–weishaupt–

product

Information on sound absorbers

Sound absorbers for Weishaupt burners

The outstanding effectiveness of Weishaupt sound absorbers

W-SH 20 in a district heating centre, with bespoke shroud cutouts for the fuel and power supplies.

Weishaupt gas, oil, and dual-fuel burners operate quietly, thanks to the aerodynamic design of their air-ducting parts. Likewise, their mixing assemblies have been developed to ensure that the mixing process is quiet, and their motors and fan wheels are dynamically balanced. All this helps to ensure both low noise levels during operation and the longevity of the equipment.

Sound attenuation measures
The burner, heat generator, and flue gas side equipment in every heating installation form an acoustic system. Resonance phenomena can propogate sound, with the resultant noise being more or less disturbing, depending on its intensity and frequency.

Noise reduction measures – such as the use of sound-absorbing shrouds – can be implemented to ensure that noise limits for the boiler room and adjacent areas are not exceeded.

There is a choice of sound-absorbing shrouds to absorb and dampen the noise created by the burner. To reduce the noise created by any flue gas side equipment, we would recommend the installation of a flue gas sound absorber.

Effectiveness
Weishaupt sound-absorbing shrouds work to dampen and absorb sound. By covering or insulating the source of the noise, the sound energy within them is reflected internally and thus reduced. It is important that the insulation be as complete as possible, without accoustical bridges. All sound absorbing shrouds therefore feature an integral air intake section. This, and the whole shroud, are lined with non-woven glass fleece insulation and mineral wool; the resultant high degree of absorption converts the sound energy into heat.

Assessment of the sound level
The amount of noise generated by a burner is given as a sound pressure level measured in decibels [dB(A)].

During the analysis the sound pressure levels are determined area by area using octave filtering. This gives lineally mediated levels referenced to the relative octave centre frequency, which are then displayed in the form of a graph.

The test result is an A-weighted sound pressure level, obtained by summing across the whole frequency range, taking into account weighting curve A.

The evaluation of sound emissions with the test unit conforms to EC 1672.

Construction
The sound-absorbing shrouds, which can be wheeled into and out of position and adjusted for height as required, are noteworthy for their self-supporting “flat-pack” design. They comprise several easy-to-handle component parts – the base, sides, air inlet, and lid – that can be easily assembled by means of quick-release catches to form a single sound-proof unit.

The shroud has openings either to the side or below for gas, oil and electrical supply lines. An oil drip tray is available if required.

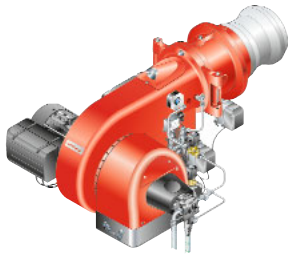
Design stage considerations
When designing a plantroom with sound-absorbing shrouds, it should be ensured that electrical cables and oil supply lines will be installed such that they do not form an obstruction that would hinder the wheeling into position of the shroud. Care must be taken, for the same reason, with regard to any protrusion of boiler plinths and to the position of any stanchions, gulleys, or walls. Gas valve train components should not be in a position that would necessitate overly large openings in the shroud, reducing its effectiveness.

There must be sufficient space available behind the shroud to allow for it to be freely wheeled back, so that servicing work can be carried out on the burner.

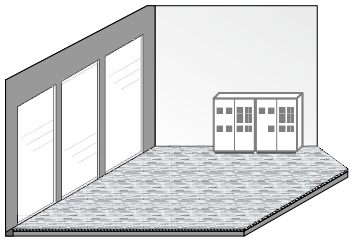
We will be happpy to advise you should you have special requirements to be accomodated. For example, a supporting frame might be required for the legs of the sound-absorbing shroud. A supporting frame is always required for floor clearances (to the underside of the shroud) in excess of 800 mm. The relevant ordering information can be found on pages 8 and 9.

The use of sound-absorbing shrouds results in a small suction side pressure loss. Depending on the type of shroud and the burner rating, this is in the region of 1.5 mbar.

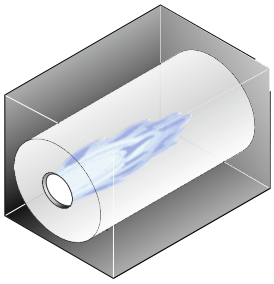
Burner sound pressure level



Spatial sound reflections



Combustion chamber noise

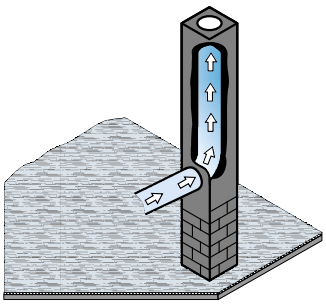


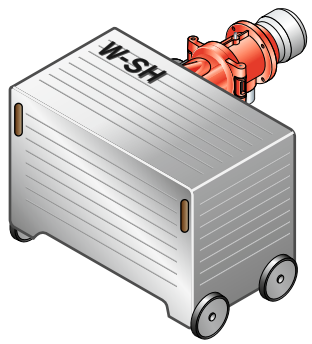
Other influences

– Solenoid valves
– Air ducts
– Safety valves
– Feed water pumps
– Pump stations
– Circulation pumps
– Gas valve trains
– Structure-borne sound

dB(A)

Noise within the flue

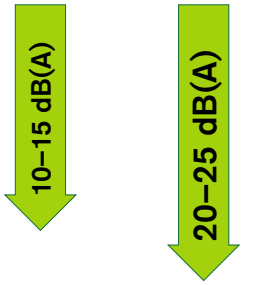




Sound-absorbing shrouds
Weishaupt's optional W-SH sound-absorbing shrouds can make a considerable reduction in burner noise emissions.

There are two different versions of sound absorbing shroud available (see box, right).

W-SH 15 **W-SH 20**



Sound pressure level reduction

Examples of some of the factors that contibute to noise levels

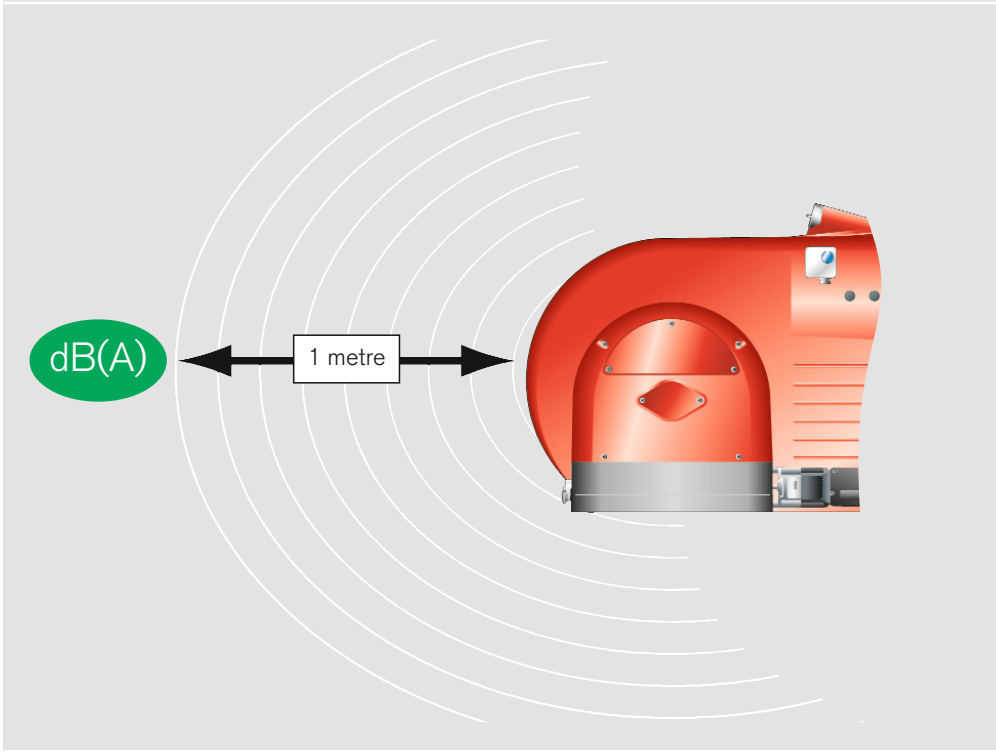
What is the difference between sound power level and sound pressure level?

Sound power level, L_{WA}, and sound pressure level, L_{pA}, are two different quantities that are both measured in decibels (dB(A)).

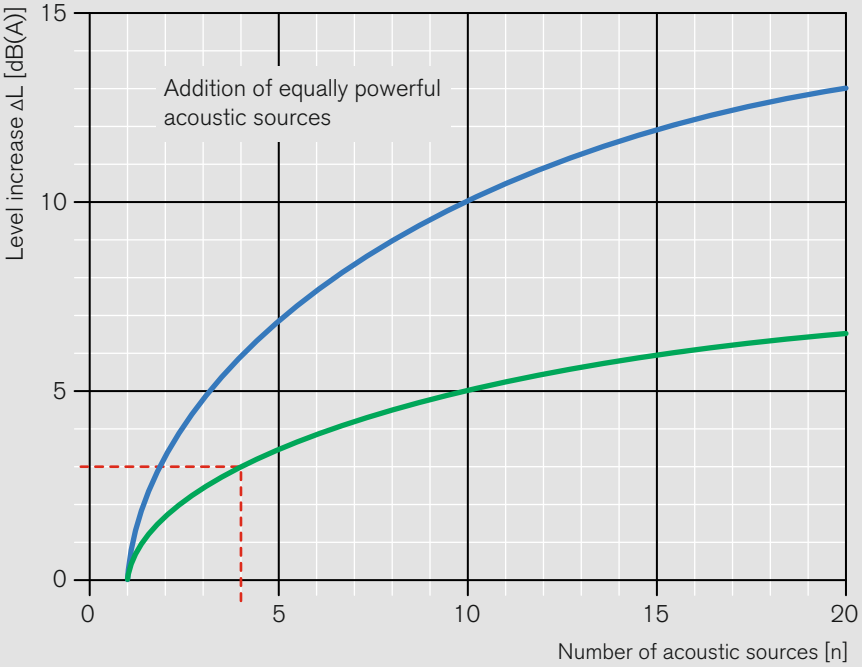
Sound emission
The sound energy that continually radiates from an acoustic source is referred to as a sound emission. The term sound power refers to the rate at which sound energy is transmitted per unit time.

Sound power level
Sound power, measured in accordance with EN ISO 9614-2, is a theoretical quantity that cannot be measured directly. It is derived from a measurement of intensity on an envelope (designated volume around the burner). The result can be expressed in two different units: as the sound power, which is measured in watts, or as a sound power level (L_{WA}), which is measured in decibels. Sound power is **independent** of spatial and distance considerations. The sound power of an acoustic source causes sound pressure variations in the air, whereas the sound pressure of an acoustic source is the resultant, distance- **dependent** effect.

Sound pressure level
The reference point for airborne sound was defined at the beginning of the 20th century to be p_0 = 20 µPa. This sound pressure was considered to be the threshold level of human hearing at a frequency of 1 kHz. It is measured at a distance of 1 metre from the acoustic source (burner). Project specifications and local regulations mostly stipulate sound pressure levels.



Adding sound levels from multiple acoustic sources



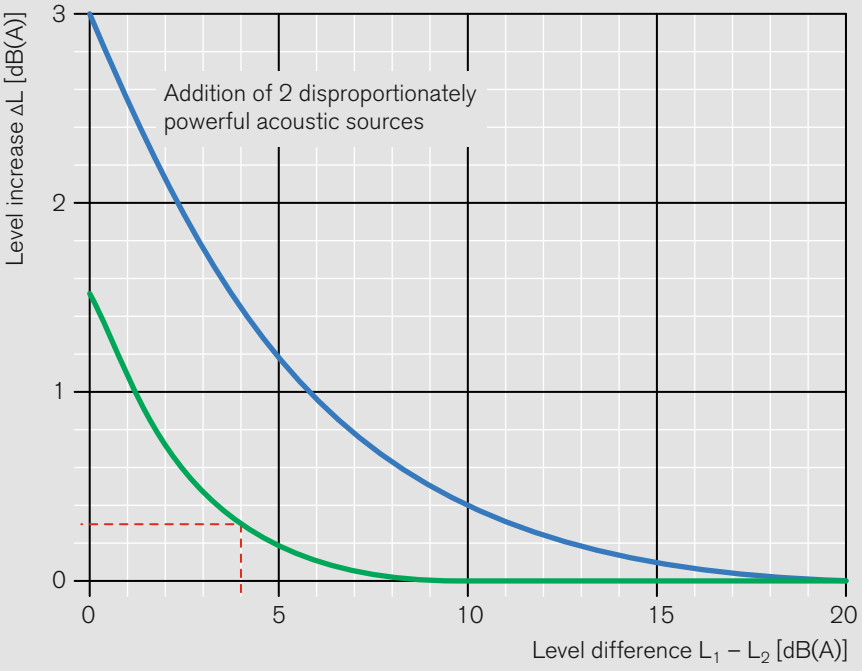
Addition of equally powerful, reference-free acoustic signals.

Example:
Multi-boiler plant with 4 burners

4 acoustic sources, each at:	78 dB(A)
Increase to level:	3 dB(A)
Total sound pressure level:	81 dB(A)

— Machines installed in very close proximity

— Spatially separated machines (standard for boiler plant)



Addition of two disproportionately powerful, reference-free acoustic signals.

Example:
Multi-boiler plant with 2 burners

Acoustic source 1:	79 dB(A)
Acoustic source 2:	75 dB(A)
Level difference:	4 dB(A)
Level increase:	0.3 dB(A)
Total level:	79.3 dB(A)

— Machines installed in very close proximity

— Spatially separated machines (standard for boiler plant)

The total level is calculated by adding the level increase to the highest acoustic source level.

Reducing the overall sound level
The degree of attenuation that can be achieved depends very much on the customisation of the shroud to suit the plant and an advance, site-specific check has invariably proved invaluable. Where required, a site measurement survey can be undertaken in order to record the necessary details.

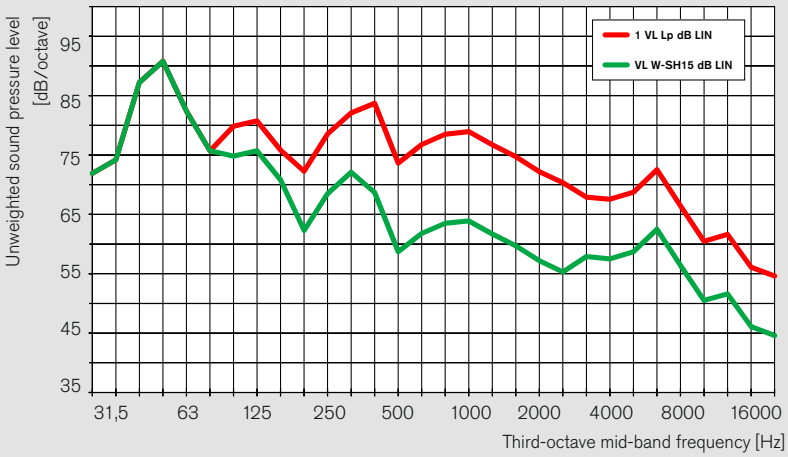
The reduction of burner noise addresses only one factor in the overall noise level of a boiler room, albeit not an insiginificant one. Other factors include:

- How and where the heat exchanger is installed
- Radiation of low-frequency flame noise from the front of the boiler
- The ducting of flue gases within the heat exchanger and between the heat exchanger and the chimney
- Adjacent boiler plant
- Pumps, ancillary equipment
- Design of the building etc.

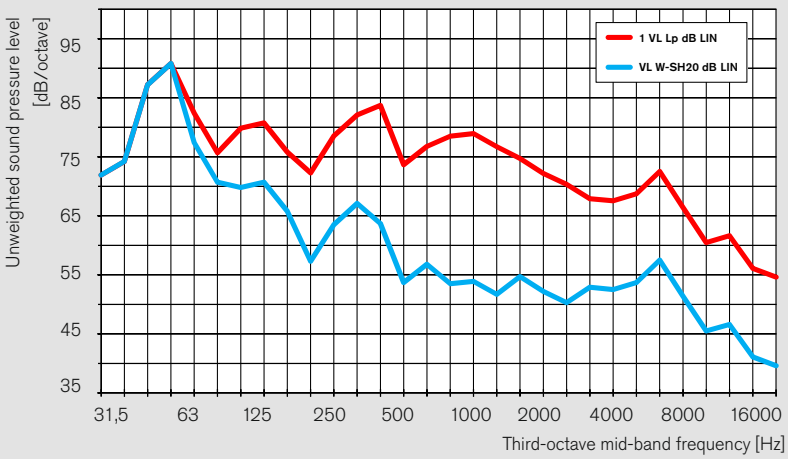
The reduction of the overall noise level of a system can therefore end up being less than the reduction in burner noise achieved through the use of burner sound absorbers. The influence of the above factors under reflective conditions can often not be fully separated from burner noise. Taking this into account, the extent to which any reduction in the overall noise level of a system can be inferred from a statement on the reduction of burner noise is limited.

In particular, it should be noted that the ambient noise level in the vicinity of the burner (extraneous noise emissions) can affect the measurement of the burner noise level.

Sound level measurement – Example 1



Sound level measurement – Example 2



Sound absorbing shrouds
Technical description

Rear view of W-SH15 sound absorbers for W-series (l) and larger (r) burners.

Front view of a W-SH15 sound absorber

Rear view of a W-SH20 sound absorber for larger burners.

Function
Use of these shrouds dampens and absorbs noise emanating from the burner.

Composition
The exterior cladding is constructed from painted stainless steel. Inside, the shroud is lined with sound-absorbing, heat-resistant, non-combustible mineral wool (DIN 4102 class A2 fire protection) and glass fleece. The interior of the "flat-pack"-type shrouds for monarch-series burners and larger is additionally lined with galvanised, perforated plate.

Construction
For W-series burners, the shroud is a single-piece construction with removable lid. For monarch-series burners and above, the shroud is composed of several easy-to-handle component parts – the base, sides, air inlet, and lid – that can be easily assembled by means of quick-release catches to form a single soundproof unit.

The shroud is mounted on castors and is rolled into and out of position. Two of the castors can be fixed with wheel locks when required. Shroud height is bespoke but the legs can be shortened if it proves necessary.

Air ingress is via an integral air inlet section. The shroud has cutouts either in the sides, base, or lid for gas, oil and electrical supply lines.

Shroud dimensions
See pages 8 and 9 for dimensions and burner-relevant details. Minor site-specific deviations are permissible.

Paint finish
The shroud components are finished in the following standard colours
- Lid: matt black RAL 9005
- Sides: anthracite RAL 7016
- Base and legs: matt black RAL 9005

Other RAL colours are available upon request.

W-SH 10 and W-SH 15 shrouds
Dimensions and scope of delivery

W-SH 10 sound absorbing shrouds (5–10 dB(A) attenuation)

Burner type	W x H x D mm	Order No.
WL5 (not purflam)	450 x 450 x 450	698 301
WL10	480 x 480 x 500	698 302
WL20	530 x 530 x 550	698 303
WG5	450 x 450 x 450	698 310
WG10	480 x 480 x 500	698 311
WG20	530 x 530 x 550	698 312

Notes:
The W-SH 10 shroud is constructed from painted sheet steel and is of a hanging, single-piece design.

The shroud is hung from the burner housing. Air ingress is via an integrated attenuating section.

Installation dimensions
A form will be provided to record the specific measurements which must be taken on site when ordering a sound absorbing shroud. An on-site survey can be undertaken by Weishaupt instead, if preferred (additional cost on application).

W-SH 15 sound absorbing shrouds (10–15 dB(A) attenuation)

Burner type	W x H x D mm	Order No.
WL30	560 x 600 x 560	698 002
WL40	560 x 680 x 775	698 003
WM-L10	910 x 780 x 880	698 042
WM-L20	1000 x 950 x 1070	698 044
WM-L30	1200 x 1150 x 1200	698 051
WM-L50	1640 x 1730 x 1800	698 054
WKmono-L80	2100 x 2250 x 2550	698 057
L1	750 x 730 x 760	698 004
L3, RL3	900 x 780 x 865	698 005
L5, RL5	930 x 830 x 950	698 006
L7, RL7	970 x 950 x 1010	698 007
L8, RL8	1010 x 950 x 950	698 008
L9, RL9, RL10	1090 x 1060 x 1180	698 009
RL11	1120 x 1100 x 1180	698 010
L30, RL30	1050 x 975 x 1170	698 011
L40, RL40	1110 x 1010 x 1140	698 012
RL50	1110 x 1010 x 1140	698 013
RL60	1350 x 1310 x 1660	698 014
RL70	1540 x 1510 x 1660	698 015
WG10–20	500 x 550 x 460	698 016
WG / WGL30	560 x 600 x 650	698 017
WG / WGL40	560 x 680 x 730	698 018
WM-G10	910 x 780 x 1020	698 043
WM-G20	1000 x 950 x 1180	698 045
WM-G30	1150 x 1150 x 1400	698 052
WM-G50	1640 x 1730 x 1800	698 055
WKmono-G80	2100 x 2250 x 2550	698 058
G1, GL1	880 x 730 x 900	698 019
G3	910 x 780 x 1020	698 020
G5	930 x 830 x 1090	698 021
G7	960 x 950 x 1180	698 022
G8	1000 x 950 x 1180	698 023
G9, G10	1100 x 1060 x 1380	698 024
G11	1130 x 1060 x 1420	698 025
G30	1110 x 975 x 1350	698 026
G40	1150 x 1010 x 1410	698 027
G50	1230 x 1160 x 1520	698 028
G60	1300 x 1340 x 1760	698 029
G70	1500 x 1510 x 1950	698 030

Burner type	W x H x D mm	Order No.
WM-GL10	970 x 780 x 1020	698 048
WM-GL20	1110 x 950 x 1180	698 050
WM-GL30	1350 x 1150 x 1400	698 053
WM-GL50	1780 x 1730 x 1800	698 056
WKmono-GL80	2100 x 2250 x 2550	698 059
GL3, RGL3	970 x 780 x 1020	698 031
GL5, RGL5	1000 x 830 x 1090	698 032
GL7, RGL7	1080 x 950 x 1180	698 033
GL8, RGL8	1120 x 950 x 1180	698 034
GL9, RGL9		
RGL10	1210 x 1060 x 1380	698 035
RGL11	1240 x 1060 x 1420	698 036
GL30, RGL30	1160 x 978 x 1350	698 037
GL40, RGL40	1210 x 1010 x 1410	698 038
RGL50	1400 x 1160 x 1520	698 039
RGL60	1560 x 1340 x 1760	698 040
RGL70	1750 x 1510 x 1950	698 041
WKL, G, GL70[1]	1600 x 1800 x 2000	698 344
WKL, G, GL80[1]	1800 x 2000 x 2400	698 345

Oil drip tray for W-SH 15

W30–40	500 x 50 x 400	698 201
WM10	600 x 50 x 400	698 208
WM20	700 x 50 x 500	698 209
WM30	600 x 50 x 900	698 210
WM50	1150 x 50 x 900	698 211
WKmono80	1900 x 50 x 900	698 212
Monarch		
1–5	600 x 50 x 400	698 202
7–8	700 x 50 x 500	698 203
9–11	900 x 50 x 600	698 204
Industrial		
30–40	800 x 50 x 600	698 205
50–60	1000 x 50 x 700	698 206
70	1350 x 50 x 750	698 207

Stand-off spacer for burners with integral frequency convertor size 4

Type	Order No.
Size 50 (except for G50/1)	
Sizes 60 and 70	
WM-GL30/1-A ZM-R-3LN	
WM 30/2 (except for WM-G, 380–415 V)	
WM 30/3	
WM 50	217 315 07 332

Supporting frame for shroud legs

Type	Order No.
W-SH 15 (Required for some heat generators and for all floor clearances greater than 800 mm)	698 250

Notes:
The stated dimensions are an approximate guide only. Every shroud is manufactured to site-specific dimensions.

The W-SH 15 shroud is constructed from painted sheet steel and has a removable lid.

The shroud stands on legs with castors. The legs can be adjusted to control the height of the shroud. Air ingress is via an integrated attenuating section.

[1] The shroud has a cutout for air ductwork in lieu of an integrated attenuating section

Installation dimensions
A form will be provided to record the specific measurements which must be taken on site when ordering a sound absorbing shroud. An on-site survey can be undertaken by Weishaupt instead, if preferred (additional cost on application). The shroud's legs will be manufactured to the correct length for the installation. Minor adjustments to accomodate uneven flooring are possible.

*) Please enquire regarding gas burners with FGR

W-SH 20 shrouds
Dimensions and scope of delivery

W-SH 20 sound absorbing shrouds (20–25 dB(A) attenuation)

Burner type	W x H x D mm	Order No.
WL30	630 x 630 x 680	698 102
WL40	590 x 720 x 880	698 103
WM-L10	910 x 780 x 990	698 142
WM-L20	1040 x 950 x 1170	698 146
WM-L30	1250 x 1150 x 1300	698 151
WM-L50	1680 x 1750 x 1820	698 154
WKmono-L80	2100 x 2250 x 2550	698 157
L1	750 x 730 x 870	698 104
L3, RL3	900 x 780 x 975	698 105
L5, RL5	930 x 830 x 1060	698 106
L7, RL7	1010 x 950 x 1160	698 107
L8, RL8	1050 x 950 x 1160	698 108
L9, RL9, RL10	1130 x 1060 x 1330	698 109
RL11	1160 x 1100 x 1330	698 110
L30, RL30	1050 x 975 x 1300	698 111
L40, RL40	1180 x 1010 x 1270	698 112
RL50	1270 x 1160 x 1390	698 113
RL60	1430 x 1330 x 1530	698 114
RL70	1670 x 1530 x 1720	698 115
WG30, WGL30	590 x 640 x 780	698 117
WG40	590 x 720 x 880	698 118
WM-G10	910 x 780 x 1130	698 143
WM-G20	1040 x 950 x 1330	698 147
WM-G30	1200 x 1150 x 1500	698 152
WM-G50	1680 x 1750 x 1820	698 155
WKmono-G80	2100 x 2250 x 2550	698 158
G1, GL1	880 x 730 x 1010	698 119
G3	910 x 780 x 1030	698 120
G5	930 x 830 x 1200	698 121
G7	1000 x 950 x 1330	698 122
G8	1040 x 950 x 1330	698 123
G9, G10	1140 x 1060x 1530	698 124
G11	1170 x 1060 x 1570	698 125
G30	1110 x 975 x 1490	698 126
G40	1150 x 1010 x 1550	698 127
G50	1270 x 1150 x 1670	698 128
G60	1340 x 1350 x 1820	698 129
G70	1580 x 1530 x 2010	698 130
WM-GL10	970 x 780 x 1130	698 148
WM-GL20	1150 x 950 x 1330	698 150
WM-GL30	1400 x 1150 x 1500	698 153
WM-GL50	1820 x 1750 x 1820	698 156
WKmono-GL80	2100 x 2250 x 2550	698 159

Burner type	W x H x D mm	Order No.
GL3, RGL3	970 x 780 x 1030	698 131
GL5, RGL5	1000 x 830 x 1200	698 132
GL7, RGL7	1120 x 950 x 1330	698 133
GL8, RGL8	1160 x 950 x 1330	698 134
GL9, RGL9		
RGL10	1250 x 1060 x 1530	698 135
RGL11	1280 x 1060 x 1570	698 136
GL30, RGL30	1160 x 975 x 1490	698 137
GL40, RGL40	1210 x 1010 x 1550	698 138
RGL50	1440 x 1150 x 1670	698 139
RGL60	1640 x 1360 x 1820	698 140
RGL70	1830 x 1530 x 2010	698 141

Oil drip tray for W-SH 20

W30–40	500 x 50 x 400	698 201
WM10	600 x 50 x 400	698 208
WM20	700 x 50 x 500	698 209
WM30	600 x 50 x 900	698 210
WM50	1150 x 50 x 900	698 211
WKmono80	1900 x 50 x 900	698 212
Monarch		
1–5	600 x 50 x 400	698 202
7–8	700 x 50 x 500	698 203
9–1	900 x 50 x 600	698 204
Industrial		
30–40	800 x 50 x 600	698 205
50–60	1000 x 50 x 700	698 206
70	1350 x 50 x 750	698 207

Stand-off spacer for burners with integral frequencyconvertor size 4

Type	Order No.
Size 50 (except for G50/1)	
Sizes 60 and 70	
WM-GL30/1-A ZM-R-3LN	
WM 30/2 (except for WM-G, 380–415 V)	
WM 30/3	
WM 50	217 315 07 332

Supporting frame for shroud legs

Type	Order No.
W-SH 20 (Required for some heat generators and for all floor clearances greater than 800 mm)	698 250

Notes:
The stated dimensions are an approximate guide only. Every shroud is manufactured to site-specific dimensions.

The W-SH 20 shroud is constructed from painted sheet steel and is of a "flat pack" design.

The shroud stands on legs with castors. The legs can be adjusted to control the height of the shroud. Air ingress is via an integrated attenuating section.

Installation dimensions
A form will be provided to record the specific measurements which must be taken on site when ordering a sound absorbing shroud. An on-site survey can be undertaken by Weishaupt instead, if preferred (additional cost on application). The shroud's legs will be manufactured to the correct length for the installation. Minor adjustments to accomodate uneven flooring are possible.

Please enquire regarding sound absorbing shrouds for duobloc WK-series burners.

*) Please enquire regarding gas burners with FGR.

Dimensional checklist and notes

Customer _____

Project No. _____

Weishaupt

Organisation _____

Name _____

Tel. _____

Email _____

Contact person for queries

Company _____

Person _____

Tel. _____

Email _____

Street _____

Town _____

Country _____

Heat generator and burner

Heat generator model _____

Heat generator rating _____ kW

Flat-fronted heat generator ☐ Yes ☐ No

(If no, a dimensional drawing of the front of the heat generator must be provided)

Burner type _____

Frequency convertor ☐ Yes ☐ No

☐ Burner-mounted without fan

☐ Burner-mounted with fan (size 4)

☐ Outside of the sound absorbing shroud

Gas valve train	Gas 1	Gas 2
Double gas valve assembly type		
Double gas valve assembly DN		
Gas fed from right-hand side	☐	☐
Gas fed from left-hand side	☐	☐
Gas fed from below	☐	☐
Ignition pilot line	☐	☐
VPS-type valve proving	☐	☐
Gas valve train junction box	☐	☐
Other fittings, gas 1		
Other fittings, gas 2		

Oil supply

☐ Right-hand side ☐ Left-hand side ☐ From below

☐ Burner with electromagnetic clutch

☐ Burner with burner-mounted pump station

☐ Burner with separate pump station

Electrical connections

☐ Right-hand side ☐ Left-hand side ☐ From below

☐ Flexible ☐ Ducted

Attenuation

☐ 10-15 dB(A)* ☐ 20-25 dB(A)*

* Please refer to page 6, “Reducing the overall sound level”.

Colour

☐ Standard (Anthracite, RAL 7016)

☐ Bespoke colour, RAL No. _____

Spatial data

☐ Wheelable version

☐ Shroud air inlet above the burner

☐ Shroud air inlet behind the burner

☐ Other position (please enquire)

Access to the plant room

☐ Level

☐ Via steps

Dimension of narrowest access point _____ mm

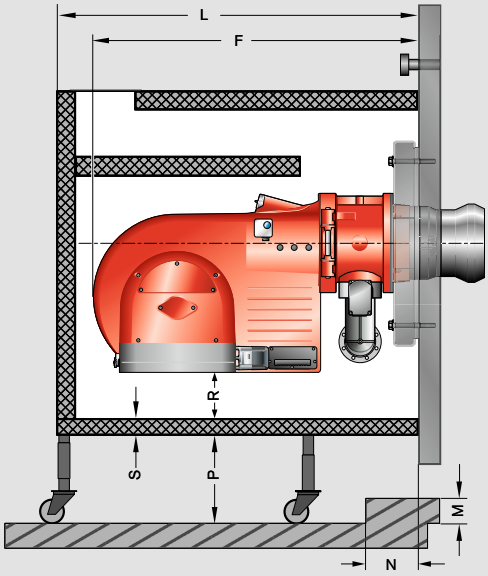
Delivery of the sound absorber

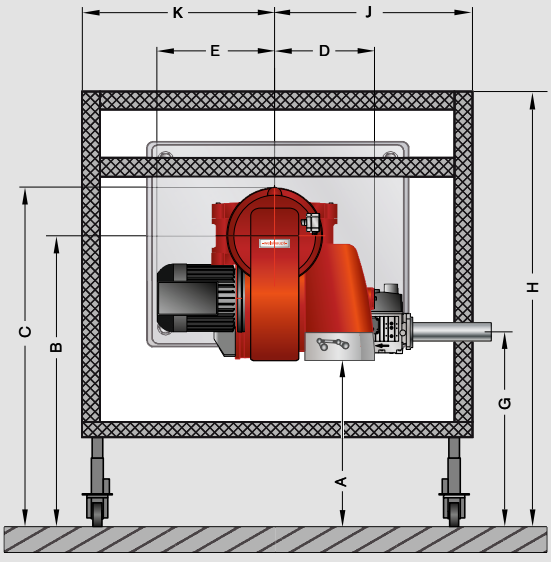
☐ Flat-packed

☐ Seaworthy packaging

Note:
Additional costs may be incurred in accomodating any site-specific dimensions that reveal details which were unknown to Weishaupt at the quotation stage.

Dimensions for checklist





Minimum burner firing height
Dimensions P, R, and S should be noted for standard, wheelable shrouds. Dimension A should be checked. It may be possible to accomodate a reduced firing height through the use of a special-execution shroud (additional costs might be incurred). Solutions may include:
– A non-wheelable shroud
– A lowered section in the base plate
– Etc.

Minimum clearances and attenuation levels

Burner type	Minimum clearance P mm	R mm	Attenuation W-SH15 S mm	W-SH20 S mm
W 5	80	50	25 [1]	–
W 10–40	80	50	25	40
WM 10	80	120	40	60
WM 20–30	120	150	40	60
WM 50	150	200	60	80
WKmono80	190	200	60	80
3–5	80	120	40	60
7–11	120	150	40	60
30–40	120	150	60	80
50–70	150	200	60	80

[1] WSH10

Burner dimensions

A	FFL to underside of burner	mm
B	Burner firing height	mm
C	FFL to topside of burner	mm
D	Burner width, right-hand side	mm
E	Burner width, left-hand side	mm
F	Burner length	mm
G	FFL to CL of gas valve train 1	mm
G	FFL to CL of gas valve train 2	mm

Shroud dimensions

H	Max. overall height	mm
J	Max. shroud width, right-hand side	mm
K	Max. shroud width, left-hand side	mm
L	Max. length of shroud	mm

Plinth dimensions

M	Height of plinth	mm
N	Projection of plinth under burner	mm

Supporting frame ☐ Yes ☐ No

Leg lengths (dimension P) greater than 800 mm require a supporting frame.
Control calculation: P = A - R - S (see table for values)

–weishaupt–

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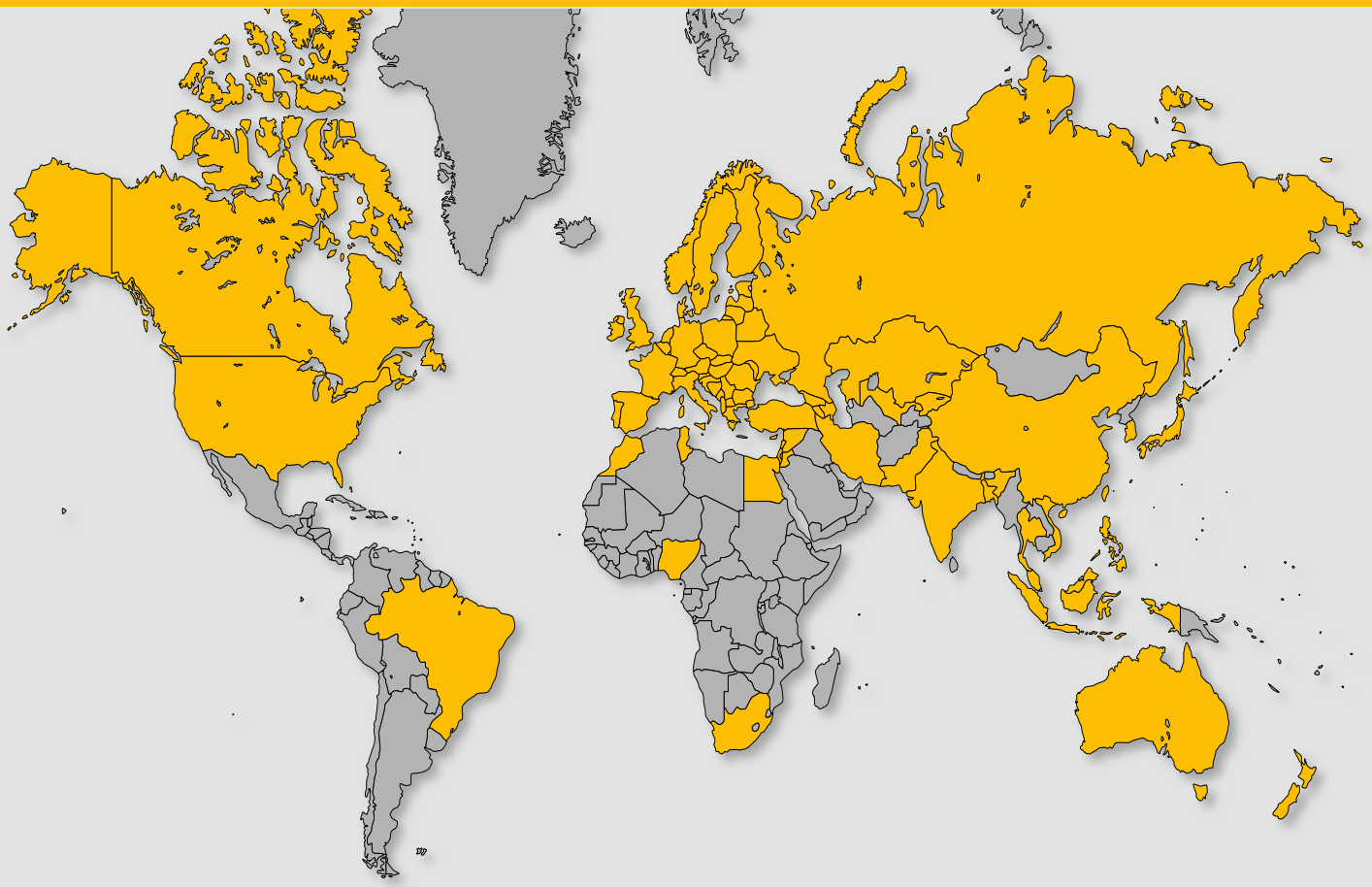

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