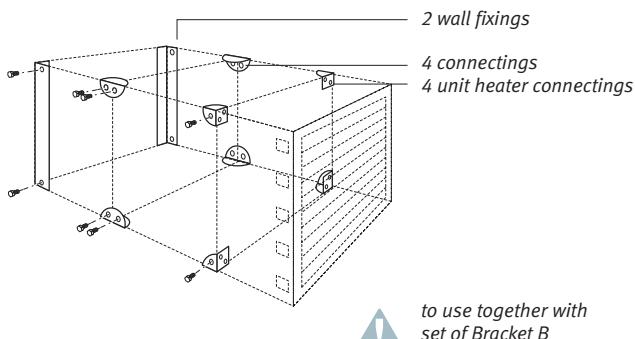


Unit heater

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

Fixing set B

For mounting of 2 air inlet options.



Complete set

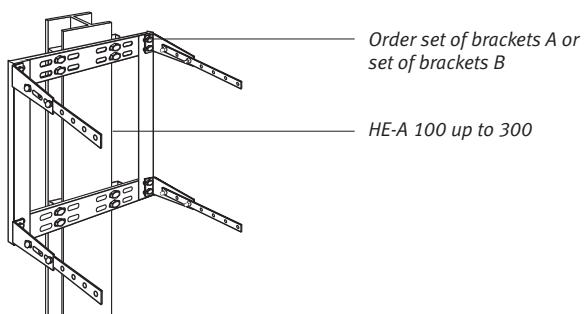
Size	CODE
100	8376.040101
200	8376.040102
300	8376.040103
400	8376.040104

Parts

Parts	Size	CODE
2 wall fixings	100	8376.040201
	200	8376.040202
	300	8376.040203
	400	8376.040204
4 connectings + 8 bolts	8376.040300	
4 Unit heater connectings + 8 bolts		8376.040400

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

Fixing on metal construction



Fixing on metal construction

Size	CODE
100	8376.050101
200	8376.050102
300	8376.050103
400	8376.050104

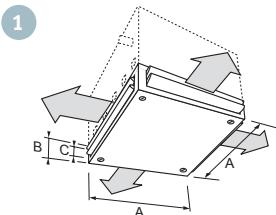
- Finish in the same colour as the unit heater (sandblast grey metallic, colour 001).
- inclusive screw bolts.

Jaga AVS® Unit heater_Air exhaust options



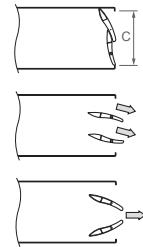
Unit heater

4-Sided AVS air diffuser

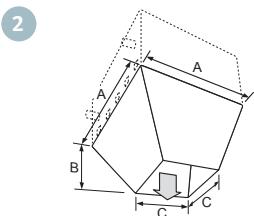


for size	CODE	A	B	C	Weight kg
000 (Mini)	8375.060100	41.0	18.8	13.8	7.2
100	8375.060101	53.0	18.8	13.8	9.2
200	8375.060102	65.0	18.8	13.8	11.8
300	8375.060103	77.0	18.8	13.8	14.6
400	8375.060104	89.0	18.8	13.8	17.7

- Order together with the unit heater. The unit heater needs to be adjusted.
- at this option has the unit heater no air exhausting grille
- will be delivered separately. Easy to mount and disassemble through click-fixing.
- finish identical to the unit heater (sandblast grey metallic, colour 001).
- aerodynamical angled louvres in satin black lacquered aluminium.
- maximum height = 2.5 m bottom end of the appliance.



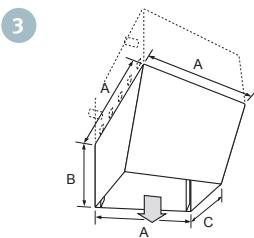
Exhaust cone



for size	CODE	A	B	C	Weight kg
100	8375.080101	53.0	43.3	22.0	8.2
200	8375.080102	65.0	46.1	32.0	10.7
300	8375.080103	77.0	55.8	37.0	14.8
400	8375.080104	89.0	64.2	43.0	18.9

- Application: 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 click-fixing.
- Finish identical to the unit heater (sandblast grey metallic, colour 001).

Exhaust mouth piece



for size	CODE	A	B	C	Weight kg
100	8375.070101	53.0	54.5	10.5	9.7
200	8375.070102	65.0	60.0	18.0	17.3
300	8375.070103	77.0	72.5	19.0	24.0
400	8375.070104	89.0	103.5	25.0	36.7

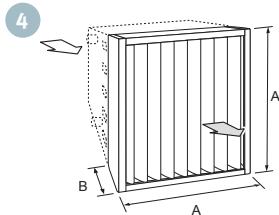
- Application: prevent cold air entering the room via the gates etc...
- Order together with the unit heater. The unit heater needs to be adjusted.
- Will be delivered separately. Easy to mount and disassemble through click-fixing.
- Finish identical to the unit heater (sandblast grey metallic, colour 001).

Jaga AVS® Unit heater_Air exhaust options



Unit heater

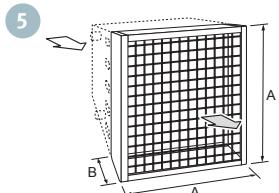
Double deflection front grille



for size	CODE	A	B	Weight kg
000 (Mini)	8375.110100	41.0	10.1	5.0
100	8375.110101	53.0	10.1	6.1
200	8375.110102	65.0	10.1	8.1
300	8375.110103	77.0	10.1	10.4
400	8375.110104	89.0	10.1	13.0

- Prevents developing too high a temperature at the opposite wall.
- Not suitable in use with the modulating version.
- Easy to mount through click-fixing at the top.
- Finish identical to the unit heater (sandblast grey metallic, colour 001).
- Aerodynamic angled louvres in satin black lacquered aluminium.

Protection grille for sport centers



for size	CODE	A	B	Weight kg
100	8375.100101	53.0	10.1	5.7
200	8375.100102	65.0	10.1	6.7
300	8375.100103	77.0	10.1	8.4
400	8375.100104	89.0	10.1	8.8

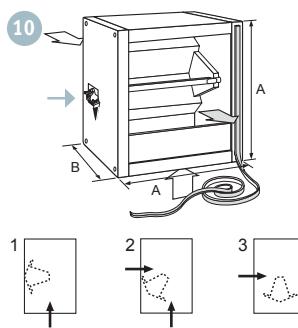
- Easy to mount through click-fixing at the top.
- Not suitable in use with the modulating version.
- Finish identical to the unit heater (sandblast grey metallic, colour 001).

Jaga AVS® Unit heater_Air inlet options



For losses of air flow and/or capacity when use is made of extraction appliances: see graphs pag. 178

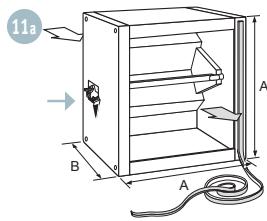
Air mixing box



for size	CODE galvanized	CODE lacquered	A	B	Weight kg
100	8375.010101	83751.010101	53.0	35.0	13.6
200	8375.010102	83751.010102	65.0	45.0	19.3
300	8375.010103	83751.010103	77.0	55.0	25.9
400	8375.010104	83751.010104	89.0	66.5	33.1

- Unlacquered galvanized steel, or lacquered in the same colour as the unit heater (sandblast grey metallic, colour 001).
- Manually adjusted.

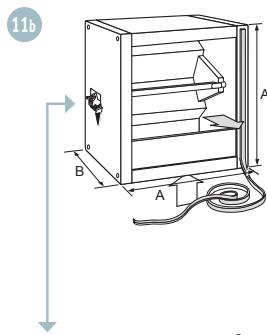
Shutter box 180°



for size	CODE galvanized	CODE lacquered	A	B	Weight kg
100	8375.020101	83751.020101	53.0	35.0	15.1
200	8375.020102	83751.020102	65.0	45.0	20.1
300	8375.020103	83751.020103	77.0	55.0	29.1
400	8375.020104	83751.020104	89.0	66.5	37.1

- Unlacquered galvanized steel, or lacquered in the same colour as the unit heater (sandblast grey metallic, colour 001).
- Manually adjusted

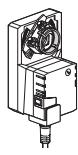
Shutter box 90°



for size	CODE galvanized	CODE lacquered	A	B	Weight kg
100	8375.020201	83751.020201	53.0	35.0	15.1
200	8375.020202	83751.020202	65.0	45.0	20.1
300	8375.020203	83751.020203	77.0	55.0	29.1
400	8375.020204	83751.020204	89.0	66.5	37.1

- Unlacquered galvanized steel, or lacquered in the same colour as the unit heater (sandblast grey metallic, colour 001).
- Manually adjusted

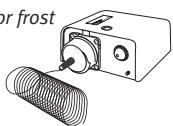
Servo motor



Switch box



Thermostat for frost protection



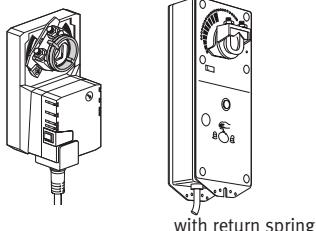
Jaga AVS® Unit heater_Air inlet options

Control / protection for air mixing box and shutter box



*Be assembled delivered.
The servo motor has to be ordered together with shutter box or air mixing box.
The frost protection thermostat has to be ordered together with the unit heater.*

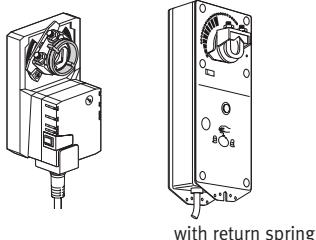
Servo motors "on/off"



CODE	Drawing	Description
8383.2301	1	servo motor "on/off-230 V"
8383.2302	2	servo motor "on/off-230 V" with return spring**
8383.2403	3	servo motor "on/off-24 V" with return spring**
8383.2404	4	Servo motor "on/off-24 V"

- *idem for each size*
- *Return spring: the mixing box or the shutter box will be closed automatically in case of a power cut (frost protection).*

Servo motors "modulating"



CODE	Drawing	Description
8383.2303	5	Servo motor "modulating - 230 V"
8383.2401	6	servo motor "modulating-24 V"
8383.2402	7	servo motor "modulating-24 V" with return spring**

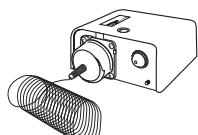
- *idem for each size*
- *Return spring: the mixing box or the shutter box will be closed automatically in case of a power cut (frost protection).*

Switch boxes for servo motors



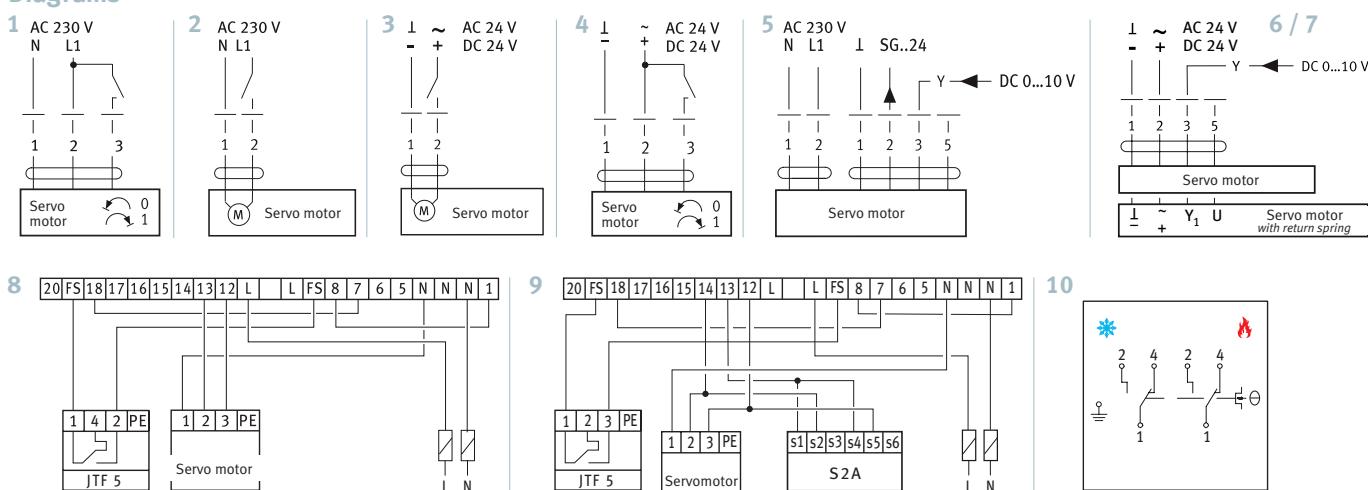
CODE	Drawing	Description
8351.070001	8	switch box open/closed for servo motor 230V 8383.2301
8351.070002	9	Switch box open/middle/closed, incl. second switch, for servo motor 230 V 8383.2301

Thermostat for frost protection



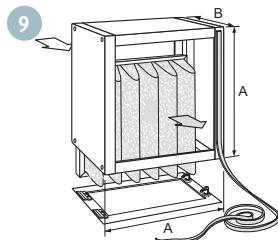
CODE	Drawing	Description	€
8384.0001	10	Thermostat for frost protection (from -10° up to +12°C)	

Diagrams



Jaga AVS® Unit heater_Air inlet options

Filter box with a filter element



for size	CODE galvanized	CODE lacquered	A	B	Weight kg
100	8375.140101	83751.140101	53.0	35.0	18.1
200	8375.140102	83751.140102	65.0	45.0	22.4
300	8375.140103	83751.140103	77.0	55.0	26.7
400	8375.140104	83751.140104	89.0	66.5	31.9

- Unlacquered galvanized steel, or lacquered in the same colour as the unit heater (sandblast grey metallic, colour 001).
- when ordering a filter box it is recommended to also order a spare filter element.

Filter element



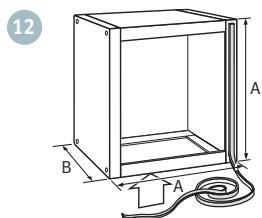
Caution!

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
- in classified in accordance DIN EN 779

for size	CODE
100	8375.150101
200	8375.150102
300	8375.150103
400	8375.150104

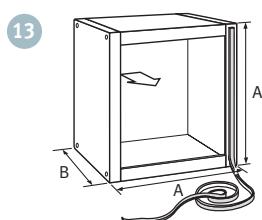
Angular box



for size	CODE galvanized	CODE lacquered	A	B	Weight kg
100	8375.030101	83751.030101	53.0	35.0	12.5
200	8375.030102	83751.030102	65.0	45.0	18.3
300	8375.030103	83751.030103	77.0	55.0	24.9
400	8375.030104	83751.030104	89.0	66.5	32.7

- Unlacquered galvanized steel, or lacquered in the same colour as the unit heater (sandblast grey metallic, colour 001).

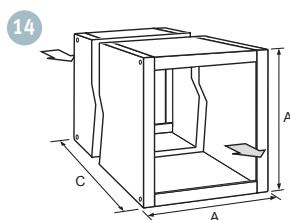
Extension box



for size	CODE galvanized	CODE lacquered	A	B	Weight kg
100	8375.040101	83751.040101	53.0	35.0	11.1
200	8375.040102	83751.040102	65.0	45.0	16.2
300	8375.040103	83751.040103	77.0	55.0	22.3
400	8375.040104	83751.040104	89.0	66.5	29.4

- Unlacquered galvanized steel, or lacquered in the same colour as the unit heater (sandblast grey metallic, colour 001).

Extention channel



for size	CODE galvanized	CODE lacquered	A	C	Weight kg/m
100	8375.170101	83751.170101	53.0	measure C	27.3
200	8375.170102	83751.170102	65.0	per cm,	32.5
300	8375.170103	83751.170103	77.0	up to max.	37.7
400	8375.170104	83751.170104	89.0	289 cm	42.9

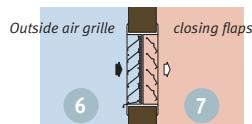
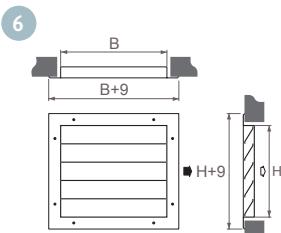
- Unlacquered galvanized steel, or lacquered in the same colour as the unit heater (sandblast grey metallic, colour 001).



Jaga AVS® Unit heater_Air inlet options

Outside air grille

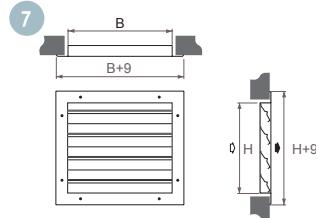
Unit heater



for size	CODE	B	H
100	8375.120101	40.0	34.5
200	8375.120102	60.0	34.5
300	8375.120103	60.0	51.0
400	8375.120104	80.0	51.0

- Protection against rain
- With fine structured metal anti-vermin grille
- Galvanized.

Automatic closing flaps for the outside air grille



for size	CODE	B	H
100	8375.130101	40.0	34.5
200	8375.130102	60.0	34.5
300	8375.130103	60.0	51.0
400	8375.130104	80.0	51.0

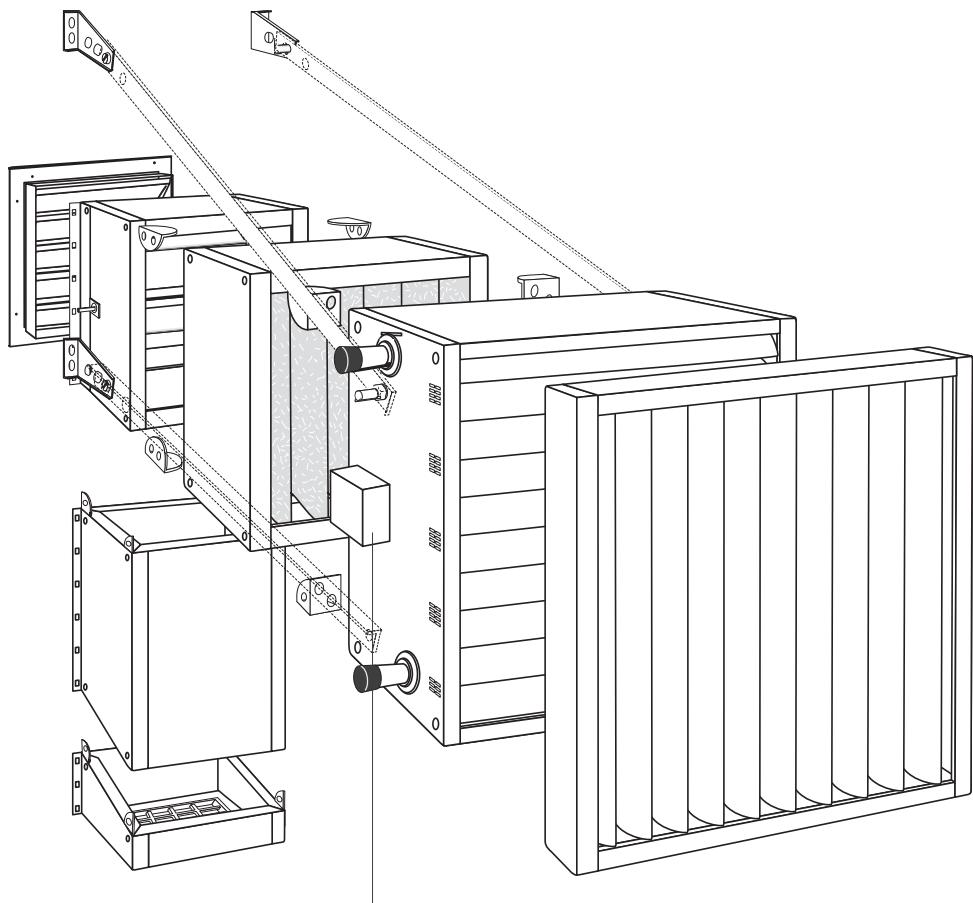
- Galvanized with aluminium fins.
- To prevent warm air from flowing out of a stationary ventilator.

JAGA AVS Unit heater



Unit heater

Example combination possibilities



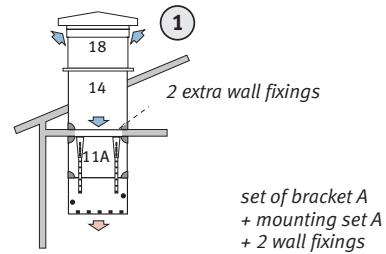
Terminal at the side end
When using air inlet options, it is
possible to order the unit heater with
the terminal at the side instead of on
the engine box.
See price tables.p. 156 up to 159.

Jaga AVS® Unit heater Combination examples for ceiling mounted fixings

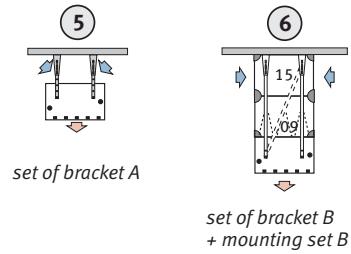


All air inlets should be installed by means of a fixing set. For additional safety, the entire assembly have to be consolidated by the brackets. (not for MINI UH)

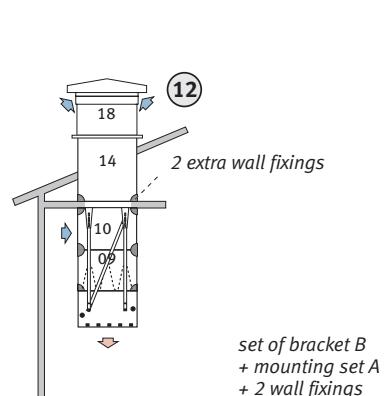
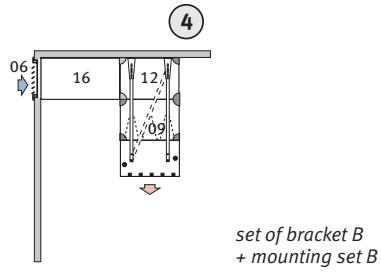
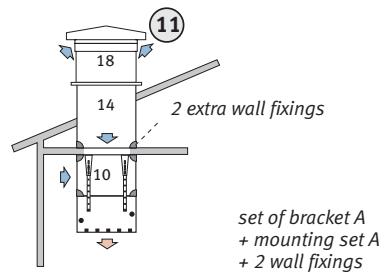
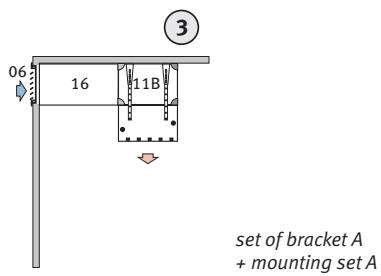
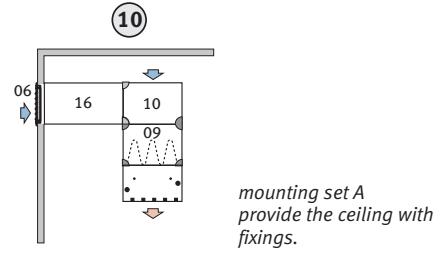
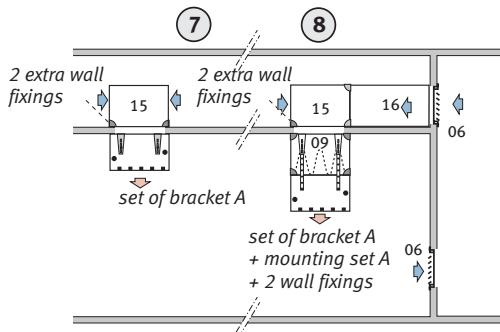
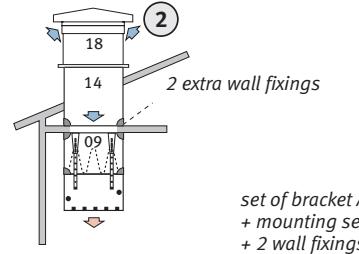
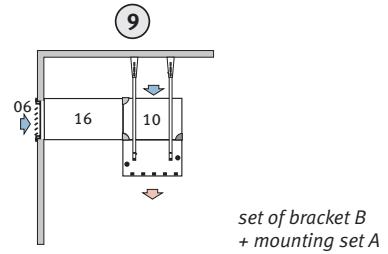
With 100% external air



With 100% ambient air



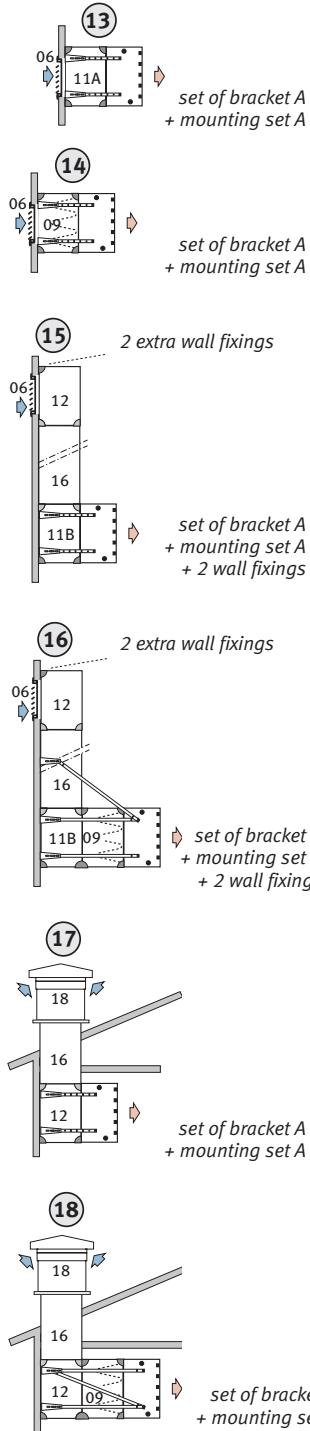
With mixed air



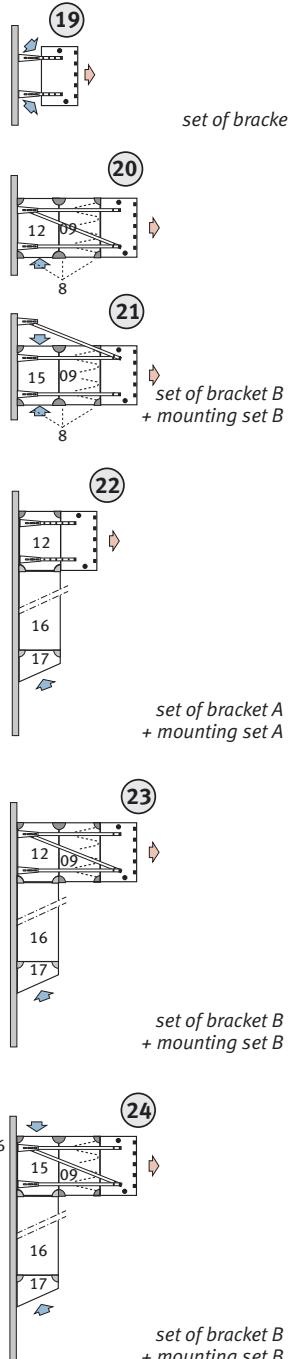
Jaga AVS® Unit heater Combination examples for wall mounted fixings

⚠ All air inlets should be installed by means of a fixing set. For additional safety, the entire assembly have to be consolidated by the brackets. (not for MINI UH)

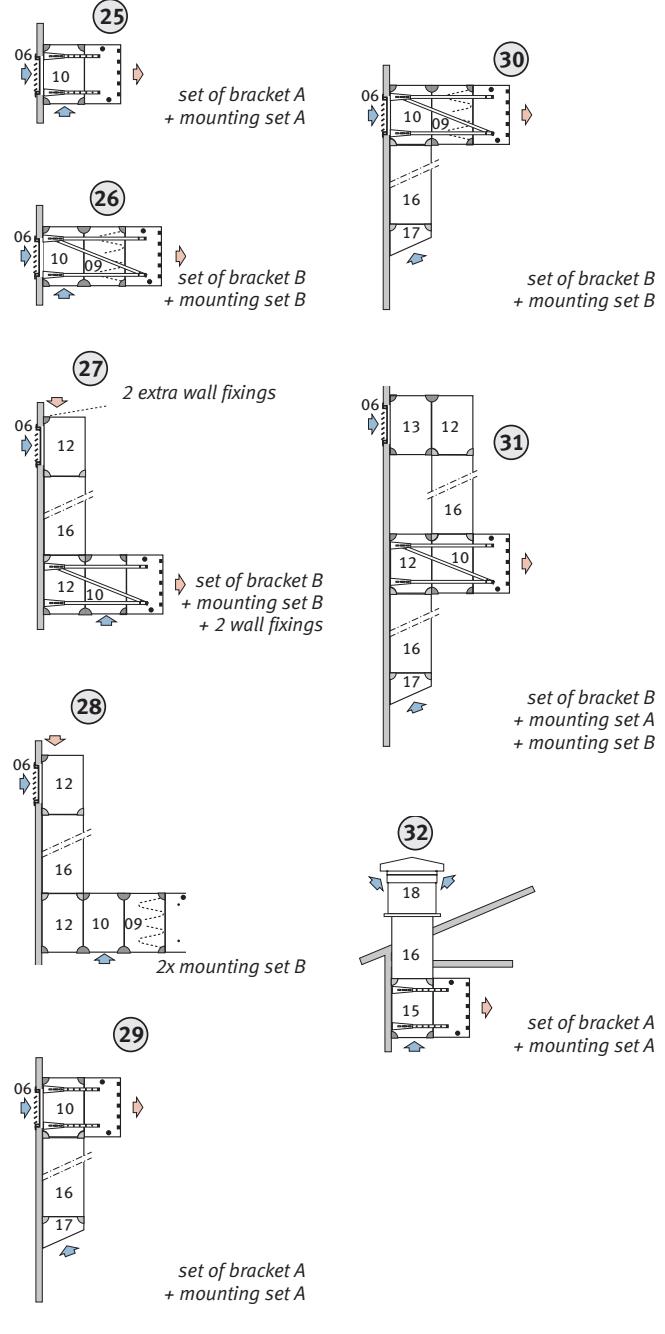
With 100% external air



With 100% ambient air



With mixed air



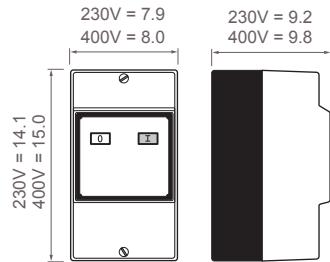
Unit heater

Jaga AVS® Unit heater_Electric connection

Work safety switch

CODE	Description
8351.050001	1 x 230V
8351.050002	3 x 400V

Can be delivered mounted see price tables pag. 155 - 159



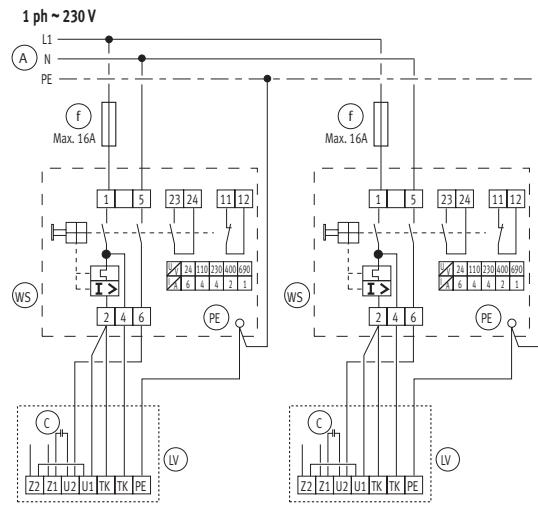
Application:

when each individual unit heater requires an operating switch and a thermal protection as thermal protection and operating switch in case switches without thermocontacts are being used (TK)

How to fit:

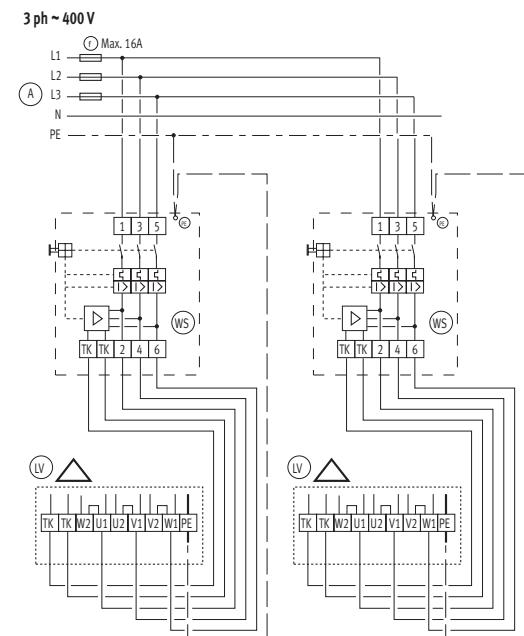
At the side of the unit heater.

Work safety switch 1 x 230V



The thermal protection inside the switch box must be bypassed in case a Jaga safety switch has been used - see n° 4 page 175

Work safety switch 3 x 400V



- Y connection = see drawing n° 3 page 175

- The thermal protection inside the switch box must be bypassed in case a Jaga safety switch has been used - see n° 4 page 175

Electrical scheme available on request:

- A0 230V mono, (mini unit heater)
- A1 230V mono, standard
- A2 230V mono, with safety switch
- A3 230V mono, with modulating motor and control
- A4 230V mono, with safety switch, modulating motor and control

- B1 3x400V mono, standard
- B2 3x400V mono, with safety switch
- B3 3x400V mono, with modulating motor and control
- B4 3x400V mono, with safety switch, modulating motor and control



Jaga AVS® Unit heater_Electric connection

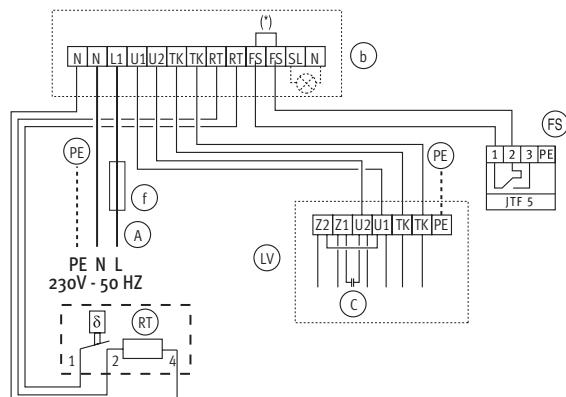
5 speeds switch box

230 V mono - for motor 1 and 5



CODE	Amp.
8351.040131	2.2
8351.040132	3.4
8351.040133	5.2
8351.040134	7.2
8351.040135	13.6

Connection possibility for room thermostat, thermocontact (TK), frost protection and external failure signal (SL).



A mains connection
 RT room thermostat
 b terminals
 PE aeth terminal
 FS frost protection

LV unit heater
 C capacitor
 f fuse
 TK integrated motor

(*) By pass when not using the frost protection.

- When connecting several unit heaters to 1 switch box, the thermal protection should be linked up in series - see drawing n° 1 page 175.
- When using a Jaga safety switch, the thermal protection inside the switch box must be bypassed - see drawing n° 4 page 175.
- Drawing safety switch: see page 172.

Electrical output for 5 speed switch box

Position switch	Electrical output
0	0
1	85
2	105
3	130
4	160
5	230

Total numbers of unit heaters per switch box

Size	000*	100	200	300	400
Switch box 2.2A					
motor 1	4	2	0	0	0
motor 5	-	4	2	1	0
Switch box 3.4A					
motor 1	6	3	1	1	0
motor 5	-	6	3	2	1
Switch box 5.2A					
motor 1	9	5	2	2	1
motor 5	-	10	5	4	2
Switch box 7.2A					
motor 1	13	7	3	2	2
motor 5	-	14	8	6	3
Switch box 13.6A					
motor 1	25	14	5	5	3
motor 5	-	27	15	11	5

000* = Mini unit heater

Jaga AVS® Unit heater_Electric connection

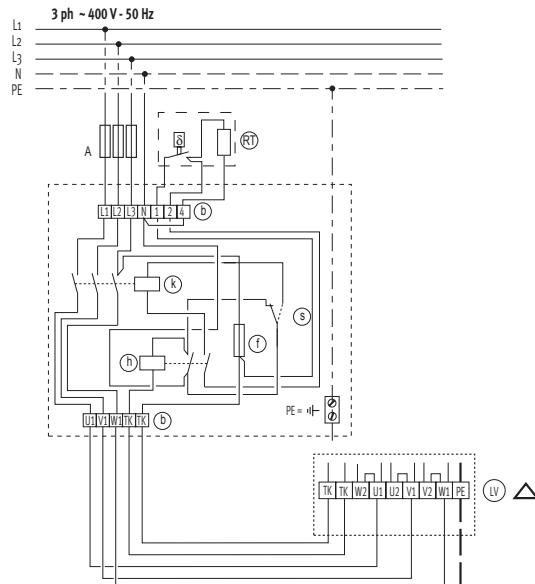
1 speed switch box

3-phase / 400 V _ for motor 3 and 7



CODE	Amp.
8351.021205	10.0

-Connection possibility for room thermostat and thermocontact (TK)



A: mains connection
safety fuse max. 10A
RT: room thermostat
b: terminals
k: line contactor
s: operating switch

h: auxiliary contactor
f: control fuse 2A
PE: earth terminal
TK: integrated motor protection
LV: unit heater

- Star-connection: see drawing n° 3 page 175.
- When connecting several unit heaters to 1 switch box, the thermal protection should be linked up in series - see drawing n° 2 of 5 page 175.
- When using a Jaga safety switch, the thermal protection inside the switch box must be bypassed - see drawing n° 4 page 175.
- Drawing safety switch: see page 172.

Total numbers of unit heaters per switch box

Size	100	200	300	400
motor 3	40	11	10	5
motor 7	100	20	25	10

Y Connections = Speed 4
Δ Connections = Speed 5
depending on choice of UH motor



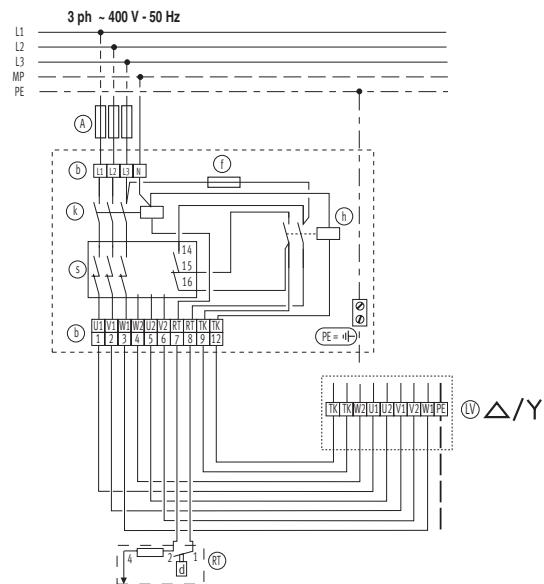
2 speeds switch box

3-phase / 400 V _ for motor 3 and 7



CODE	Amp.
8351.022205	10.0

-Connection possibility for room thermostat and thermocontact (TK)



A: mains connection
safety fuse max. 10A
RT: room thermostat
b: terminals
k: line contactor
s: operating switch

h: auxiliary contactor
f: control fuse 2A
PE: earth terminal
TK: integrated motor protection
LV: unit heater

- When connecting several unit heaters to 1 switch box, the thermal protection should be linked up in series - see drawing n° 6 p. 175.
- Remove the connecting wires at the fan motor when using a 2 speed switch box: see drawing n° 6 p. 175.



Never use this switch box in combination with a Jaga safety switch!

Electrical output for 2 speed switch box

Position switch	Electrical output
Y	230V
Δ	400V

Y Connections = Speed 4
Δ Connections = Speed 5
depending on connection of UH motor

Total numbers of unit heaters per switch box

Size	100	200	300	400
motor 3	40	11	10	5
motor 7	100	20	25	10

Jaga AVS® Unit heater_Electric connection

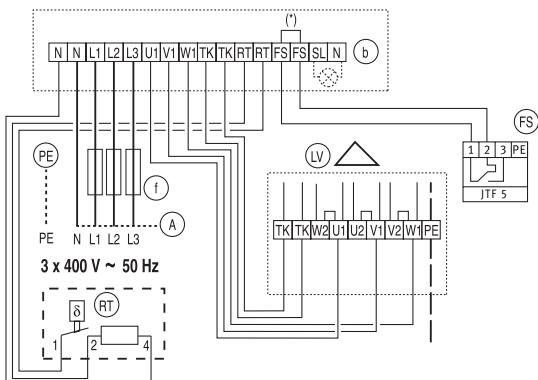
5 speeds switch box

3-phase / 400 V _ for motor 3 and 7



CODE	Amp.
8351.025401	2.0
8351.025403	4.0
8351.025404	7.0

Connection possibility for room thermostat, thermocontact (TK), frost protection and external failure signal (SL).



A: mains connection
RT: room thermostat
b: terminals
PE: earth terminal
TK: integrated motor protection

SL: external failure signal
FS: frost protection
f: fuses
LV: unit heater

Always Δ or Y connection

(*) Bypass when not using the frost protection.

- when connecting several unit heaters to 1 switch box, the thermal protection should be linked up in series - see drawing n° 2 alongside.
- when using a Jaga safety switch, the thermal protection inside the switch box must be bypassed - see drawing n° 4 alongside.
- drawing safety switch, see p. 172.

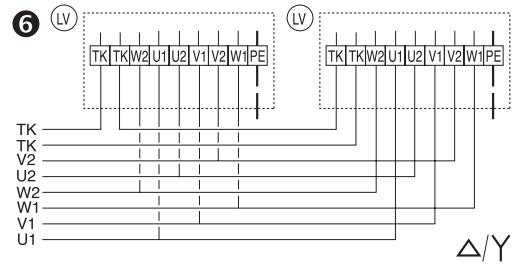
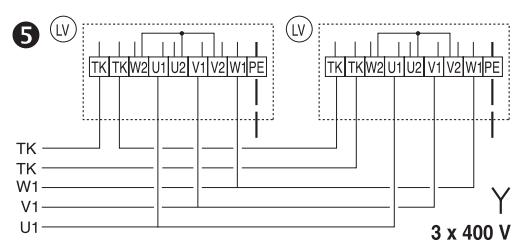
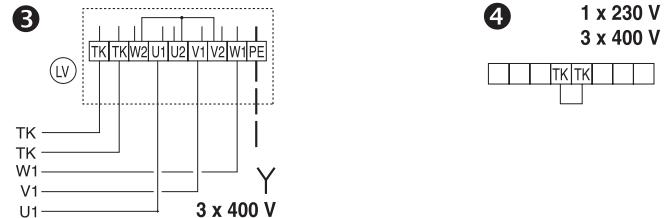
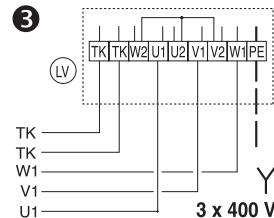
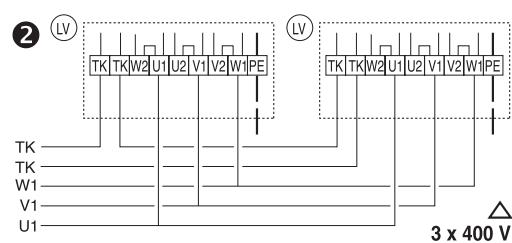
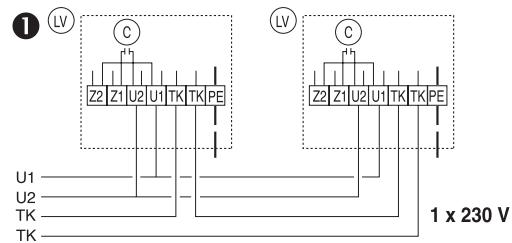
Total numbers of unit heaters per switch box

Size	100	200	300	400
Switch box 2A				
motor 3	8	2	2	1
motor 7	20	4	5	2
Switch box 4A				
motor 3	15	4	4	2
motor 7	40	8	10	4
Switch box 7A				
motor 3	28	7	7	4
motor 7	70	14	17	8

Electrical output for 5 speed switch box

Position switch	Electrical output
0	0
1	90
2	140
3	180
4	230
5	400

Additional drawings



Jaga AVS® Unit heater_Correction factors

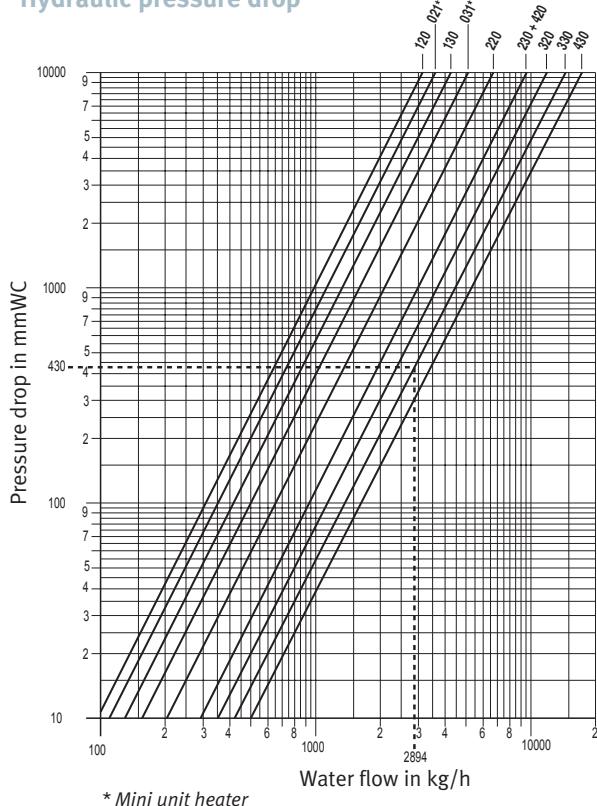
Correction factors (cf) in function of ΔT

(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

Unit heater

Hydraulic pressure drop



Calculation

Calculation for other temperatures.

T_v = Flow temperature
 T_r = return temperature
 T_l = room temperature
 Q_v = Requested capacities

Calculation example

70 °C
 50 °C
 18 °C
 25 kwatts

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

↓

correction factor Cf

↓

0.84

2. Calculation imaginary output (Qf):

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

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

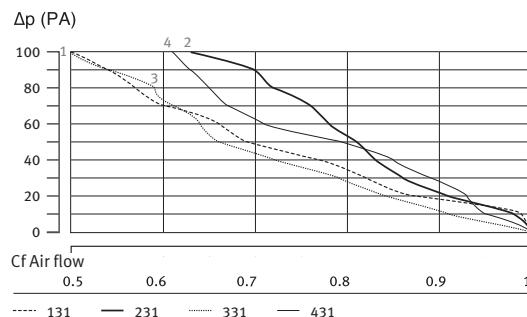
3. Choice unit heater:

Select in table $\Delta=50$ a unit heater with an imaginary output of 29.76 kwatt (Qf).

This unit heater will provide the requested output (Q_v) of 25 kwatt at a water temperature $T_v - T_r$ (70°C/50°C) and a room temperature T_l (18°C).

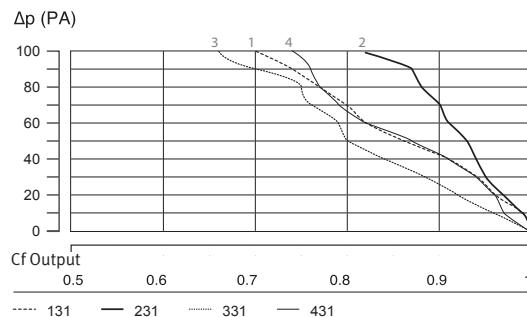
Air flow / correction factor for the air flow

(Pressure drop with air inlet options).



Thermal output / correction factors for the heating loss of output

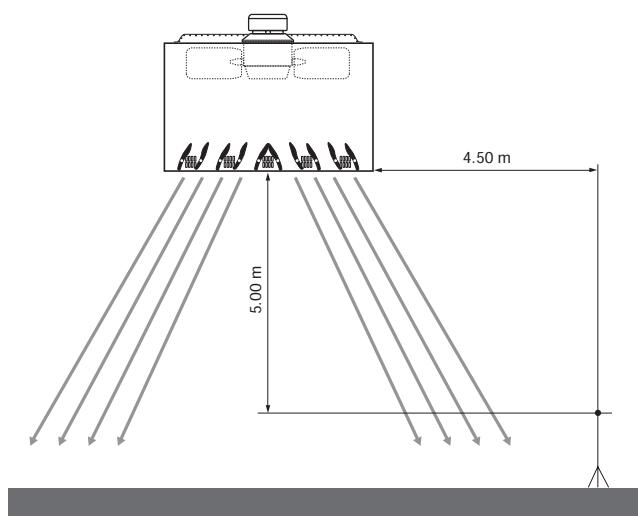
(Pressure drop with air inlet options).



Jaga AVS® Unit heater_Correction factors sound

Noise sources

The noise level



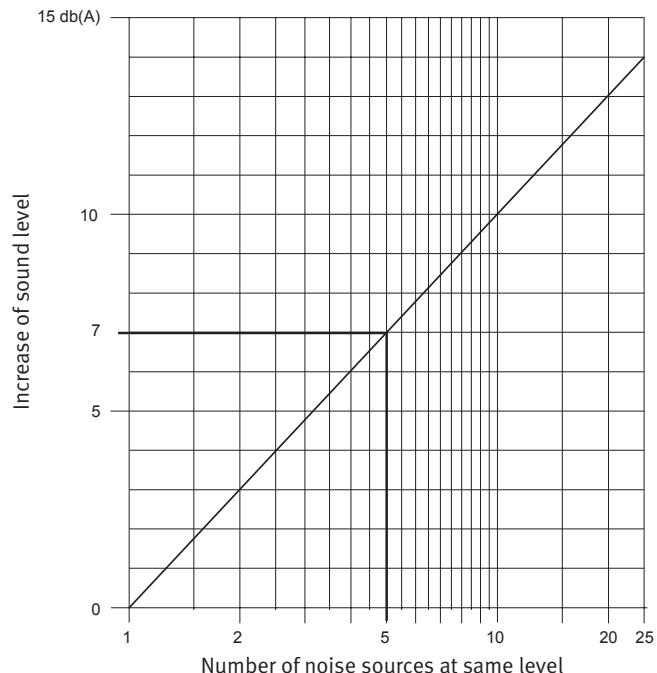
Sound measuring in a room in accordance to (DIN) EN 23741 and 23742

The information regarding the noise level of the unit heaters is applicable in case of a full air flow at a distance of 5 m high and 4.5 m sideways from the equipment, in a room without reflection, in accordance to DIN 23741 and 23742.

These values are approximate values for a free air inlet and outlet flow, which may be strongly influenced by the conditions of the installation of the equipment and the heated room.

ex.: the value of a room with partial reflection is around 4 dbA higher.

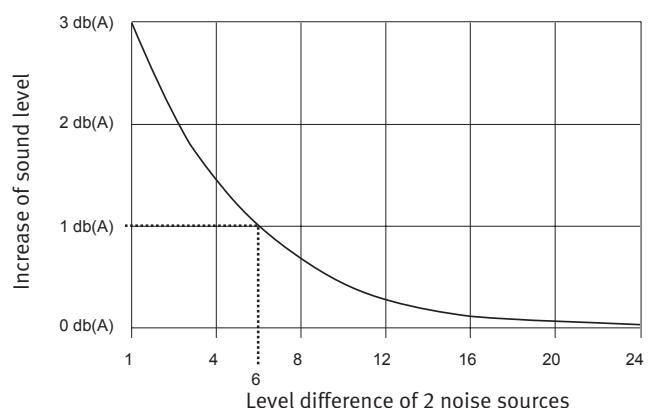
Combination of different noise sources at the same sound level



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:

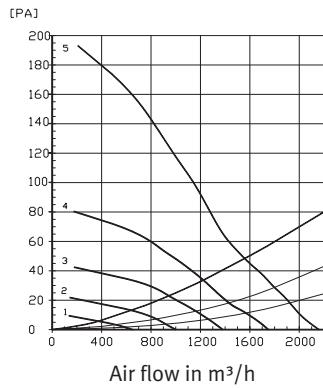
- given: 2 sound sources 53 dbA and 59 db(A)
- difference = 6 db(A)
- asked: the total sound intensity
- the total sound intensity: 59 db(A) plus 1 db(A) = 60 db(A)



Unit heater

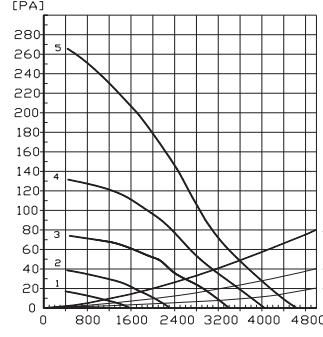
Jaga AVS® Unit heater_Air flow with options

Unit heater



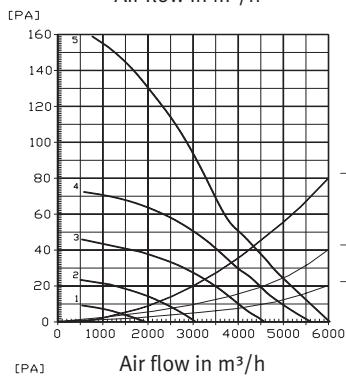
LV 121

- Filter
- Outside air grille
- Air inlet options & Air exhaust options



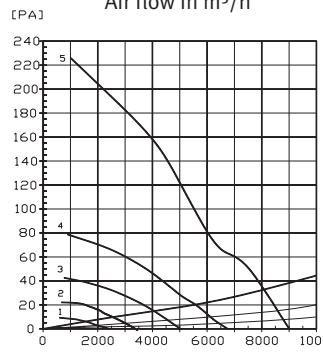
LV 221

- Filter
- Outside air grille
- Air inlet options & Air exhaust options



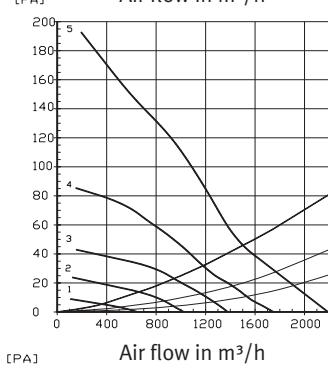
LV 321

- Filter
- Outside air grille
- Air inlet options & Air exhaust options



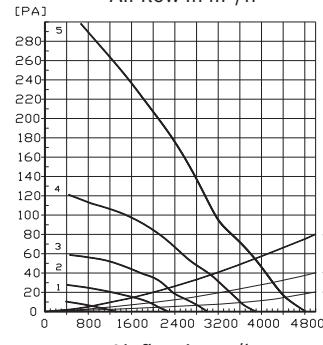
LV 421

- Filter
- Outside air grille
- Air inlet options & Air exhaust options



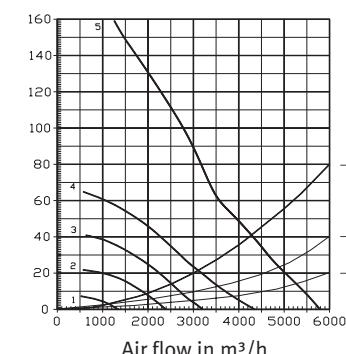
LV 123

- Filter
- Outside air grille
- Air inlet options & Air exhaust options



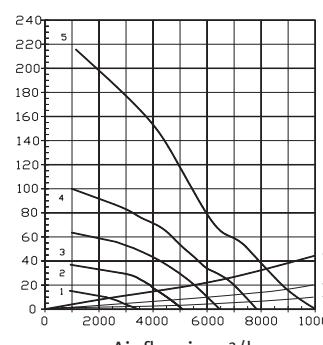
LV 223

- Filter
- Outside air grille
- Air inlet options & Air exhaust options



LV 323

- Filter
- Outside air grille
- Air inlet options & Air exhaust options



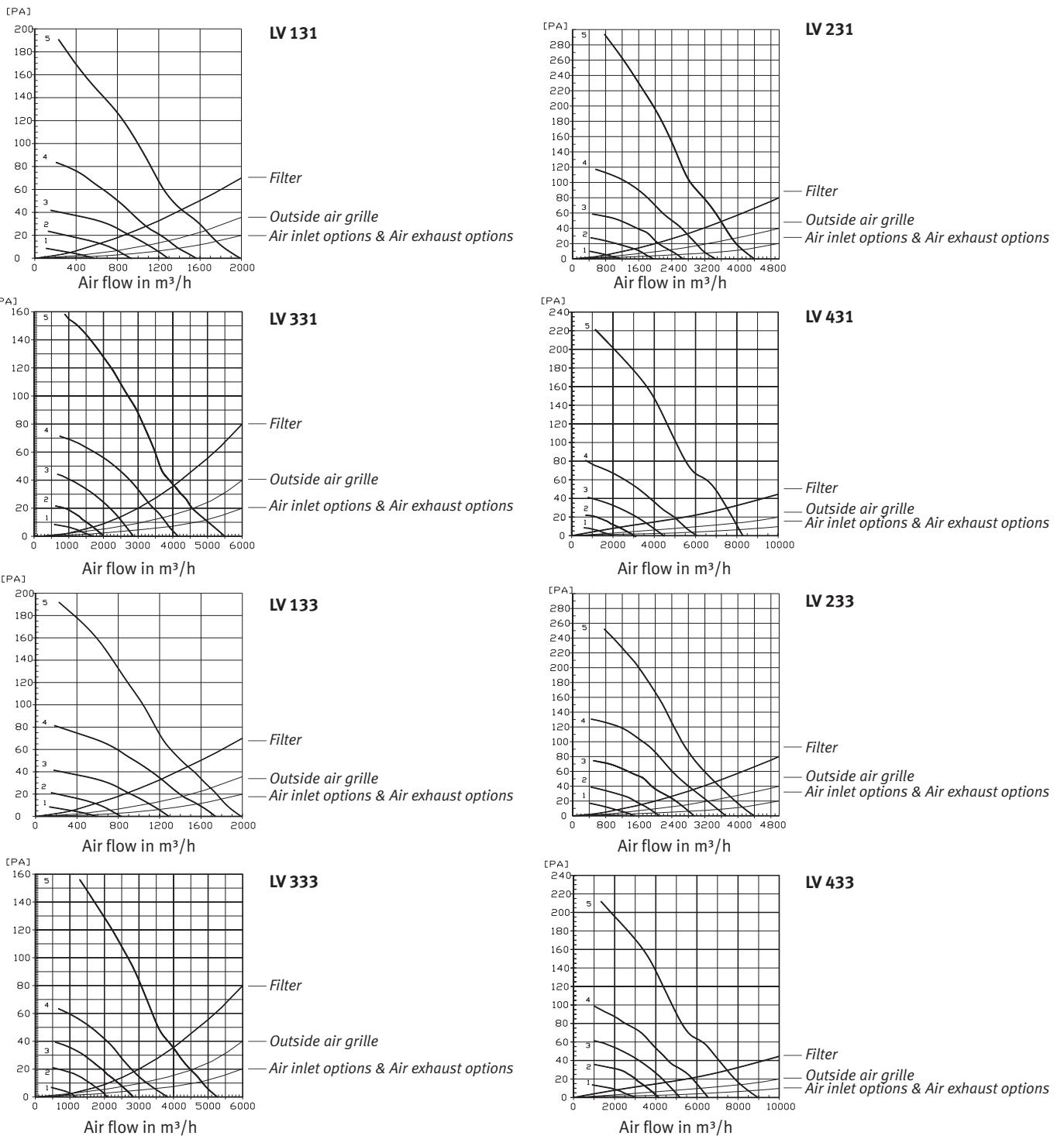
LV 423

- Filter
- Outside air grille
- Air inlet options & Air exhaust options

The calculations for unit heaters at speed reductions (motor 005 and 007) are available on demand.



Jaga AVS® Unit heater_Air flow with options



The calculations for unit heaters at speed reductions (motor 005 and 007) are available on demand.

Jaga AVS® Unit heater - Parts

Parts: motor and heat exchanger

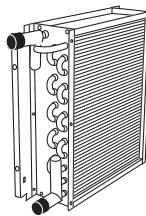
Unit heater

Motor

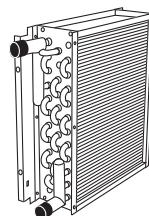
	for size	CODE
motor 1 Standard speed $1 \times 230 \text{ V}$	000*	24502.02200100
	100	24502.02200101
	200	24502.02200201
	300	24502.02200301
	400	24502.02200401
motor 3 Standard speed $3 \times 400 \text{ V}$	100	24506.33800103
	200	24506.33800203
	300	24506.33800303
	400	24506.33800403
motor 5 Speed reduction $1 \times 230 \text{ V}$	100	24531.02200105
	200	24531.02200205
	300	24531.02200305
	400	24531.02200405
motor 7 Speed reduction $3 \times 400 \text{ V}$	100	24536.33800107
	200	24536.33800207
	300	24536.33800307
	400	24536.33800407

Heat exchanger

	for size	CODE
<i>Low-H₂O heat exchanger with 2 rows of pipes</i>	000 (Mini)	8393.010105
	100	8393.010101
	200	8393.010102
	300	8393.010103
	400	8393.010104
<i>Low-H₂O heat exchanger with 3 rows of pipes</i>	000 (Mini)	8393.020105
	100	8393.020101
	200	8393.020102
	300	8393.020103
	400	8393.020104



Low-H₂O heat exchanger with 2 rows of pipes



Low-H₂O heat exchanger with 3 rows of pipes

technical data: motor and heat exchanger

Type	Output			Current			Water-Content °C	Max. Air inlet T°:
	Δ	kwatts	Y	Δ	A Y	L		
021 - 031*	---	0.10	---	---	0.52	---	0.9 - 1.3	55
121 - 131	---	0.24	---	---	0.89	---	1.8 - 2.6	50
221 - 231	---	0.60	---	---	2.10	---	3.6 - 4.2	60
321 - 331	---	0.65	---	---	2.30	---	4.0 - 5.8	55
421 - 431	---	0.72	---	---	3.20	---	5.5 - 8.9	50
123 - 133	0.13	---	0.08	0.25	---	0.14	1.8 - 2.6	70
223 - 233	0.45	---	0.34	0.88	---	0.60	3.6 - 4.2	45
323 - 333	0.39	---	0.20	0.92	---	0.48	4.0 - 5.8	50
423 - 433	0.75	---	0.47	1.65	---	0.90	5.5 - 8.9	40
125 - 135	---	0.12	---	---	0.47	---	1.8 - 2.6	70
225 - 235	---	0.21	---	---	0.83	---	3.6 - 4.2	60
325 - 335	---	0.30	---	---	1.10	---	4.0 - 5.8	70
425 - 435	---	0.43	---	---	2.20	---	5.5 - 8.9	50
127 - 137	0.05	---	0.03	0.10	---	0.05	1.8 - 2.6	70
227 - 237	0.17	---	0.11	0.48	---	0.25	3.6 - 4.2	70
327 - 337	0.16	---	0.10	0.39	---	0.21	4.0 - 5.8	70
427 - 437	0.38	---	0.25	0.90	---	0.48	5.5 - 8.9	50

*motor with integrated thermocontact and fitted thermal box: insulation range B / IP 54
working pressure max. 11 bar at 130 °C
pressure tested: 25 bar*

* Mini unit heater

