Product Data Sheet RER220-44/14/2TDMO

ebmpapst

Die Wahl der Ingenieure



GREEN TECH

RER220-44/14/2TDMO

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1 General

Fan type	Blower without chassis with intake nozzle	
Rotational direction looking at rotor	clockwise	
Airflow direction	Air in axially, Air out radially	
Bearing system	Ball bearings	
Mounting position	any	

2 Mechanics

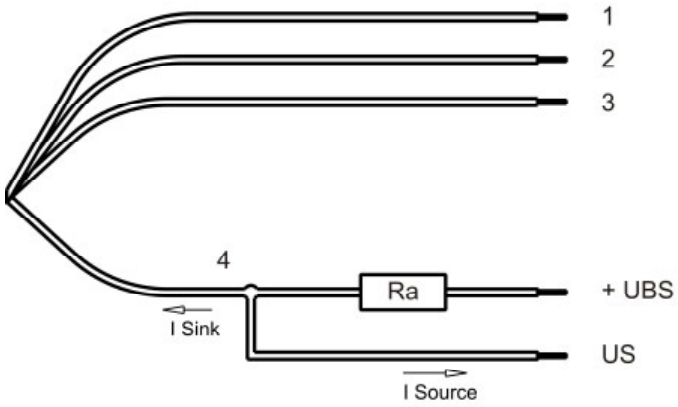
2.1 General

Depth	71 mm	
Diameter	220 mm	
Weight	0,92 kg	
Housing material	--	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Length of lead wire Tolerance	L = 425 mm +- 10 mm	
Length of tube Tolerance	S = 135 mm +- 5 mm	
Wire gauge (AWG)	18 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	CONTR
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: AWG18 (Insulation diameter 2,05mm)
Lead wire 3 - 4: AWG22 (Insulation diameter 1,35mm)

3 Operating Data

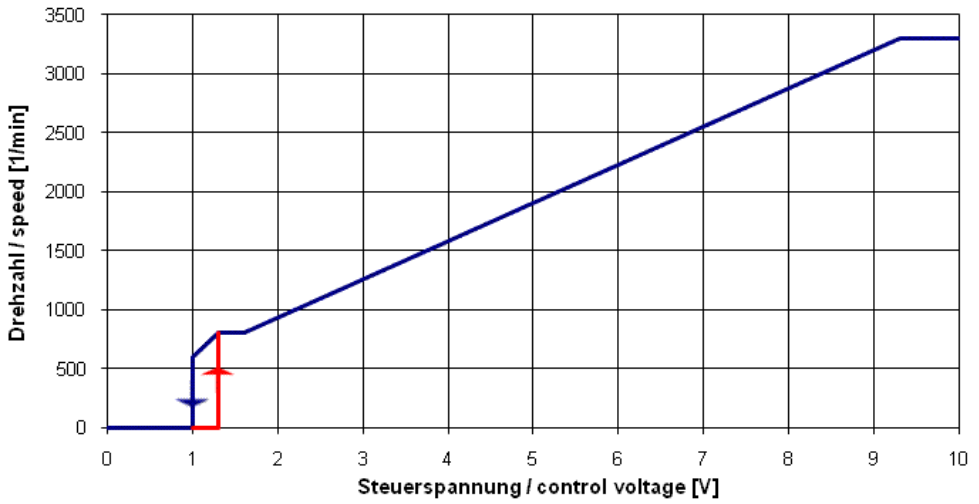
3.1 Operating Data - Electrical Interface - Input

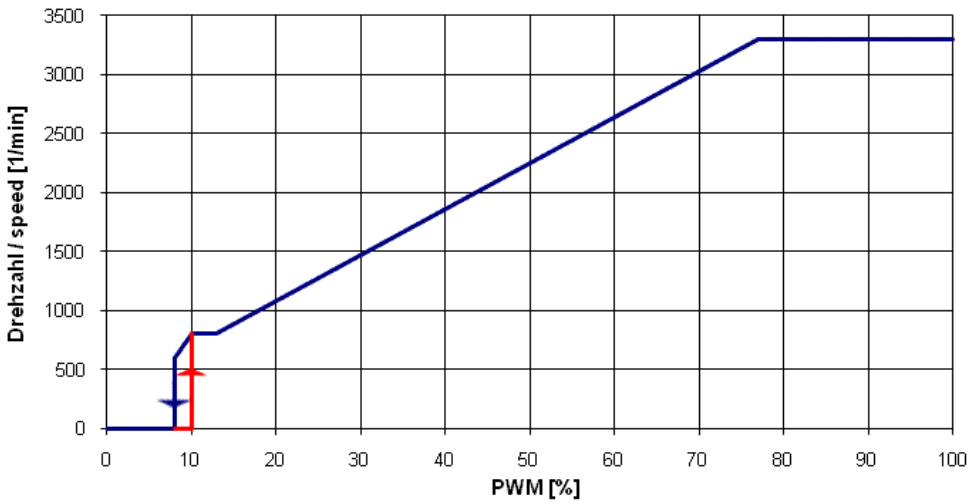
Control input	Analog

Features

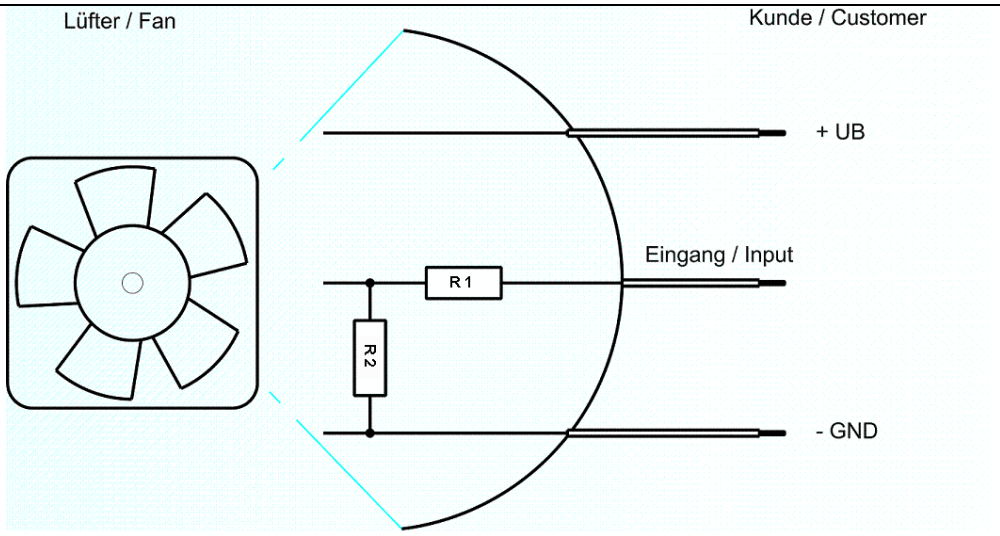
PWM - Frequency		1 kHz - 10 kHz Typical: 2 kHz
Inpute voltage range		0 V - 10 V

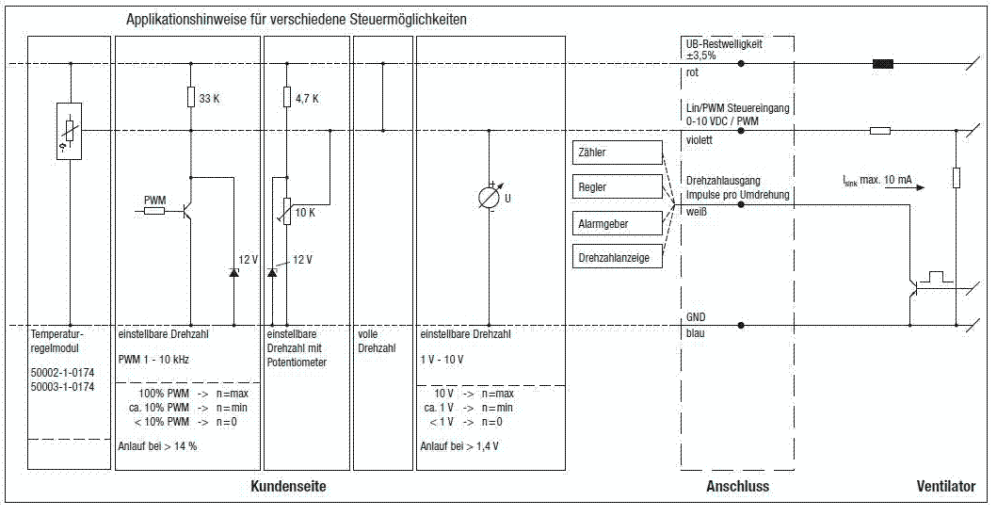
Characteristics





Schematics





Input voltage divider:
R1 = 47 kOhm
R2 = 36 kOhm
For protection: There is parallel to R2 a 5,1 V Z-Diode

Speed control:
By pulse-width modulation (PWM) 0 ... 100%
with switching transistor in emitter circuit and collector resistance to 12 V
Frequency = 2 kHz (1 - 10 kHz)

Information to the curve PWM:

0% - <10% PWM:	0 1/min
10% PWM:	800 1/min (Fan on, comming from 0% PWM)
10% - 13% PWM:	800 1/min (corresponding to min. speed)
13% - 78% PWM:	linear increasing curve
78% - 100% PWM:	3.300 1/min (corresponding to max. speed)
10% - >8% PWM:	linear decreasing curve (comming from 100% PWM)
8% PWM:	600 1/min or 0 1/min (Fan off, comming from 100% PWM)

or:

Speed control:
By analog voltage 0 - 10 V

Information to the curve analog:

0 V - < 1,3 V:	0 1/min
1,3 V:	800 1/min (Fan on, comming from von 0 V)
1,3 V - 1,6 V:	800 1/min (corresponding to min. speed)
1,6 V - 9,4 V:	linear increasing curve
9,4 V - 10 V:	3.300 1/min (corresponding to max. speed)
1,3 V - > 1,0 V:	linear decreasing curve (comming from 10 V)
1,0 V:	600 1/min or 0 1/min (Fan off, comming from 10 V)

The fan has no sensor break detection!

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:	225 mm x 225 mm
Intake nozzle:	D: 155 mm; R: 25 mm
Distance between bottom and top plate:	90 mm
Overlapping impeller / nozzle:	2 mm

$\Delta p = 0$: corresp. to free air flow (see section 3.5)
I: corresp. to arithm. mean current value

Name	**Condition**		
U Contr. 0001	U Contr.: 10,0 V		

Features	**Condition**	**Symbol**	**Values**		
Voltage range	$\Delta p = 0$	U	16,0 V		36,0 V
Nominal voltage	$\Delta p = 0$	U_N		24,0 V	
Power consumption Tolerance	$\Delta p = 0$ U Contr. 0001	P	59,2 W +- 10,0 %	120,0 W +- 10,0 %	118,8 W +- 10,0 %
Current consumption Tolerance	$\Delta p = 0$ U Contr.0001	I	3.700 mA +- 10,0 %	5.000 mA +- 10,0 %	3.300 mA +- 10,0 %
Speed Tolerance	$\Delta p = 0$ U Contr. 0001	n	2.600 1/min +- 10,0 %	3.300 1/min +- 5,0 %	3.300 1/min +- 5,0 %
Starting current consumption				5.300 mA	
max. allowed input voltage ripple (within the specified voltage range)			+- 3 %		
max. allowed input voltage ripple (within the specified voltage range)			>= 50 Hz		

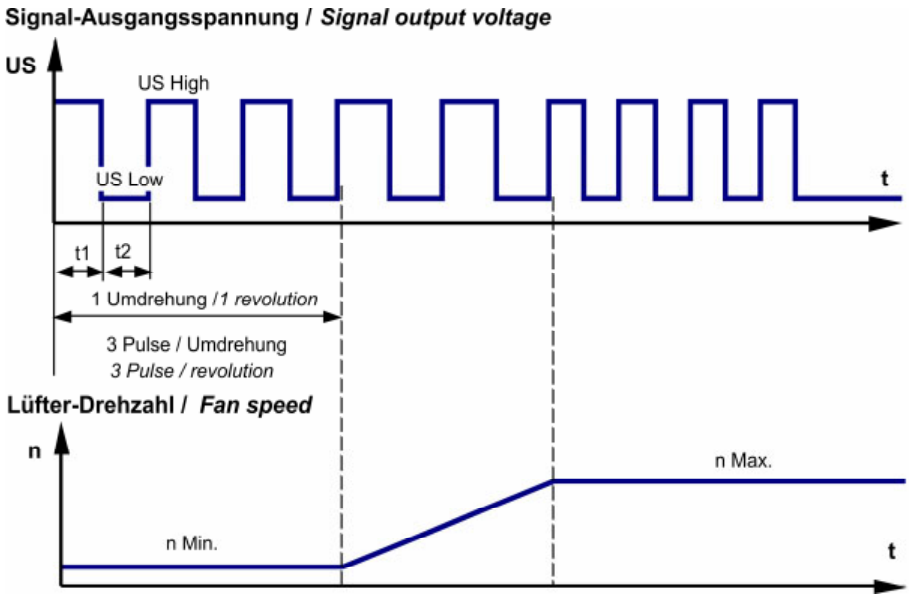
100% PWM; f = 2 kHz or broken lead wire (open control input)

Name	Condition		
U Contr. 0002	U Contr.: 5,0 V		

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	16,0 V		36,0 V
Nominal voltage	Δp = 0	U_N		24,0 V	
Power consumption Tolerance	Δp = 0 U Contr. 0002	P	22,4 W +- 10,0 %	24,0 W +- 10,0 %	25,2 W +- 10,0 %
Current consumption Tolerance	Δp = 0 U Contr. 0002	I	1.400 mA +- 10,0 %	1.000 mA +- 10,0 %	700 mA +- 10,0 %
Speed Tolerance	Δp = 0 U Contr. 0002	n	1.900 1/min +- 5,0 %	1.900 1/min +- 5,0 %	1.900 1/min +- 5,0 %

3.3 Operating Data - Electrical Interface -Output

Tacho type	/2 (Open collector)



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

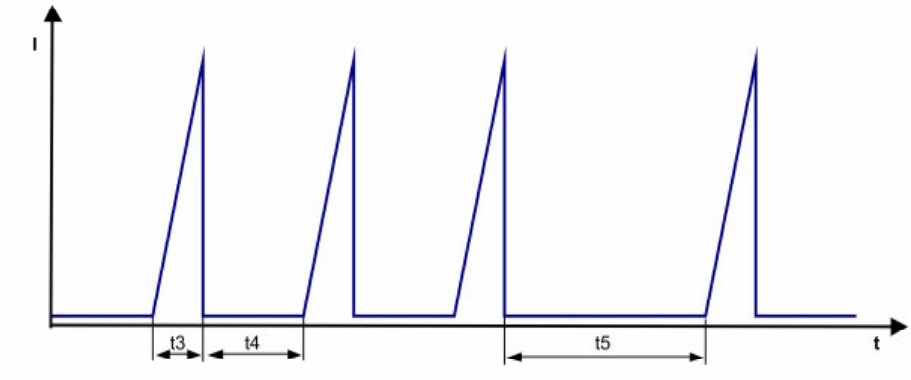
Features	Note	Values
Tacho operating voltage (UBS)		<= 60,0 V
Tacho signal Low	I sink: 2 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	<= 60,0 V
Maximum sink current		<= 20 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	(3 x n) / 60	165 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. 2.700 mA	
Clock signal t3/t4 at locked rotor	Typical: 8,2 s / 10,0 s	



Locked rotor signal t5:

After 4 failed start-ups there is an extended timeout of 50 s.

3.5 Data according ErP directive

Installation / Efficency category	A / static
Speed control	integrated
Specific ratio	1,00363
Target overall efficiency 2015	43,8 %
Overall efficiency	45,5 %
Efficiency grade	62
Power input	184,6 W
Speed	3.160 1/min

All values measured in optimum energy efficiency point.

3.6 Aerodynamic

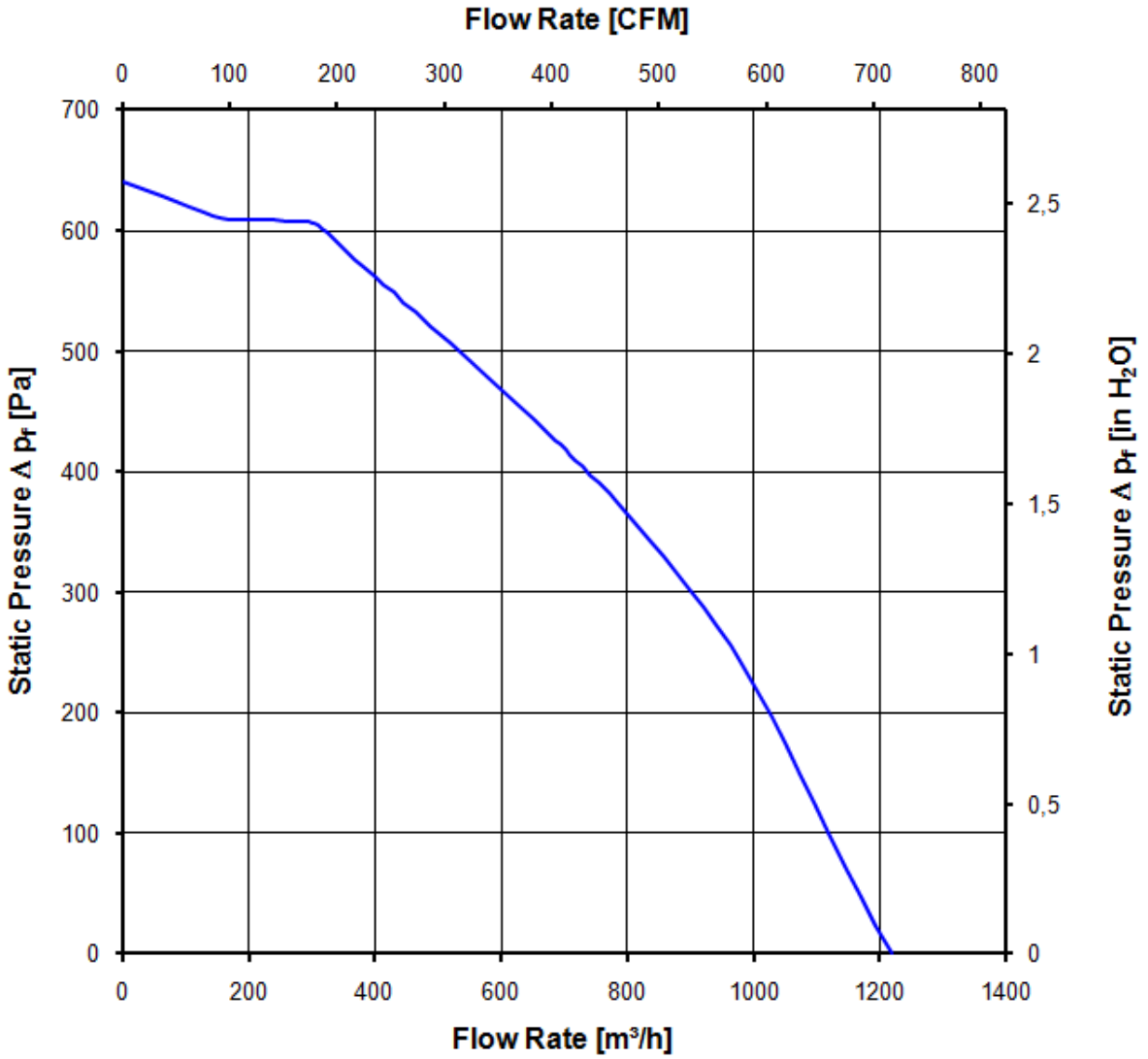
Measurement conditions: Measured with a double chamber intake rig acc. to DIN EN ISO 5801.
Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C;
In the intake and outlet area should not be any solid obstruction within 0,5 m.
The information is only valid under the specified test conditions and may 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:	225 mm x 225 mm
Intake nozzle:	D: 155 mm; R: 25 mm
Distance between bottom and top plate:	90 mm
Overlapping impeller / nozzle:	2 mm

a.) Operation condition:

3.300 1/min at free air flow	U Contr. 10,0 V		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	1.220,0 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	640 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:

3.300 1/min at free air flow	U Contr. 10,0 V		

Optimal operating point	790,0 m3/h @ 336 Pa	
Sound power level at the optimal operating point	8,0 bel(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	55 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

4.2 Climatic requirements*)

Humidity requirements	humid heat, constant; according to DIN EN 60068-2-78, 14 days	
Water exposure	None	
Dust requirements	None	
Salt fog requirements	None	

*) Permittet 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.

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.	500 VAC / 1 Min. 500 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	III	

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	No
CSA	Canadian Standards Association	Yes / CSA audited by UL according to C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	No

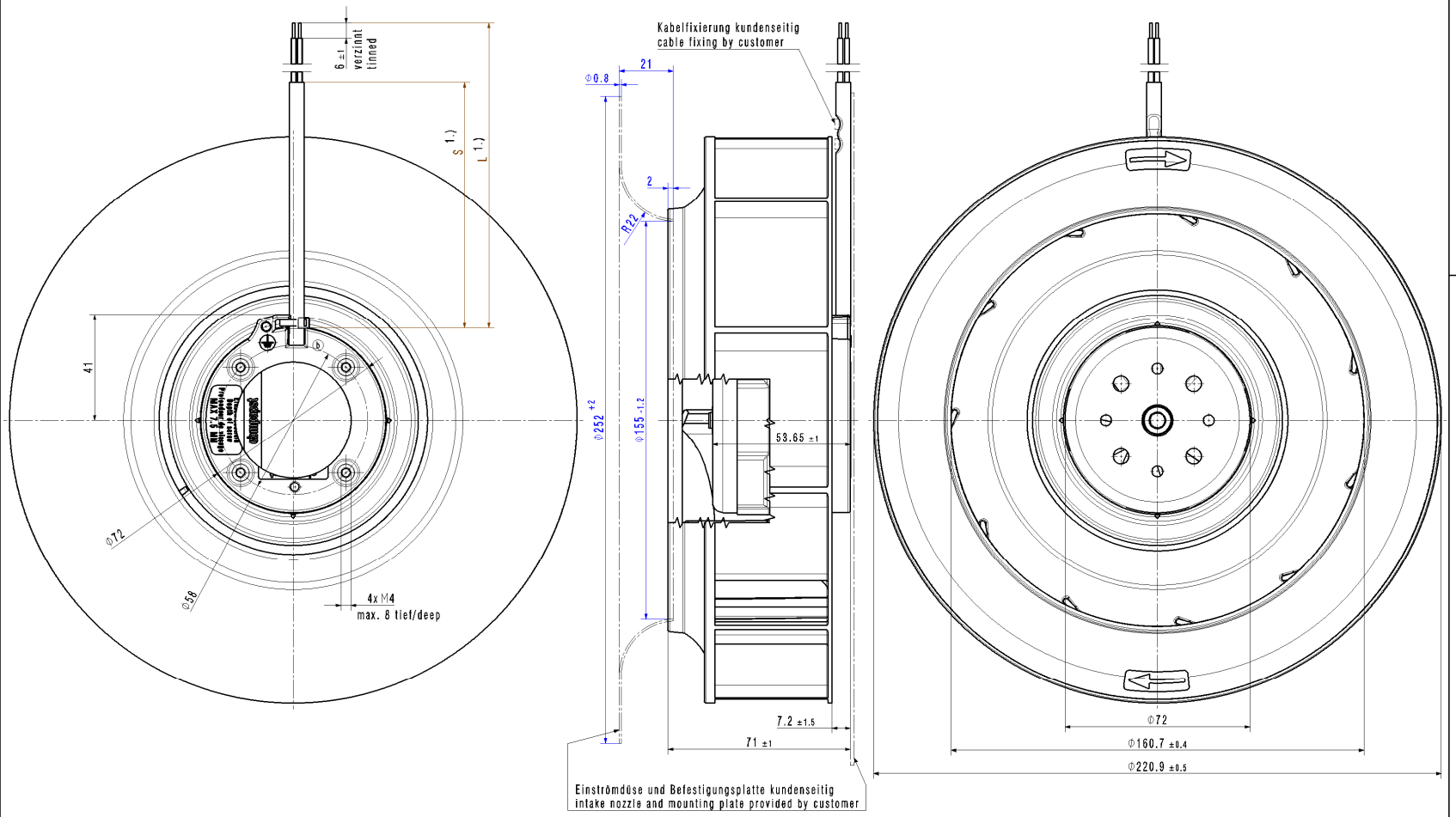
6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	75.000 h	
Life expectancy L10 at TU max.	52.500 h	
Life expectancy L10 IPC (40 °C)	127.500 h	

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1.) Anzahl und Länge der Litzen sowie Länge des Schlauchs ab Flanschrand siehe Produktspezifikation.
- Axialspiel: mit Feder spielfrei gelagert.

1.) length and number of wires and length of tube from flange edge see design specification.
- without axial clearance by a pre-loaded spring.

SAP-Status/Stats	Aend.-Nr./ Change-No.	CATIA-System-Version/ CATIA-System-Version	CAD-Angabe ung/ CAD-Info:-rukken
		8900420003 CP0 0004	
		3D-Referenzmodell / 3D-Reference model	
Toleranzen / Tolerances:		Datum	Name
Allgemeintoleranzen / Gen. Tolerances:		Bearb./ Drawn	
		Gepr./ Checked	
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