251657216

Product Data Sheet 8315100113

VFS0108XUJCZ
RET108-40/14/2TDLOR-00113

ebmpapst
The engineer's choice

GREEN TECH

RET108-40/14/2TDLOR-00113

INDEX

1 General

Fan type	Blower without chassis without intake nozzle	
Rotating direction looking at rotor	Clockwise	
Airflow direction	Air in axially, Air out radially	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

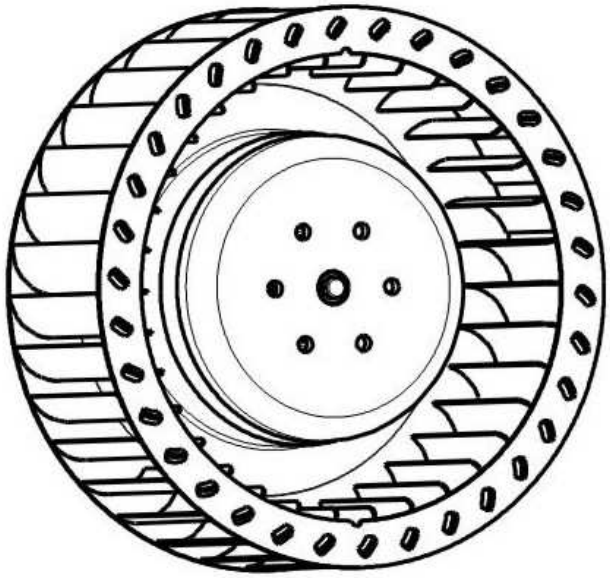
2 Mechanics

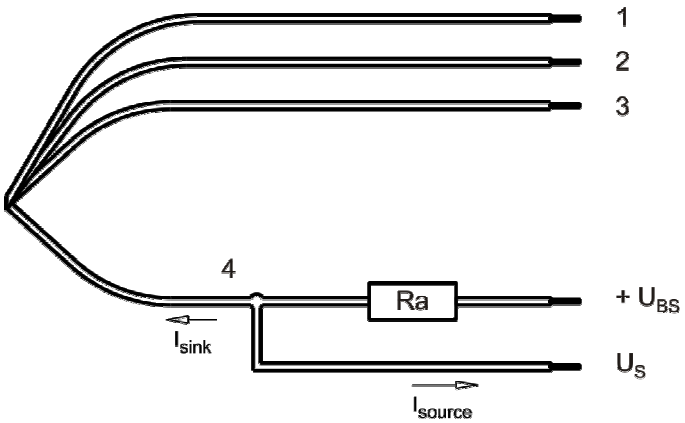
2.1 General

Depth	54 mm	
Diameter	108 mm	
Mass	0,486 kg	
Housing material		
Impeller material	Metal	

2.2 Connections

Electrical connection	Wires - Plug	
Lead wire length Tolerance	L = 150 mm +- 5 mm	
Tube length Tolerance	S = 118 mm +- 5 mm	
Plug	See drawing	
Contact	See drawing	





Wire	Color	Operation	Plug connection	Wire size	Insulation diameter
1	red	+ UB	Pin 1	AWG 22	1,7 mm
2	blue	- GND	Pin 2	AWG 22	1,7 mm
3	violet	PWM	Pin 3	AWG 22	1,7 mm
4	white	Tacho	Pin 4	AWG 22	1,7 mm

3 Operating Data

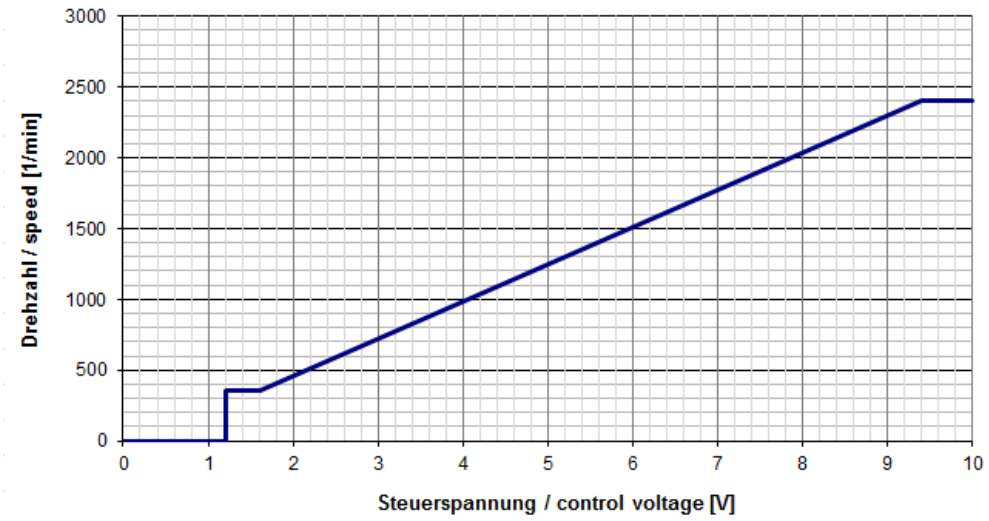
3.1 Electrical Interface - Input

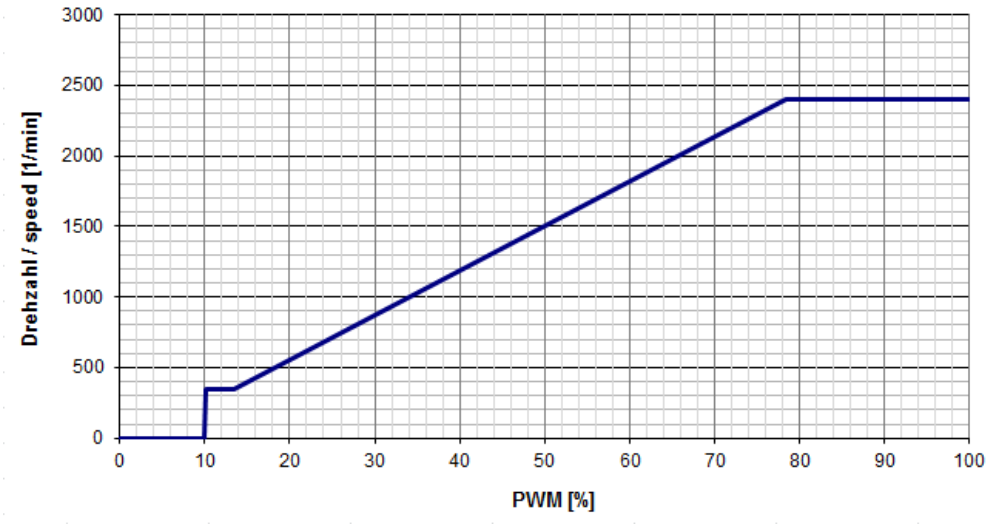
Control input	Analog

Features

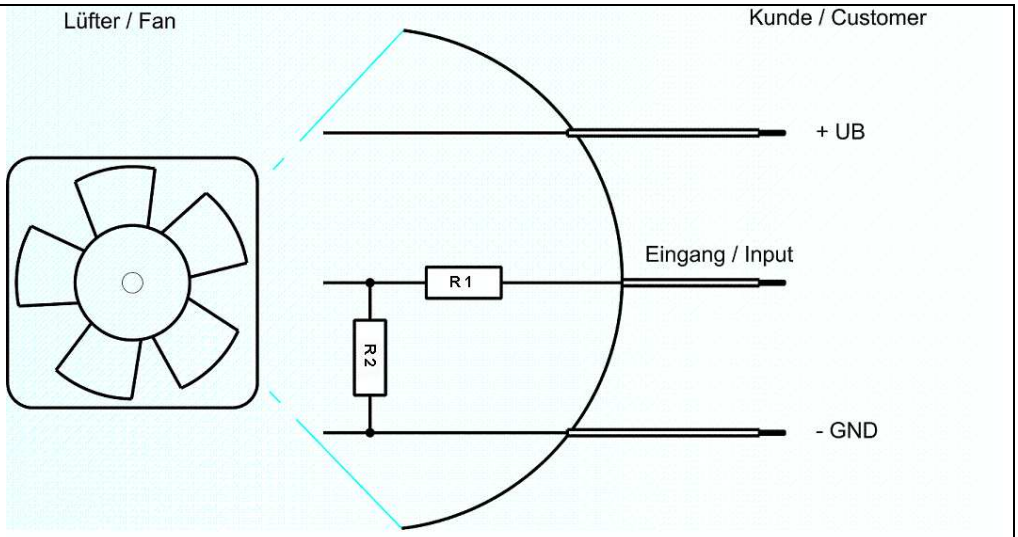
PWM - Frequency		1 kHz - 10 kHz typical: 2 kHz
Input voltage range		0 V - 10 V

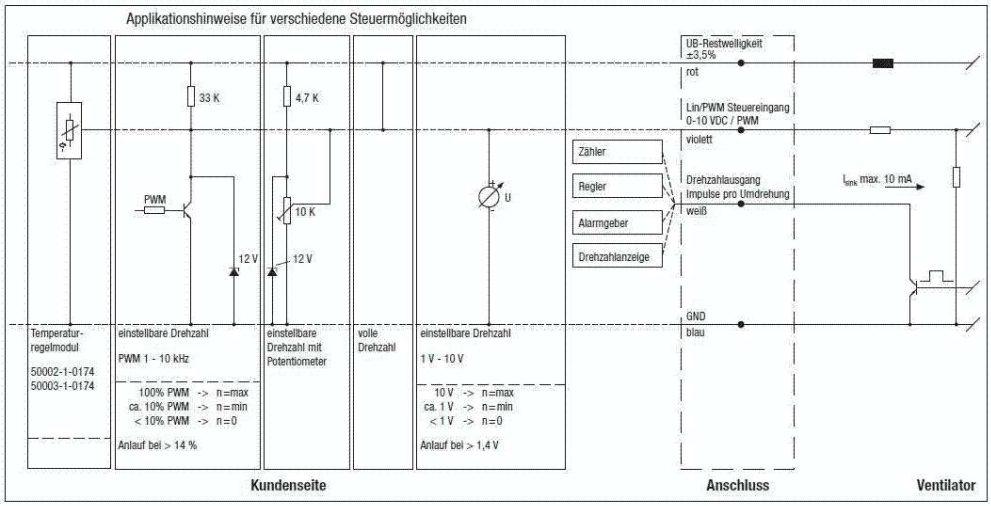
Characteristics





Schematics





Input voltage divider:
R1 = 30kOhm + 33kOhm
R2 = 24 kOhm
For protection: There is parallel to R2 a BAT54S 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
active PWM:

0 % - 10 % PWM:	0 1/min
10 % - 13 % PWM:	350 1/min (corresponding to min. speed)
13% - 78 % PWM:	linear increasing curve
78% - 100% PWM:	2400 1/min (corresponding to max. speed)
10 % PWM:	350 1/min (Fan on, comming from 0% PWM)
9 % PWM:	0 1/min (Fan off, comming from 100% PWM)

analog voltage:

0 V - 1,2 V:	0 1/min
1,2 V - 1,6 V:	350 1/min (corresponding to min. speed)
1,6 V - 9,4 V:	linear increasing curve

9,4 V - 10 V:	2400 1/min (corresponding to max. speed)
1,1V:	350 1/min (Fan on, comming from 0% PWM)
1 V:	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℃ +/ - 3℃; 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.

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

Name	Condition		
U Contr. 0001	U Contr.: 10 V		

Features	Condition	Symbol	Values		
Voltage range		U	20 V		28 V
Nominal voltage		U_N		24 V	
Power consumption Tolerance	Δp = 0 U Contr. 0010	P	34 W +- 10 %	36 W +- 10 %	33,6 W +- 10 %
Current consumption Tolerance	Δp = 0 U Contr. 0010	I	1.700 mA +- 10 %	1.500 mA +- 10 %	1.200 mA +- 10 %
Speed Tolerance	Δp = 0 U Contr. 0010	n	2.400 1/min +- 5 %	2.400 1/min +- 5 %	2.400 1/min +- 5 %
Starting current consumption				1.200 mA	

Measurement conditions: Normal air density = 1,2 kg/m3; Temperature 23℃ +/ - 3℃; 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.

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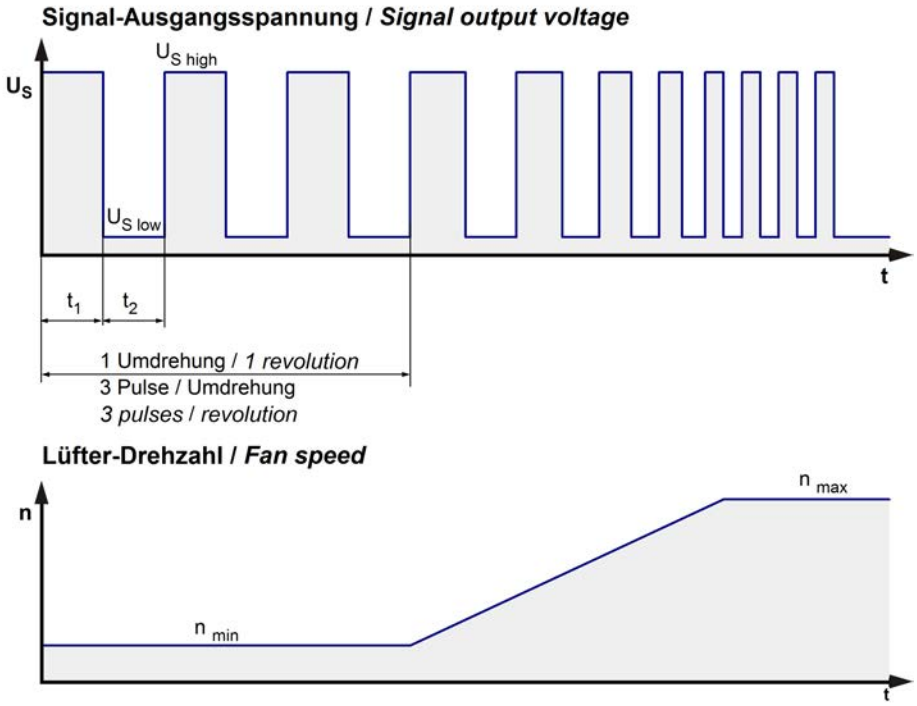
Current consumption Tolerance	Δp = 0 U Contr.0010	I	1.700 mA +- 10 %	1.500 mA +- 10 %	1.200 mA +- 10 %
Speed Tolerance	Δp = 0 U Contr. 0010	n	2.380 1/min +- 5 %	2.400 1/min +- 5 %	2.380 1/min +- 5 %

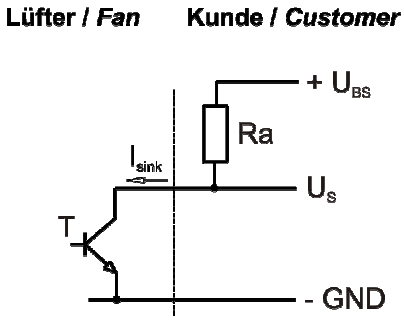
Gemessen im Gehäuse 03406-2-2517 / 03407-2-2517 + Einlegeteil SK0170106519

3.3 Electrical Interface - Output

Tacho type	/2 (open collector)



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



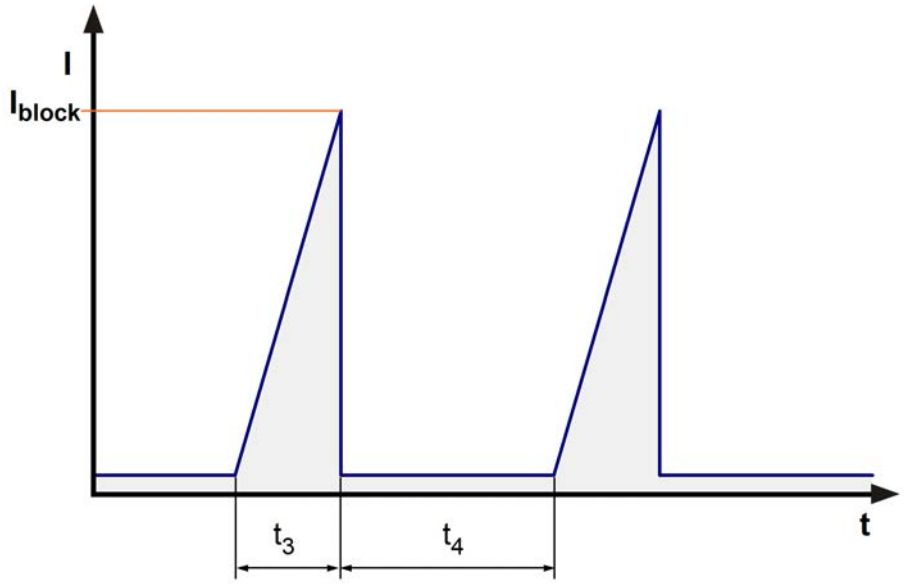
Features		Note	Values
Tacho operating voltage	U_{BS}		<= 28 V
Tacho signal Low	$U_{S\,low}$	I sink: 2 mA	<= 0,4 V
Tacho signal High	$U_{S\,high}$	I source: 0 mA	<=28 V
Maximum sink current	I_{sink}		<= 20 mA
Maximum source current			0 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(3 x n) / 60	120 Hz @ 2.400 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	Rectifying diode I_F <= 500 uA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 520 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 4 s / 10 s	
Internal fuse	Littelfuse NANO2 > Very Fast-Acting > 452/454 Series 2,5A / 125V (Art.No.: 045202.5MRL)	
Voltage control *)	Fan turns on at U_B > 19 V or < 29 V Fan turns off at U_B < 18 V or > 30 V	

*) This fan has an undervoltage and overvoltage control circuit integrated which turns the motor off if the voltage is out of range.



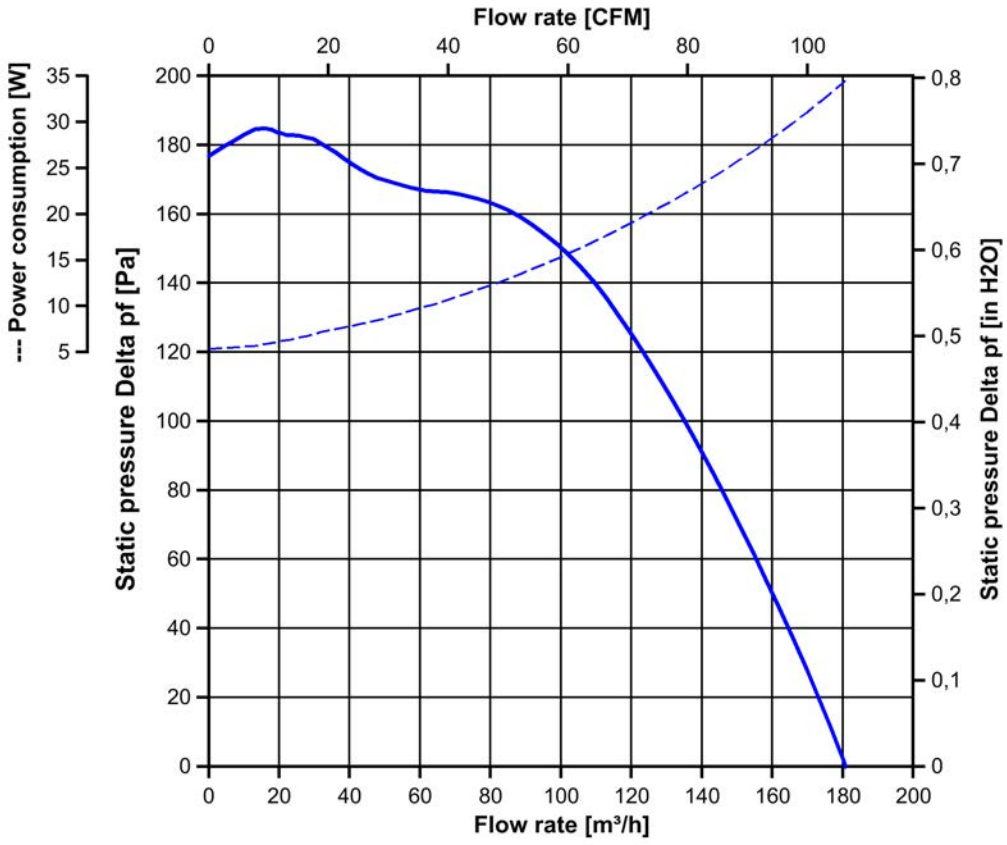
3.5 Aerodynamics

Measurement conditions:	Measured with a double chamber intake rig acc. to DIN EN ISO 5801. Normal air density = 1,2 kg/m3; Temperature 23℃ +/ - 3℃; 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:

2.400 1/min at free air flow	U Contr. 10 V		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	180 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	177 Pa	



3.6 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 chapter aerodynamics.

a.) Operation condition:

2.400 1/min at free air flow	U Contr. 10 V		

Optimal operating point	50 m3/h @ 170 Pa	
Sound power level at the optimal operating point	6,3 bel(A)	
Sound pressure level at free air flow, measured in rubber bands		

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 ℃	
Max. permitted ambient temperature TU max.	60 ℃	
Min. permitted storage temperature TL min.	-40 ℃	
Max. permitted storage temperature TL max.	80 ℃	

4.2 Climatic Requirements

Humidity requirements	humid heat, cyclic; according to DIN EN 60068-2-30, 6 cycle	
Water exposure	None	
Dust requirements	Dust check; according to DIN EN 60068-2-68, 6g/m2d, 1 day	
Salt fog requirements	None	

Permitted application area:
The product is for the use in sheltered rooms with limited controlled temperature. Occasionally condensed water is allowed. Direct exposure to water must be avoided. Saline ambient conditions must be avoided.

Pollution degree 2 (according DIN EN 60664-1)
It occurs only non-conductive pollution. Occassionally, temporary conductivity caused by condensation occurs.

Please require severity levels and specification parameters from the responsible development departments.

4.3 EMC

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

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

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

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℃. 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℃ measured with U=500 VDC for 1 min.	RI > 10 MOhm	
Clearance / creepage distance	0,5 mm / 1,2 mm	
Protection class	III	

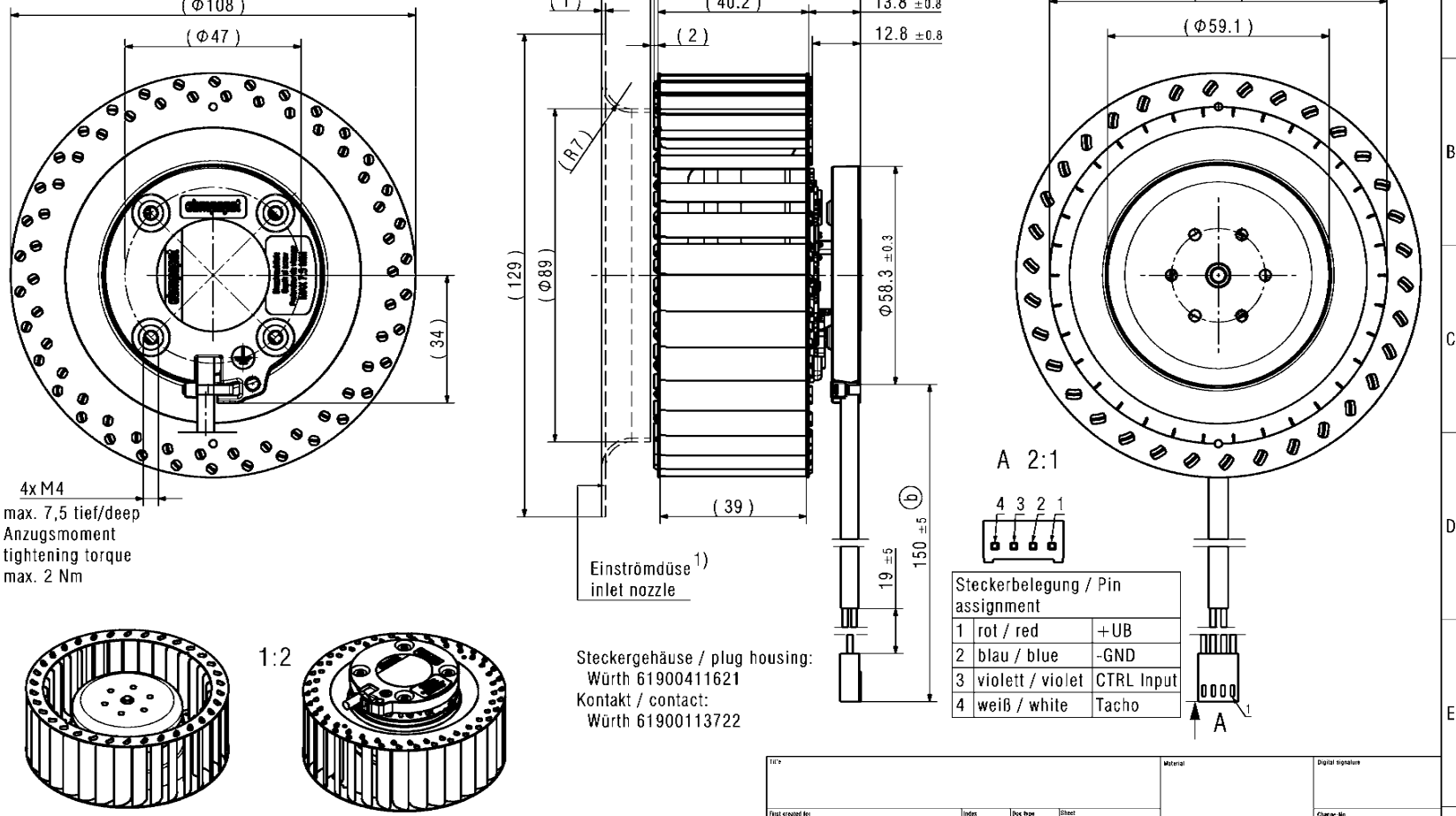
5.2 Approval Tests

CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans E38324
VDE	Association for Electrical, Electronic and Information Technologies	No
CSA	Canadian Standards Association	No
CCC	China Compulsory Certification	Not applicable

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 ℃	95.000 h	
Life expectancy L10 at TU max.	52.500 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 ℃	160. 000 h	



Steckerbelegung / Pin assignment		
1	rot / red	+UB
2	blau / blue	-GND
3	violett / violet	CTRL Input
4	weiß / white	Tacho

Steckergehäuse / plug housing:
Würth 61900411621
Kontakt / contact:
Würth 61900113722

- Axialspiel der Kugellager mit Feder spielfrei gelagert.
1) Einströmdüse nur, wenn in Lieferumfang enthalten.

- Ball bearing without clearance by a pre-load spring.
1) Inlet nozzle only, if included in delivery.

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