Product Data Sheet RER175-42/18/2TDPU

ebmpapst

Die Wahl der Ingenieure



GREEN TECH

RER175-42/18/2TDPU

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6.1 General 12

1 General

Fan type	Radial blower w/o chassis and w/o intake nozzle	
Rotating direction looking at rotor	Clockwise	
Airflow direction	Air in axially, Air out radially	
Bearing system	Ball bearing	
Mounting position	Any	

2 Mechanics

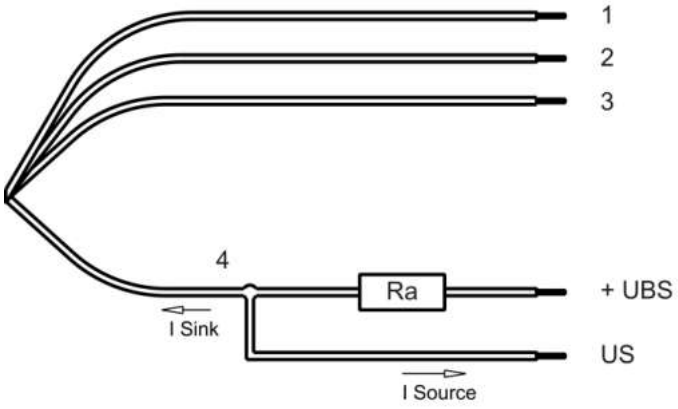
2.1 General

Depth	69,0 mm	
Diameter	175,0 mm	
Mass	0,775 kg	
Housing material		
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Lead wire length Tolerance	L = 425 mm +- 10,0 mm	
Tube length Tolerance	S = 115 mm +- 5,0 mm	
Wire size (AWG)	20 22	
Insulation diameter	2,05 mm 1,35 mm	
Contact	See drawing	





	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	PWM
Wire 4	white	Tacho

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

Lead wire 1 - 2: AWG20 (Insulation diameter 2,05 mm)
Lead wire 3 - 4: AWG22 (Insulation diameter 1,35 mm)

3 Operating Data

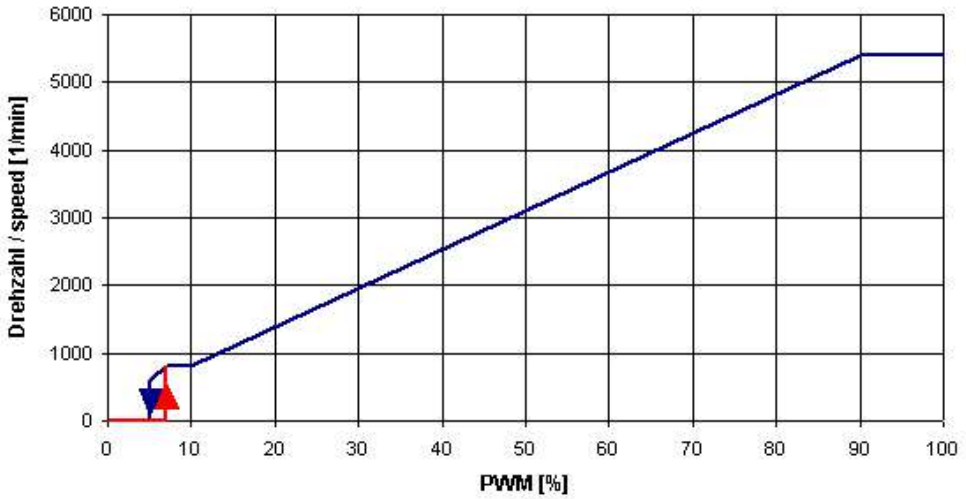
3.1 Operating Data - Electrical Interface - Input

Control input	PWM

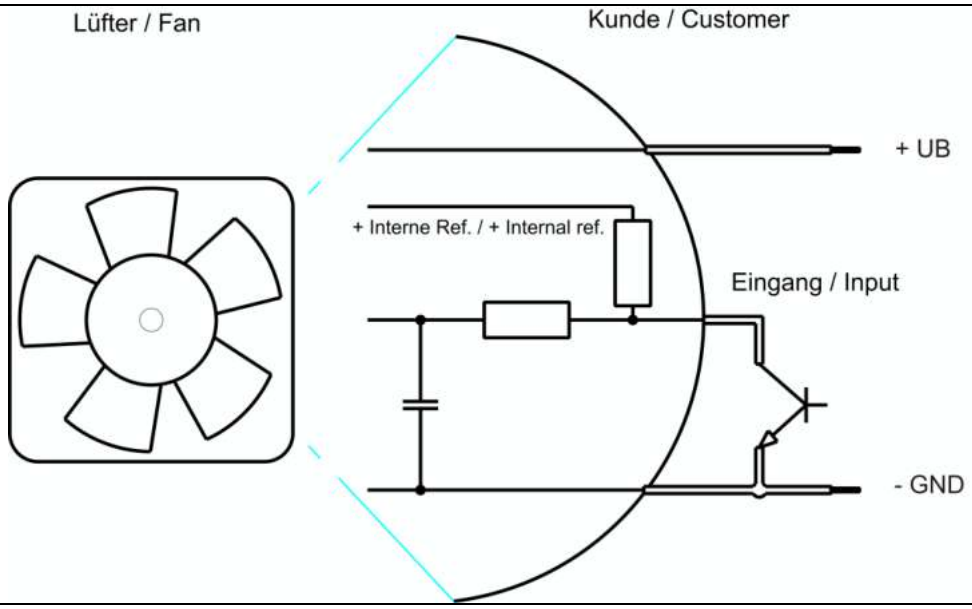
Features

Inpute type	Open collector	
PWM - Frequency		1 kHz - 10 kHz Typical: 2 kHz

Characteristics



Schematics



Speed control:
By Puls width modulation (PWM) 0 ... 100%.
Open collector in relation to signal-ground; f = 2kHz +-20%.

Information to the curve:

0 % - 7% PWM:	0 1/min
7 % - 10% PWM:	800 1/min (corresponding to min. speed)
10 % - 90% PWM:	linear increasing curve
90 % - 100% PWM:	5.400 1/min (corresponding to max. speed)
7 % PWM:	800 1/min (Fan on, comming from 0% PWM)
5 % PWM:	600 1/min or 0 1/min (Fan off, comming from 100% PWM)

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 (unless otherwise specified).
In the intake and outlet area should not be any solid obstruction within 0,5 m.

Measurement setup:	Measured between two steel plates
Steel plate:	180 mm x 180 mm
Intake nozzle:	D: 125,5 mm; R: 10 mm
Distance between bottom and top plate:	80 mm
Overlapping impeller / nozzle:	2 mm

Δp = 0: corresp. to free air flow (see section 3.5)
I: corresp. to arithm. mean current value

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

Features	**Condition**	**Symbol**	**Values**		
Voltage range	Δp = 0	U	36,0 V		72,0 V
Nominal voltage	Δp = 0	U_N		48,0 V	
Power consumption Tolerance	Δp = 0 PWM 0001	P	108,0 W +- 10,0 %	166,0 W +- 10,0 %	161,0 W +- 10,0 %
Current consumption Tolerance	Δp = 0 PWM0001	I	3.000 mA +- 10,0 %	3.450 mA +- 10,0 %	3.350 mA +- 10,0 %
Speed Tolerance	Δp = 0 PWM 0001	n	4.800 1/min +- 7,5 %	5.400 1/min +- 5,0 %	5.400 1/min +- 5,0 %
max. allowed input voltage ripple (within the specified voltage range)			+- 3 %		
max. allowed input voltage ripple (within the specified voltage range)			>= 50 Hz		

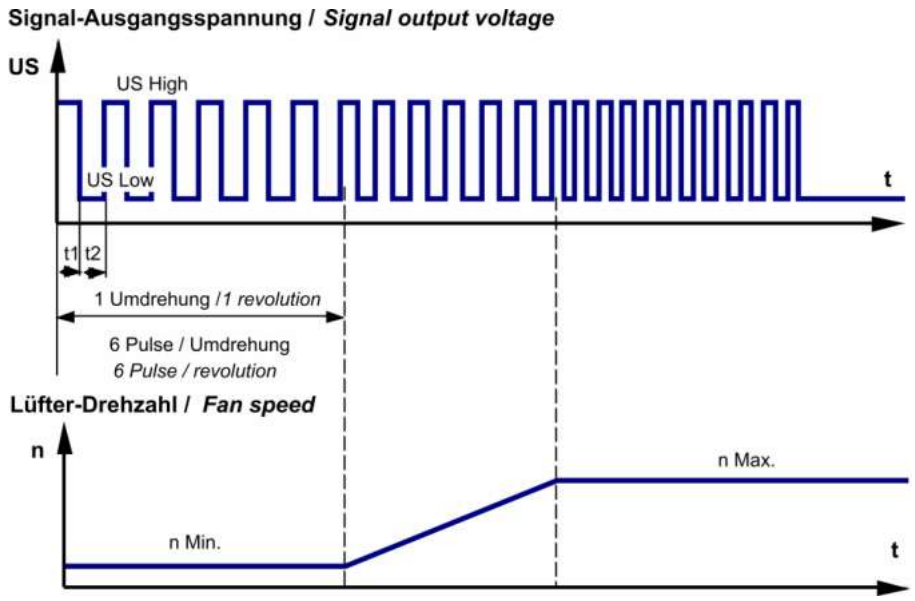
100% PWM; f = 2 kHz or broken lead wire (open control input)

Name	**Condition**		
PWM 0002	PWM: 50 %; f: 2 kHz		

Features	**Condition**	**Symbol**	**Values**		
Voltage range	Δp = 0	U	36,0 V		72,0 V
Nominal voltage	Δp = 0	U_N		48,0 V	
Power consumption Tolerance	Δp = 0 PWM 0002	P	29,9 W +- 10,0 %	31,7 W +- 10,0 %	33,1 W +- 10,0 %
Current consumption Tolerance	Δp = 0 PWM 0002	I	830 mA +- 10,0 %	660 mA +- 10,0 %	460 mA +- 10,0 %
Speed Tolerance	Δp = 0 PWM 0002	n	3.000 1/min +- 7,5 %	3.000 1/min +- 7,5 %	3.000 1/min +- 7,5 %

3.3 Operating Data - Electrical Interface - Output

Tacho type	/2 (open collector)



$$Ra = \frac{UBS - US\ Low}{I\ Sink}$$

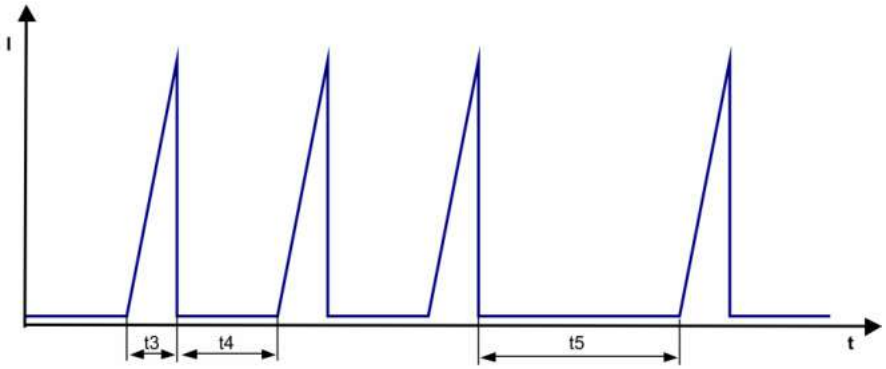
Features	Note	Values
Tacho operating voltage (UBS)		<= 60,0 V
Tacho signal Low	I sink: 2 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	<= 60,0 V
Maximum sink current		<= 20 mA
Maximum source current		0 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	(6 x n) / 60	540 Hz
Tacho isolated from motor	No	
Slew rate		=> 0,5 V/us

Please note:
At zero speed the tacho signal is at a static HIGH. It will be also HIGH when the fan is still spinning, but the speed control signal is set to zero speed already.
The tacho signal is only activated after the start-up is completed.

Alarm type	None

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	P-CH FET IF <= 5 mA	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 2.300 mA	
Clock signal t3/t4 at locked rotor	Typical: 1,0 s / 10,0 s	



Locked rotor signal t5:

After 4 failed start-ups there is an extended timeout of 40 s.

3.5 Data According ErP Directive

Installation / Efficency category	A / static
Speed control	integrated
Specific ratio	1,00598
Target overall efficiency 2015	45,2 %
Overall efficiency	44,1 %
Efficiency grade	62
Power input	249,7 W
Speed	5.360 1/min

All values measured in optimum energy efficiency point.

3.6 Aerodynamics

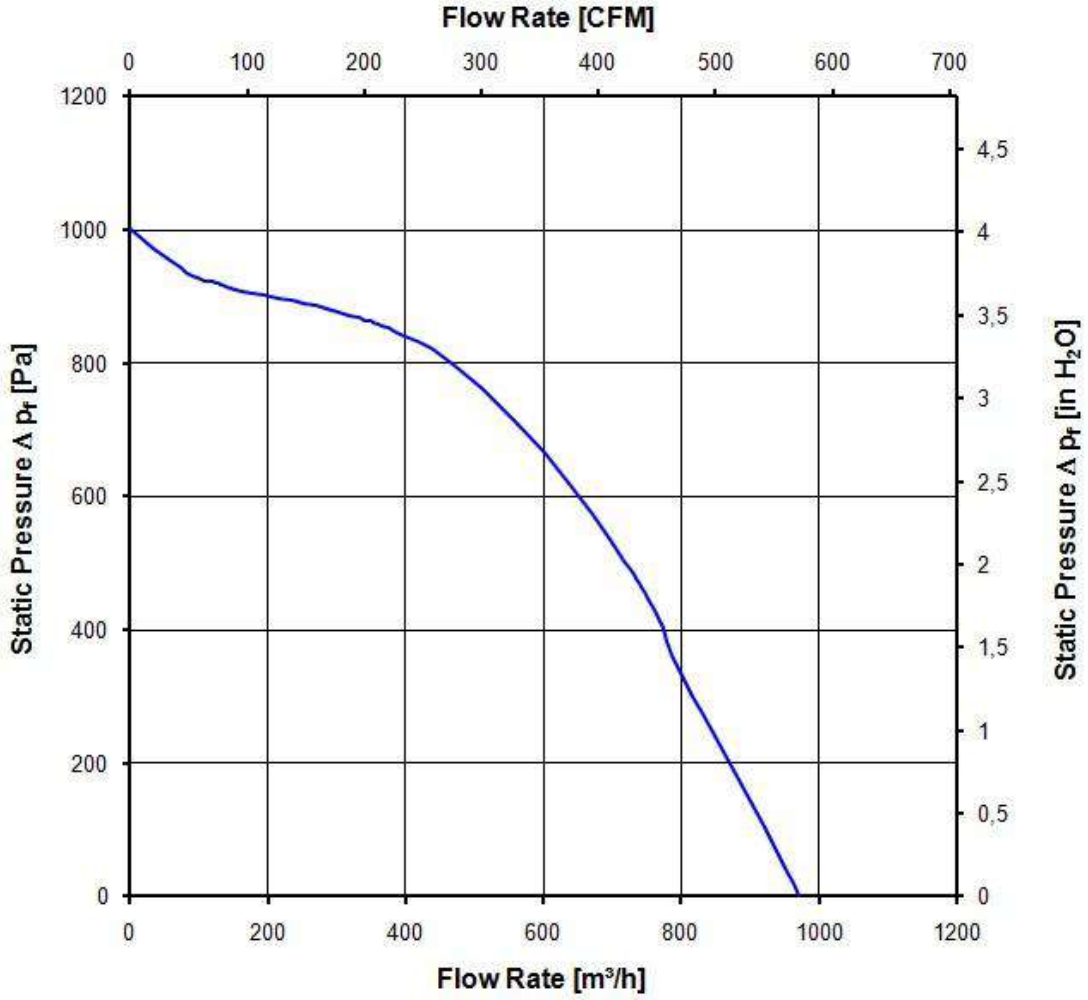
Measurement conditions:	Measured with a double chamber intake rig acc. to DIN EN ISO 5801. Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; In the intake and outlet area should not be any solid obstruction within 0,5 m. The information is only valid under the specified test conditions and may 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.

Measurement setup:	Measured between two steel plates
Steel plate:	180 mm x 180 mm
Intake nozzle:	D: 125,5 mm; R: 10 mm
Distance between bottom and top plate:	80 mm
Overlapping impeller / nozzle:	2 mm

a.) Operation condition:

5.400 1/min at free air flow	PWM 100 %; f: 2 kHz		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	970,0 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	1.000 Pa	



3.7 Sound Data

Measurement conditions:	Sound pressure level: 1 Meter distance between microphone and the air intake. Sound power level: Acc. to DIN 45635 part 38 (ISO 10302) Measured in a semianchoic chamber with a background noise level of Lp(A) < 5 dB(A) For further measurement conditions see section 3.5

a.) Operation condition:

5.400 1/min at free air flow	PWM 100 %; f: 2 kHz	PWM min.: ; f:	PWM max.:; f:

Optimal operating point	690,0 m3/h @ 485 Pa	
Sound power level at the optimal operating point	8,4 bel(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-33 °C	
Max. permitted ambient temperature TU max.	65 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

4.2 Climatic Requirements*)

Humidity requirements	humid temperature, cyclic; according to DIN EN 60068-2-38, 10 cycle and condensation water check; according to DIN EN ISO 6270-2, 14 days	
Water exposure	Splash water check IPX4; according to DIN EN 60529 VDE 0470, not certified	
Dust requirements	Dust check IP5X; according to DIN EN 60529 VDE 0470, not certified	
Salt fog requirements	None	

*) Permittet application area:
The product is for the use in partial sheltered rooms or open, roofed areas. Direct exposure to water is allowed provided that this does not prevent the normal operation. Saline ambient conditions must be avoided.

Pollution degree 3 (according DIN EN 60664-1)
It occurs conductive pollution or dry non-conductive pollution which becomes conductive due to condensation.

5 Safety

5.1 Electrical Safety

Dielectric strength DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700) 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.	 1000 VAC / 1 Min. 1000 VAC / 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 / 1,2 mm	
Protection class	I	

5.2 Approval Tests

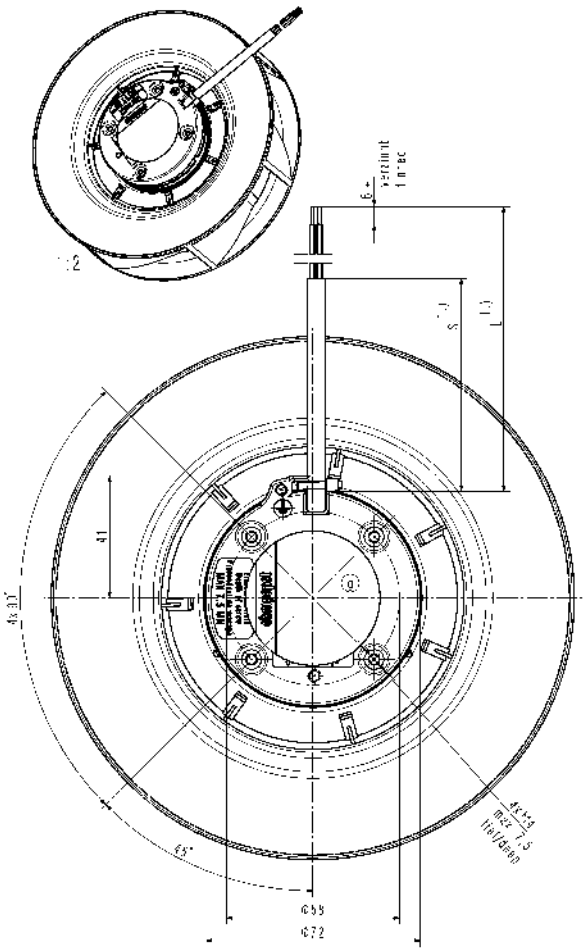
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	Yes / C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	Yes / GB 12350 Safety Requirements for small Power Motors

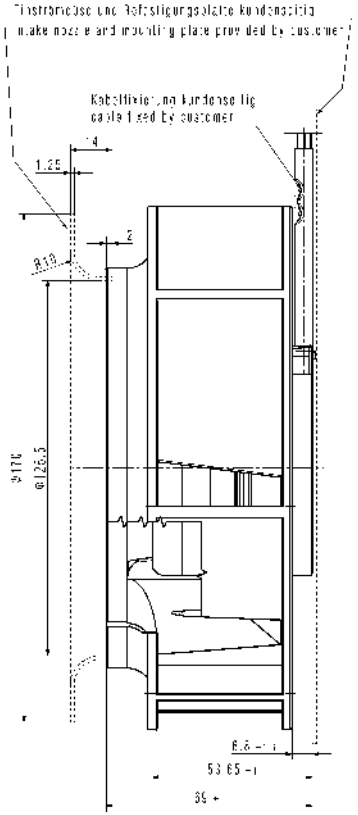
The approval tests are observed to:
U approval max.:72,0 V @ TU approval max.: 65,0 °C

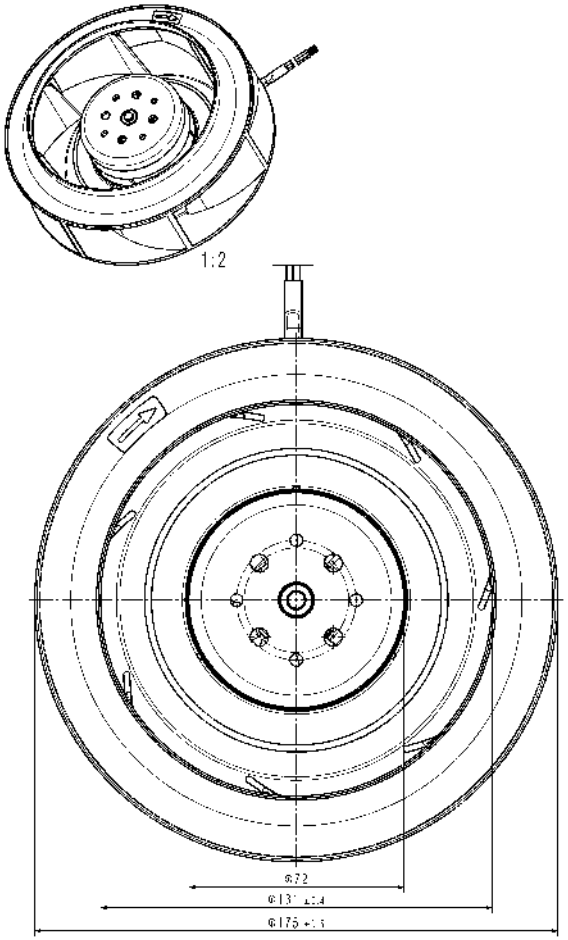
6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	60.000 h	
Life expectancy L10 at TU max.	32.500 h	
Life expectancy L10 IPC (40 °C)	102.500 h	







1.) Anzahl und Länge der Litzen sowie Länge des Schlauches ab Flanschrand siehe Produktspezifikation

- Axialspiel der Kugellager mit Federscheibe vorgespannt

1.) Length and number of wires and length of tube from flange edge see design specification.

Ball bearing without axial clearance by a pre-loaded spring

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