Technical Information

AlphaRad 100 / 125 / 150 / 160

January 2021

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1 Standards and markings

1.1 Important notes

AlphaRad fans and associated control units comply with DIN VDE regulations within the scope of the Equipment and Product Safety Act.

Pressure / flow characteristics and electrical data: Measurements are made on test benches in accordance with DIN 24163 or ISO 5801.

1.2 CE marking

AlphaRad fans meet the essential requirements of the EC Low Voltage Directive 2014/35/EU, the EC Electrical Magnetic Compatibility Directive 2014/30/EU and the EU Regulation VO 327/11.

2 Electrical connection

Electrical connection, commissioning, cleaning, maintenance and repairs only by qualified electricians in accordance with the electrotechnical regulations (DIN EN 50110-1, DIN VDE 0100 with the corresponding parts, DIN EN 60204-1 etc.). Prerequisite: Professional training and knowledge of the technical standards, EU directives and EU regulations.

The fans must be connected to a fixed electrical installation. This must be equipped with a device for disconnection from the mains with at least 3 mm contact opening on each pole.

3 Motor protection

Most fans have an integrated thermal protection switch, which protects the motor against overheating better than an overcurrent protection relay. This is especially important when the fan is controlled by voltage reduction, since in this case it is not possible to determine the exact overcurrent.

The thermal contacts are located in the motor winding. They open and interrupt the current supply to the fan as soon as the critical temperature is reached.

Fans with implemented thermal contacts (two wires connected to the integrated thermal contact; marked TK in the circuit diagram) must in any case be connected to a motor protection switch.

4 Heat recovery

Heat recovery ratio: The ratio of the incoming and outgoing enthalpy flows according to DIN 45635-38:1986-0.

Heat recovery ratio: Ratio of the recovered heat, including the heat that enters the room with the supply air flow through electrical units, to the enthalpy difference.

5 Delivery volume

Unless otherwise noted, all discharge volume data refers to free-suction/free-blowing condition.

6 Speed control

AlphaRad fans are suitable as standard for speed control by variable voltage with constant frequency, i.e. for operation on transformers or with phase angle control. Speed control via frequency converter can be provided on request via a special fan.

An advantage of speed control is the clearly audible noise reduction. And is therefore particularly suitable for night-time operation of ventilation and air-conditioning systems.

The level reduction can be up to: DL ≈ 50 Lg (n/n0) dB. (n0: nominal speed)

Example: halving the speed reduces the noise level by up to 15 dB.

Due to the phase angle control technique, a physically induced humming noise may occur in the lower speed range.

In rooms with the requirement for low-noise fan operation, therefore, use 5-step transformers TRE for speed control.

For the design of speed controllers and transformers, the value IMax is specified for the fans.

For speed control of the EZ/DZ and DPK EC series, frequency converters with the following limit values can also be used:

U peak < 1000 V
du/dt < 500 V/µs

If these values are not complied with, the frequency inverters must be equipped with additional sine filters.

In the case of speed control with frequency inverters, it is essential to consult the factory.

6.1 Speed control units

The speed control unit offered can be used to operate one or more fans (up to the max. rated current).

6.2 Transformers

Stage	1	2	3	4	5
Single-phase voltage [V]	85	115	150	180	230
Three-phase voltage [V]	105	150	190	250	400

7 Sound

7.1 Sound power level

Measurements of sound power levels are made at rated voltage.

L_{WA2} = Enclosure sound power level of tube fans in dB.

L_{WA5} = Free inlet sound power level of tube fans in dB.

L_{WA6} = Free discharge sound power level of tube fans in dB.

L_{WA7} = Casing and free-suction sound power level of wall fans in dB.

L_{WA8} = Casing and free-discharge sound power level of wall fans in dB.

7.2 Sound power level of central ventilation units with heat recovery

L_{WA2} = Casing sound power level in dB.

L_{WA5} = Free-suction sound power level in dB. Sound power emitted to the free environment. Measured at one operating point at the connecting piece facing the room (exhaust air).

L_{WA6} = Free discharge sound power level in dB. Sound power emitted to the free environment. Measured at one operating point at the connecting piece facing the room (supply air).

7.3 Sound measurements

All measurements are carried out in an anechoic chamber with free-field conditions. The measuring instruments comply with

DIN EN 60651 Class 1.

The sound power LWA is the acoustic power emitted by a sound source (fan). It is independent of the measuring distance and room influences.

The sound pressure level LP changes with the distance to the sound source (fan) and the sound absorption capacity of the environment.

A-weighted sound pressure levels: The sound pressure levels given in the technical data apply to free-suction and free-blowing wall-mounted fans measured on the suction side. The values refer to free-field conditions with a distance of 1 m and a directional factor Q = 2.

Sound power level LWA7 = casing and free-suction sound power level in dB. For wall-mounted fans, free-eye and free-blowing.

7.4 Conversion example

In the following, the conversion of the sound power level LWA into sound pressure level LP is shown using the example of the EZQ 30/2 B fan.

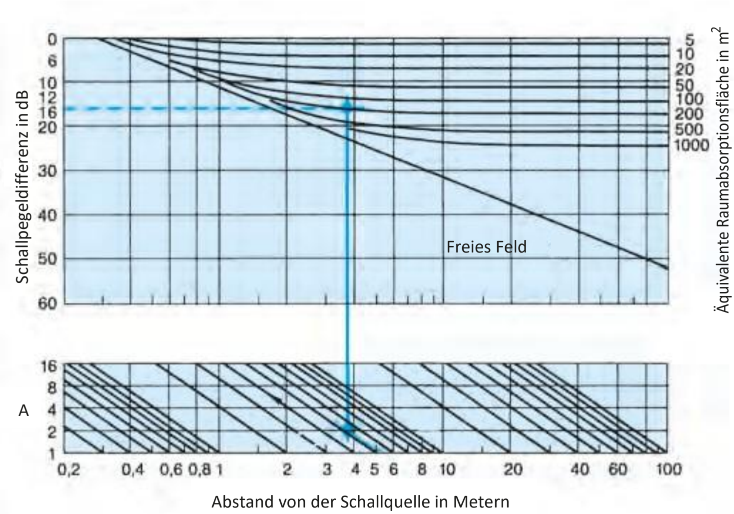
The sound pressure level LP is to be determined for a distance of 5 m, an equivalent room absorption area of 200 m² and a directional factor Q = 2.

Technical data EZQ 30/2 B:

Casing and free-blowing sound power level LWA8 = 88 dB (A).

Sound level difference according to diagram = 16 dB (A).
LP = 88 dB (A) - 16 db (A) = 72 dB (A).

7.5 Determining the sound level difference



A: Directional factor Q for sound radiation, depending on the installation situation of the fan.

Q = 1: Favorable, e.g. when a ceiling fan is installed in the center of the room. Sound propagation is spherical to all sides.

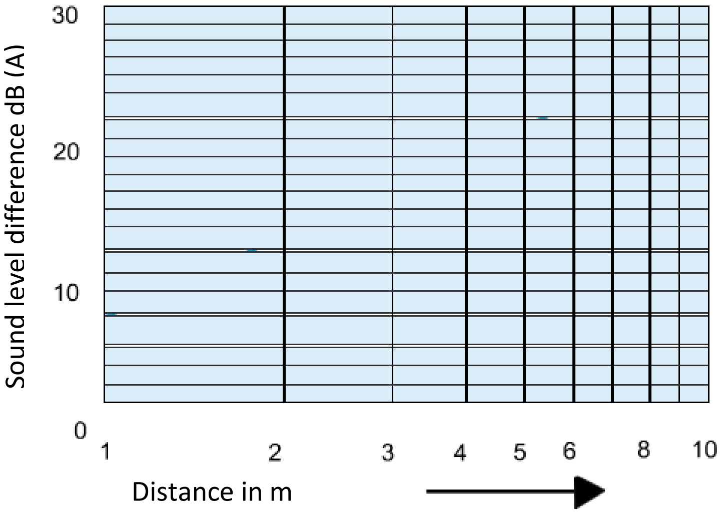
Q = 4: Less favorable, e.g. when fan is mounted in ceiling. For exact determination of Q, see VDI 2081.

7.6 Noise level at the workplace

According to the Workplace Ordinance, the following values should not be exceeded as a continuous level.

Activity	Db (A)
predominantly mental activity	55
mechanical office activity	70
all other activities	85
max. permissible exceedance 5 dB (A)	55

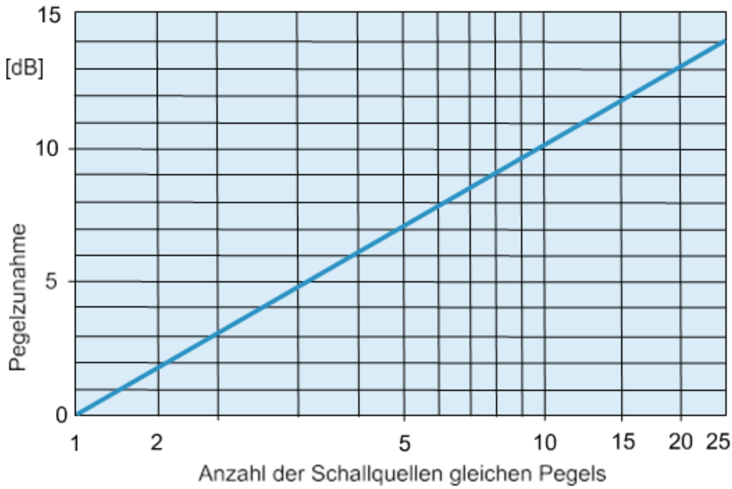
7.7 Difference of sound power to sound pressure with distance



Example: Sound power of the fan = 70 db(A)

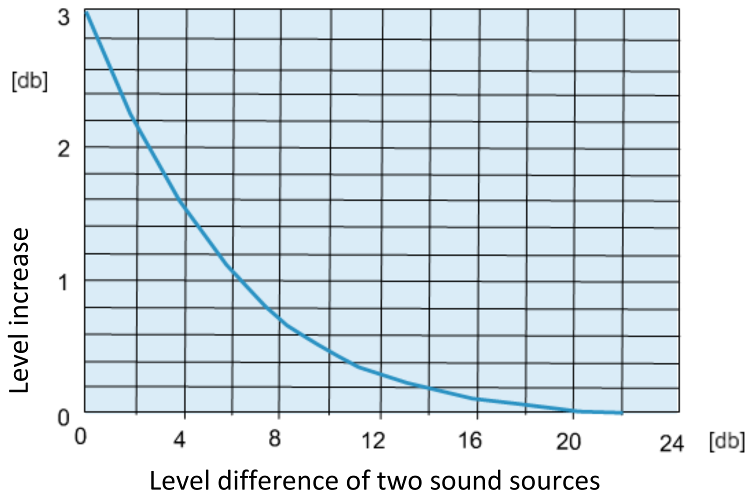
Sound pressure at 1 m distance (free field) = 70 dB(A) minus 8 = 62 dB(A)

7.8 Addition of several sound sources of the same sound level



Example: 10 sound sources a 60 dB(A) Total volume: 60 dB(A) + 10 dB(A) = 70 dB(A)

7.9 Addition of several sound sources of different sound level



Example: 2 sound sources 60 dB(A) and 64 dB(A) Total sound intensity: 64 dB(A) + 1.5 dB(A) = 65.5 dB(A)

7.10 Immission guide values for sound transmission

Immission guide values = guide values for sound pressure level Lp in dB (A).

Measurement outside (according to DIN VDI 2058, sheet 1): 0.5 m outside, approximately in front of the center of an open window.

Guideline values outside	Time of day	Lp dB(A)
For pure commercial areas	-	70
For mixed areas with commercial facilities and apartments	daytime nighttime	60
For areas with exclusively apartments	daytime night	45
For spa areas, hospitals, nursing homes	daytime night	50

8 Ventilation

8.1 Ventilation of apartments according to DIN 1946-6

The guideline values given are intended as a guide for calculating ventilation systems. The values, which depend on local conditions, will vary if boundary conditions change.

The following tables are based on DIN 1946-6:2009.

Specified air exchange rates are purely empirical values.

They serve exclusively to check the volume flow rates determined from air rates or balances.

Take the listed standards and guidelines into account during planning and execution.

Before dimensioning a ventilation system according to DIN EN 13779 or DIN EN 13779/DIN EN 15251, the specifications between the client and the planner must be observed.

In utilization units, ventilation measures are required if the required air volume flow for moisture protection $q_{v,ges,NE,FL}$ is greater than the air volume flow due to infiltration $q_{V,Inf,wirk}$.

Air volume flow for moisture protection:

$q_{v,ges,NE,FL} = f_{WS} - (- 0,001 - A_{NE}^2 + 1,15 - A_{NE} + 20)$

Air flow rate due to infiltration:

$q_{v,Inf,wirk} = f_{wirk,Komp} - A_{NE} - H_R - n_{50} - (f_{wirk,Lage} \text{-} Dp/50)^n$

Where:

f_{WS} = 0.3 for thermal insulation high (buildings with thermal insulation at least according to WSchV 95) or 0.4 for thermal insulation low

$f_{wirk,Komp}$ = 0,5 (simplifying for the determination of the

ventilation measures)

$f_{wirk,Lage}$ = 1,0 (simplified for the determination of the ventilation measures)

H_R = room height

n_{50} = measured value or default value see table on next page.

D_p = design differential pressure for single-story NE:

low wind areas = 2 Pa high wind areas = 4 Pa

for multi-storey NE: low-wind areas = 5 Pa high-wind areas = 7 Pa

n = default value 2/3 or measured value

Minimum total external volume flows for use units including infiltration.

	30	50	70	90	110	130	150	170	190	210
Ventilation for moisture protection Thermal protection high $q_{v,gesNE,FLH}$ (m³/h)	15	25	30	35	40	45	50	55	60	65
Ventilation for moisture protection Heat protection low $q_{v,ges,BE,FLG}$ (m³/h)	20	30	40	45	55	60	70	75	80	85
Reduced ventilation $q_{v,ges,NE,RL}$ (m³/h)	40	55	65	80	95	105	120	130	140	150
Nominal ventilation $q_{v,ges,NE,NL}$ (m³/h)	55	75	95	115	135	155	170	185	200	215
Intensive ventilation qv,ges,NE,IL (m³/h)	70	100	125	150	175	200	220	245	265	285

Total extract air volume flows $q_{v,ges,R,ab}$ for fan-assisted ventilation for individual rooms with or without windows. Including effective infiltration.

	Nominal ventilation	Ventilation for moisture protection LF	Reduced ventilation RL	Intensive ventilation IL
Utility room basement room (hobby) hallway (optional) WC	25	$q_{v,ges,FL} = (q_{v,ges,NL} / q_{v,ges,NE,NL}) * q_{v,ges,NE,FL}$	$q_{v,ges,RL} = (q_{v,ges,NL} / q_{v,ges,NE,NL}) * q_{v,ges,NE,RL}$	$q_{v,ges,IL} = (q_{v,ges,NL} / q_{v,ges,NE,NL}) * q_{v,ges,NE,IL}$
kitchen, kitchenette bathroom with / without WC, shower room	45			
sauna / fitness room	100			

Determination of the outdoor air flow by infilitration

$$q_{v,Inf,wirk} = f_{wirk,Komp} - V_{NE} - n_{50} - (Dp - f_{wirk,Lage} / 50)^n$$

Default values of the design air exchange at 50 Pa differential pressure

Design air exchange rate $n_{50,Ausl}$ for new construction and modernization in 1/h Category [1]		
A	B	C
1,0 [2]	1,5 [3), 5), 6]	2,0 [4), 5), 6]

1) The average building stock is described with an n50,Ausl of 4.5 1/h.

2) Fan-assisted ventilation in single-story and multi-story utilization units.

3) Free ventilation in new buildings in single-story and multi-story utilization units and in modernization in single-story utilization units (e.g., typical in MFH).

4) Free ventilation in the case of modernization in multi-storey usage units (e.g. in single-family houses).

5) The modernization measure provides at least for a permanently air-impermeable building envelope in accordance with the recognized rules of technology.

6) In case of a partial modernization of the building envelope, e.g. by not completely replacing the windows, it is recommended to dimension the technical ventilation measures according to the n50 values given for a complete modernization of the building envelope.

Correction factor for the effective infiltration air fraction $f_{wirk,Komp}$

Ventilation system	Free ventilation		Fan assisted ventilation			
	Cross-ventilation	Cross ventilation & ventilation shaft	Supply / exhaust air system (balanced)	Exhaust air system or supply air system		
Apartment type	All units of use			Single-storey utility units		Multi-storey utility units (EFH)
				With	without	
				Installation shaft		
	0,5	0,6	-	0,65	0,7	0,8
ALD	0,15		0,45		0,15	
ÜLD	-	0,35	-			
Shaft	-	-	0,45	0,15		0,2

Total outdoor air volume flow

$q_{v,ges} = q_{v,LtM} + q_{v,Inf,wirk} + q_{v,FE,wirk}$

Fresh air volume flow per unit of use, moisture protection

Thermal insulation high (new building after 1995, complete renovation)

$q_{v,ges,NE,FL} = 0{,}3 \bullet q_{v,ges,NE,NL}$

Thermal insulation low (unrenovated old building, construction before 1995)

$q_{v,ges,NE,FL} = 0{,}4 \bullet q_{v,ges,NE,NL}$

Fresh air volume flow per utilization unit, reduced ventilation

$q_{v,ges,NE,RL} = 0{,}7 \bullet q_{v,ges,NE,NL}$

Outdoor air flow rate per unit of use, nominal ventilation

$q_{v,ges,NE,NL} = - 0{,}001 \bullet A_{NE} + 1{,}15 \bullet A_{NE} + 20$

Outdoor air volume flow per unit of use, intensive ventilation

- $q_{v,ges,NE,IL} = 1{,}3 \bullet q_{v,ges,NE,NL}$
- $q_{v,ges}$ = effective total outdoor air flow rate
- $q_{v,LtM}$ = air volume flow by ventilation measures (free or fan-assisted)
- $q_{v,Inf,wirk}$ = effective air volume flow by infiltration
- $q_{v,FE,wirk}$ = effective air volume flow through active window opening window opening (not used for the design of ventilation measures according to DIN 1946.6:2009)
- $q_{v,ges,FL}$ = ventilation for moisture protection
- $q_{v,ges,NE,FL}$ = outdoor air volume flow per utilization unit for ventilation for moisture protection

- $q_{v,ges,RL}$ = Total outdoor air volume flow Reduced ventilation

- $q_{v,ges,NE,RL}$ = Outdoor air volume flow per utilization unit for reduced ventilation

- $q_{v,ges,NL}$ = Total outdoor air volume flow rate Nominal ventilation

- $q_{v,ges,NE,NL}$ = Outdoor air volume flow per utilization unit for nominal ventilation

- $q_{v,ges,IL}$ = Total fresh air volumetric flow intensive ventilation

- $q_{v,ges,NE,IL}$ = outdoor air volume flow per utilization unit for intensive ventilation

- $q_{v,Inf,wirk}$ = effective air volume flow by infiltration in m3/h

- $f_{wirk,Komp}$ = Correction factor for the effective infiltration air component for one ventilation component in m3/h, value according to table

- $f_{wirk,Lage}$ = Correction factor for the effective infiltration air component depending on the building location in m3/h, default value = 1

- V_{NE} = Air volume of the utilization units in m

- n_{50} = Air change in 1/h, default value n50,Ausl from table or measured value of air change at 50 Pa

- n = pressure exponent (value is 0.67 if no data from air tightness tests are available)

- D_p = design differential pressure in Pa

    - Single-story utilization unit: low wind = 2 Pa, high wind = 4 Pa; single-story utilization units are

    - typical apartments in multi-family buildings.

    - Multi-story use unit: low wind = 5 Pa, high wind = 7 Pa; Multi-story use units are, for example, a single-family house or duplex apartments.

8.2 Ventilation of non-residential buildings according to DIN EN 13779, DIN EN 15251 and workplace guidelines

Determining the volume flow rate via the air exchange rate
Air exchange rates (see table below) are empirical values without any particular load of pollutants and impurities.

V = VR - LW/h [m³/h] VR: Room volume m³

LW: Air exchange rate 1/h from table below

Determination of volume flow rate via the number of persons

V = P - ARP [m³/h] P: Number of persons

ARP: Outside air rate per person from table below

Volume flow rate determination for heat dissipation

V = (Q - 3600) / (p - cp - Dϑ) [m³/h]

Q: heat output to be dissipated kW

cp: specific heat of air kJ/(kg * K) (air 20 °C: cp about 1)

Dϑ: temperature difference between fresh air and heated air K

p:air density kg/m³ (air 20 °C, 1013mbar = 1,2 kg/m³

(1 kWh = 3600 kJ))

Determination of the heating power for heating the outside air

QL = (V - p - cp - Dϑ) / 3600 [m³/h]

Ventilation heat / heating power kW

V: volume flow m³/h

p: air density 1,2 kg/m³ (20 °C)

cp: specific heat kJ/(kg * K)

Dϑ: temperature difference (K) between ϑi room temperature and ϑa outdoor temperature

$D\vartheta = \vartheta i - \vartheta a$ [K]

Notes on the following table

The given guide values serve as an orientation guide for the calculation of ventilation systems. The values, which depend on local conditions, will vary if boundary conditions change.

Specified air exchange rates are purely empirical values.

They are used exclusively to check the volume flow rates determined from air rates or balances.

Take the listed standards and guidelines into account during planning and execution.

Before dimensioning a ventilation system according to DIN EN 13779, the specifications between the client and the planner must be observed.

Standard values for non-residential buildings and workplaces

	Minimum external volume flow according to DIN EN 15251 / DN EN 13779 Workplace guideline		Hourly air change	Permissible sound pressure level according to DIN EN 13779	Standards and guidelines	Notes on special requirements
	per person m^3 / h 1)	per m^2 m^3 / (h x m^2) 2)				
Garages: Low inbound / outbound traffic Other garages	–	6 12	ca. 5	70	VDI 2053 and GarVO of the countries	
Sports and multipurpose halls: per athlete per spectator Exhibition halls	60 20 20	–	2 - 3	45 - 50	DIN 18032-1	Reduction of pollutant concentration (CO)
Swimming pools	–	–	3 - 4	45 - 50	VDI 2089	
Waiting room	–	–	4 - 7	40 - 45	–	
Toilets	–	–	5	45	–	- –
per urinal	25	–	–	–	–	Dehumidification
per WC	25	–	–	–	–	- –
Changing room	–	–	4 - 8	35	–	- –
	–	25	6 - 15	52	VDI 2051 DIN 1946-7	- –
Laboratories	–	–	5 - 15	55 - 65	–	- –
Dye works	–	–	8 - 15	55 - 65	VDI 3802	Dehumidification
foundries	–	–	60 - 100	80	VDI 3802	Venting
hardening shops	–	–	20 - 50	70 - 80	VDI 2084	Explosion protection Corrosion protection
Welding shops	20 - 50	–	5 - 7	60 - 70	ASR	Explosion protection
Assembly halls	–	–	4 - 8	–	ASR	–
Workshops	–	–	8 - 10	50 - 65	ASR	–
Compressor rooms Computer rooms Transformer rooms	–	–	300 m3 / h per kWh heat loss	–	–	–
Welding shops	40	–	–	40 - 45	–	–
Assembly halls	45	30	–	–	–	–
Workshops	90	60	–	–	–	–
Measuring and testing rooms	45	11,3	–	40 - 45	–	–
Compressor rooms	45	15	6 - 8	30 - 40	–	–
Computer rooms Transformer rooms	45	18	5 - 7	35	–	–
Cafeteria, restaurant	45	3,8	–	40	–	–

1) DIN EN 13779, Tabelle A11

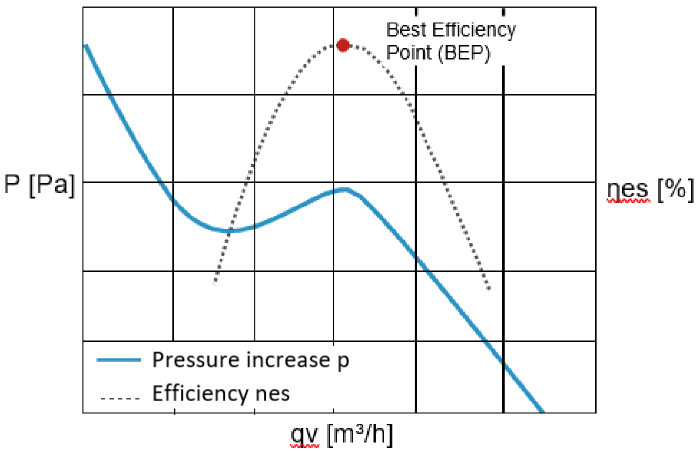
2) DIN EN 15251, Standardwerte für die Netto-Bodenfläche pro Person gem. Tabelle

9 Product information within the scope of the EU Regulation VO 327/11 (ErP)

Product information within the scope of VO 327/11 is shown on the relevant internet and main catalog pages as well as on the nameplates of the products.

Below are some notes on terminology:

The energy efficiency optimum (BEP) represents the highest possible efficiency of a fan. The calculation is based on the ratio of the electrical power consumed to the air output.



The following data are collected and published in the energy efficiency optimum: delivery volume BEP, pressure p_{BEP}, speed n_{BEP}, power consumption P_{BEP}, current consumption I_{BEP}, and the sound power level L_{WA}.

The calculated parameter N is used to compare the efficiency level specified by the EU. The calculated efficiency level N must be greater than or equal to the specified efficiency level.

The total efficiency η is the calculated static or total efficiency of the fan, depending on the efficiency category.

The measurement category indicates how and with which tools the efficiency measurement of the fan was performed:

- A: free inlet and outlet conditions.
- B: free inlet condition as well as mounted piping at outlet
- C: mounted piping at inlet as well as free outlet conditions
- D: mounted piping at inlet and outlet conditions.

The efficiency category describes the measurement method used to determine the energy efficiency. Depending on the measurement category, static or total fan pressure is used.

The specific ratio for all ErP-relevant AlphaRad products is ≈ 1. It indicates the ratio between the dynamic pressure measured in the fan outlet and the dynamic pressure at the fan inlet at the energy efficiency optimum (BEP) of the fan.

The energy efficiency of all ErP-relevant AlphaRad products was measured without an additional speed controller. An additional VSD (Variable Speed Drive) to achieve the BEP values is therefore not required for any AlphaRad fan.

Information on disassembly and disposal of the fan can be found in the assembly instructions.

Information on installation, operation and maintenance of the fan can also be found in the installation instructions.

In measuring the energy efficiency, only the items described by the measurement category indicated in each case were used. Deviations from this are noted directly on the product concerned.

10 Explosion protection according to Directive 2014/34/EU (ATEX)

AlphaBlower Ex fans for operation in potentially explosive atmospheres or for conveying potentially explosive gas, steam and air mixtures comply with the requirements of Directive 2014/34/EU (ATEX).

The fans are marked according to (4) and have the EC type examination certificate.

AlphaBlower Ex fans are suitable:

- for operation in potentially explosive atmospheres.
- for conveying potentially explosive gas, steam and air mixtures.

The Declaration of Conformity according to Directive 2014/34/EU confirms the conformity of the product as well as the requirements, evaluation procedures as specified according to the EU Directive.

The Ex -fans meet the type of protection "e" increased safety, use in zone 1 and 2. equipment group II, category 2G.

The mechanical part is manufactured according to DIN EN 14986.

Make the connection in accordance with the relevant regulations.

All binding data can be found on the motor nameplate. For example, the tE time for the motor protection switch or the tA time for the PTC thermistors according to DIN EN 60079-0 / VDE 0170 / 0171 or DIN EN 60079-10 / VDE 0165-101.

Speed control only for specially designed types in conjunction with MVS 6 or TMS motor protector.

Device groups

Equipment group I: Use in underground operations and their surface installations which may be endangered by mine gas and combustible dusts.

Equipment group II: Use in all other areas that may be endangered by explosive atmospheres.

Equipment categories

1 - Very high level of safety

2 - High level of safety

3 - Normal level of safety

The categories of equipment group II are extended with a letter after them - G for gases, D for dust.

The explosion-proof fans correspond to equipment group II, category 2G (see product-specific notes) for operation in zone 1 or 2 and meet the basic safety and health requirements when installed correctly.

Type of protection

Designation: "e" - Increased safety

For fan motors with terminal boxes, ignition protection type "e" is generally used as a subgroup.

Type of protection "e" corresponds to explosion group II.

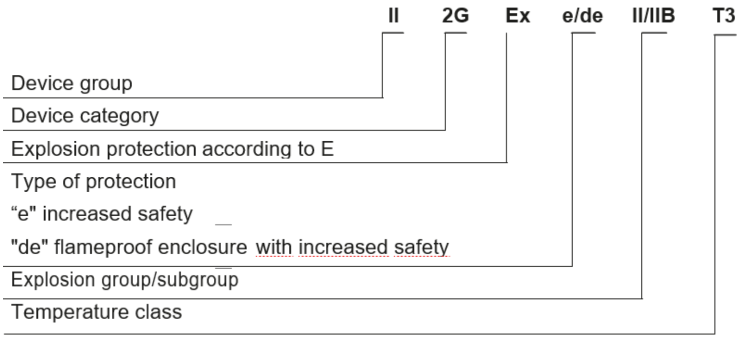
Zone classification, equipment groups and categories

Flammable substances	Zone according DIN EN 60079-10	Explanations	Device-groups	Device categories
	Zone 0	Areas in which hazardous explosive atmospheres are present continuously or for long periods.	II	1G
Gases, vapors, mists	Zone 1	places in which an explosive atmosphere is likely to occur occasionally.	II	1G or 2G
	Zone 2	places in which an explosive atmosphere is likely to occur only infrequently and then only for a short period.	II	3G, 2G or 1G

Temperature class, surface and ignition temperature

Temperature class	Maximum permissible surface temperature of the equipment	Ignition temperature of the flammable substances
T1	450 °C	> 450 °C
T2	300 °C	> 300 °C
T3	200 °C	> 200 °C
T4	135 °C	> 135 °C
T5	100 °C	> 100 °C
T6	85 °C	> 85 °C

Marking



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Safety-related key figures for flammable gases and vapors

Substance name	Ignition temperature °C	Temperatur class				Explosion group		
Acetaldehyde	155				T4	II A		
Acetone	535	T1				II A		
Acetylene	305		T2					II C
Ethane	515	T1				II A		
Ethylacetane	470	T1				II A		
Ethyl ether	175				T4		II B	
Ethyl alcohol	400		T2				II B	
Ethyl chloride	510	T1				II A		
Ethylene	440		T2				II B	
Ethylene oxide	435 Self-decay		T2				II B	
Ethyl glycol	235			T3			II B	
Ammonia	630	T1				II A		
I-amyl acetate	380		T2			II A		
Gasolines, petrols Initial boiling point < 135 °C	220 to 300			T3		II A		
Special benzines Initial boiling point > 135 °C	220 to 300			T3		II A		
Benzene (pure)	555	T1				II A		
n-Butane	365		T2			II A		
n-Butyl alcohol	325		T2				II B	
Cyclohexanone	430		T2			II A		
1,2-dichloroethane	440		T2			II A		
Diesel fuels DIN 516010/04.78	220 to 300			T3		II A		
Jet fuels	220 to 300			T3		II A		
Acetic acid	485	T1				II A		
Acetic anhydride	330		T2			II A		
Heating oil EL	220 to 300			T3		II A		
DIN 51603 part 1/12.81	220 to 300			T3		II A		
Fuel oil L	220 to 300			T3		II A		
DIN 51603 part 2/10.76	230			T3		II A		
Fuel oils M and S	605	T1				II A		
DIN 51603 part 2/10.76	595	T1				II A		
n-Hexane	440		T2			II A		

Substance name	Ignition temperature °C	Temperatur class				Explosion group		
Methyl chloride	625	T1				II A		
Naphthalene	540	T1				II A		
Oleic acid	250 Self-decay			T3			- *	
Phenol	595	T1				II A		
Propane	470	T1				II A		
n-Propyl alcohol	385		T2				II B	
Carbon disulfide	95				T6			II C
Hydrogen sulfide	270			T3			II B	
Town gas (illuminating gas)	560	T1					II B	
Tetralin (tetrahydronaphthalene)	390		T2			- *		
Toluene	535	T1				II A		
Hydrogen	560	T1						II C

* Extract from the table work "Sicherheitstechnische Kenngrößen", Volume 1: Flammable liquids and gases, Physikalisch-Technische Bundesanstalt, Braunschweig, by E. Brandes/W. Möller. ISBN 3-89701-745-8

-* The explosion group has not yet been determined for this substance.

11 Support and Contact

11.1 Troubleshooting/FAQ

You will find answers to the most frequently asked questions on our website:

https://www.radontec.de

11.2 Contact Us

Should you have any further questions or require further help and technical support, please do not hesitate to contact us.

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