Product Data Sheet RET97-25/14/2TDMLOR-057

ebmpapst

The engineer's choice



GREEN TECH

RET97-25/14/2TDMLOR-057

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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

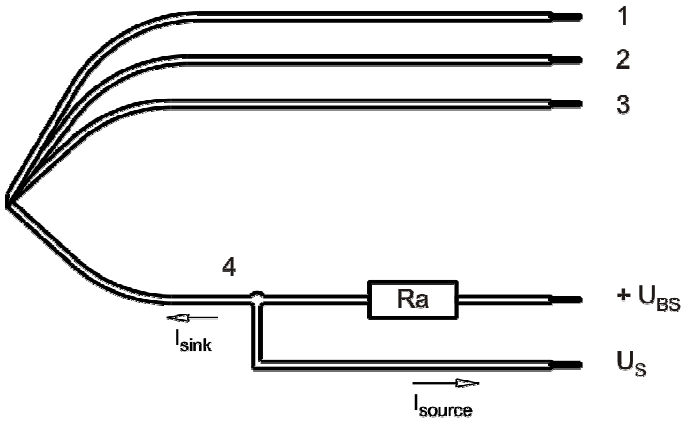
2.1 General

Depth	40 mm	
Diameter	97 mm	
Mass	0,34 kg	
Housing material		
Impeller material	Metal	

2.2 Connections

Electrical connection	Wires	
Lead wire length Tolerance	L = 310 mm +- 10 mm	
Tube length Tolerance	S = 80 mm +- 5 mm	





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

3 Operating Data

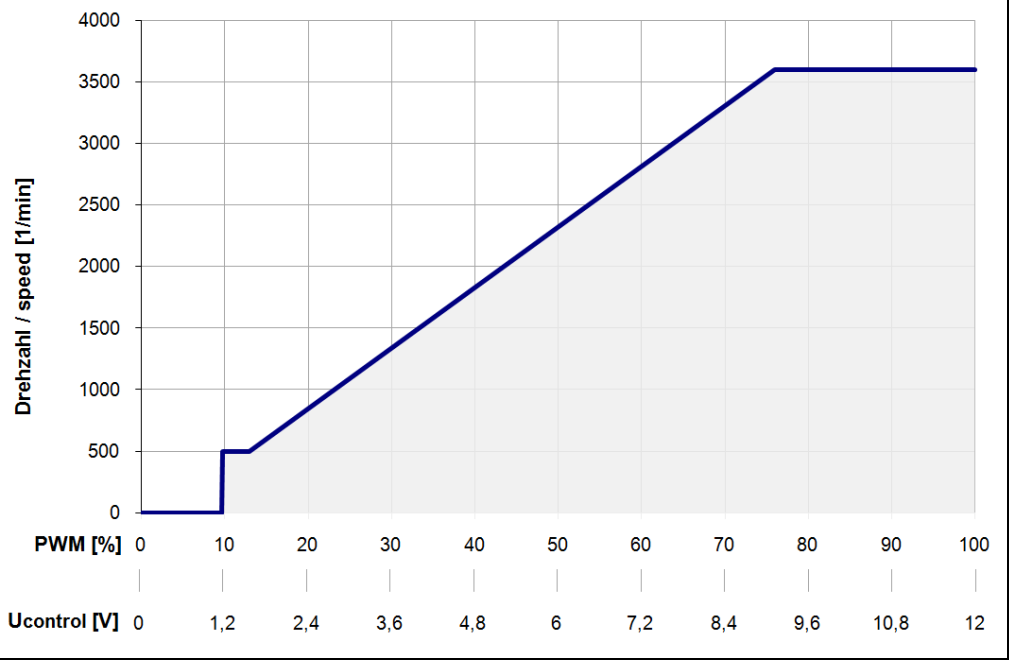
3.1 Electrical Interface - Input

Control input	Analog

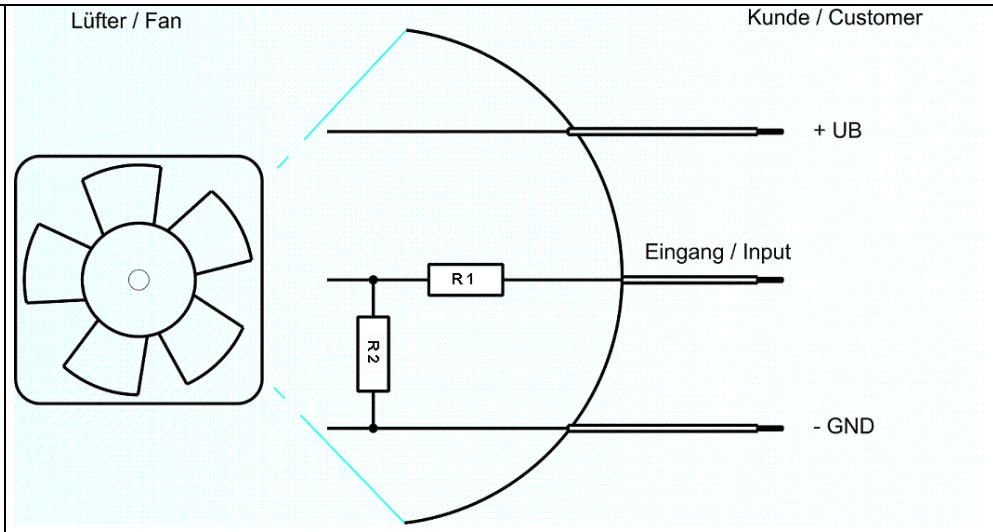
Features

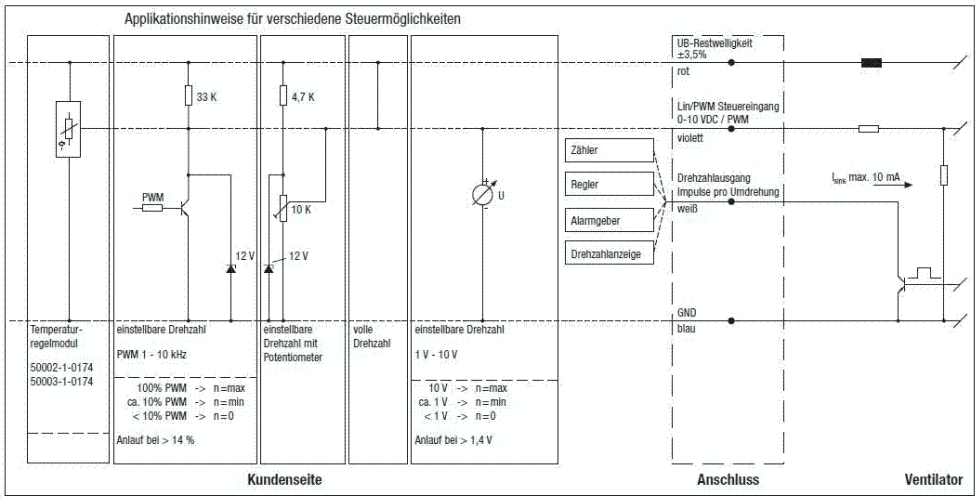
Inpute type	Active PWM	
PWM - Frequency		1 kHz - 10 kHz typical: 2 kHz
Input voltage range		0 V - 10 V

Characteristics



Schematics





Speed control:
Aktiv PWM (12V) and analog voltage (0...10V)
Information to the curve

active PWM:

0 % - 10 % PWM:	0 1/min
10 % - 13 % PWM:	500 1/min (corresponding to min. speed)
13% - 76 % PWM:	linear increasing curve
76% - 100% PWM:	3.600 1/min (corresponding to max. speed)
10 % PWM:	500 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:	500 1/min (corresponding to min. speed)
1,6 V - 9,1 V:	linear increasing curve
9,1 V - 10 V:	3.600 1/min (corresponding to max. speed)
1,1V:	500 1/min (Fan on, comming from 0% PWM)
1 V:	0 1/min (Fan off, comming from 100% PWM)

The fan has no sensor break detection.

The fan has a power limitation at 33W. The max. speed of 3.600 1/min just can reached with backpressure. (At free air in housing the speed is 3200 1/min)

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.

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

Name	Condition		
U Contr. 0001	U Contr.: 11 V		

Features	Condition	Symbol	Values		
Voltage range		U			
Nominal voltage		U_N		24 V	
Power consumption Tolerance	Δp = 0 U Contr. 0010	P		34 W	
Current consumption Tolerance	Δp = 0 U Contr. 0010	I		1.400 mA	
Speed Tolerance	Δp = 0 U Contr. 0010	n		3.600 1/min	
Starting current consumption				800 mA	

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.

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

Name	Condition		
U Contr. 0001	U Contr.: 11 V		

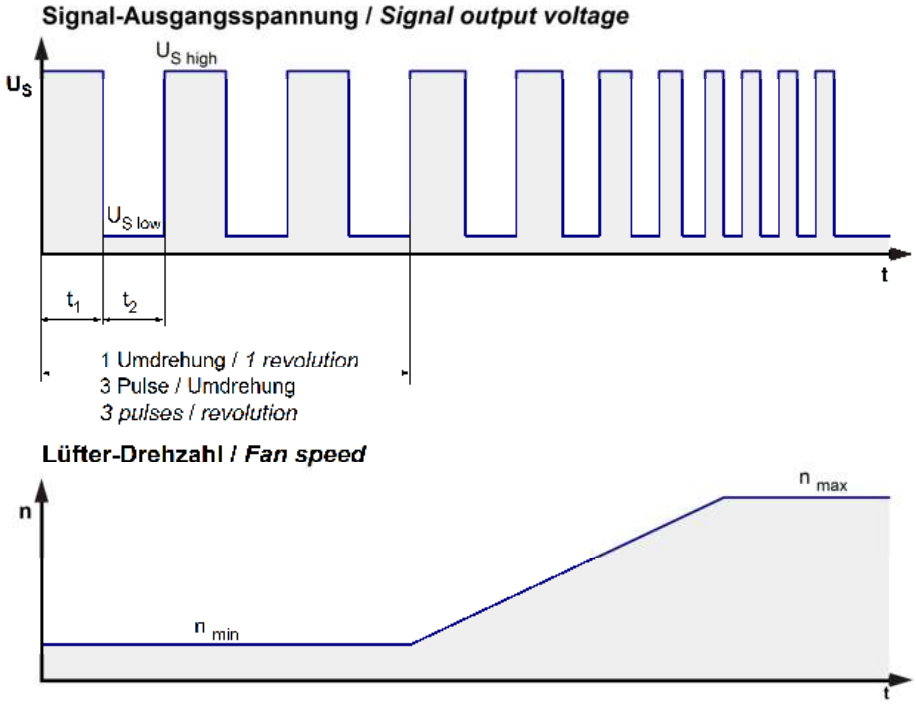
Measurement with housing 6274006000 and plate SK5600051708

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	22 W +- 10,0 %	34 W +- 10,0 %	34 W +- 10,0 %
Current consumption Tolerance	Δp = 0 U Contr.0010	I	1.100 mA +- 10,0 %	1.400 mA +- 10,0 %	1.200 mA +- 10,0 %
Speed Tolerance	Δp = 0 U Contr. 0010	n	2.900 1/min +- 10 %	3.300 1/min +- 10 %	3.300 1/min +- 10 %

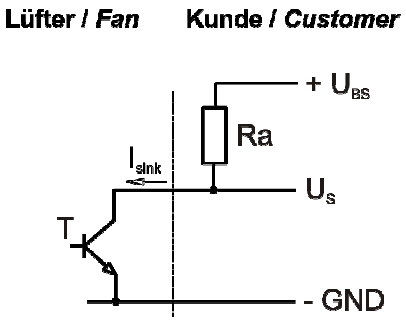
Measurement with housing 6274006000 and plate SK5600051708

3.3 Electrical Interface - Output

Tacho type	/2 (open collector)



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

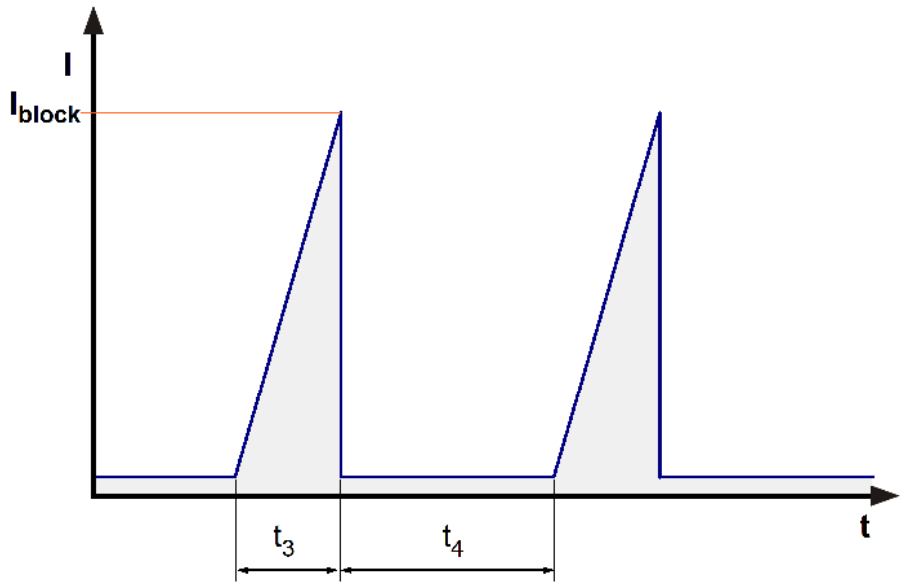


Features		Note	Values
Tacho operating voltage	U_{BS}		<= 32 V
Tacho signal Low	$U_{S\,low}$	I sink:	<=0,4 V
Tacho signal High	$U_{S\,high}$	I source: 0 mA	<=32 V
Maximum sink current	I_{sink}		<= 4 mA
Maximum source current			0 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(3 x n) / 60	
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 <= 5 mA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 100 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 3 s / 10 s	



The tolerance of the blocking clock is + -10%.

3.5 Aerodynamics

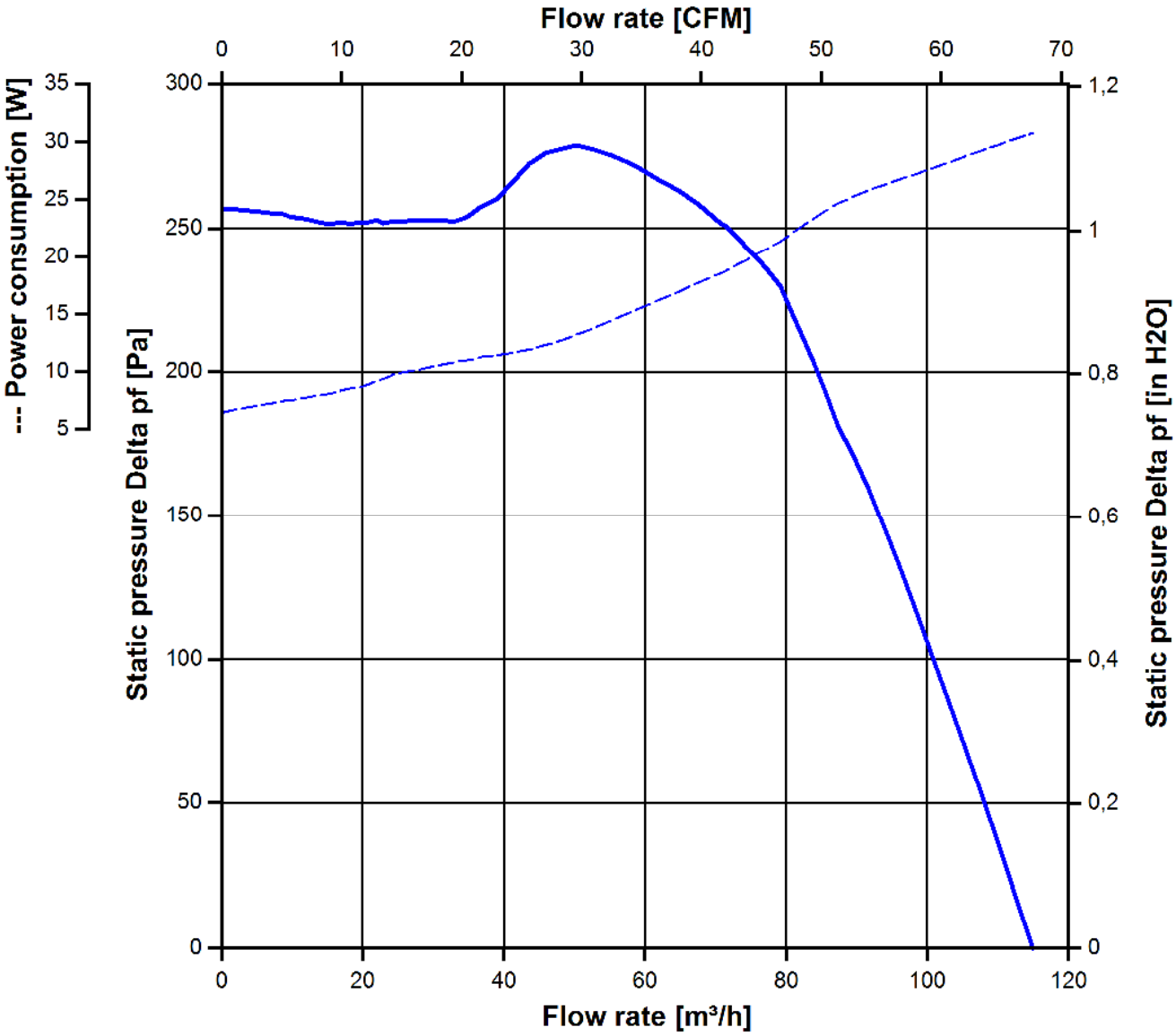
Measurement conditions:	Measured with a double chamber intake rig acc. to DIN EN ISO 5801. Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; In the intake and outlet area should not be any solid obstruction within 0,5 m. Motor shaft horizontal. The information is only valid under the specified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

3.600 1/min at free air flow	U Contr. 11 V		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	115 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	257 Pa	

The measurements were taken in the housing 6274006000 and plate SK5600051708. The speed at free air is at 24 V approx. 3.200 1/min.


Flow rate [CFM]
0
10
20
30
40
50
60
70
--- Power consumption [W]
35
30
25
20
15
10
5
Static pressure Delta pf [Pa]
300
250
200
150
100
50
0
Static pressure Delta pf [in H2O]
1,2
1
0,8
0,6
0,4
0,2
0
0
20
40
60
80
100
120
Flow rate [m³/h]

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:

3.600 1/min at free air flow	U Contr. 11 V		

Optimal operating point	50 m3/h @ 280 Pa	
Sound power level at the optimal operating point	6,5 bel(A)	
Sound pressure level at free air flow, measured in rubber bands		

Measurement with housing 6274006000 and plate SK5600051708

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °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 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.

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}	Random vibration 5 - 20 Hz : 1,0 m² / s³ 20 - 500 Hz : - 3 dB / Oct 0,91 G

		Axes of vibration Test duration	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	**Radiated Emission; 30 MHz - 1000 MHz**
According	DIN EN 55022:2007-04
Ceck accuracy / Limit	Class B
Result	Below limit Class B

Kind	**Electrostatic Discharge Immunity Test**
According	DIN EN 61000-4-2:2001-12
Ceck accuracy / Limit	Contact Discharge +/- 4 kV; Air Discharge +/- 8 kV
Result	B: The monitored function may deviate from designed performance to a specified level during exposure to a disturbance or revert to a fail safe mode or operation, but shall return to normal operation after the disturbance is removed.

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	B: The monitored function may deviate from designed performance to a specified level during exposure to a disturbance or revert to a fail safe mode or operation, but shall return to normal operation after the disturbance is removed.

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; 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 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. 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 / 1,2 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	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	Not applicable

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	92.500 h	
Life expectancy L10 at TU max.	52.500 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	155.000 h	



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