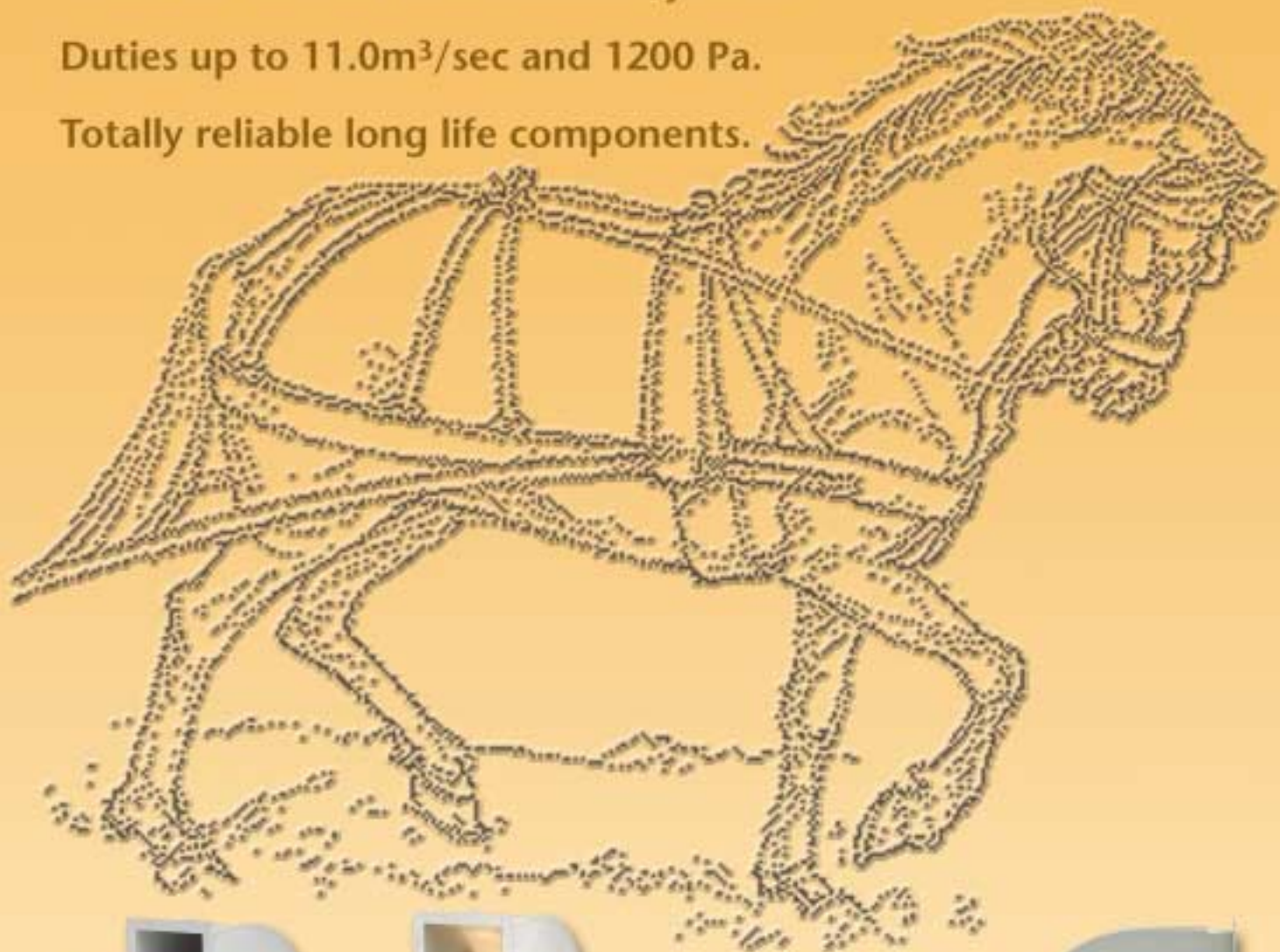


# WORK HORSE FANS

Extract fans for high pressure, high temperature polluted air  
- ideal for kitchen hood extract systems.

Duties up to 11.0m<sup>3</sup>/sec and 1200 Pa.

Totally reliable long life components.



*Tough products for  
arduous environments*

A valuable addition to the designer's tool box.

These fans are ideal for high temperatures, high pressures, arduous environments, and where long term reliability with minimal maintenance is a priority.

They can be used in both internal and external locations, and are particularly suitable for kitchen hood extract systems.

Duty range from 0.5 to 11.0m<sup>3</sup>/sec.

## Main Features

### Non-overloading

- Single inlet fans with backward curved impeller, providing high pressure and a non-overloading fan characteristic.

### Air temperatures up to 190°C

- Standard fan maximum operating temperature 150°C. Workhorse fans can be used for air temperatures up to 190°C providing special installation instructions are followed. Heat dissipator fitted to fan shaft, and shaft seal fitted at fan scroll.

### Heavy guage casings

- Airtight housings in heavy guage steel with structural steel frame, the entire unit is phosphatised and finished with a thermally fused polyester powder coat, colour light grey to RAL 7038.

### Long working life

- Ground and polished fan shaft mounted in heavy duty pillar block ball bearings with a life expectancy in excess of 200,000 hours at maximum operating conditions.



Unit with flexible connections fitted



Drive guard and isolator fitted as standard

### Easy clean

- Easy to clean - all fans have access door to fan scroll plus drain connection at lowest point.

### Weatherproof as standard

- Units can be located outside without further protection. The motor and drive guard is fully weatherproof.

### Universal mounting

- The fan scroll can be rotated through eight discharge positions, and can be turned round to face the opposite direction from standard. This will be set up at VES factory prior to despatch. See dimensions page for outlet positions.

### Easy maintenance

- A pivoting motor plate with adjusting screws makes drive belt adjustment a quick and easy operation.

### Fully tested

- Fans have been tested in accordance with the AMCA Standard 210 test procedure and are licensed to bear the AMCA Certified Ratings Seal for air performance.



Fitted standby motor

## High temp. flex. conns.

The flexible connections are silicone coated glass fabric, suitable for temperatures up to 250°C, fire rated to BS 476 Part 7 Class 1, and BS 476 Part 20 for 150 minutes.

## Wide range - good delivery

There are seven sizes of Workhorse fan, and there are always units kept in stock ready for completion to customers requirements.

## Keen prices

The Workhorse range is very competitively priced when compared to products of a similar specification.

## Options to Specify

- Channel base, AV mounts, flexible connections.
- Flanged outlet to fan.
- Inlet and outlet guards.
- Two speed motor.
- Two speed controller.
- Standby motor.
- Inverter fan speed control.
- Matching silencers -
  - To meet required noise criteria.
  - Standard or cleanable construction.
- Acoustic housing over entire unit for noise sensitive applications.



Heat dissipator and shaft seal

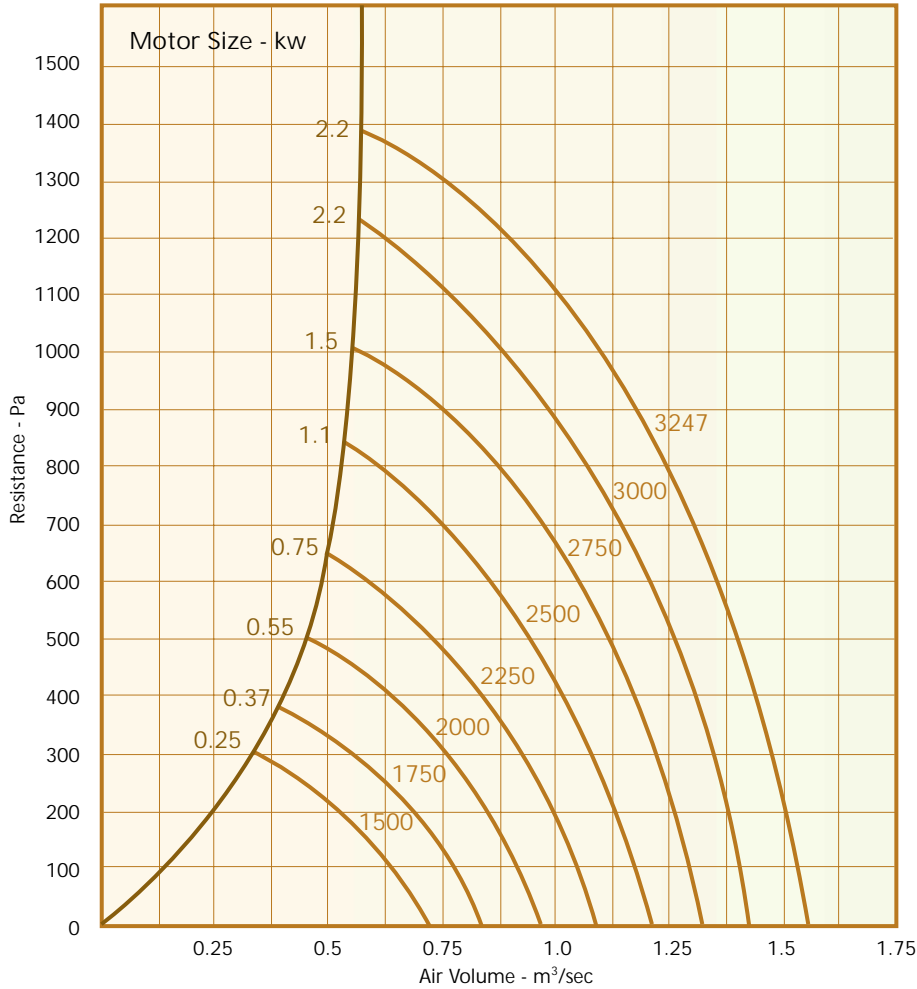
## Specify the unit you require:

State model number, configuration R or L with discharge position, fan speed, 1 or 3 phase.

i.e. WH 218 / R 090 / 1700 - 3

Then list any extras from the options above.

## WH 212 - Fan Curves

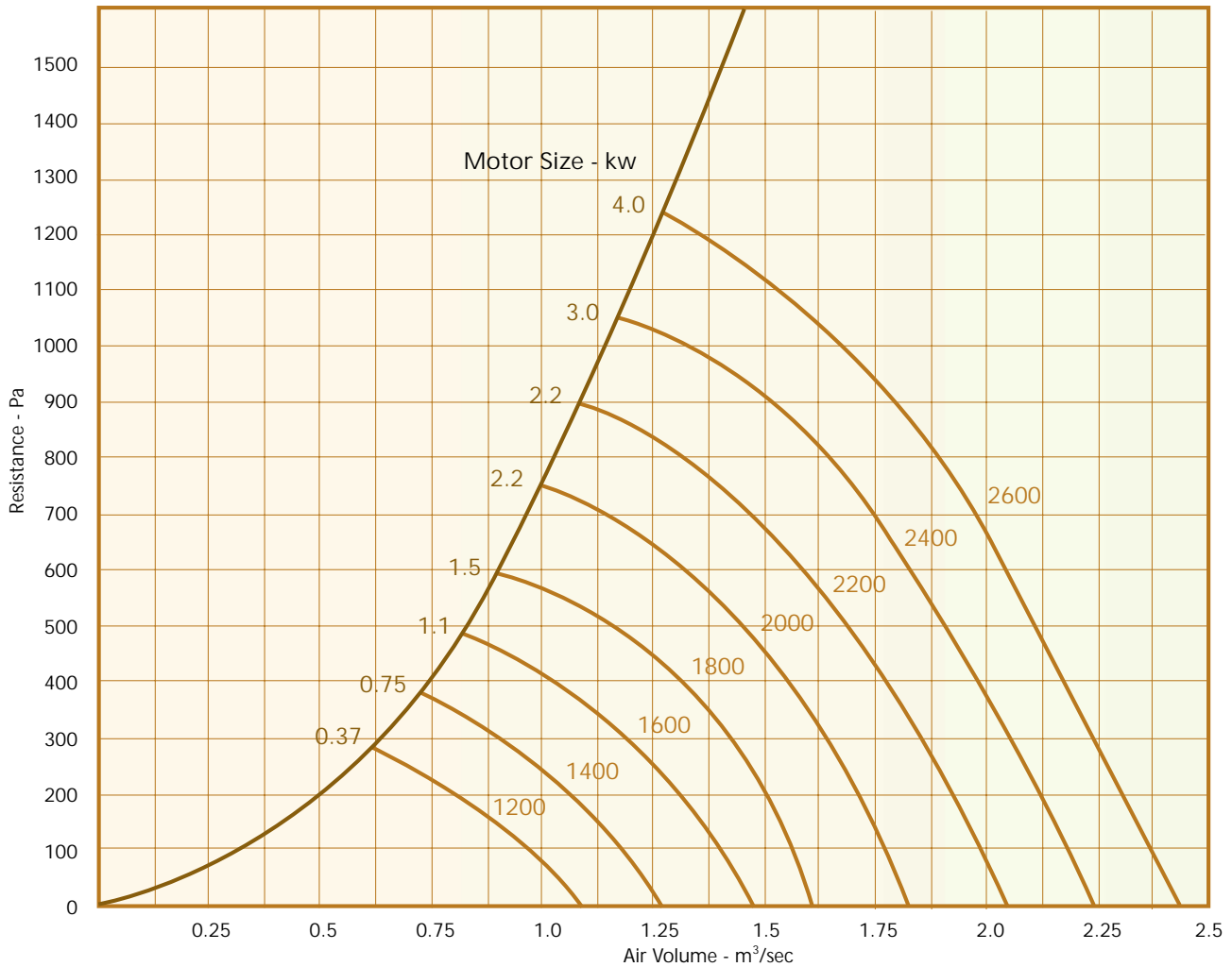


## WH 212 - Noise Levels

Model WH212	Sound Power Level Spectrum dB re 10 <sup>-12</sup> w. PWL								SPL dBA @3.0m
	Centre Frequency - Hz								
Fan Speed	63	125	250	500	1k	2k	4k	8k	
1500	77	73	69	71	66	65	57	52	61
1750	82	74	72	75	69	69	62	57	64
2000	88	75	74	77	72	71	65	60	67
2250	90	77	75	80	74	73	69	63	69
2500	90	77	76	82	75	74	70	65	71
2750	93	80	78	85	78	78	75	70	74
3000	95	82	79	88	80	80	78	73	76
3247	94	82	80	89	81	81	79	75	78



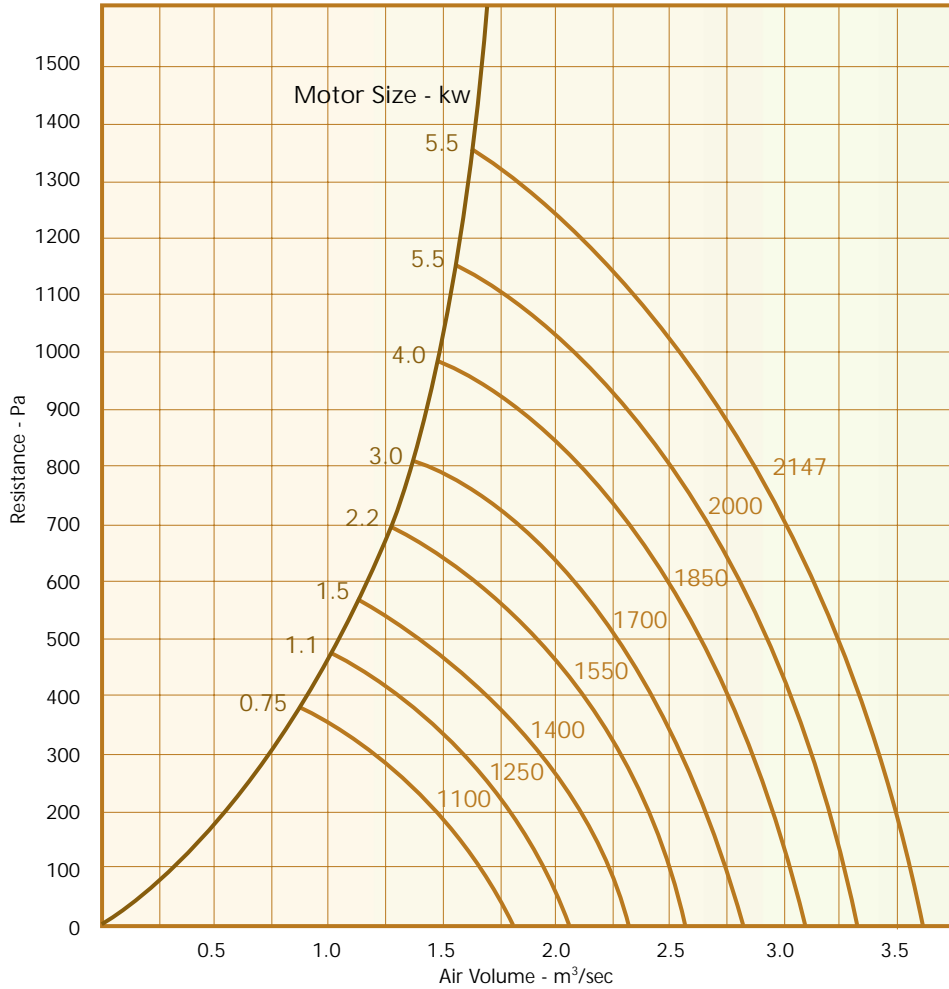
## WH 215 - Fan Curves



## WH 215 - Noise Levels

Model WH 215	Sound Power Level Spectrum dB re 10 <sup>-12</sup> w. PWL								SPL dBA @3.0m
	Centre Frequency - Hz								
Fan Speed	63	125	250	500	1k	2k	4k	8k	
1200	77	72	71	70	67	63	55	51	60
1400	81	74	74	74	70	67	61	55	64
1600	85	76	76	77	73	71	65	59	67
1800	88	78	77	80	75	73	68	62	70
2000	89	79	79	82	77	75	71	65	71
2200	91	81	81	84	79	78	74	68	74
2400	93	82	82	87	81	80	77	72	76
2600	94	83	83	88	82	81	79	74	78

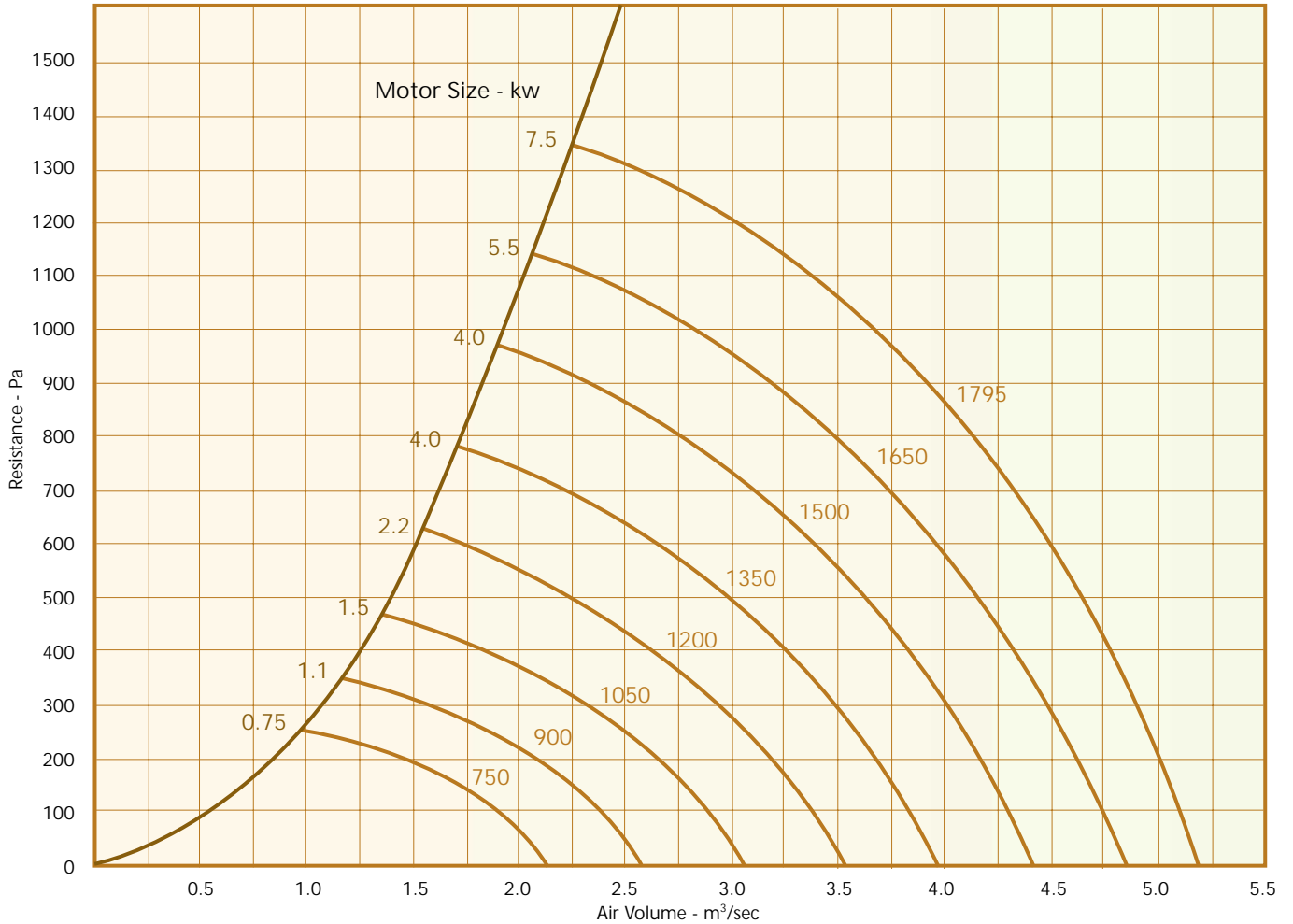
## WH 218 - Fan Curves



## WH 218 - Noise Levels

Model WH 218	Sound Power Level Spectrum dB re 10 <sup>-12</sup> w. PWL								SPL dBA @3.0m
	Centre Frequency - Hz								
Fan Speed	63	125	250	500	1k	2k	4k	8k	
1100	82	76	78	74	67	65	62	56	64
1250	81	77	82	76	70	68	64	59	67
1400	84	76	82	76	72	70	67	64	68
1550	86	81	87	82	76	74	70	65	72
1700	89	82	88	85	79	77	72	68	75
1850	91	85	90	88	82	79	75	70	77
2000	91	87	89	88	83	80	76	73	78
2147	93	89	91	91	86	82	78	75	80

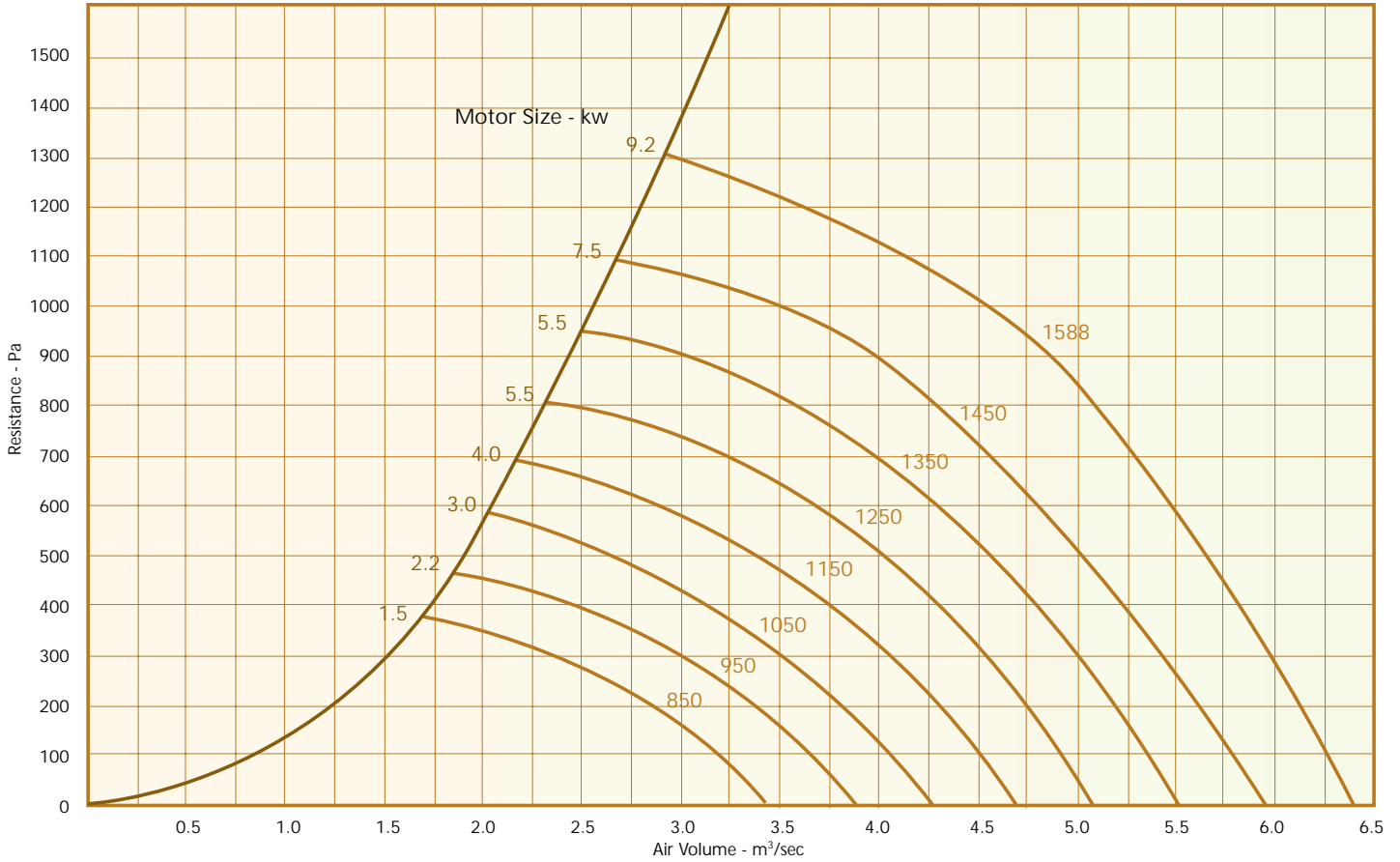
## WH 222 - Fan Curves



## WH 222 - Noise Levels

Model WH 222	Sound Power Level Spectrum dB re 10 <sup>-12</sup> w. PWL								SPL dBA @3.0m
	Centre Frequency - Hz								
Fan Speed	63	125	250	500	1k	2k	4k	8k	
750	84	76	72	69	64	62	58	51	60
900	84	76	77	73	68	66	62	56	64
1050	84	78	80	75	71	69	66	61	66
1200	85	80	83	77	74	72	69	66	69
1350	88	85	89	84	79	76	72	67	75
1500	89	87	89	86	81	78	75	71	76
1650	91	89	90	88	83	80	77	74	78
1795	93	92	92	90	86	82	80	78	80

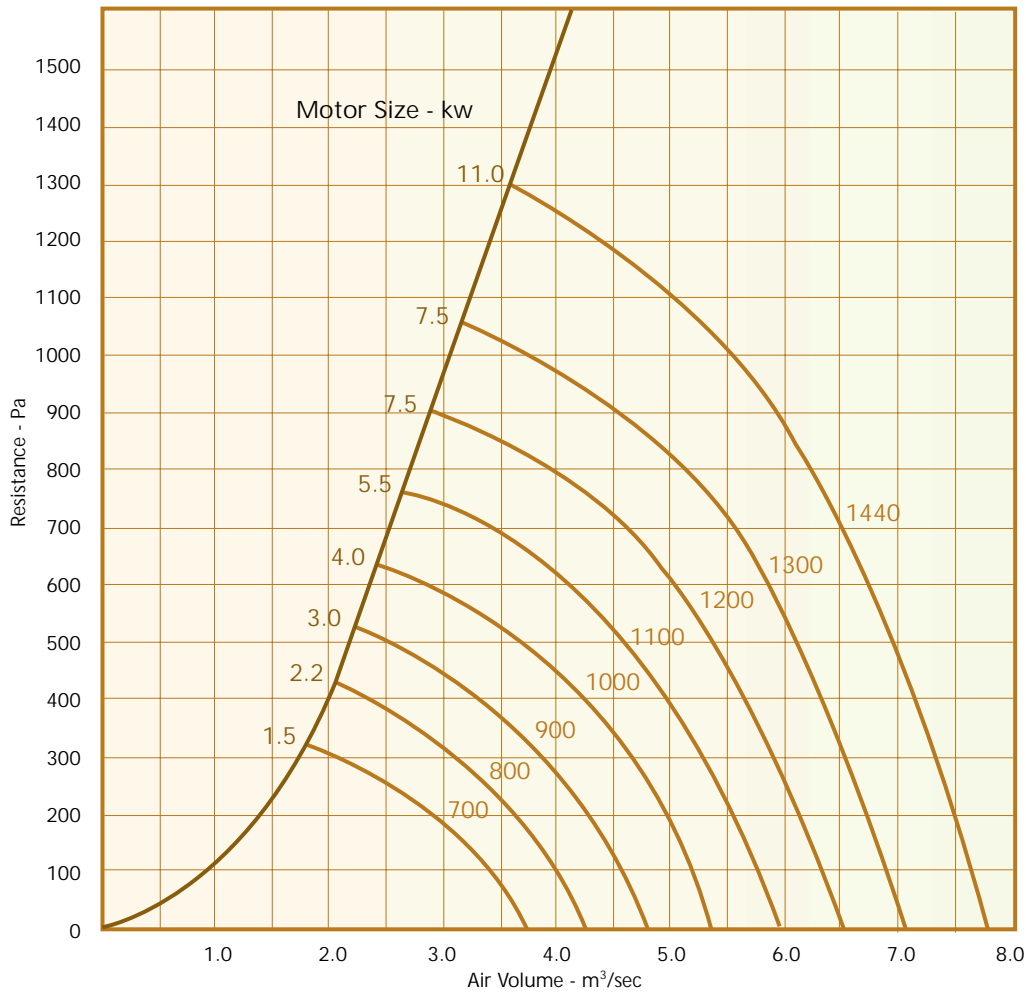
## WH 224 - Fan Curves



## WH 224 - Noise Levels

Model WH 224	Sound Power Level Spectrum dB re 10 <sup>-12</sup> w. PWL								SPL dBA @3.0m
	Centre Frequency - Hz								
Fan Speed	63	125	250	500	1k	2k	4k	8k	
850	84	76	77	71	69	67	62	57	64
950	84	78	82	74	71	70	64	60	67
1050	85	79	87	77	74	73	67	63	70
1150	86	79	87	79	76	74	70	66	72
1250	89	81	90	83	78	77	72	68	75
1350	90	83	91	85	80	79	74	70	76
1450	92	86	93	89	83	81	76	71	79
1588	93	89	94	92	86	83	79	74	81

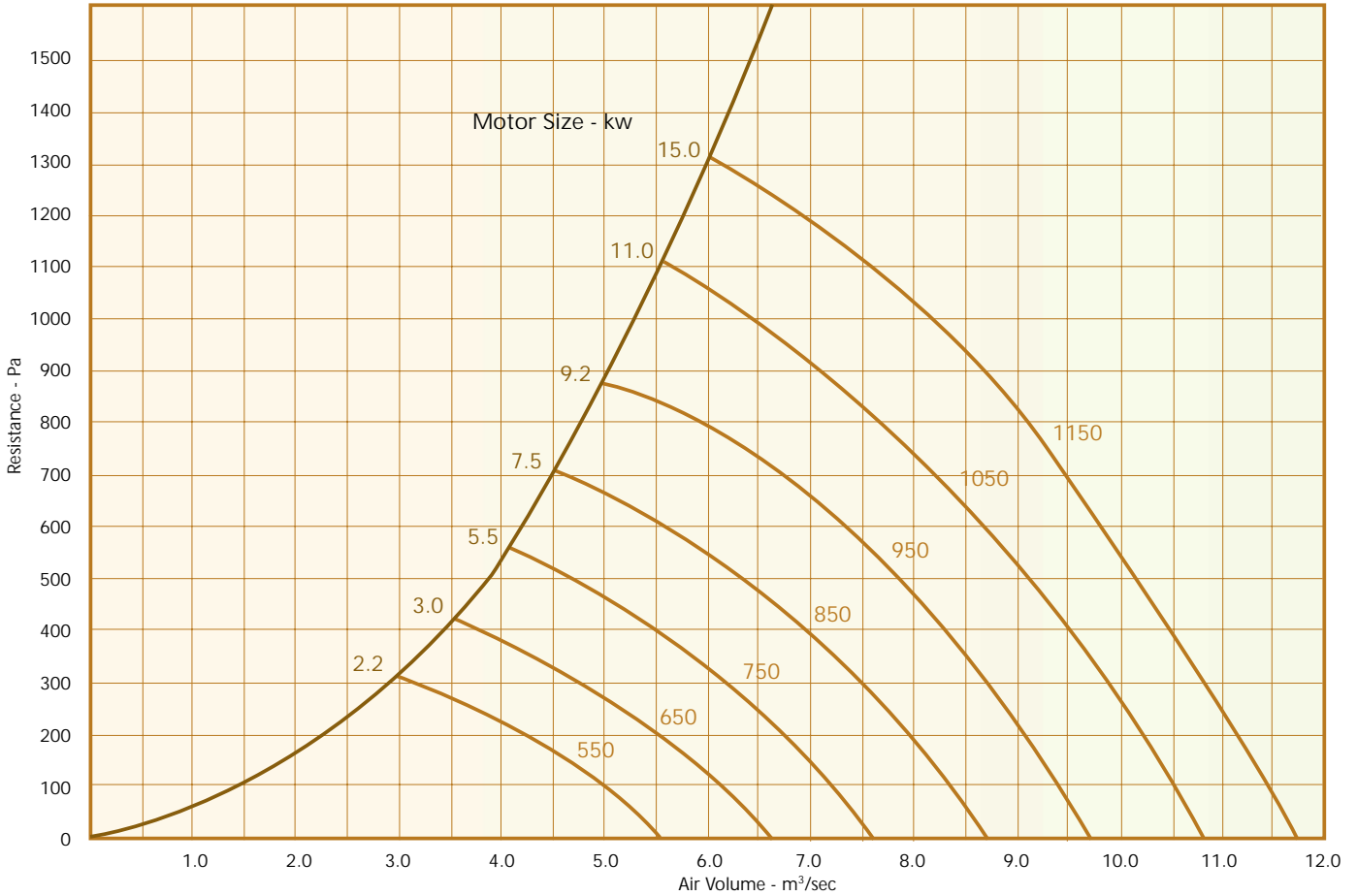
## WH 227 - Fan Curves



## WH 227 - Noise Levels

Model WH 227	Sound Power Level Spectrum dB re 10 <sup>-12</sup> w. PWL								SPL dBA @3.0m
	Centre Frequency - Hz								
Fan Speed	63	125	250	500	1k	2k	4k	8k	
700	84	78	76	71	68	66	60	54	63
800	84	79	80	73	70	69	62	57	65
900	84	80	84	76	73	71	65	61	68
1000	85	80	85	78	75	73	68	64	70
1100	87	82	88	81	77	76	71	67	73
1200	90	84	90	84	80	78	73	70	76
1300	92	88	93	88	83	81	76	71	79
1440	94	91	94	91	86	83	79	73	81

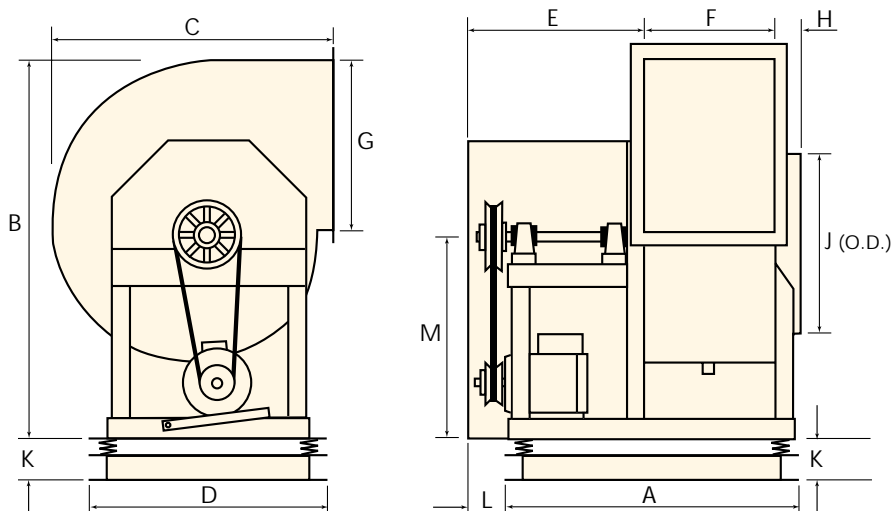
## WH 233 - Fan Curves



## WH 233 - Noise Levels

Model WH 233	Sound Power Level Spectrum dB re 10 <sup>-12</sup> w. PWL								SPL dBA @3.0m
	Centre Frequency - Hz								
Fan Speed	63	125	250	500	1k	2k	4k	8k	
550	83	77	74	70	68	65	59	53	62
650	84	80	78	73	72	68	62	58	65
750	84	83	83	77	75	71	66	63	69
850	86	86	87	81	78	75	70	66	73
950	89	89	91	85	81	78	73	68	76
1050	91	90	92	87	83	81	75	71	78
1150	94	93	95	91	87	84	79	74	81

## Dimensions

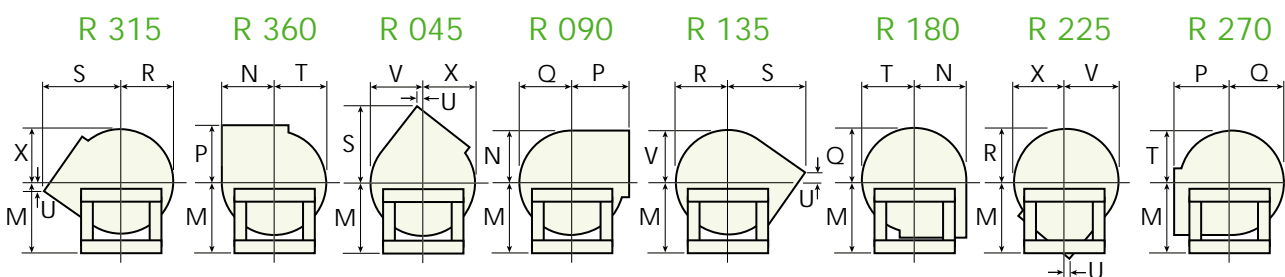


Unit Size	A	B	C	D	E	F	G	H	J	K	L	M	Weight kgs*
WH 212	630	721	543	450	405	246	330	50	330	120	100	384	85
WH 215	735	881	654	558	480	297	400	50	403	120	100	470	115
WH 218	905	1067	784	644	574	373	505	50	489	120	120	568	160
WH 222	1020	1333	937	785	625	445	610	64	584	160	125	730	220
WH 224	1075	1467	1033	870	652	495	673	64	657	160	125	800	280
WH 227	1179	1553	1137	991	703	543	730	64	724	162	165	838	350
WH 233	1320	1899	1410	1159	747	654	885	64	886	162	170	1016	480

\* Weight with largest motor and channel base.

- Notes:**
- Standard configuration is R 090 when facing the fan from the motor side, and the fan is rotating clockwise, (as drawn above and below). Opposite configuration is L, with the fan rotating counter clockwise when facing the motor.
  - The flexible connection to fan outlet is flanged both ends, length 160mm. The flexible connection to the circular inlet spigot is banded into position, length 120mm.
  - The motor and drive guard is supplied fitted to all units.

## Discharge Positions



Unit Size	N	P	Q	R	S	T	U	V	X
WH 212	337	248	297	271	410	252	59	314	229
WH 215	413	297	359	332	495	308	79	384	279
WH 218	500	349	435	402	594	372	103	465	336
WH 222	603	413	525	484	713	449	132	562	406
WH 224	667	451	581	535	786	497	148	621	451
WH 227	714	514	622	559	864	530	127	673	483
WH 233	889	635	768	686	1041	656	184	822	584

# Silencers

VES can supply silencers for both inlet and outlet of the Workhorse fan range. We recommend cylindrical pod silencers for the inlet, and rectangular silencers for the outlet, although either can be used as required.

For a standard range of cleanable rectangular silencers go to page 23 of the Centrifume leaflet.

Transitions are required equivalent to dimension 'J' on page 11 between fan and silencers.

## Inlet (Room Side) Silencers - Cylindrical Pod Silencers type CSP.

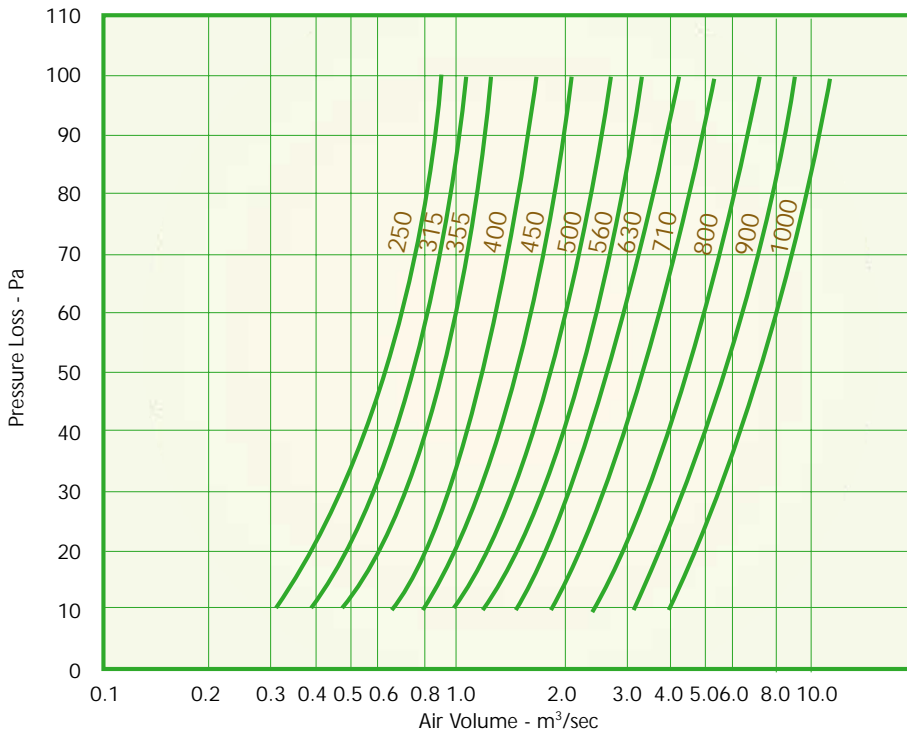
Designed for high temperature use, silencers have a rockwool infill with Melinex facing retained by perforated galvanised steel sheet. The pod nose cones and end rings are also spun galvanised steel sheet. The connections are straight galvanised steel spigots. Flanged connections available if required. Powder coat paint finish available, standard colour light grey to BS 00A05.

If the silencer requires occasional cleaning, it should be installed to allow for easy removal.

Specify standard silencer as Pod Silencer model CSP 450

For flanged connections, add suffix F

and powder coated external finish add suffix to model number denoting colour, e.g. CSP 450 / 00A05.



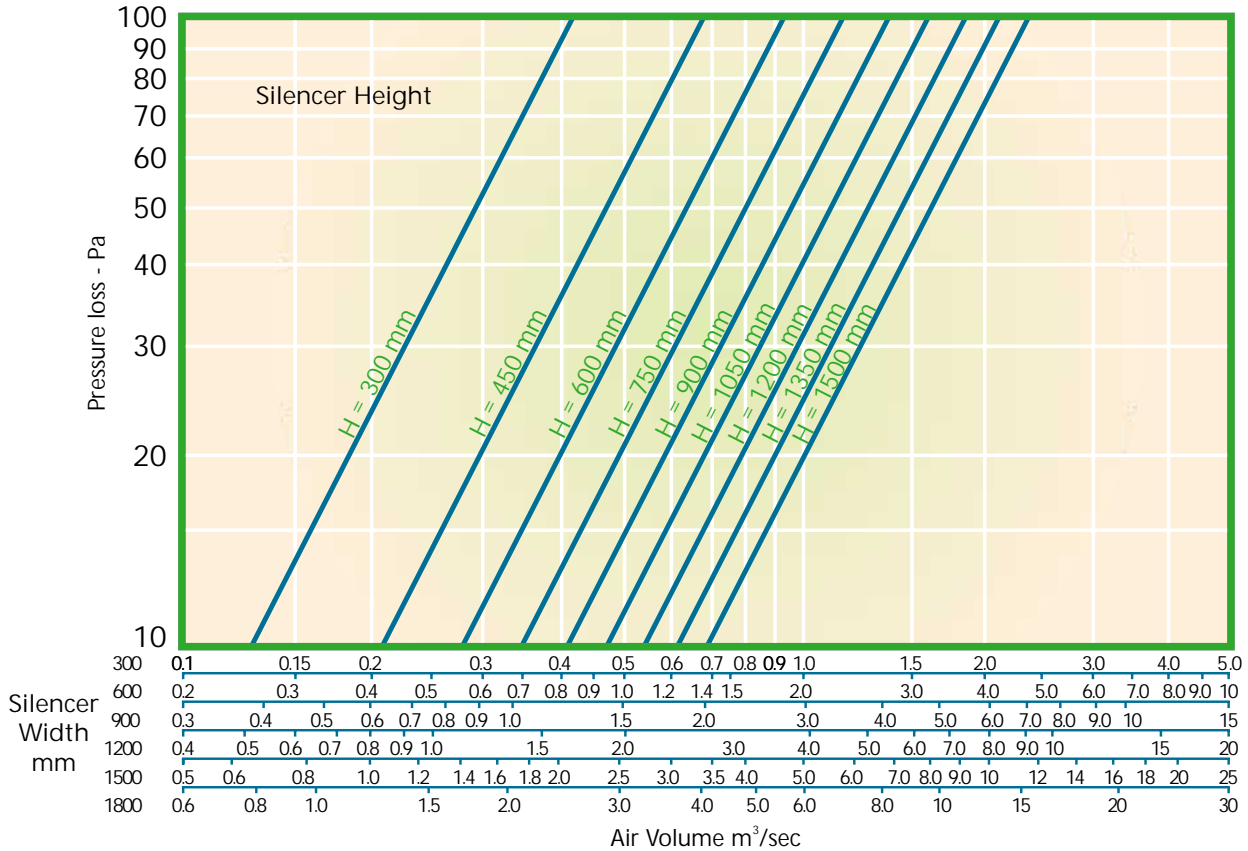
## Silencer Dimensions and Attenuation

Model	Connection Diameter mm	Overall Diameter mm	Length mm	Attenuation in dB in octave bands Hz							
				63	125	250	500	1k	2k	4k	8k
CSP 250	250	411	500	3	12	12	20	23	19	11	10
CSP 315	315	452	630	3	13	13	20	24	20	11	13
CSP 355	355	509	710	3	10	14	19	23	20	16	11
CSP 400	400	553	800	3	10	13	20	24	19	15	11
CSP 450	450	602	900	3	7	11	19	23	19	14	10
CSP 500	500	653	1000	4	10	15	22	23	19	16	10
CSP 560	560	713	1120	4	9	16	23	23	18	13	12
CSP 630	630	785	1260	5	9	17	24	24	19	13	10
CSP 710	710	864	1420	5	9	16	24	23	20	14	10
CSP 800	800	955	1600	5	8	17	25	24	19	15	10
CSP 900	900	1106	1800	5	11	17	25	24	17	11	8
CSP 1000	1000	1207	2000	5	10	18	25	24	18	12	9

## Outlet Silencers

The rectangular outlet silencers can be supplied with a removable side panel from which the acoustic splitters can be withdrawn. These contain resin bonded mineral wool slab, heat shrink sealed into polythene enclosures, and fitted into modules of perforated galvanised sheet steel, and are completely waterproof.

Starting with the air volume, select silencer width and height with an air pressure drop between 40 and 60 Pa.



## Silencer Attenuation

Silencer Length (mm)	Attenuation in dB in octave bands Hz							
	63	125	250	500	1k	2k	4k	8k
900	5	9	16	30	38	38	30	26
1200	6	12	23	40	50	50	40	28
1500	8	15	26	43	50	50	45	32
1800	9	17	30	45	50	50	48	35
2100	11	20	35	48	50	50	50	40
2400	12	23	40	50	50	50	50	46



VES silencers are described as follows:

VA4 - Width - Height - Length (in cms)  
e.g. 1.75m<sup>3</sup>/sec airflow. VA4 - 90 - 60 - 150 Apd 42Pa.

Cleanable silencer - add suffix RS to model number i.e. VA4 - 90 - 60 - 150 / RS.

For weatherproof silencer, specify powder coat finish by adding suffix to model number denoting colour.  
i.e. VA4 - 90 - 60 - 150 / RS / 00A05.

Outlet cowl available to match fan and/or silencer.

## Electrical Details

Workhorse units are normally supplied with a fitted local isolator. This includes 1 and 3 phase single speed motors and all 3 phase two speed motors.

240 volt 1 phase motor kw	FLC amps
0.25	2.30
0.37	3.00
0.55	4.00
0.75	4.90
1.10	7.40
1.50	9.00
2.20	12.50

240 volt 1 phase motors are available up to a maximum of 2.2kw.

400 volt 3 phase motor kw	FLC amps
0.25	1.20
0.37	1.25
0.55	1.80
0.75	2.30
1.10	2.90
1.50	3.70
2.20	5.60
3.00	6.90
4.00	9.30
5.50	11.70
7.50	15.50
9.20	19.20
11.00	22.50
15.00	29.50

2 speed motor kw	FLC's amps
0.55/0.12	1.55/0.75
0.75/0.18	2.00/0.95
1.10/0.18	3.00/1.20
1.50/0.25	4.00/1.55
2.20/0.37	5.20/2.70
3.00/0.70	6.80/2.70
3.50/0.60	10.50/2.60
5.50/0.75	13.00/3.00
7.50/1.20	17.00/4.80
9.20/1.85	18.00/6.00
14.00/2.30	27.50/7.50
17.00/2.80	35.50/12.50

### Two speed controllers

Two speed controllers consist of an enclosure with high/low/off switch, delay timer, overloads, contactors, run and trip lights for each speed, door isolator, labelling.

The enclosure size for all panels up to 5.5/0.75 kw motor is 300mm wide x 400mm high x 150mm deep, and for all larger motor sizes 400mm wide x 500mm high x 150mm deep.

### Three phase motor speed control using a matched three phase inverter.

Up to and including 2.2kw the standard inverter has an IP 20 housing and accessible electrical connections. These are only suitable for mounting in a control panel or in the optional IP 54 enclosure supplied by VES.

Sizes 3.0kw and above come in an IP 54 enclosure as standard.

For each inverter a local manual fan speed controller with on/off switch can be supplied, model CFSC1, in which case the inverter is programmed at VES to match the controller before despatch.

## BS 6173 / 2001: ventilation of catering establishments with gas fired appliances

The designer should be aware that in kitchens with gas fired appliances the mechanical ventilation must be interlocked with the gas supply.

This is to ensure that the ventilation system is switched on before the appliances in the kitchen can be used.

VES can supply a control panel to operate a gas solenoid valve.

The recommended design philosophy is as follows:

At manual switch-on of the control panel, the ventilation will start and the gas circuit enabled. The gas valve will not open until the airflow has been proved by a flow switch in the extract duct. When the panel is switched off, the fan will stop and the solenoid valve will be closed.

If the airflow switch detects a drop in flow, it will shut the gas valve off and leave the fan running. (Investigation of the airflow switch will usually reveal a blockage due to grease).

At this point the kitchen operative will call the duty manager who will confirm, or not, the presence of an airflow. If there is airflow, a momentary key switch on our panel will energise a timer in the panel to run-on for six hours. This will require resetting by the key holder if the switches have not been cleaned after six hours.

### Control panel specification

- On/off switch for supply fan unit.*
- On/off switch for extract fan unit.*
- Seven day time clock.*
- Run and trip lights for supply and extract fans.*
- Gas valve live light.*
- Gas valve override light.*
- Contactor for gas solenoid valve  
230 volt 1 amp.*
- Key operated gas solenoid override switch,  
linked to six hour timer.*
- Link for fire alarm relay or manual knock off  
button to shut panel down.*



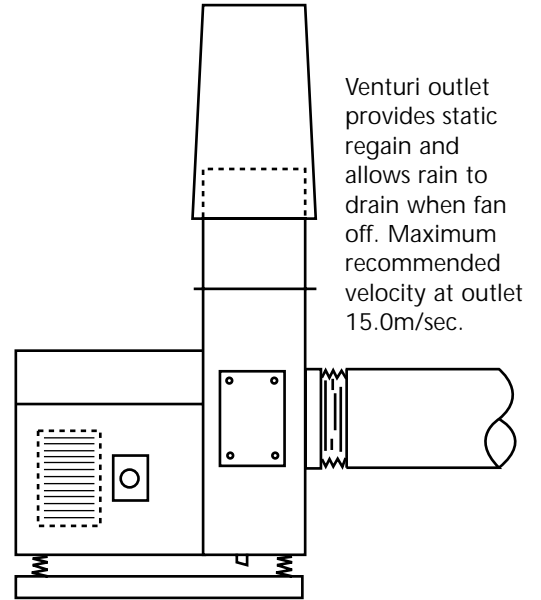
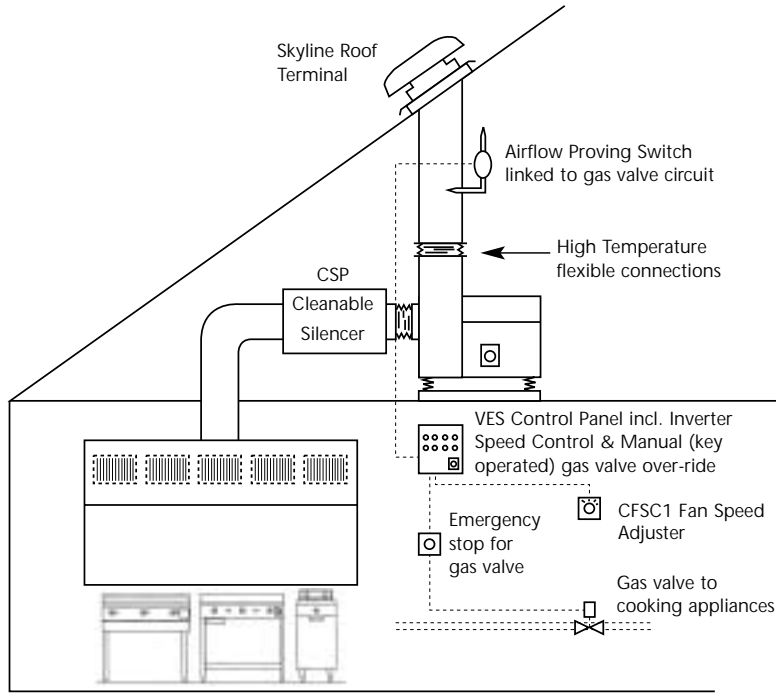
If flame failure devices are fitted to all gas appliances, this is all that is needed.

However, if all appliances do not have flame failure devices, a gas pressure proving system will also have to be fitted.

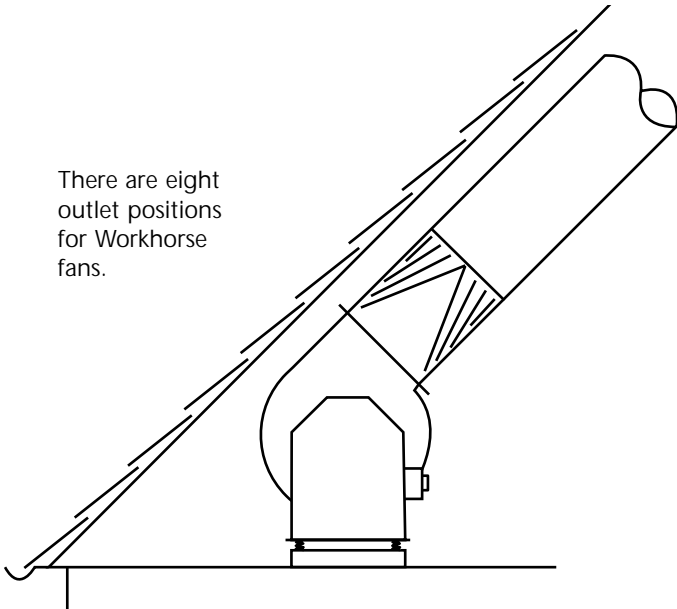
VES can combine the above into a control panel which operates all functions including heating, cooling, dirty filter alarm, fire alarm relay, inverter fan speed control or two speed motor control etc.

## Design Ideas

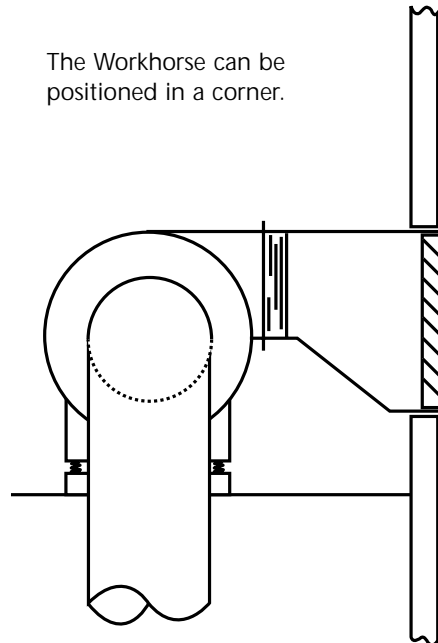
Workhorse fans are useful for awkward duct layouts, and can be used in the corner of a plantroom or in vertical duct runs.



There are eight outlet positions for Workhorse fans.



The Workhorse can be positioned in a corner.



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