W6D910-GA15-20

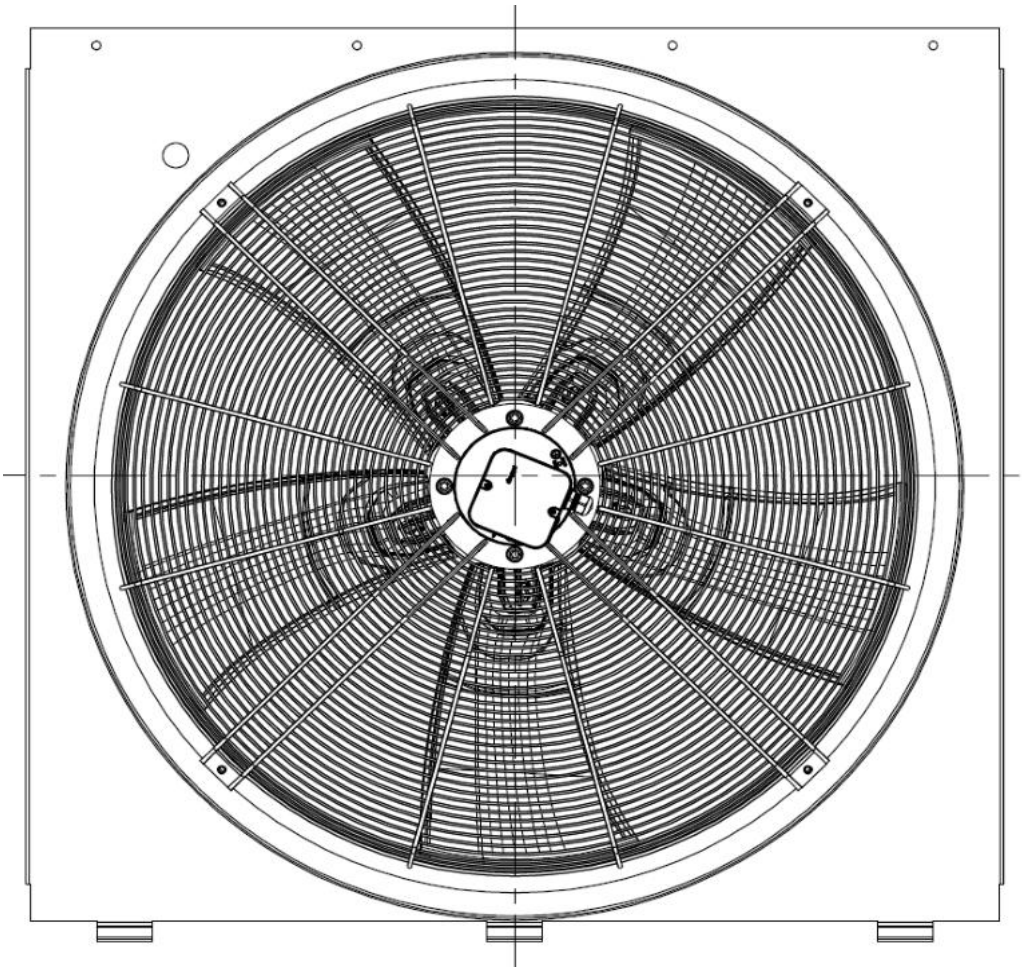
AC axial fan - HyBlade®

sickled blades (S series)

with full square nozzle

ErP2015 EXCEEDS THE NORM

Specification



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County court Stuttgart · HRB 590142

Version : initiate

Date : 2013-9-10

ebmpapst

W6D910-GA15-20

AC axial fan - HyBlade®

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Nominal data

Type	W6D910-GA15-20
Motor	**M6D138-NA**

Phase		3~	3~
Nominal voltage	VAC	400	400
Connection		**Δ**	Y
Frequency	Hz	50	50
Type of data definition		ml	ml
Valid for approval / standard		CE	CE
Speed	min^{-1}	885	670
Power input	W	2100	1350
Current draw	A	4.18	2.47
Max. back pressure	Pa	85	53
Max. ambient temperature	°C	65	55

ml = max. load · me = max. efficiency · fa = running at free air · cs = customer specs · cu = customer unit
Subject to alterations

Operating voltage: 380V/50Hz+10% is admissible

Data according to ErP directive

Installation category	A
Efficiency category	Static
Variable speed drive integrated	No
Specific ratio*	1,00

* Specific ratio = 1 + p_{fs} / 100 000 Pa

		Actual	Request 2013	Request 2015
Overall efficiency η_{es}		36,1	32,1	36,1
Efficiency grade N		40	36	40
Power input P_e	kW	2,46		
Air flow q_v	m^3/h	21770		
Pressure increase p_{fs}	Pa	142		
Speed n	min^{-1}	890		

Data established at point of optimum efficiency

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W6D910-GA15-20

AC axial fan - HyBlade®

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Technical features

Mass	52.4 kg
Size	910 mm
Surface of rotor	Cast in aluminium
Material of terminal box	PP plastic
Material of blades	Aluminium sheet insert, sprayed with PP plastic
Material of wall ring	Sheet steel, pre-galvanised and coated in black plastic (RAL 9005)
Material of guard grille	Steel, coated in black plastic (RAL9005)
Number of blades	5
Blade angle	0°
Direction of air flow	"V"
Direction of rotation	Clockwise, seen on rotor
Type of protection	IP 54
Insulation class	"F"
Humidity class	F3-1
Max. permissible ambient motor temp. (transp./ storage)	+ 80 °C
Min. permissible ambient motor temp. (transp./storage)	- 40 °C
Mounting position	Any
Condensate discharge holes	On rotor and stator sides
Operation mode	S1
Motor bearing	Ball bearing
Leakage current	<= 3.5 mA
Electrical leads	Via terminal box
Motor protection	Thermal overload protector (TOP) brought out , TOP will action on 140+/-5°C , will reset on 90-100°C
Cable exit	Axial
Protection class	I (if protective earth is connected by customer)
Product conforming to standard	EN 60034; EN 61800-5-1; CE
Approval	VDE
Balancing quality grade	4.2
LRA of the fan motor	18.6 A
Fuse select rule	Slow acting fuse , Max operating current draw is 5.15A .

Reliability

Basic test

NO.	ITEMS	Test Method / Standard	Results
1	drop test	Shock test according to DIN IEC 68, parts 2-27	OK
2	high speed destroy test (1.5 times rated speed ?)	destruction fan speed: >2700rpm rated speed at 400V 50Hz: 885rpm (at max. load) speed at 400V 50Hz (free blowing condition): 930rpm --> factor 2.9	OK
3	high ambient place test	Temperature rise tests of the fan are carried out according to EN60034-1	OK
4	dynamic balance test	DIN ISO 1940	OK
5	balance tab fastness confirmation	In order to confirm the fixity of balancing weights we perform "spinning tests ". In this tests, we turn the fan wheel to min. speed of 1.4 x nominal speed and check the positions of the individual balancing weights.	OK
6	blade life test (100,000 start/off cycle ?)	No cycle test was performed with the 910 blade. As a reference we may mention the HyBlade 630mm blade which we can guarantee 1Mio cycles for (Indeed, diameter is smaller, however, speed is higher!)	OK
7	Motor Temperature Rise (key parts : winding, outer race of bearing ?)	When we have all the specific ambient conditions available and the final part number selected we may coduct a L10 calculation.	OK
8	rotor locked test	tested according to EN60034-11	OK
9	reversed rotary start test (low voltage)	Basically, it shouldn't be a problem for the fan to start in reversed rotation conditions. This would mean that the motor is breaking down from reversed direction to 0rpm and then starts into normal operation mode. During this phase, however, LRA is applied.	OK
10	cotinuous running test		OK
11	overcurrent protection test	Locked rotor test is the condition of max. current draw. This is tested according to EN60034-11.	OK
12	rain test (heavy rainfall standard)	IPX4 tested in the style of DIN 60529 and DIN60034-5 for critical parts	OK
13	vibration test	Vibration test in operation according to DIN IEC 68, parts 2-6. Vibration test at stand still according to DIN IEC 68, parts 2-6	OK

Reliability

Fan material comparison of RTXC and RTXA

Component	RTXC	RTXA
	A6D910AA0101/ W6D910GA0101	W6D800GJ0101
Rotor	Iron Steel, encased in aluminum	Iron steel, encased in aluminum
Stator	Consisting of different components..	Consisting of different components..
	e.g. stator bushing: aluminum casting alloy	e.g. stator bushing: aluminum casting alloy
Winding	Enamelled copper wire	Enamelled copper wire
Bearing	Inner ring/ outer ring / balls: 100 Cr6	Inner ring/ outer ring / balls: 100 Cr6
	Cage: steel	Cage: steel
	Plates: steel	Plates: steel
	Lubricant: Klübersynth BHP 72-102	Lubricant: Asonic HQ 72-102
Shaft	Steel	steel
Impeller	HyBlade: Aluminium sheet insert, sprayed with PP plastic (UL94 HB flammability class)	Die-cast aluminum
Screw	Both p/n's, W6D910GA0101 and W6D800GJ0101 are using the same screws.	
	30000-7-6203 oval head screw with flange, adhesive micro encapsulated, tempering steel, surface ZnNi8B	
	33908-7-6238 fillister head screw, adhesive micro encapsulated, tempering steel, surface ZnNi8B	
	11010-7-6215 combi screw, tempering steel, surface treatment according to A2K	
	69771-4-7623 screw cable gland, polyamid	
	26805-7-6201 fillister head screw, tempering steel, surface treatment according to A2K	
Wallring	Sheet steel, pre-galvanized and coated in black plastic	Sheet steel, pre-galvanised and coated in black plastic
Guard grille	Steel, coated in black plastic (RAL9005)	Steel, coated in black plastic

W6D910-GA15-20

AC axial fan - HyBlade®

sickled blades (S series)

Reliability

Ball bearing life expectancy calculation

calculation number:	12487	note:	Data and temperature of bearings based on reference measurements. Calculated for 25850 m³/h @ 85 Pa.
date:	18.09.2013		
type:	A6D 910-AA00-XB		
motor:	M6D 138-NA		
customer:	TRANE		

motor date		general data	
voltage [V]:	380	lubricant :	Klübersynth BHP 72-102
frequency [Hz]:	50	rotor side ball bearing :	Kugellager
capacitor [µF]	0	stator side ball bearing :	Kugellager
power [W]:	2050	ambient temperature [°C] :	65
speed [1/min]:	885	probability a1 :	1

operating pos	rotor above	bearing :	rotor side	coeff. of grease a_{23} :	0,65
nominal life expectancy			L_{nh}	= 89232,15	
modified nominal life expectancy			L_{nah} =a1*a23*L_{nh}	= 58284*	
lubricant life expectancy			t_f	= 41913	

*The life expectancy is limited to 41913 by the lubricant life expectancy.

operating pos	rotor below	bearing :	rotor side	coeff. of grease a_{23} :	0,65
nominal life expectancy			L_{nh}	= 426411,60	
modified nominal life expectancy			L_{nah} =a1*a23*L_{nh}	= 278522*	
lubricant life expectancy			t_f	= 41913	

*The life expectancy is limited to 41913 by the lubricant life expectancy.

operating pos	horizontal shaft	bearing:	rotor side	coeff. of grease a_{23} :	0,65
nominal life expectancy			L_{nh}	= 251585,70	
modified nominal life expectancy			L_{nah} =a1*a23*L_{nh}	= 164330*	
lubricant life expectancy			t_f	= 41913	

*The life expectancy is limited to 41913 by the lubricant life expectancy.

This calculation only takes influences into account, which occur within the scope of optimal application of the above motor and ventilator type.
Date of printing:18.09.2013

W6D910-GA15-20

AC axial fan - HyBlade®

sickled blades (S series)

Reliability

Ball bearing life expectancy calculation

calculation number:	12488	note:	Data and temperature of bearings based on reference measurements. Calculated for 25850 m³/h @ 85 Pa.
date:	18.09.2013		
type:	A6D 910-AA00-XB		
motor:	M6D 138-NA		
customer:	TRANE		

motor date		general data	
voltage [V]:	380	lubricant :	Klübersynth BHP 72-102
frequency [Hz]:	50	rotor side ball bearing :	Kugellager
capacitor [µF]	0	stator side ball bearing :	Kugellager
power [W]:	2050	ambient temperature [°C] :	40
speed [1/min]:	885	probability a1 :	1

operating pos	rotor above	bearing :	rotor side	coeff. of grease a_{23} :	0,78
nominal life expectancy			L_{nh}	= 89232,15	
modified nominal life expectancy			L_{nah} =a1*a23*L_{nh}	= 70274*	
lubricant life expectancy			t_f	= 70155	

*The life expectancy is limited to 70155 by the lubricant life expectancy.

operating pos	rotor below	bearing :	stator side	coeff. of grease a_{23} :	0,83
nominal life expectancy			L_{nh}	= 89232,15	
modified nominal life expectancy			L_{nah} =a1*a23*L_{nh}	= 74634*	
lubricant life expectancy			t_f	= 70155	

*The life expectancy is limited to 70155 by the lubricant life expectancy.

operating pos	horizontal shaft	bearing:	rotor side	coeff. of grease a_{23} :	0,78
nominal life expectancy			L_{nh}	= 251585,70	
modified nominal life expectancy			L_{nah} =a1*a23*L_{nh}	= 198133*	
lubricant life expectancy			t_f	= 70155	

*The life expectancy is limited to 70155 by the lubricant life expectancy.

This calculation only takes influences into account, which occur within the scope of optimal application of the above motor and ventilator type.
Date of printing:18.09.2013

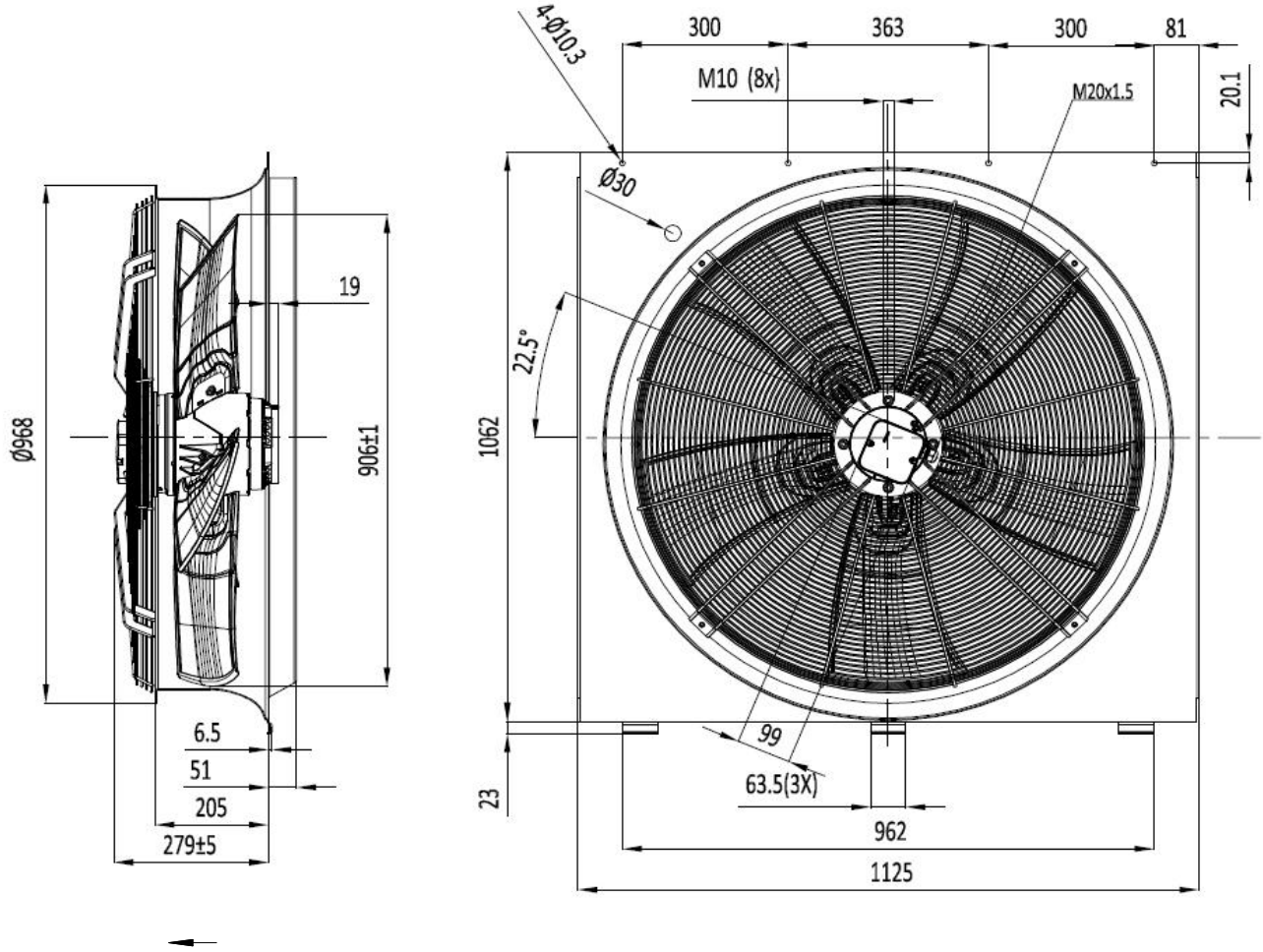
W6D910-GA15-20

AC axial fan - HyBlade®

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with full square nozzle

Product drawing



1	Direction of air flow "V"
2	Tightening torque 1.5±0.2 Nm
3	Cable diameter: min. 7 mm, max. 14 mm; tightening torque: 2±0.3 Nm

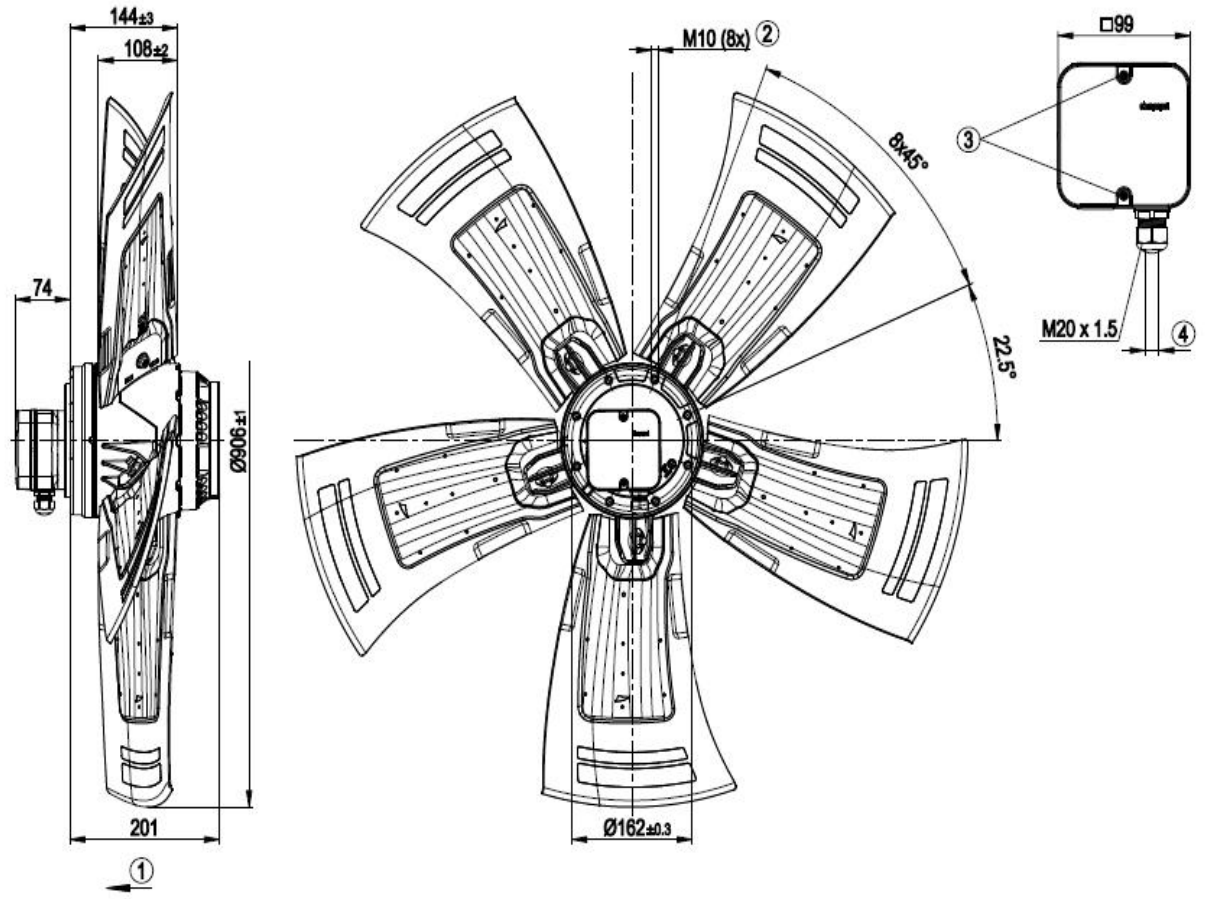
W6D910-GA15-20

AC axial fan - HyBlade®

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with full square nozzle

A6D910AA0101 Product drawing



All measures have the unit mm.

1	Direction of air flow "V"
2	Depth of screw max. 18 mm
3	Tightening torque 1.5±0.2 Nm
4	Cable diameter: min. 7 mm, max. 14 mm; tightening torque: 2±0.3 Nm

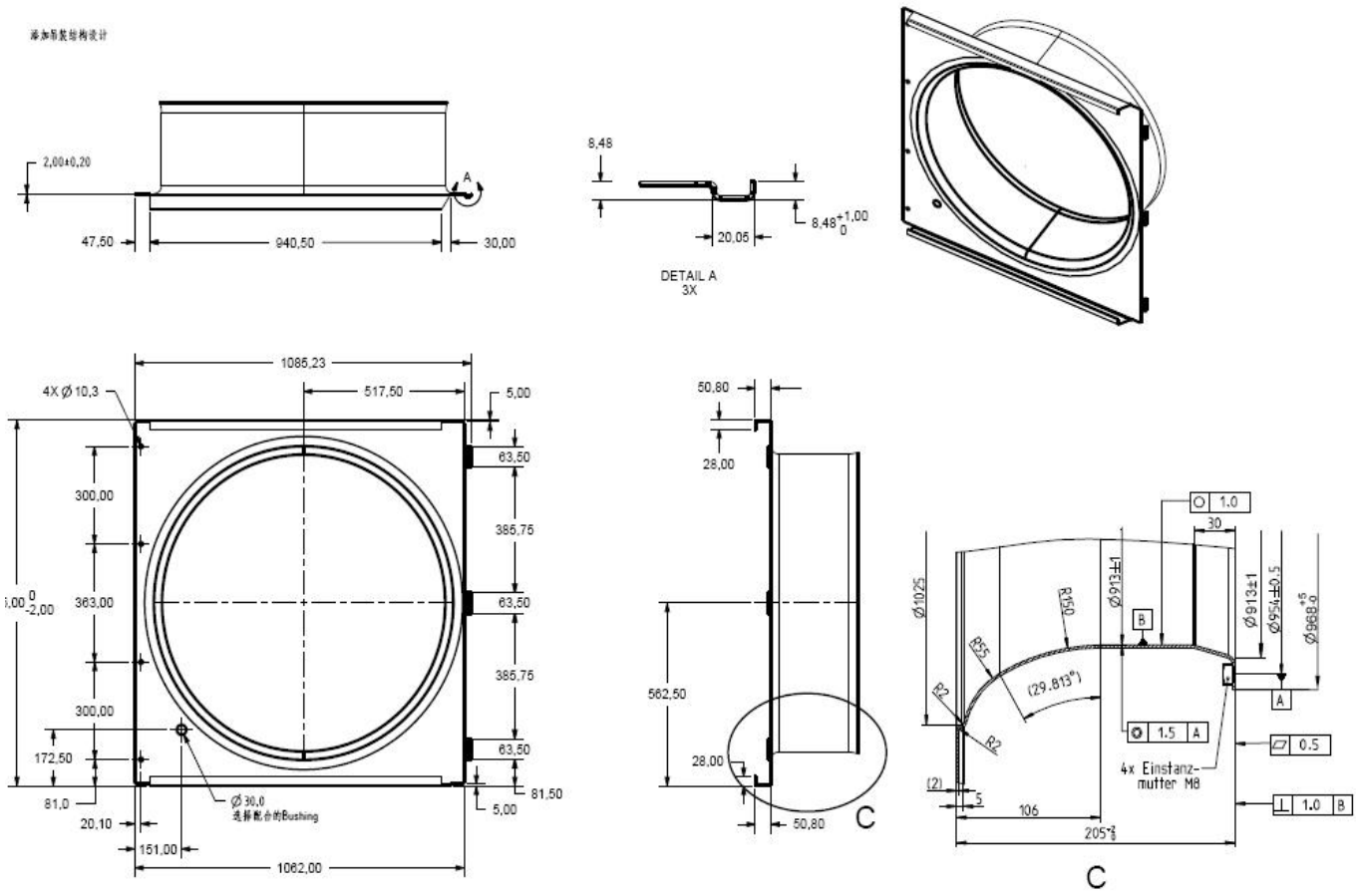
W6D910-GA15-20

AC axial fan - HyBlade®

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Wallring drawing



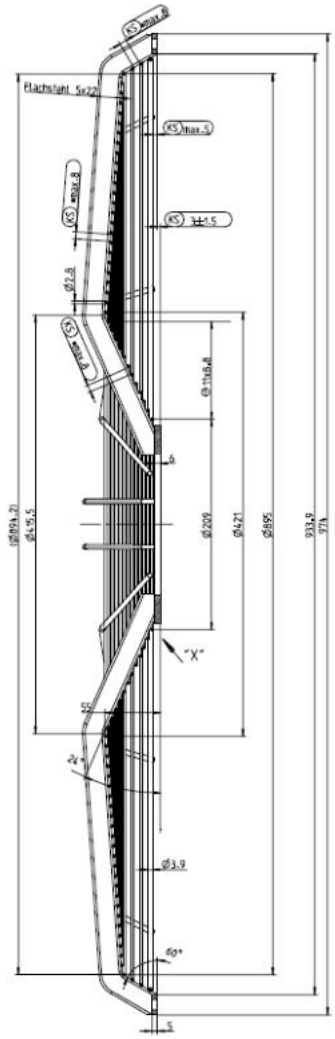
W6D910-GA15-20

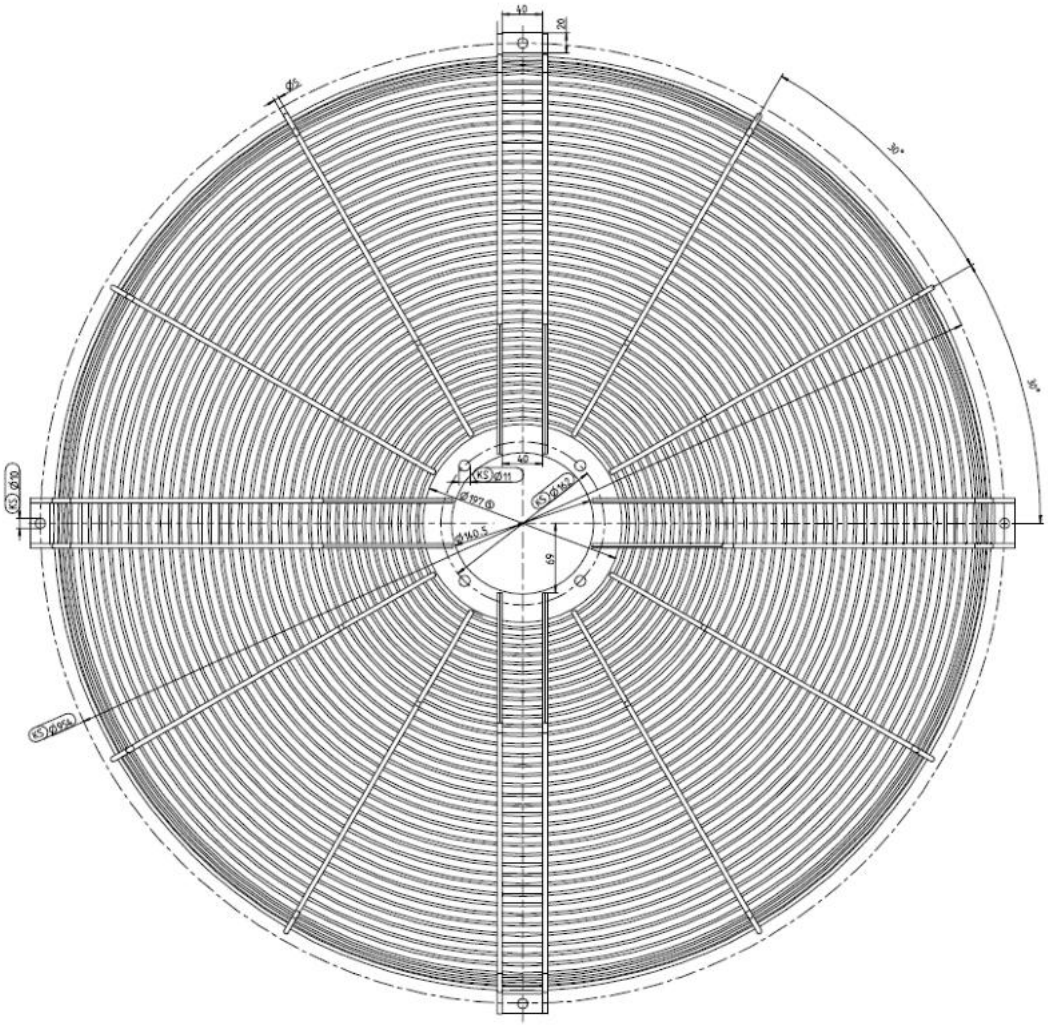
AC axial fan - HyBlade®

sickled blades (S series)

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Guard grille drawing





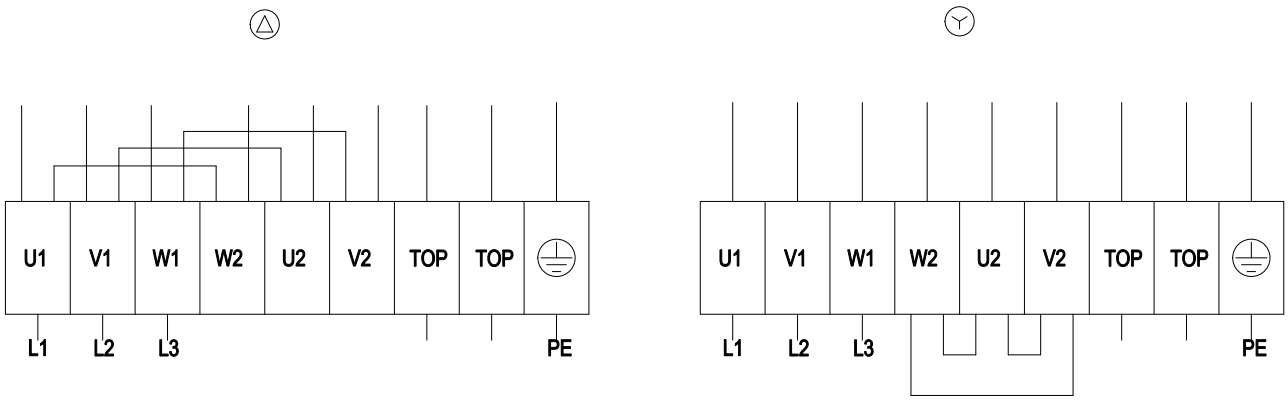
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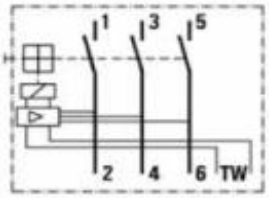
Connection screen



Δ	Delta connection	Y	Star connection	L1	= U1 = black
L2	= V1 = blue	L3	= W1 = brown	W2	yellow
U2	green	V2	white	TOP	2 x grey
PE	green/yellow				

Direction of rotation is reversed by swapping two line phases.

– **Electr. connection, three-phase:**



W6D910-GA15-20

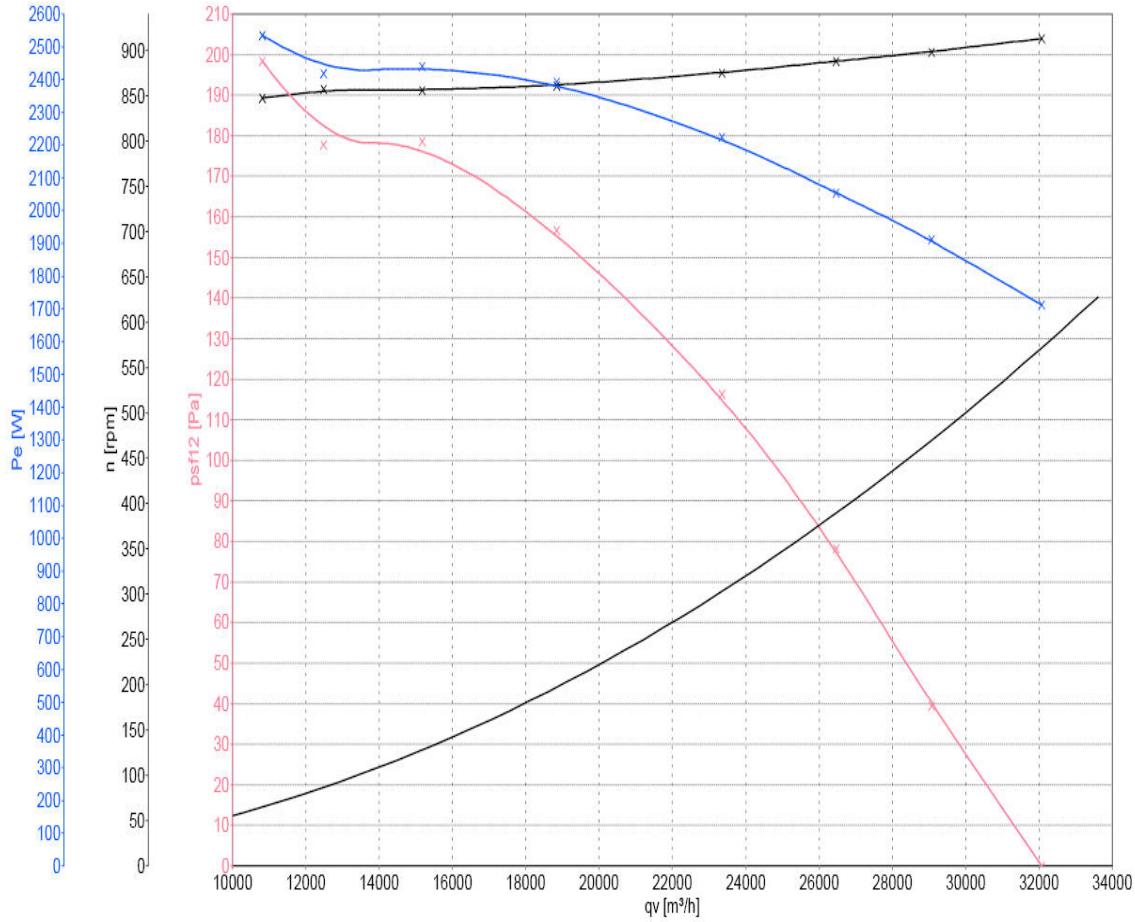
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with full square nozzle

Charts: Air flow 50 Hz

IDNO	Type	U [V]	f [Hz]	C [uF]	Uc [V]	PWM [%]	Layout	Inst. cat.	Line	Remark
157694	A6D910AA00XB-01B	400	50		0		Δ	A		



Measurement: LU-117504
Measurement: LU-118398

Air performance measured as per ISO 5801 Installation category A. For detailed information on the measuring set-up, please contact ebm-papst. Suction-side noise levels: LwA measured as per ISO 13347 / LpA measured with 1m distance to fan axis. The values given are valid under the measuring conditions mentioned above and may vary according to the actual installation situation. With any deviation from the standard set-up, the specific values have to be checked and reviewed with the unit installed.

W6D910-GA15-20

AC axial fan - HyBlade®

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Temperature test according to guideline EN60034-1

DATE	14.04.2009	HANDLED BY	AV_6230	PROJECT NO.	44413
CUSTOMER	ebm-papst Mulfing	APPLICATION		TEST NO.	13782
TYPE	A6D910AA0101-02C	MOTOR	M6D138NA	MODEL	
IDNO:	27288				
VOLTAGE	400 V	WIRING	Dreieck	FREQUENCY	50 Hz
MOTOR LAYOUT	7031				
ROTOR NO.	631				
IMPELLER Ø	904 mm	IMPELLER WIDTH	mm	IMPELLER NO.	55910-1-3234
DIM. C	mm				

START OF TEMPERATURE TEST:

No	P	V~ [V]	f [Hz]	I U1 [mA]	I V1 [mA]	I W1 [mA]	S [A/mm²]	P1 [W]	Speed [rpm]	λ	Vc~ [V]	Pfa [Pa]	Rc U1 [Ω]	Rc V1 [Ω]	Rc W1 [Ω]	T a [°C]			
1	WA4A	400	50	4808	4933	4665	6,27	2082	916	0,625		65	7,15	7,87	8,19	27,5			
2	WA4A	420	50	5082	5166	4912	6,62	2148	923	0,581		66	7,15	7,87	8,19	27,5			
3	WA4A	380	50	4605	4730	4480	6	2020	906	0,666		64	7,15	7,87	8,19	27,5			
4	WA4A	300	50	4482	4595	4345	5,84	1780	850	0,764		55	7,15	7,87	8,19	27,5			
5	WA4A	230	50	4625	4722	4500	6,03	1445	744	0,784		43	7,15	7,87	8,19	27,5			
6	WA4A	180	50	4475	4550	4350	5,83	1060	619	0,76		31	7,15	7,87	8,19	27,5			
7	WA4A	140	50	3975	4043	3855	5,18	705	489	0,731		21	7,15	7,87	8,19	27,5			

end OF TEMPERATURE TEST:

No	P	V~ [V]	f [Hz]	I U1 [mA]	I V1 [mA]	I W1 [mA]	S [A/mm²]	P1 [W]	Speed [rpm]	λ	Vc~ [V]	Pfa [Pa]	Rw U1 [Ω]	Rw V1 [Ω]	Rw W1 [Ω]	T Ω [°C]	dT U1 [K]	dT V1 [K]	dT W1 [K]
2	WA4A	420	50	4950	4935	4760	6,45	2170	917	0,603		65	9,34	10,39	10,71	25,5	82,3	85,9	82,9

U~ =Versorgungsspannung (Effektivspannung)
f =Netzfrequenz der Versorgungsspannung
I V1 =Stromaufnahme Phase V1 (Effektivstrom)
λ =Phasenwinkel zwischen Spannung und Strom
Rw U1 =Warm-Widerstand U1
Rw V1 =Warm-Widerstand V1
Rw W1 =Warm-Widerstand W1
dT V1 =Erwärmung Wicklung W1
S =Stromdichte in der Wicklung
N =Motordrehzahl
T a =Umgebungstemp. am Anfang des Erwärmungslaufes

I U1 =Stromaufnahme Phase U1 (Effektivstrom)
I W1 =Stromaufnahme Phase W1 (Effektivstrom)
Rk U1 =Kalt-Widerstand U1
Rk V1 =Kalt-Widerstand V1
Rk W1 =Kalt-Widerstand W1
dT U1 =Erwärmung Wicklung W1
dT W1 =Erwärmung Wicklung W1
P1 =Leistungsaufnahme (Wirkleistung)
Pfa =Druckerhöhung frei ausblasender Ventilator
T Ω =Umgebungstemp. am Ende des Erwärmungslaufes

W6D910-GA15-20

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Operation instructions

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CONTENTS

1. SAFETY REGULATIONS AND NOTES 1
1.1 Levels of hazard warnings 1
1.2 Staff qualification 1
1.3 Basic safety rules 1
1.4 Electrical voltage 1
1.5 Safety and protective functions 2
1.6 Mechanical movement 2
1.7 Emission 2
1.8 Hot surface 2
1.9 Transport 2
1.10 Storage 2
1.11 Disposal 2
2. PROPER USE 3
3. TECHNICAL DATA 4
3.1 Product drawing 4
3.2 Nominal data 5
3.3 Data according to ErP directive 5
3.4 Technical features 5
3.5 Mounting data 5
3.6 Transport and storage conditions 5
4. CONNECTION AND START-UP 6
4.1 Connecting the mechanical system 6
4.2 Connecting the electrical system 6
4.3 Connection in terminal box 7
4.4 Connection screen 8
4.5 Opening of second screwed cable gland 9
4.6 Checking the connections 9
4.7 Switch on device 9
4.8 Switching off the device 9
5. MAINTENANCE, MALFUNCTIONS, POSSIBLE CAUSES AND REMEDIES 9
5.1 Cleaning 10
5.2 Safety test 10

Translation of the original operating instructions

1. SAFETY REGULATIONS AND NOTES

Please read these operating instructions carefully before starting to work with the device. Observe the following warnings to prevent malfunctions or physical damage to both property and people.
These operating instructions are to be regarded as part of this device. If the device is sold or transferred, the operating instructions must accompany it.
These operating instructions may be duplicated and forwarded for information about potential dangers and their prevention.

1.1 Levels of hazard warnings

These operating instructions use the following hazard levels to indicate potentially hazardous situations and important safety regulations:

DANGER
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Compliance with the measures is mandatory.

WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Exercise extreme caution while working.

CAUTION
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage of property.

NOTE
A potentially harmful situation can occur and, if not avoided, can lead to property damage.

1.2 Staff qualification

Only specialised electrical personnel may install the device, perform the test run and work on the electrical system.
Only trained and authorised specialist personnel are permitted to transport, unpack, assemble, operate or maintain the device, or to use it in any other manner.

1.3 Basic safety rules

Any safety hazards stemming from the device must be re-evaluated once it is installed in the end device.
Observe the following when working on the unit:

⇒ Do not make any modifications, additions or conversions to the device without the approval of ebm-papst.

1.4 Electrical voltage

⇒ Check the electrical equipment of the device at regular intervals, refer to chapter 5.2 Safety test.

⇒ Replace loose connections and defective cables immediately.

DANGER
Electrical load on the device
Risk of electric shock

→ Stand on a rubber mat if you are working on an electrically charged device.

WARNING
Terminals and connections have voltage even with a unit that is shut off
Electric shock

→ Wait five minutes after disconnecting the voltage at all poles before opening the device.

Operation instructions

CAUTION
In the event of failure, there is electric voltage at the rotor and impeller
The rotor and impeller are base insulated.

→ Do not touch the rotor and impeller once they are installed.

CAUTION
The motor restarts automatically when operating voltage is applied, e.g. after a power failure.
Danger of injury

→ Keep out of the danger zone of the device.

→ When working on the device, switch off the mains supply voltage and secure the latter from being switched on again.

→ Wait until the device stops.

→ Insert the brought-out thermal overload protector into the control circuit so that the cooled off motor does not switch on independently after a fault.

1.5 Safety and protective functions



DANGER
Missing safety device and non-functioning safety device
If there is no safety device, you could be seriously injured, for example by reaching into the running device with your hands.

→ Operate the device only with a fixed and isolating safety protection and a fixed guard grille. The guard must withstand the kinetic energy of a fan blade detaching at maximum speed.

→ The device is a built-in component. You, the owner/ operator, are responsible for providing adequate protection for the device.

→ Shut down the device immediately if you detect a missing or ineffective protective feature.

1.6 Mechanical movement



DANGER
Rotating device
Body parts that come into contact with the rotor and impeller can be injured.

→ Secure the device against accidental contact.

→ Before working on the system/machine, wait until all parts have come to a standstill.

WARNING
Rotating device
Long hair, loose items of clothing and jewellery could become entangled and pulled into the device. You could be injured.

→ Do not wear any loose clothing or jewellery while working on rotating parts.

→ Protect long hair by wearing a cap.

1.7 Emission

WARNING
Depending on the installation and operating conditions, a sound pressure level greater than 70 dB(A) may arise.
Danger of noise-induced hearing loss

→ Take appropriate technical safety measures.

→ Protect operating personnel with appropriate safety equipment, e.g. hearing protection.

→ Also observe the requirements of local agencies.

1.8 Hot surface



CAUTION
High temperature at the motor housing
Danger of burn injuries

→ Ensure that sufficient protection against accidental contact is provided.

1.9 Transport

NOTE
Transport of device

→ Transport the device in its original packaging only.

→ Secure the device so that it does not slip, e.g. by using a clamping strap.

1.10 Storage

⇒ Store the device, partially or fully assembled, in a dry and weatherproof manner in the original packing in a clean environment.

⇒ Protect the device from environmental impacts and dirt until the final installation.

⇒ We recommend storing the device for a maximum up to one year to guarantee proper operation and longest possible service life.

⇒ Even devices explicitly suited for outdoor use are to be stored as described prior to being commissioned.

⇒ Maintain the storage temperature, see chapter 3.6 Transport and storage conditions.

⇒ Please make sure that all screwed cable glands are fitted with dummy plugs.

1.11 Disposal

When disposing of the device, please comply with all relevant requirements and regulations applicable in your country.

Translation of the original operating instructions

2. PROPER USE

The device is exclusively designed as a built-in device for moving air according to its technical data.
Any other or secondary use is deemed improper and constitutes a misuse of the device.
Installations on the customer's side must meet the mechanical, thermal and service life-related stresses that can occur.

Proper use also includes:

- Only using the device in stationary systems.
- Carrying out all maintenance.
- Moving air with a density of 1.2 kg/m³.
- Using the device in accordance with the permitted ambient temperature, see chapter 3.6 Transport and storage conditions and chapter 3.2 Nominal data.
- Operating the device with all protective features in place.
- Minding the operating instructions.

Improper use

Using the device in the following ways is particularly prohibited and may cause hazards:

- Operating the device with an imbalance, e.g. caused by dirt deposits or icing.
- Operation in medical equipment with a life-sustaining or lifesaving function.
- Operation with external vibrations.
- Moving solids content in flow medium.
- Painting the device
- Connections (e.g. screws) coming loose during operation.
- Opening the terminal box during operation.
- Moving air that contains abrasive particles.
- Moving highly corrosive air, e.g. salt spray mist. Exceptions are devices that are intended for salt spray mist and protected accordingly.
- Moving air that contains dust pollution, e.g. suctioning off saw dust.
- Operating the device close to flammable materials or components.
- Operating the device in an explosive atmosphere.
- Using the device as a safety component or for taking on safety-related functions.
- Operation with completely or partially disassembled or modified protective features.
- In addition, all application options that are not listed under proper use.

Translation of the original operating instructions

3. CONNECTION AND START-UP

3.1 Connecting the mechanical system



CAUTION
Cutting and crushing hazard when removing the fan from the packaging



→ Carefully remove the device from its packaging, holding it by the centre of the blades only. Make sure to avoid any shock.

→ Wear safety shoes and cut-resistant safety gloves.

CAUTION
Heavy load when taking out the device
Bodily harm, e.g. back injuries, are possible.

→ Two people should remove the device out of its packaging together.

⇒ Check the device for transport damage. Damaged devices must no longer be installed.

⇒ Do not make any modifications, additions or renovations to the device. Replacing the terminal box is not permitted.

⇒ Install the undamaged device according to your application.

3.2 Connecting the electrical system



DANGER
Electric voltage on the device
Electric shock

→ Always install a protective earth first.

→ Check the protective earth.



DANGER
Incorrect insulation
Risk of fatal injury from electric shock

→ Use only cables that meet the specified installation requirements for voltage, current, insulation material, load etc.

→ Route cables such that they cannot be touched by any rotating parts.



DANGER
Electrical load (>50 µC) between mains wire and protective earth connection after switching of the supply when switching multiple devices in parallel.
Electric shock, risk of injury

→ Make sure that sufficient protection against accidental contact is provided.
Before working on the electrical connection, the connections to the mains supply and PE must be shorted.

CAUTION
Electrical voltage
The fan is a built-in component and features no electrically isolating switch.

→ Only connect the fan to circuits that can be switched off with an all-pole separating switch.

→ When working on the fan, you must switch off the installation/machine in which the fan is installed and secure it from being switched on again.

NOTE
Water penetration into leads or wires
Water enters at the cable end on the customers side and can damage the device.

→ Make sure that the cable end is connected in a dry environment.



Connect the device only to circuits that can be switched off using an all-pole disconnecting switch.

3.2.1 Prerequisites

⇒ Check whether the data on the type plate agree with the connection data.

⇒ Before connecting the device, ensure that the supply voltage matches the operating voltage of the device.

⇒ Only use cables designed for current according to the type plate. For determining the cross-section, follow the basic principles in accordance with EN 61800-5-1. The protective earth must have a cross-section equal to or greater than the outer conductor cross-section.
We recommend the use of 105°C cables. Ensure that the minimum cable cross-section is at least AWG26/0.13 mm².

Earth wire contact resistance to EN 61800-5-1

Compliance with the impedance specifications to EN 61800-5-1 for the protective earth circuit must be verified in the end application.
Depending on the installation situation, it may be necessary to install an additional protective earthing conductor via the additional protective earth connection point available on the device.
The protective earth connection point is located on the housing and has a protective earth symbol and a bore hole.

3.2.2 Residual current operated device



Only pulse-current sensitive and/or universal RCD protective devices (Type A or B) are permitted. Like frequency inverters, RCD protective devices cannot provide personal safety while operating the device.

3.2.3 Voltage control



With open loop speed control using transformers or electronic voltage regulators (e.g. phase angle control), excessive current may occur.
In addition, noises can occur with phase angle control depending on the mounting situation.

3.2.4 Frequency inverter



Fit sinusoidal filters that work on all poles (live-live and live-earth) between the frequency inverter and the motor for operation with frequency inverters.
Depending on how the device is installed, noises may occur.

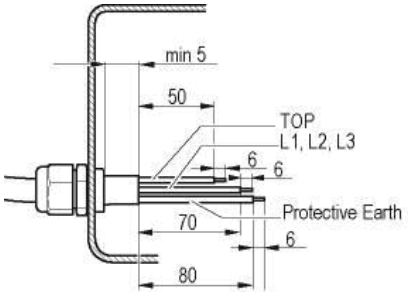
Translation of the original operating instructions

Operation instruction

3.3 Connection in terminal box

3.3.1 Preparing connection lines for the connection

Strip the cable just enough so that the screwed cable gland is tight and the terminals are relieved of strain. Tightening torque, see chapter 3.1 Product drawing.



3.3.2 Connecting cables with terminals

⇒ Remove the cap from the screwed cable gland.

Remove the cap only in those places where cables are inserted.

⇒ Insert the line(s) (not included in the standard scope of delivery) into the terminal box.

⇒ First connect the "PE" (protective earth) connection.

⇒ Connect the lines to the corresponding terminals.

⇒ Connect the thermal overload protector (TOP).

Use a screwdriver to do so.
During the connection work, ensure that no cables splice off.
The terminal strip is equipped with a penetration prevention device.

⇒ Insert the strands until they meet resistance.

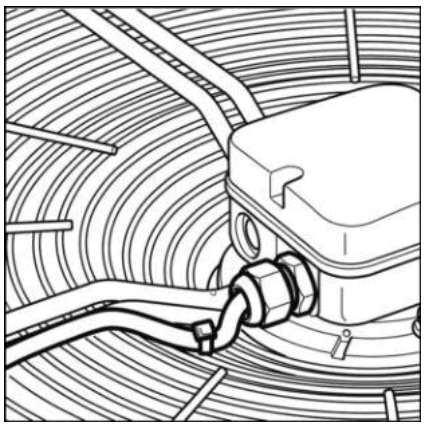
⇒ Seal the terminal box.

3.3.3 Cable routing

No water may penetrate along the cable in the direction of the cable gland.

Fans installed lying flat

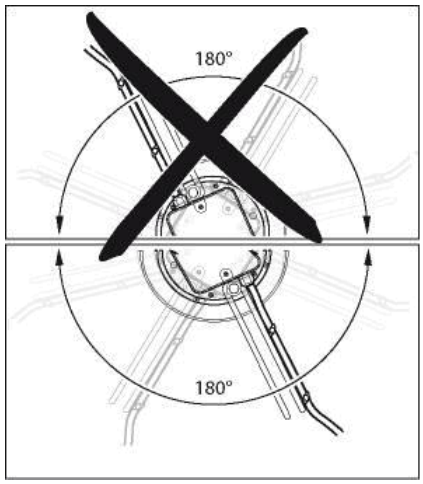
Make sure that the cable is routed in the form of a loop (water trap).



Ill. 2: Fan installed lying flat, cable routed as a water trap.

Fans installed in upright position

When routing the cable, ensure that the screwed cable glands are arranged at the bottom. The cables must always be routed downwards.



Ill. 3: Cable routing for fans installed upright.

3.3.4 Motor protection

CAUTION
Electrical voltage
The device is a built-in component and features no electrically isolating switch.

→ Connect the device to a suitable trigger device. Connect the device only to circuits that can be switched off using an all-pole disconnecting switch.

→ When working on the device, you must switch off the system/machine in which the device is installed and secure it from being switched on again.

NOTE
Lack of motor protection
Without motor protection, the motor can overheat and suffer damage.

→ Connect up the thermal overload protector installed in the coil.

The motors are equipped with thermal overload protectors to protect the devices.
Check to make sure that the thermal overload protector is correctly connected before each operation.
Failure to connect up the thermal overload protector correctly will invalidate your warranty claim.

Translation of the original operating instructions

Operation instruction

3.5 Opening of second screwed cable gland

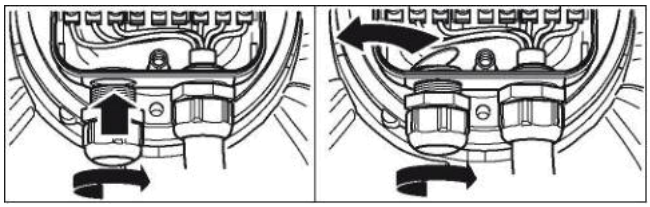
It is possible to make a second screw hole in the terminal box.

WARNING
In event of a fault, the screwed cable gland is under electrical voltage
Electric shock

→ Do not use metal cable glands for plastic terminal boxes.

⇒ Screw the cable gland into the pre-cut thread using a screwdriver. When doing so, note the tightening torques, see chapter 3.1 Product drawing.

⇒ Remove the plastic tab that falls off when the wire is pressed through into the terminal box.



Ill. 4: Screwed cable gland opening

3.6 Checking the connections

⇒ Make sure that the power is off (all phases).

⇒ Secure it from being switched on again.

⇒ Check the correct fit of the connection lines.

⇒ Screw the terminal box cover closed again. Terminal box tightening torque, see chapter 3.1 Product drawing.

⇒ Make sure that the terminal box is correctly closed and sealed and that all screws and screwed cable glands are properly tightened.

3.7 Switch on device

WARNING
Hot motor housing
Fire hazard

→ Ensure that no combustible or flammable materials are located close to the fan.

⇒ Inspect the device for visible external damage and the proper function of the protective features before switching it on.

⇒ Check the air flow paths of the fan for foreign objects and remove any that are found.

⇒ Apply the nominal voltage to the voltage supply.

3.8 Switching off the device

⇒ Disconnect the device from the supply voltage at the main switch for the supply line.

⇒ When disconnecting, be sure to disconnect the earth wire connection last.

4. MAINTENANCE, MALFUNCTIONS, POSSIBLE CAUSES AND REMEDIES

The motor is sealed by ebm-papst. Changes or repairs may be carried out by ebm-papst only.
The terminal box does not have to be opened for maintenance.
Do not perform any repairs on your device. Return the device to ebm-papst for repair or replacement.

WARNING
Terminals and connections have voltage even with a unit that is shut off
Electric shock

→ Wait five minutes after disconnecting the voltage at all poles before opening the device.

CAUTION
The motor restarts automatically when operating voltage is applied, e.g. after a power failure.
Danger of injury

→ Keep out of the danger zone of the device.

→ When working on the device, switch off the mains supply voltage and secure the latter from being switched on again.

→ Wait until the device stops.

→ Insert the brought-out thermal overload protector into the control circuit so that the cooled off motor does not switch on independently after a fault.

If the device remains out of use for some time, e.g. when in storage, we recommend switching the device on for at least two hours to allow any condensate to evaporate and to move the bearings.

Malfunction/error	Possible cause	Possible remedy
Impeller running roughly	Imbalance in rotating parts	Clean the device; if imbalance is still evident after cleaning, replace the device. If you have attached any weight clips during cleaning, make sure to remove them afterwards.
Motor does not turn	Mechanical blockage	Switch off, de-energise, and remove mechanical blockage.
	Mains supply voltage faulty	Check mains supply voltage, restore power supply.
	Faulty connection	De-energise, correct connection, see connection diagram.
	Thermal overload protector responded	Allow motor to cool off, locate and rectify cause of error, if necessary cancel restart lock-out

Translation of the original operating instructions

Operation instruction

	Unacceptable operating point	Check operating point
Overtemperature of motor	Ambient temperature too high	Lower ambient temperature if possible
	Insufficient cooling	Improve cooling

If you have any other problems, contact ebm-papst.

4.1 Cleaning

NOTE
Damage to the device during cleaning.
Malfunction possible

→ Do not clean the device using a water jet or high-pressure washer.

→ Do not use any cleaners containing acids, bases or solvents.

→ Do not use any pointed or sharp-edged objects to clean.

4.2 Safety test

What has to be tested?	How to test?	Frequency	Which measure?
Check the protective casing against accidental contact for damage and to ensure that it is intact	Visual inspection	At least every 6 months	Repair or replacement of the device
Check the device for damage to blades and housing	Visual inspection	At least every 6 months	Replacement of the device
Mounting the connection lines	Visual inspection	At least every 6 months	Fasten
Mounting of protective earth connection	Visual inspection	At least every 6 months	Fasten
Check the insulation of the wires for damage	Visual inspection	At least every 6 months	Replace wires
Tightness of screwed cable gland	Visual inspection	At least every 6 months	Retighten, replace if damaged
Condensate discharge holes for clogging, as necessary	Visual inspection	At least every 6 months	Open bore holes
Weld seams for crack formation	Visual inspection	At least every 6 months	Replace device
Check the ball bearings to ensure they are quiet, can move easily and are free of play	Manual check by turning the rotor in shut-off state	At least every 6 months	Replace device in case of noise, difficulty of movement or clearance of the bearings

Translation of the original operating instructions

Approval

VDE Prüf- und Zertifizierungsinstitut

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Bachmühle 2
74673 Mulfingen**

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Руководитель (заместитель руководителя) органа по сертификации (подпись, инициалы, фамилия) С.Н.Богданова

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