



# High-Performance Packaged Boiler

Australia's largest certified  
package boiler company.



**The Environmental  
Group Limited**  
*Engineering a Sustainable Future*

The Environmental Group Limited

[www.environmental.com.au](http://www.environmental.com.au)

# Working across the Circular Economy

## Our Purpose

Engineering a sustainable future.

## Our Mission

To enable our clients to contribute to a cleaner environment by safely delivering pivotal solutions while generating value for our shareholders, staff, and partner industries.

## Our Team

Our local experts are dedicated to reducing waste and boosting energy performance. Trusted worldwide to provide the highest standards of service and support.

# Tomlinson Energy Services

*Part of The Environmental Group*

Tomlinson Energy Services is Australia's leading provider of packaged boiler solutions, delivering the highest combustion efficiency to keep operating costs low and performance high.

We specialise in custom design, installation, commissioning, and national servicing and repairs, complemented by our 24/7 emergency support.

With offices and a dedicated service team across Australia, Tomlinson Energy Services ensures boilers operate at peak performance for maximum efficiency and reliability.



# SOUND ABSORBERS FOR WEISHAAPT BURNERS



# Offering Industry Leading Burners

**Weishaupt** produces gas and oil-fired boilers, heat pumps, and burners. These top-quality products are characterised by their meticulous development, high-quality workmanship, outstanding operational reliability, and maximum Efficiency. Their unrivalled excellence extends equally to design and function.

# 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 propagate 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 acoustical 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

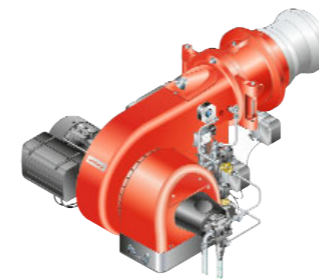
When designing a plantroom with sound-absorbing shrouds, it should be ensured that electrical cables and oil supply lines will be installed such that they do not form an obstruction that would hinder the wheeling into position of the shroud. Care must be taken, for the same reason, with regard to any 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.

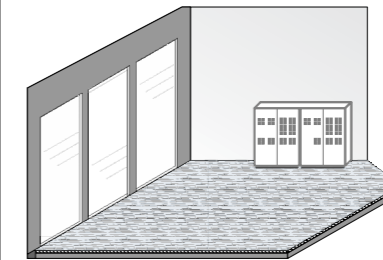
We will be happy to advise you should you have special requirements to be accommodated. For example, a supporting frame might be required for the legs of the sound-absorbing shroud. A supporting frame is always required for floor clearances (to the underside of the shroud) in excess of 800 mm. The relevant 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.

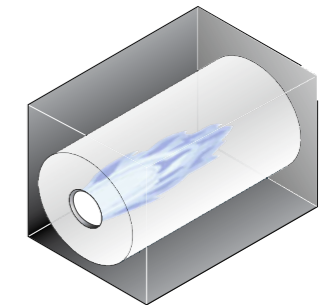
### Burner sound pressure level



### Spatial sound reflections



### Combustion chamber noise

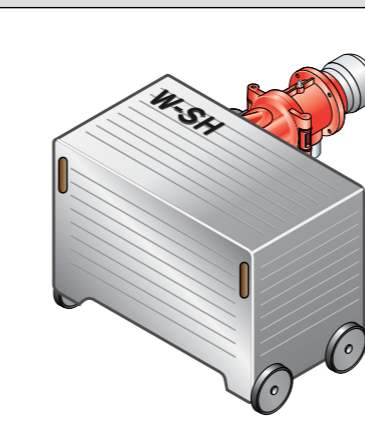
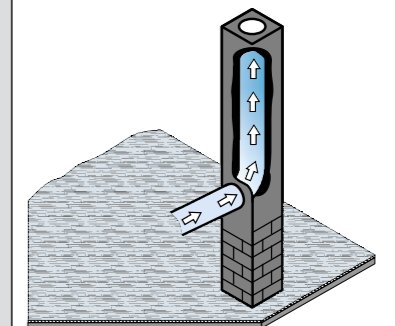


### Other influences

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



### 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 contribute 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

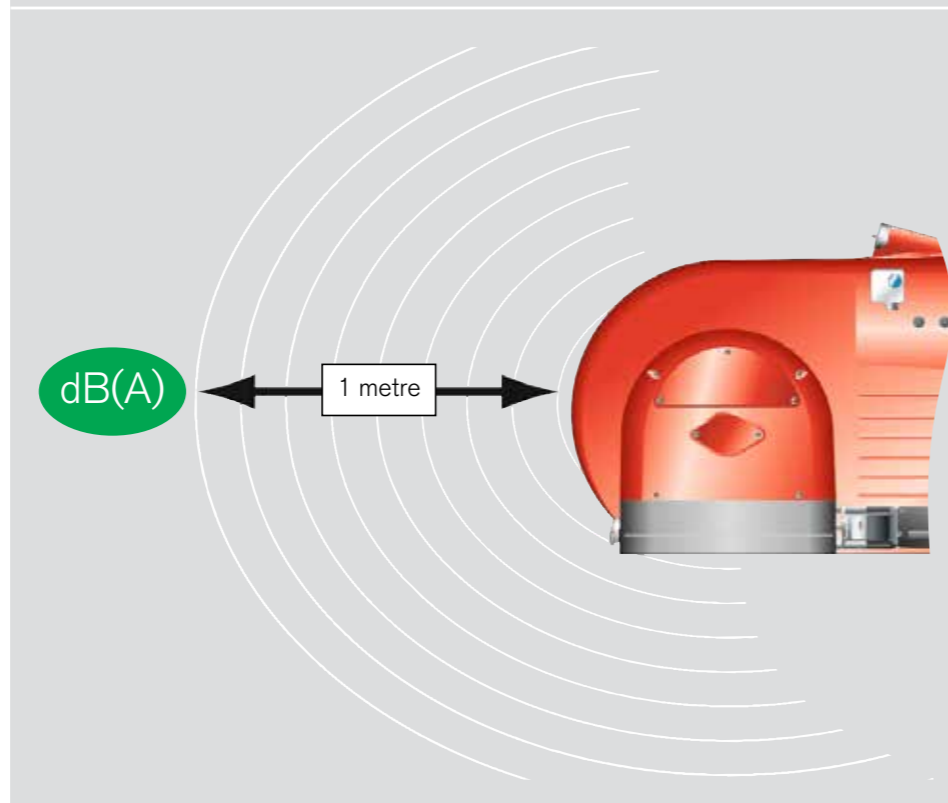
The sound energy that continually radiates from an acoustic source is referred to as a sound emission. The term sound power refers to the rate at which sound energy is transmitted per unit time.

## Sound power level

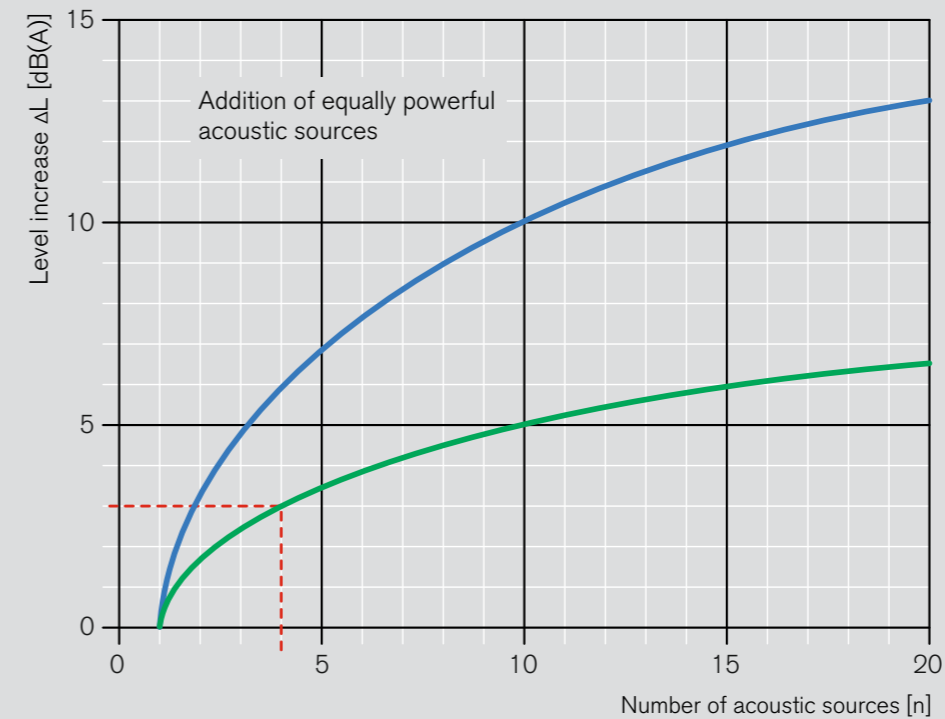
Sound power, measured in accordance with EN ISO 9614-2, is a theoretical quantity that cannot be measured directly. It is derived from a measurement of intensity on an envelope (designated volume around the burner). The result can be expressed in two different units: as the sound power, which is measured 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  $p_0 = 20 \mu\text{Pa}$ . 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

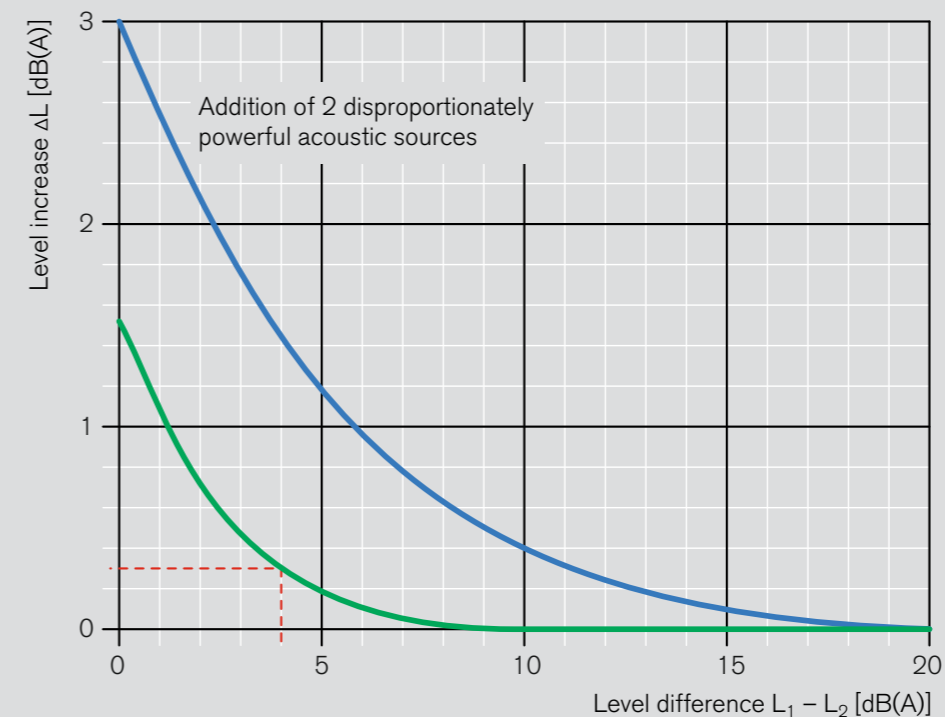


**Addition of equally powerful, reference-free acoustic signals.**

**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.**

# Sound absorbing shrouds

## Technical description

### 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.

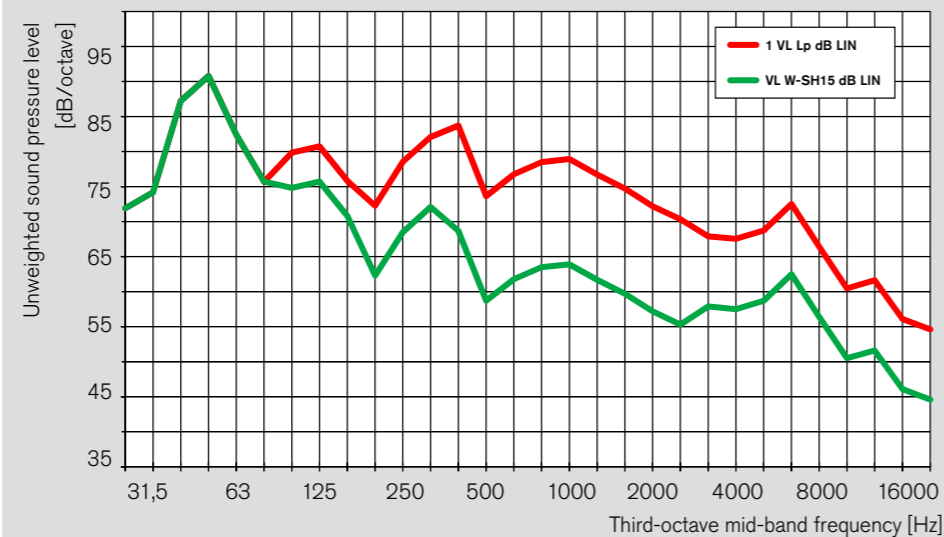
The reduction of burner noise addresses only one factor in the overall noise level of a boiler room, albeit not an insignificant one. Other factors include:

- 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.

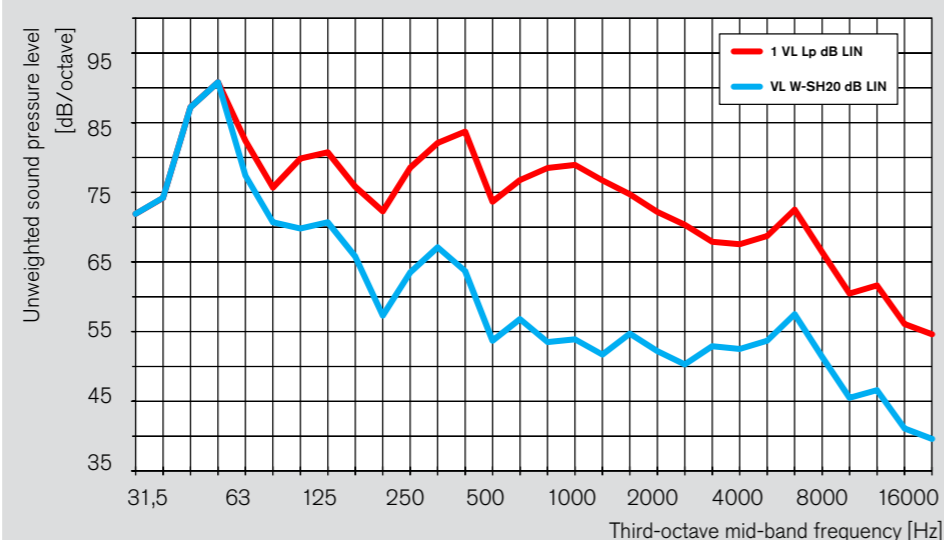
The reduction of the overall noise level of a system can therefore end up being less than the reduction in burner noise achieved through the use of burner sound absorbers. The influence of the above factors under reflective conditions can often not be fully separated from burner noise. Taking this into 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



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.

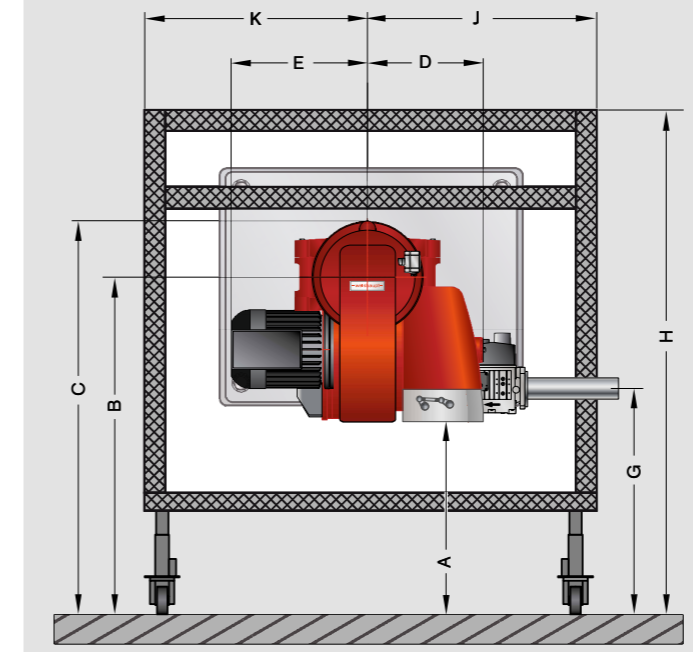
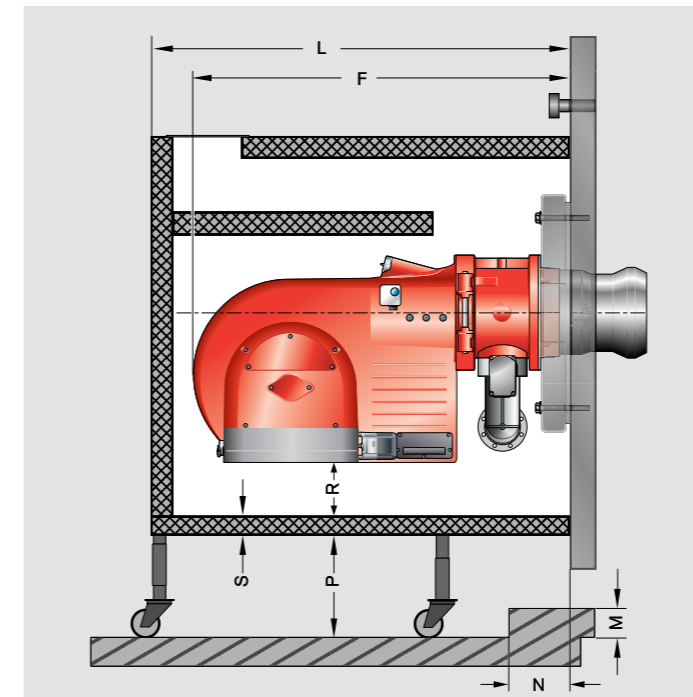


# Dimensional checklist and notes

# Dimensions for checklist

<b>Customer</b>	_____	<b>Contact person for queries</b>	_____
<b>Project No.</b>	_____	Company	_____
	_____	Person	_____
<b>Weishaupt</b>		Tel.	_____
Organisation	_____	Email	_____
Name	_____	Street	_____
Tel.	_____	Town	_____
Email	_____	Country	_____

<b>Heat generator and burner</b>		<b>Electrical connections</b>	
Heat generator model	_____	<input type="checkbox"/> Right-hand side	<input type="checkbox"/> Left-hand side
Heat generator rating	_____ kW	<input type="checkbox"/> From below	<input type="checkbox"/> Flexible
Flat-fronted heat generator	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Ducted	
(If no, a dimensional drawing of the front of the heat generator must be provided)		Attenuation	
Burner type	_____	<input type="checkbox"/> 10-15 dB(A)*	<input type="checkbox"/> 20-25 dB(A)*
Frequency convertor	<input type="checkbox"/> Yes <input type="checkbox"/> No	* Please refer to page 6, "Reducing the overall sound level".	
<input type="checkbox"/> Burner-mounted without fan		<b>Colour</b>	
<input type="checkbox"/> Burner-mounted with fan (size 4)		<input type="checkbox"/> Standard (Anthracite, RAL 7016)	
<input type="checkbox"/> Outside of the sound absorbing shroud		<input type="checkbox"/> Bespoke colour, RAL No. _____	
<b>Gas valve train</b>		<b>Spatial data</b>	
	Gas 1      Gas 2	<input type="checkbox"/> Wheelable version	
Double gas valve assembly type	_____	<input type="checkbox"/> Shroud air inlet above the burner	
Double gas valve assembly DN	_____	<input type="checkbox"/> Shroud air inlet behind the burner	
Gas fed from right-hand side	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Other position (please enquire)	
Gas fed from left-hand side	<input type="checkbox"/> <input type="checkbox"/>	<b>Access to the plant room</b>	
Gas fed from below	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Level	
Ignition pilot line	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Via steps	
VPS-type valve proving	<input type="checkbox"/> <input type="checkbox"/>	Dimension of narrowest access point	_____ mm
Gas valve train junction box	<input type="checkbox"/> <input type="checkbox"/>		
Other fittings, gas 1	_____		
Other fittings, gas 2	_____		
<b>Oil supply</b>		<b>Delivery of the sound absorber</b>	
<input type="checkbox"/> Right-hand side <input type="checkbox"/> Left-hand side <input type="checkbox"/> From below		<input type="checkbox"/> Flat-packed	
<input type="checkbox"/> Burner with electromagnetic clutch		<input type="checkbox"/> Seaworthy packaging	
<input type="checkbox"/> Burner with burner-mounted pump station		Note:	
<input type="checkbox"/> Burner with separate pump station		Additional costs may be incurred in accommodating any site-specific dimensions that reveal details which were unknown to Weishaupt at the quotation stage.	



**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 accommodate 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		Attenuation	
	P mm	R mm	W-SH15 S mm	W-SH20 S mm
W 5	80	50	25 <sup>1)</sup>	-
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

<sup>1)</sup> 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)

# Contact Us



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