Product Data Sheet **8315100425**
VKCJ080DHFMS
DiaForce 80

ebmpapst

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DiaForce 80

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1 General

Fan type	Mixed-flow fan	
Rotating direction looking at rotor	Clockwise	
Airflow direction	Air outlet over struts	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

2 Mechanics

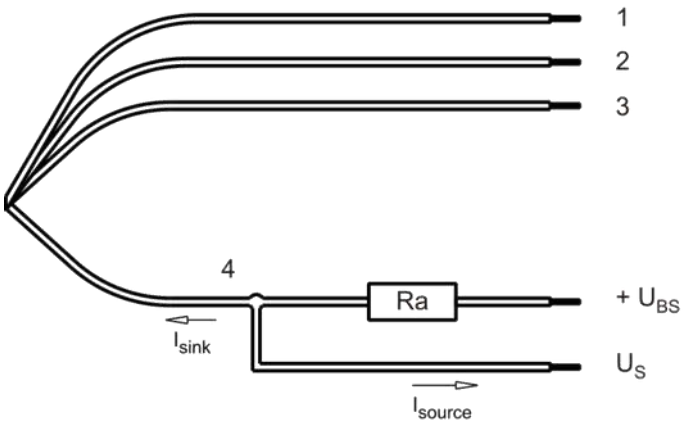
2.1 General

Width	80 mm	
Height	80 mm	
Depth	80 mm	
Diameter	69 mm	
Mass	0,35 kg	
Housing material	Mixed	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Lead wire length Tolerance	L = 310 mm +- 10 mm	





Wire	Color	Operation	Wire size	Insulation diameter
1	red	+ UB	AWG 18	2,2 mm
2	blue	- GND	AWG 18	2,2 mm
3	violet	CTRL	AWG 24	1,5 mm
4	white	Tacho	AWG 24	1,5 mm

The auxiliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

3 Operating Data

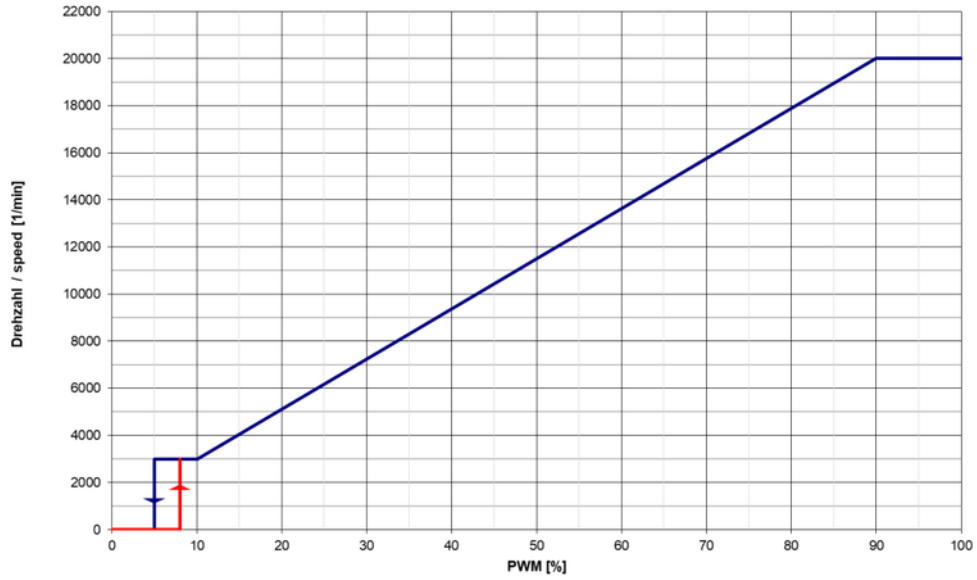
3.1 Electrical Interface - Input

Control input	PWM

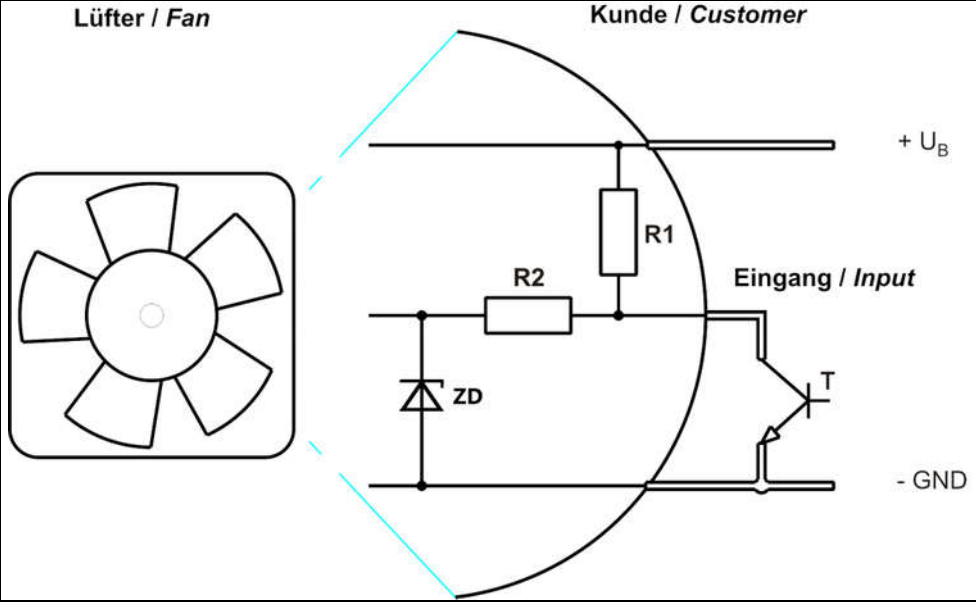
Features

Inpute type	Open collector	
PWM - Frequency		2 kHz - 10 kHz

Characteristics



Schematics



R1 = 10k, R2 = 4k7

3.2 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; Motor axis horizontal; warm-up time before measuring 5 minutes. In the intake and outlet area should not be any solid obstruction within 0,5 m.

Δp = 0: corresp. to free air flow (see chapter aerodynamics)
I: corresp. to arithm. mean current value

Name	Condition		
PWM 0001	PWM: 100 %; f: 2 kHz		

Features	Condition	Symbol	Values		
Voltage range		U	10,8 V		13,2 V
Nominal voltage		U_N		12 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	70 W +- 15 %	70 W +- 15 %	70 W +- 15 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	6.500 mA +- 15 %	5.800 mA +- 15 %	5.300 mA +- 15 %
Speed Tolerance	Δp = 0 PWM 0010	n	20.000 1/min +- 5 %	20.000 1/min +- 5 %	20.000 1/min +- 5 %

Values after 5h operating time at 100 % PWM

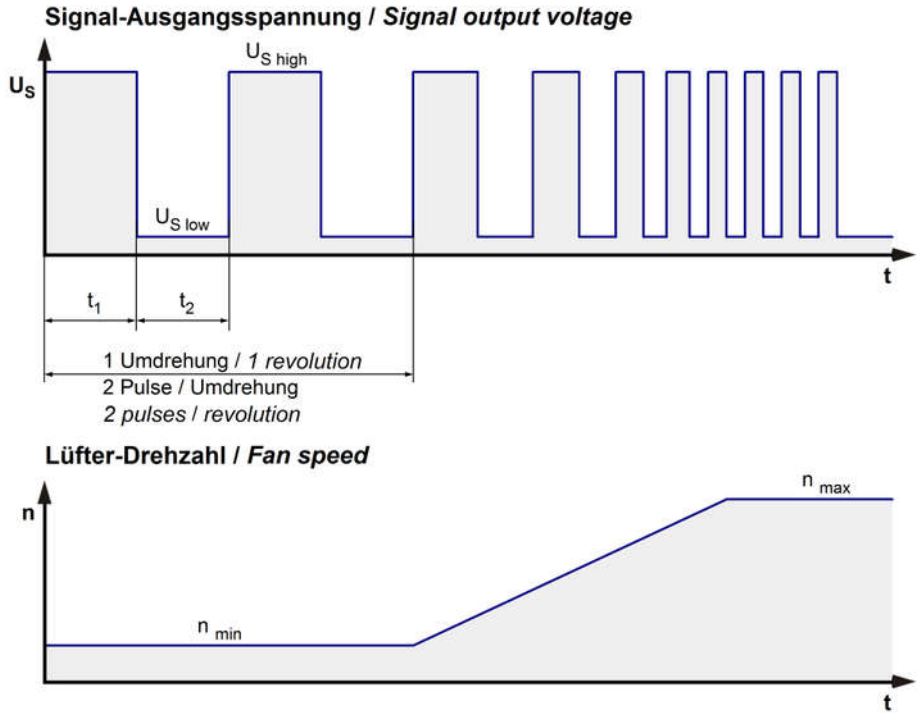
Name	Condition		
PWM 0001	PWM: 100 %; f: 2 kHz		

Features	Condition	Symbol	Values		
Voltage range		U	10,8 V		13,2 V
Nominal voltage		U_N		12 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	82 W +- 15 %	82 W +- 15 %	82 W +- 15 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	7.600 mA +- 15 %	6.800 mA +- 15 %	6.200 mA +- 15 %
Speed Tolerance	Δp = 0 PWM 0010	n	20.000 1/min +- 5 %	20.000 1/min +- 5 %	20.000 1/min +- 5 %

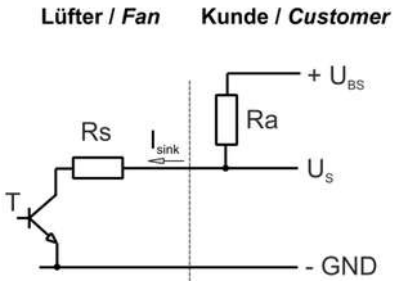
values factory new

3.3 Electrical Interface - Output

Tacho type	/2 (open collector)



$$Ra = \frac{U_{BS} - U_{S\,low}}{I_{sink}}$$

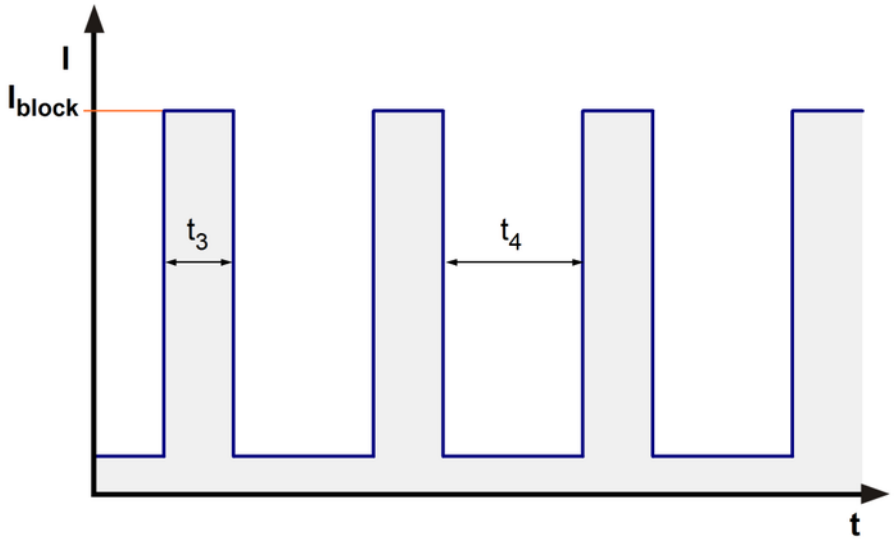


Features		Note	Values
Tacho operating voltage	U_{BS}		<= 30 V
Tacho signal Low	$U_{S\,low}$	I sink: 2 mA	<= 1 V + I_{sink} x R_S
Resistor	R_S		180 Ohm
Tacho signal High	$U_{S\,high}$	I source: 0 mA	<=30 V
Maximum sink current	I_{sink}		<= 4 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(2 x n) / 60	666 Hz @ 20.000 1/min
Tacho isolated from motor		No	
Slew rate			>= 0,5 V/us

n = revolutions per minute (1/min)

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_N	N-CH FET I_F <= 2 mA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 1.200 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 3 s / 10 s	
Internal fuse	Littelfuse NANO2 > Very Fast-Acting > 451/453 Series 15A / 75V (Art.No.: 0451015.MRL)	



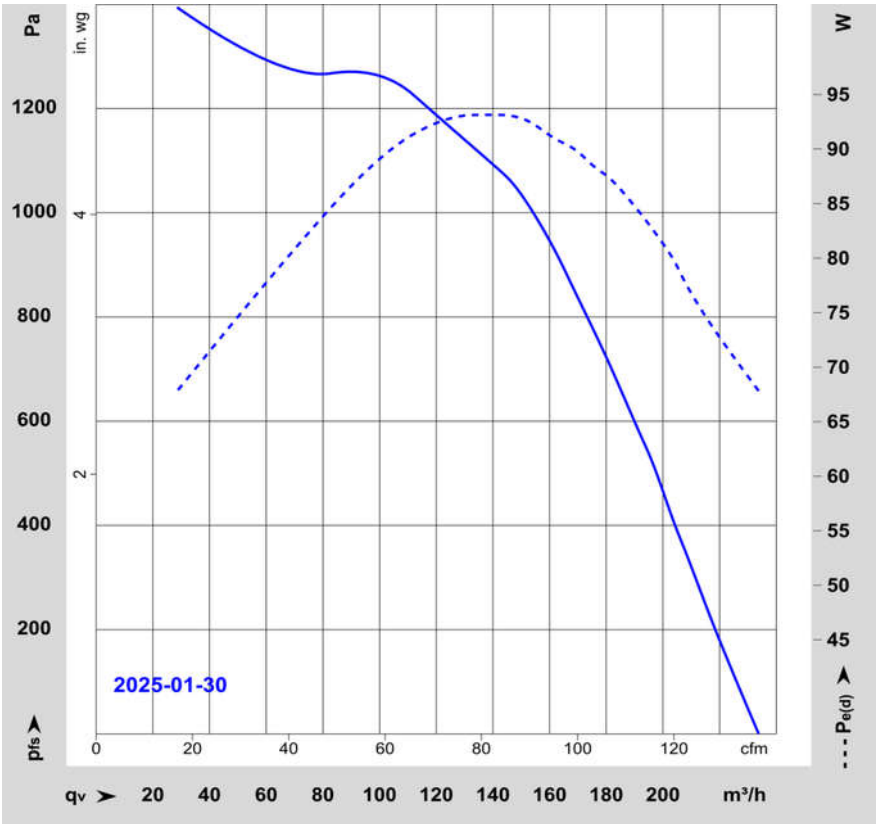
3.5 Aerodynamics

Measurement conditions:	Measured with a double chamber intake rig acc. to DIN EN ISO 5801. Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; In the intake and outlet area should not be any solid obstruction within 0,5 m. Motor shaft horizontal. The information is only valid under the specified test conditions and may be changed by the installation conditions. If there are deviations from the standard test conditions, the characteristic values must be checked under the installed conditions. Power consumption of the fan motor when operating at normal voltage is shown. Depending on the operating conditions of the application, the power input may be higher.

a.) Operation condition:

20.000 1/min at free air flow	PWM 100 %; f: 2 kHz		

Max. free-air flow (Δp = 0 / V̇ = max.)	234 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	1.400 Pa	



3.6 Sound Data

Measurement conditions:	Sound pressure level: 1 meter distance between microphone and the air intake. Sound power level: According to ISO 13347-3. Measured in a semianechoic chamber with a background noise level of Lp(A) < 5 dB(A) For further measurement conditions see chapter aerodynamics.

a.) Operation condition:

20.000 1/min at free air flow	PWM 100 %; f: 2 kHz		

Optimal operating point	153 m3/h @ 1.015 Pa	
Sound power level at the optimal operating point	8 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	71 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	70 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

4.2 Climatic Requirements

IP-protection type (certified)	IP 20 **)	
Humidity requirements	humid heat, constant; according to DIN EN 60068-2-78, 14 days	
Salt fog requirements	None	

Permitted application area:
The product is intended for use in sheltered rooms with controlled temperature and controlled humidity. Directly exposure to water must be avoided.

Pollution degree 1 (according DIN EN 60664-1)
There is either no pollution or it occurs only dry, non-conductive pollution. The pollution has no negative impact.

**) The specification of the IP protection refers to the conditions mentioned in certification of the fan. The above mentioned short description of the protection scope is not final. For detailed information of the respective protection scope and definitions, see certification as well as DIN EN 60529 (protection by housings) and ISO 20653 (for vehicles) with the letter K.

Short description of the IP-protection type:
Solid particle Protection: Protected against solid particles with a diameter of 12.5 mm and larger.
Protection against deliberate contact: Protected against contact to hazardous parts with a finger.
Protection against water: No protection.

4.3 Mechanical Requirements

severity level	stationary use		
1	storage / transportation	Random vibration not in use IEC 60068-2-64 Frequency range / ASD G_{RMS} Axes of vibration Test duration	 Random vibration 5 - 20 Hz : 1,0 m^2 / s^3 20 - 500 Hz : - 3 dB / Oct 0,91 G 3 3 x 5 h
	storage / transportation	Bump not in use IEC 60068-2-29 Shock spectrum Acceleration Duration Number of bumps (+X, -X, -Y, +Y, -Z, +Z) Total bumps	 Bump half sine 18 G 6 ms 100 in each direction 600
	stationary use	Random vibration in use IEC 60068-2-64 Frequency range / ASD G_{RMS} Axes of vibration Test duration	 Random vibration 5 - 20 Hz : 2,0 m^2 / s^3 20- 150 Hz : - 3 dB / Oct 0,83 G 3 3 x 5 h
	stationary use	Bump in use IEC 60068-2-29 Shock spectrum Acceleration Duration Number of bumps (+X, -X, -Y, +Y, -Z, +Z) Total bumps	 Bump half sine 5 G 11 ms 100 in each direction 600

4.4 EMC

Kind	**Conducted Emission; Voltage; 150 kHz-30 MHz (with PE)**
According	DIN EN 55032:2016-02
Ceck accuracy / Limit	Class A
Result	Below limit Class A

Kind	**Conducted Emission; Voltage; 150 kHz-30 MHz (without PE)**
According	DIN EN 55032:2016-02
Ceck accuracy / Limit	Class A
Result	Below limit Class A

Kind	**Radiated Emission; 30 MHz - 1000 MHz (with PE)**
According	DIN EN 55032:2016-02
Ceck accuracy / Limit	Class A
Result	Below limit Class B

Kind	**Radiated Emission; 30 MHz - 1000 MHz (without PE)**
According	DIN EN 55032:2016-02
Ceck accuracy / Limit	Class A
Result	Below limit Class B

Kind	**Electrostatic Discharge Immunity Test**
According	DIN EN 61000-4-2:2001-12
Ceck accuracy / Limit	Contact discharge +/- 6 kV; Air discharge +/- 8 kV
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	**Electromagnetic Field Immunity Test**
According	DIN EN 61000-4-3:2006-12
Ceck accuracy / Limit	10 V/m; 80 - 1000 MHz; AM; m = 0,8; f = 1 kHz; 1%; t = 3 s
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	**Electrical Fast Transient / Burst Immunity Test**
According	DIN EN 61000-4-4:2005-07
Ceck accuracy / Limit	+/- 2 kV on Power Lines; Coupling: POS, NEG, {PE}, ALL, 5 kHz and 100 kHz; 1 min
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	**Immunity to Conducted Disturbances, Induced by RF-Fields**
According	DIN EN 61000-4-6:2001-12
Ceck accuracy / Limit	10 Vrms; 150 kHz - 80 MHz; AM; m = 0,8; f = 1 kHz; 1%; t = 3 s
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

5 Safety

5.1 Electrical Safety

Dielectric strength DIN EN 62368 and DIN EN 60335 A.) Type test Measuring conditions: After 48h of storage at 95% R.H. and 25°C. No arcing or breakdown is allowed! All connections together to ground. B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	500 VAC / 1 Min. 850 VDC / 1 Sec.	
Isolation resistance Measuring conditions: After 48h of storage at 95% R.H. and 25°C measured with U=500 VDC for 1 min.	RI > 10 MOhm	
Clearance / creepage distance	1,0 mm / 1,5 mm	
Protection class	III	

5.2 Approval Tests

CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans E38324
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 62368 - Audio/video, information and communication technology equipment
CSA	Canadian Standards Association	Yes / CSA audited by UL according to C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	Not applicable

6 Reliability

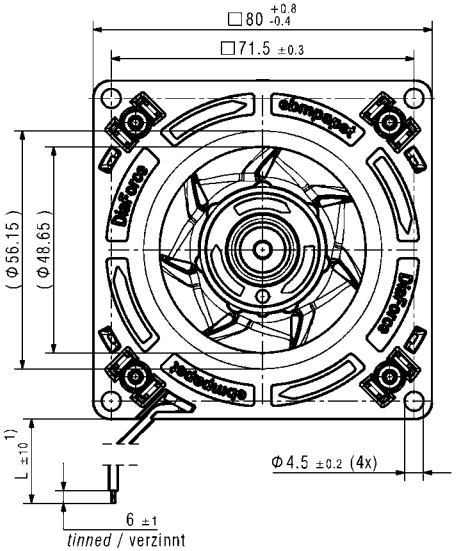
6.1 General

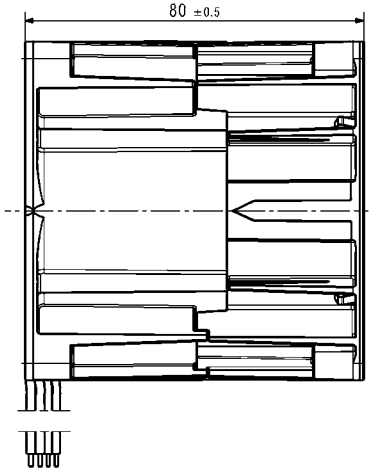
Life expectancy L10 at TU = 40 °C	60.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	102.500 h	

(life time valid for optimum operating point @ 100% pwm)

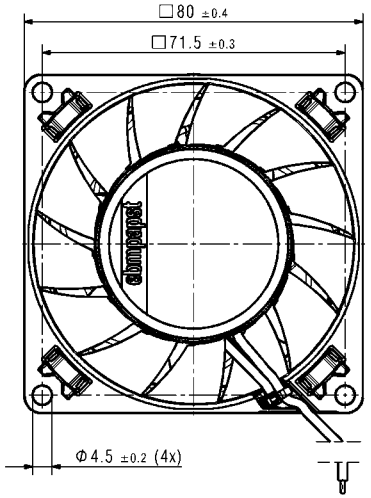
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Air inlet nozzle side / Einströmdüsenseite



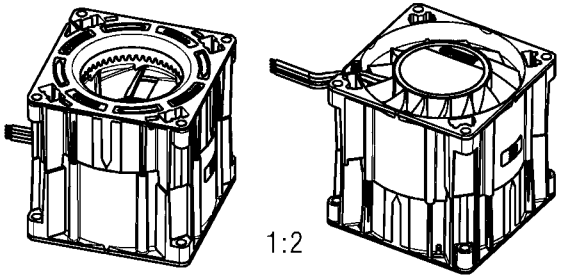


Flangs side / Flanschseite



1) *Number and length of wires see product specification* /
Anzahl und Länge der Litzen siehe Produktspezifikation

ⓐ - No pulling on the strands is permitted during transportation or when installed. /
Beim Transport und im eingebauten Zustand ist kein Zug an den Litzen erlaubt.



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