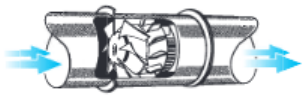
This information completes the "General Technical Information" section.

Features
RADAX® VAR is a range of high pressure in-line fans, combining the advantages of axial and centrifugal fans.
The mixed flow impeller combined with the fixed guide vanes are designed to provide high air flows and pressures very efficiently.

Air flow
The axial air flow pattern allows operation without loss, guide vanes improve and straighten the air and increase the efficiency of the fan. The VAR in-line installation eliminates the need for bulky bends, transformation pieces etc. including their resistances. This saves installation and energy costs.



Casing
Casing flanges on both sides to DIN 24155, Pt.3 with guide vanes and motor support made from galvanised steel. Models with R.P.M. = 2800 of size 400, 450, 500 as well as all models of size 630 welded casing, hot-dip galvanised. Terminal box to IP 55 fixed to the outer casing.

Impeller
Mixed flow impeller with 8 spacious curved blades. Up to size 355 made from polymer. Models with R.P.M. = 2800 of size 355 as well as all models of size 400 to 630 made from hot-dip galvanised steel. Aluminium is available (additional charge) on demand.
VAR fans offer high efficiency, low operation noise, high corrosion resistance and low vibration operation through dynamic balance to DIN ISO 1940 Pt.1 – quality grade 6.3.

Air flow temperature
The standard models are suitable in the range from –30 °C to at least +40 °C. See also information on product pages. Higher temperature models are available on request.

Information	Page
Information for planning, Acoustics, explosion prot.	10 on
General technical information, speed control	15 on

Explosion protection
The ex-proof models conform to cluster II, category 2G for operation in zone 1 or 2.
According to Directive 2014/34/EU (ATEX), larger air gaps are specified which lead to a power reduction of up to 10%.

Air flow direction
The air flow of the fan cannot be reversed, however the fan is suitable for installation in any position. The correct direction of rotation and air flow are marked on the fan.

Installation position, mounting, condensation openings
To achieve the performance figures shown, a straight duct of 2 times the diameter in length downstream of the fan is required (and installed in ducting ideally the same upstream) (Figure 1).
- RADAX® VAR can be installed in any position. Where motor condensate drainage is used, ensure the drain holes face downwards.
- When installing the fan for vertical airflow as well as in an outside position or in a permanently humid or wet atmosphere, this must be specified at time of ordering.

On site assembly and mounting must to be carried in such a way that the vertically fitted fan is distortion-free and safe.

Positioning
To avoid transmission of vibration between fan and building the use of anti vibration mounts is recommended (accessory SDD, SDZ). Larger motors may protrude to the rear and cause uneven distribution due to their high weight. An extension duct VR (accessories) is provided to determine the centre of gravity!

Installation examples
Horizontal
– **Figure 2**
Free intake, ducted on exhaust. Mounted on ceiling, wall or floor.

– **Figure 3**
Free intake with attenuator, ducted on exhaust. To reduce inlet and exhaust noise levels, attenuators can be fitted to both ends of the fan.

Fig. 1

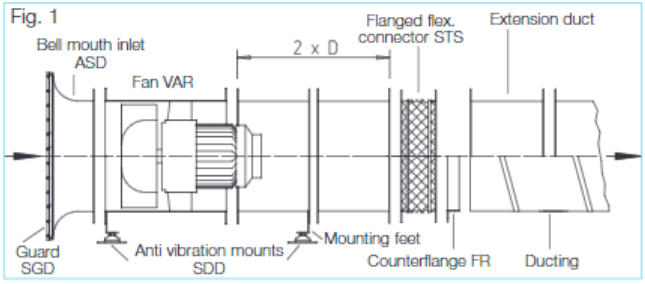


Fig. 2

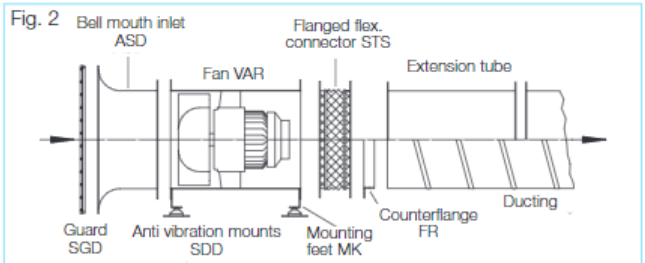


Fig. 3

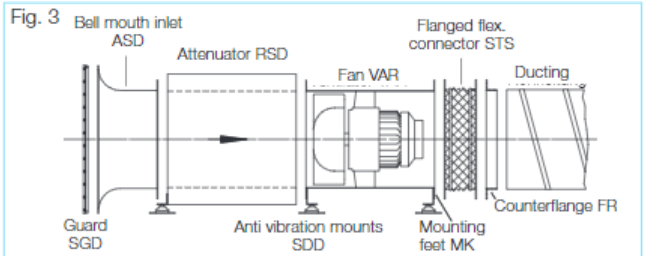
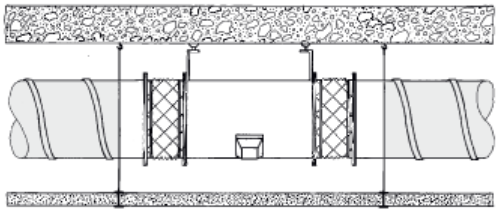


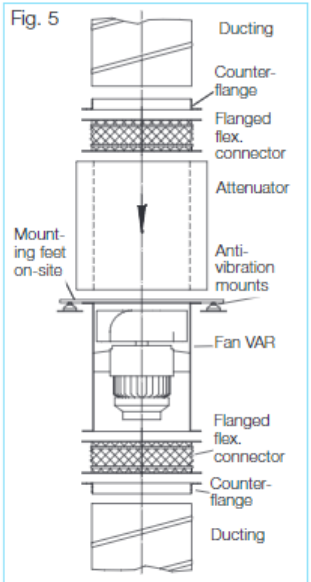
Fig. 4



– **Figure 4**
Ceiling suspension
Figure 4 shows the typical installation for ventilation. The installation of VAR systems is possible without any additional expenses through direct suspension on ceilings or walls.
The casing is designed for straight in-line installation using the flanged ends (to DIN 24155 Pt. 3).

Vertical
– **Figure 5**
In-line wall mounted installation with attenuator on intake. The accessories should be fixed separately to ensure that the fan may be easily removed for maintenance.

Fig. 5

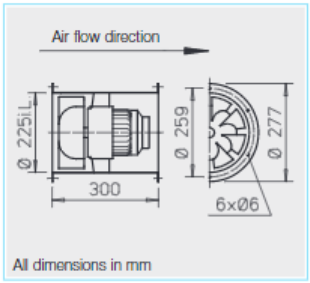


The following table facilitates the selection of RADAX® VAR high pressure fans by combining the parameters of static pressure Δp_{fa}, air flow volume $\dot{V}$, speed min^{-1}, sound pressure level dB(A) and impeller diameter DN mm.

Sizes from Ø 710 mm as well as twin and parallel VAR units are shown in a separate catalogue.

Diameter	R.P.M.	Sound pressure level - intake	Air flow volume $\dot{V}$ m^3/h against static pressure = N / m^2 = free available pressure												
mm	min^{-1}	L_{PA} dB(A)	(Δp_{fa}) in Pa												
		at 4 m	0	50	100	150	200	300	400	500	600	700	800	900	1000
225	2800	61	1770	1700	1600	1510	1400								
225	1450	46	900	730											
250	2800	64	2540	2450	2350	2250	2150	1910							
250	1450	49	1250	1050											
280	2800	68	3320	3220	3110	3010	2900	2670	2360						
280	1450	52	1630	1400	1000										
315	2800	71	4670	4550	4430	4310	4200	3930	3650	3280					
315	1450	56	2510	2300	2060	1730									
355	2800	75	7220	7080	6980	6850	6700	6450	6150	5850	5500	5050			
355	1450	60	3540	3300	3050	2750	2200								
400	2800	78	10150	10000	9850	9700	9600	9300	9000	8700	8350	7950	7500	7100	6400
400	1450	63	5260	4950	4650	4310	3930								
400	930	52	3500	3060	2290										
450	2800	83	14200	14100	13900	13750	13600	13300	12900	12500	12200	11800	11400	10800	10350
450	1450	67	7280	6950	6650	6300	5900	4800							
450	930	56	4990	4520	3870										

Diameter	R.P.M.	Sound pressure level - intake	Air flow volume $\dot{V}$ m^3/h against static pressure = N / m^2 = free available pressure												
mm	min^{-1}	L_{PA} dB(A)	(Δp_{fa}) in Pa												
		at 4 m	0	150	300	450	600	750	900	1050	1200	1550	1800		
500	2800	86	22310	21800	21400	20800	20300	19750	19200	18600	17900	16000	13500		
500	1450	70	9700	8640	7300										
500	930	59	6860	5150											
560	1450	73	13550	12500	11300	9850									
560	930	63	9850	8110											
560	725	56	7510												
630	1450	77	21460	20410	19110	17610	15760								
630	930	67	14040	12190	8740										
630	725	60	10690	7810											
	The following sizes are shown in a separate catalogue.														
710	1480	81	31350	30210	28920	27370	25680	23710	20790						
710	950	70	20110	18120	15390										
710	725	64	15330	12380											
800	1480	85	44870	43580	42210	40610	38810	36910	34780	32130	26670				
800	950	74	28770	26640	23850	19970									
800	725	67	21940	18810											
900	1480	88	63890	62450	60940	59300	57440	55410	53310	50990	48420	39610			
900	950	78	40990	38650	35710	32250	26830								
900	725	71	31260	27910	23160										
1000	1480	92	87640	86050	84410	82590	80770	78650	76400	74110	71650	66090	57450		
1000	950	81	56220	53690	50670	47080	42960	36050							
1000	725	74	42880	39330	34590	25090									



All dimensions in mm

Specification

Casing
Manufactured in galvanised sheet steel with flanges on both sides to DIN 24155, Pt. 3, with fixed guide vanes and motor support.

Impeller
Optimised for high pressure and performance.
Specially developed mixed-flow curved impeller manufactured from impact resistant polymers.

Motor
Direct driven, maintenance free flange motor, totally enclosed with an aluminium casing and cooling fins, protected to IP 54. Sealed for life ball bearings with tropicalized protection of windings and radio suppression. Optional drainage holes made to order (please state installation position).

Speed control
For all speed controllable models the current is given in the "speed controlled" column of the table below which must be used when selecting a controller (see controller column). The air flow volumes can be seen from the characteristic curves. If the fan is to be controlled by a frequency inverter without a sine filter, this must be stated when ordering. This requires a change of fan design and potential additional costs. Explosion proof fans are not controllable.

Electrical connection
Terminal box fitted externally on the casing as standard (IP 55).

Installation
Installation in any position. Ensure that motor drainage holes (where used) face downwards.

Motor protection
All models (3~ except ex proof) have thermal contacts as standard which must be connected to a full motor protection unit (see table below). With the 1 ph. ex-proof models thermal contacts are wired in series with the winding which automatically resets after cooling.
Models without thermal contacts must be protected by a conventional circuit breaker.

Sound levels
Data shown within the performance curves refer to sound power levels. For determination of the lower sound pressure levels refer to diagram on "Technical information" page.
Sound immission and acoustic information on page 10 on.

Information	Page
Technical description	208
Selection chart	209
Design of systems	10 on

Made to order designs
Alternative voltages, frequencies, protection classes, acid protection, high temperatures etc. are available on request.

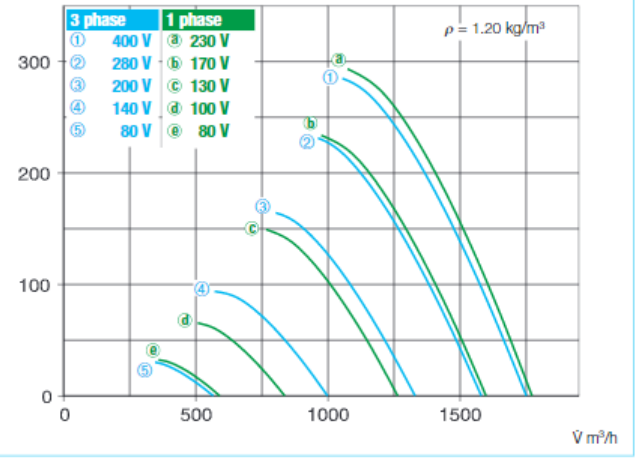
For safety and correct use note the technical information on page 15 on.

Type	Ref. no.	R.P.M.	Air flow volume (FID)	Motor power*	Voltage	Current* standard supply	Current* speed controlled	Wiring diagram	Maximum air flow temp. standard supply	Maximum air flow temp. speed controlled	Nominal weight (net)	5 step transformer controller Pole switch Type	5 step transformer controller Pole switch Ref. no.	Full motor protection starter using the motor thermal contacts Type	Full motor protection starter using the motor thermal contacts Ref. no.	Anti vibration mounts comp	Anti vibration mounts susp
		min⁻¹	V m³/h	kW	V	A	A	No.	+°C	+°C	kg	Type	Ref. no.	Type	Ref. no.	Type	Type
1 Phase motor, 1 ph. / 50 Hz, protection to IP 54																	
VARW 225/4	6660	1450	900	0.10	230	0.50	0.55	966	60	40	10.5	**MWS 1,5**[1]	1947	**MW**	1579	**SDD 1**	**SDZ 1**
VARW 225/2	6661	2770	1778	0.35	230	1.90	2.50	966	60	40	10.5	**MWS 3**[1]	1948	**MW**	1579	**SDD 1**	**SDZ 1**
3 Phase motor, 50 Hz, protection to IP 54																	
VARD 225/4	6662	1420	880	0.10	400Y	0.20	0.20	469	60	40	10.5	**RDS 1**[1) 4)]	1314	**MD**	5849	**SDD 1**	**SDZ 1**
VARD 225/2	6663	2720	1750	0.28	400Y	0.60	0.60	469	60	40	10.5	**RDS 1**[1) 4)]	1314	**MD**	5849	**SDD 1**	**SDZ 1**
Pole-switching, 2 speed motor (Dahlander windings Y/YY), 3 ph. / 50 Hz, protection to IP 54												Pole switch					
VARD 225/4/2	6771	1460/2800	880/1800	0.06/0.30	400	0.22/0.57	—	472	60	—	10.5	**PDA 12**[3]	5081	**M 3**[2]	1293	**SDD 1**	**SDZ 1**
Explosion proof, E Ex de II B, 1 ph. / 50 Hz, temperature class T1-T3, protection to IP 55																	
VARW 225/4 Ex	6733	1400	950	0.06	230	0.70	—	757	40	—	12.0	not permitted		—	—	**SDD 1**	**SDZ 1**
VARW 225/2 Ex	6734	2650	1780	0.18	230	1.23	—	757	40	—	12.5	not permitted		—	—	**SDD 1**	**SDZ 1**
Explosion proof, E Exe II, 3 ph. / 50 Hz, temperature class T1-T3, protected to IP 54																	
VARD 225/4 Ex	6664	1400	940	0.12	400	0.41	—	470	40	—	12.5	not permitted		not permitted		**SDD 1**	**SDZ 1**
VARD 225/2 Ex	6665	2850	1930	0.25	400	0.72	—	470	40	—	12.5	not permitted		not permitted		**SDD 1**	**SDZ 1**

* Ex models: For nominal value of motor see information on page 16 [1] includes full motor protection unit [2] includes operation and speed switch [3] see product page for flush mounted version
[4] Frequency inverter with integrated Sine filter, Type FU-BS 2,5, No. 5459, see product page FU.

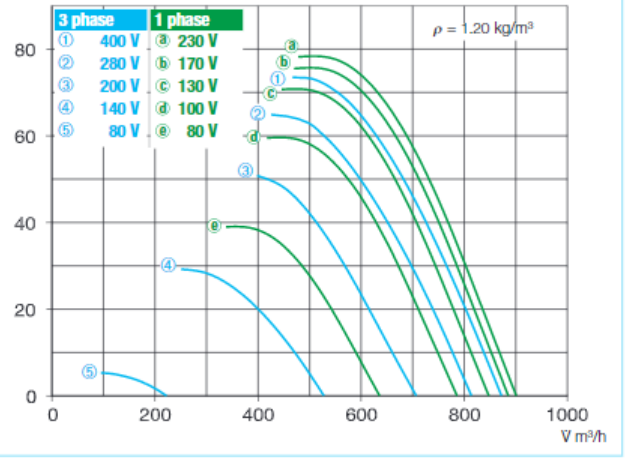
225/2 R.P.M. = 2800

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Air noise	dB(A)	81	51	62	74	76	76	72	63
$L_{PA,4m}$	Air noise	dB(A)	61	31	42	54	56	56	52	43

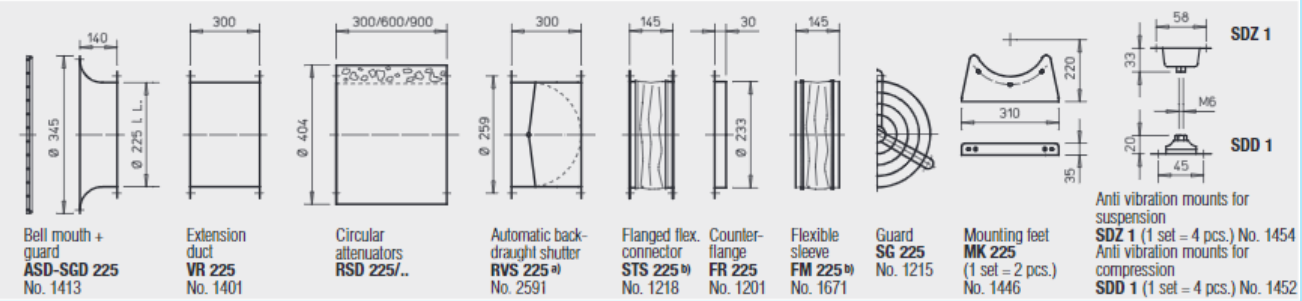


225/4 R.P.M. = 1450

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Air noise	dB(A)	66	41	55	60	62	59	52	43
$L_{PA,4m}$	Air noise	dB(A)	46	21	35	40	42	39	32	23



Accessories Specification see page 231 on



Bell mouth + guard **ASD-SGD 225** No. 1413

Extension duct **VR 225** No. 1401

Circular attenuators **RSD 225/..**

Automatic back-draught shutter **RVS 225** [a] No. 2591

Flanged flex. connector **STS 225** [b] No. 1218

Counter-flange **FR 225** No. 1201

Flexible sleeve **FM 225** [b] No. 1671

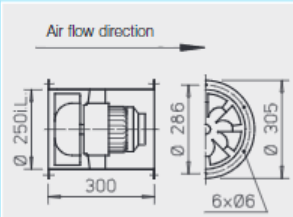
Guard **SG 225** No. 1215

Mounting feet **MK 225** (1 set = 2 pcs.) No. 1446

Anti vibration mounts for suspension **SDZ 1** (1 set = 4 pcs.) No. 1454
Anti vibration mounts for compression **SDD 1** (1 set = 4 pcs.) No. 1452

[a] For motorised shutters see accessory pages

[b] Types for explosion proof fans see above



All dimensions in mm

Specification

Casing
Manufactured in galvanised sheet steel with flanges on both sides to DIN 24155, Pt. 3, with fixed guide vanes and motor support.

Impeller
Optimised for high pressure and performance.
Specially developed mixed-flow curved impeller manufactured from impact resistant polymers.

Motor
Direct driven, maintenance free flange motor, totally enclosed with an aluminium casing and cooling fins, protected to IP 54. Sealed for life ball bearings with tropicalized protection of windings and radio suppression. Optional drainage holes made to order (please state installation position).

Speed control
For all speed controllable models the current is given in the "speed controlled" column of the table below which must be used when selecting a controller (see controller column). The air flow volumes can be seen from the characteristic curves. If the fan is to be controlled by a frequency inverter without a sine filter, this must be stated when ordering. This requires a change of fan design and potential additional costs. Explosion proof fans are not controllable.

Electrical connection
Terminal box fitted externally on the casing as standard (IP 55).

Installation
Installation in any position. Ensure that motor drainage holes (where used) face downwards.

Motor protection
All models (3~ except ex proof) have thermal contacts as standard which must be connected to a full motor protection unit (see table below). With the 1 ph. ex-proof models thermal contacts are wired in series with the winding which automatically resets after cooling.
Models without thermal contacts must be protected by a conventional circuit breaker.

Sound levels
Data shown within the performance curves refer to sound power levels. For determination of the lower sound pressure levels refer to diagram on "Technical information" page.
Sound immission and acoustic information on page 10 on.

Information	Page
Technical description	208
Selection chart	209
Design of systems	10 on

Made to order designs
Alternative voltages, frequencies, protection classes, acid protection, high temperatures etc. are available on request.

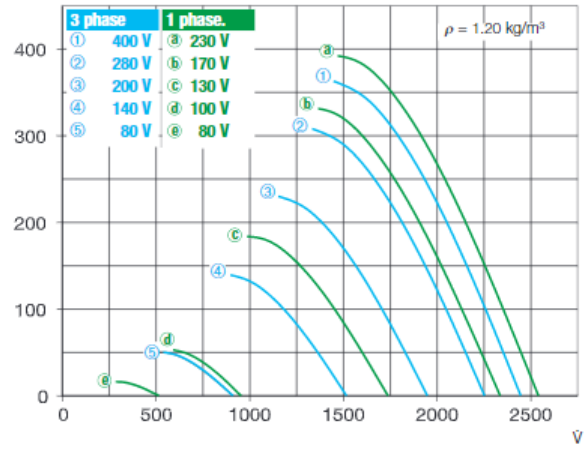
For safety and correct use note the technical information on page 15 on.

Type	Ref. no.	R.P.M.	Air flow volume (FID)	Motor power*	Voltage	Current* standard supply	Current* speed controlled	Wiring diagram	Maximum air flow temp. standard supply	Maximum air flow temp. speed controlled	Weight net	5 step transformer controller Pole switch Type	5 step transformer controller Pole switch Ref. no.	Full motor protection starter using the motor thermal contacts Type	Full motor protection starter using the motor thermal contacts Ref. no.	Anti vibration mounts comp	Anti vibration mounts susp
		min⁻¹	V m³/h	kW	V	A	A	No.	+°C	+°C	kg	Type	Ref. no.	Type	Ref. no.	Type	Type
1 Phase motor, 1 ph. / 50 Hz, protection to IP 54																	
VARW 250/4	6666	1420	1210	0.12	230	0.46	0.60	966	60	40	11.5	**MWS 1,5**[1]	1947	**MW**	1579	**SDD 1**	**SDZ 1**
VARW 250/2	6667	2840	2540	0.55	230	2.60	3.90	966	60	40	13.0	**MWS 5**[1]	1949	**MW**	1579	**SDD 1**	**SDZ 1**
3 Phase motor, 50 Hz, protection to IP 54																	
VARD 250/4	6668	1410	1250	0.09	400	0.30	0.30	469	60	40	11.5	**RDS 1**[1) 4)]	1314	**MD**	5849	**SDD 1**	**SDZ 1**
VARD 250/2	6669	2800	2450	0.47	400	1.10	1.10	469	60	40	11.5	**RDS 2**[1) 4)]	1315	**MD**	5849	**SDD 1**	**SDZ 1**
Pole-switching, 2 speed motor (Dahlander windings Y/YY), 3 ph. / 50 Hz, protection to IP 54												Pole switch					
VARD 250/4/2	6773	1425/2750	1200/2400	0.75/0.49	400	0.24/0.94	—	472	60	—	13.0	**PDA 12**[3]	5081	**M 3**[2]	1293	**SDD 1**	**SDZ 1**
Explosion proof, E Ex de II B, 1 ph. / 50 Hz, temperature class T1-T3, protection to IP 55																	
VARW 250/4 Ex	6735	1400	1290	0.06	230	0.70	—	757	40	—	13.0	not permitted		—	—	**SDD 1**	**SDZ 1**
Explosion proof, E Exe II, 3 ph. / 50 Hz, temperature class T1-T3, protected to IP 54																	
VARD 250/4 Ex	6670	1400	1300	0.12	400	0.41	—	470	40	—	13.0	not permitted		not permitted		**SDD 1**	**SDZ 1**
VARD 250/2 Ex	6671	2825	2590	0.37	400	0.95	—	470	40	—	15.5	not permitted		not permitted		**SDD 1**	**SDZ 1**

* Ex models: For nominal value of motor see information on page 16 [1] includes full motor protection unit [2] includes operation and speed switch [3] see product page for flush mounted version
[4] Frequency inverter with integrated Sine filter, Type FU-BS 2,5, No. 5459, see product page FU.

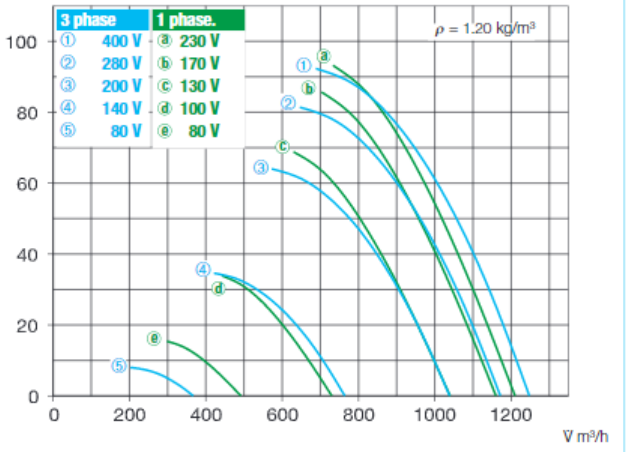
250/2 R.P.M. = 2800

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Air noise	dB(A)	84	55	65	77	79	80	75	67
$L_{PA,4m}$	Air noise	dB(A)	64	35	45	57	59	60	55	47

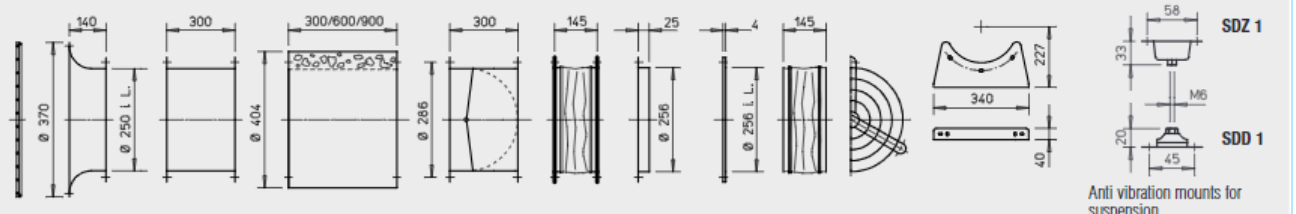


250/4 R.P.M. = 1450

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Air noise	dB(A)	69	44	58	63	65	63	56	46
$L_{PA,4m}$	Air noise	dB(A)	49	24	38	43	45	43	36	26



Accessories Specification see page 231 on



Bell mouth + guard **ASD-SGD 250** No. 1414

Extension duct **VR 250** No. 1402

Circular attenuators **RSD 250/..**

Automatic back-draught shutter **RVS 250** [a] No. 2592

Flanged flex. connector **STS 250** [b] No. 1220

Counter-flange **FR 250** No. 1203

Flat flange **FF 250** No. 4941

Flexible sleeve **FM 250** [b] No. 1672

Guard **SG 250** No. 1236

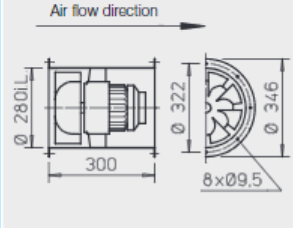
Mounting feet **MK 250** (1 set = 2 pcs.) No. 1447

Anti vibration mounts for suspension **SDZ 1** (1 set = 4 pcs.) No. 1454

Anti vibration mounts for compression **SDD 1** (1 set = 4 pcs.) Np. 1452

[a] For motorised shutters see accessory pages

[b] Types for explosion proof fans see above



All dimensions in mm

Specification

Casing
Manufactured in galvanised sheet steel with flanges on both sides to DIN 24155, Pt. 3, with fixed guide vanes and motor support.

Impeller
Optimised for high pressure and performance.
Specially developed mixed-flow curved impeller manufactured from impact resistant polymers.

Motor
Direct driven, maintenance free flange motor, totally enclosed with an aluminium casing and cooling fins, protected to IP 54. Sealed for life ball bearings with tropicalized protection of windings and interference-free. Optional drainage holes made to order (please state installation position).

Speed control
For all speed controllable models the current is given in the "speed controlled" column of the table below which must be used when selecting a controller (see controller column). The air flow volumes can be seen from the characteristic curves. If the fan is to be controlled by a frequency inverter without a sine filter, this must be stated when ordering. This requires a change of fan design and potential additional costs. Explosion proof fans are not controllable.

Electrical connection
Terminal box fitted externally on the casing as standard (IP 55).

Installation
Installation in any position. Ensure that motor drainage holes (where used) face downwards.

Motor protection
All models (3~ except ex proof) have thermal contacts as standard which must be connected to a full motor protection unit (see table below). With the 1 ph. ex-proof models thermal contacts are wired in series with the winding which automatically resets after cooling.
Models without thermal contacts must be protected by a conventional circuit breaker.

Sound levels
Data shown within the performance curves refer to sound power levels. For determination of the lower sound pressure levels refer to diagram on "Technical information" page.
Sound emission and acoustic information on page 10 on.

Information	Page
Technical description	208
Selection chart	209
Information for planning	10 on

Made to order designs
Alternative voltages, frequencies, protection classes, acid protection, high temperatures etc. are available on request.

For safety and correct use note the technical information on page 15 on.

Type	Ref. no.	R.P.M.	Air flow volume (FID)	Motor power*	Voltage	Current* standard supply	Current* speed controlled	Wiring diagram	Maximum air flow temp. standard supply	Maximum air flow temp. speed controlled	Nominal weight (net)	5 step transformer controller Pole switch Type	5 step transformer controller Pole switch Ref. no.	Full motor protection starter using the motor thermal contacts Type	Full motor protection starter using the motor thermal contacts Ref. no.	Anti vibration mounts comp	Anti vibration mounts susp
		min^{-1}	V m^3/h	kW	V	A	A	No.	+°C	+°C	kg	Type	Ref. no.	Type	Ref. no.	Type	Type
1 Phase motor, 1 ph. / 50 Hz, protection to IP 54																	
VARW 280/4	6672	1330	1600	0.11	230	0.50	0.60	966	60	40	12.0	**MWS 1,5**[1]	1947	**MW**	1579	**SDD 1**	**SDZ 1**
VARW 280/2	6659	2715	3350	0.79	230	3.70	4.90	967	60	40	14.0	**MWS 7,5**[1]	1950	**MW**	1579	**SDD 1**	**SDZ 1**
3 Phase motor, 50 Hz, protection to IP 54																	
VARD 280/4	6673	1370	1650	0.12	400	0.35	0.35	469	60	40	12.0	**RDS 1**[1) 4)]	1314	**MD**	5849	**SDD 1**	**SDZ 1**
VARD 280/2	6674	2705	3315	0.80	400	1.52	1.64	469	60	40	13.5	**RDS 2**[1) 4)]	1315	**MD**	5849	**SDD 1**	**SDZ 1**
Pole-switching, 2 speed motor (Dahlander windings Y/YY), 3 ph. / 50 Hz, protection to IP 54												Pole switch					
VARD 280/4/2	6775	1405/2810	1760/3500	0.14/0.91	400	0.44/1.78	—	472	60	—	16.0	**PDA 12**[3)]	5081	**M 3**[2)]	1293	**SDD 1**	**SDZ 1**
Explosion proof, E Ex de II B, 1 ph. / 50 Hz, temperature class T1-T3, protection to IP 55																	
VARW 280/4 Ex	6737	1330	1720	0.18	230	1.25	—	757	40	—	14.0	not permitted		—	—	**SDD 1**	**SDZ 1**
Explosion proof, E Exe II, 3 ph. / 50 Hz, temperature class T1-T3, protected to IP 54																	
VARD 280/4 Ex	6675	1400	1820	0.12	400	0.41	—	470	40	—	16.0	not permitted		not permitted		**SDD 1**	**SDZ 1**
VARD 280/2 Ex	6676	1860	3720	0.75	400	1.65	—	470	40	—	18.0	not permitted		not permitted		**SDD 1**	**SDZ 1**

* Ex models: For nominal value of motor see information on page 16 [1)] includes full motor protection unit [2)] includes operation and speed switch [3)] see product page for flush mounted version
[4)] Frequency inverter with integrated Sine filter, Type FU-BS 2,5 , No. 5459, see product page FU.