Product Data Sheet #RG220-43/18/19TDPU-300

ebmpapst

The engineer's choice



GREEN TECH

#RG220-43/18/19TDPU-300

INDEX

1 General 3

2 Mechanics 3

2.1 General 3
2.2 Connections 3

3 Operating Data 5

3.1 Electrical Interface - Input 5
3.2 Electrical Operating Data 7
3.3 Electrical Interface - Output 8
3.4 Electrical Features 9
3.5 Data According ErP Directive 10
3.6 Aerodynamics 11
3.7 Sound Data 12

4 Environment 12

4.1 General 12
4.2 Climatic Requirements 12
4.3 Mechanical Requirements 12

5 Safety 13

5.1 Electrical Safety 13
5.2 Approval Tests 13

6 Reliability 13

6.1 General 13

1 General

Fan type	Blower	
Rotating direction looking at rotor	Clockwise	
Airflow direction	Air in axially, Air out radially	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

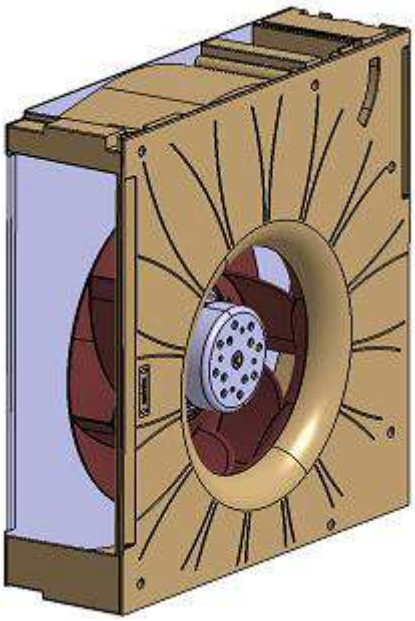
2 Mechanics

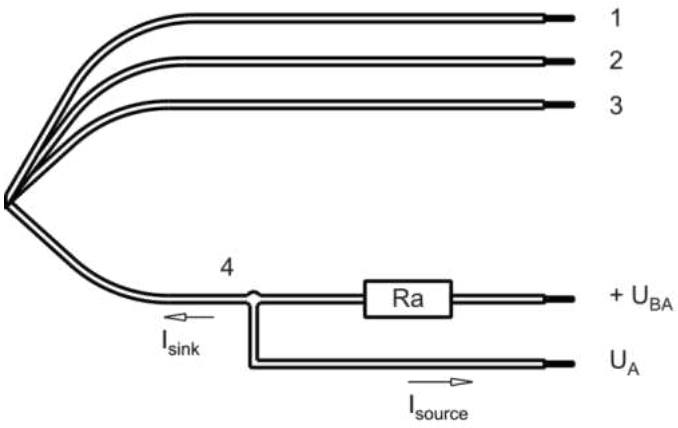
2.1 General

Width	330 mm	
Height	330 mm	
Depth	94 mm	
Mass	3,385 kg	
Housing material	Mixed	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires - Plug	
Lead wire length Tolerance	L = 287 mm +- 10,0 mm	
Tube length Tolerance	S = 235 mm + 5,0 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 3	AWG 22	1,7 mm
3	violet	PWM	Pin 4	AWG 22	1,7 mm
4	yellow	Alarm	Pin 2	AWG 22	1,7 mm

Remark:

Wire:
For power lines (red and blue): AWG18 / 2,2mm
for customer interface (yellow and purple): AWG22 /1,7mm

3 Operating Data

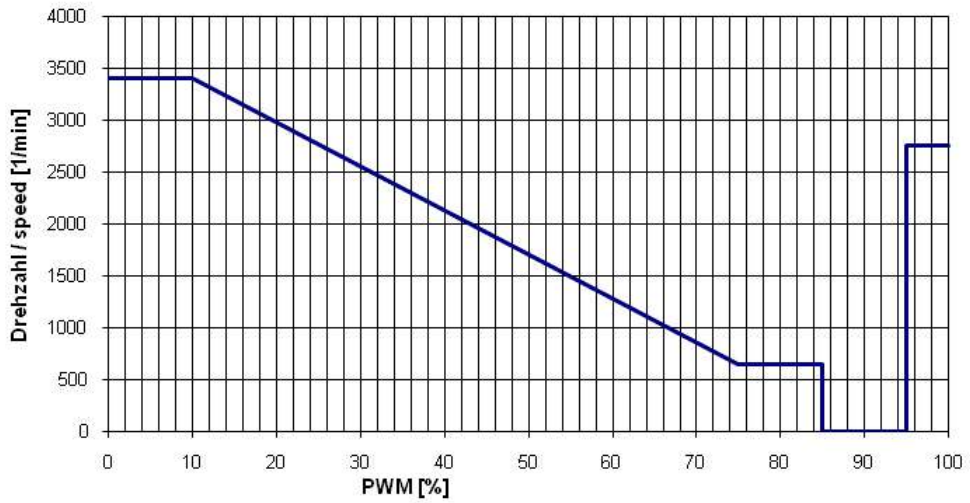
3.1 Electrical Interface - Input

Control input	PWM

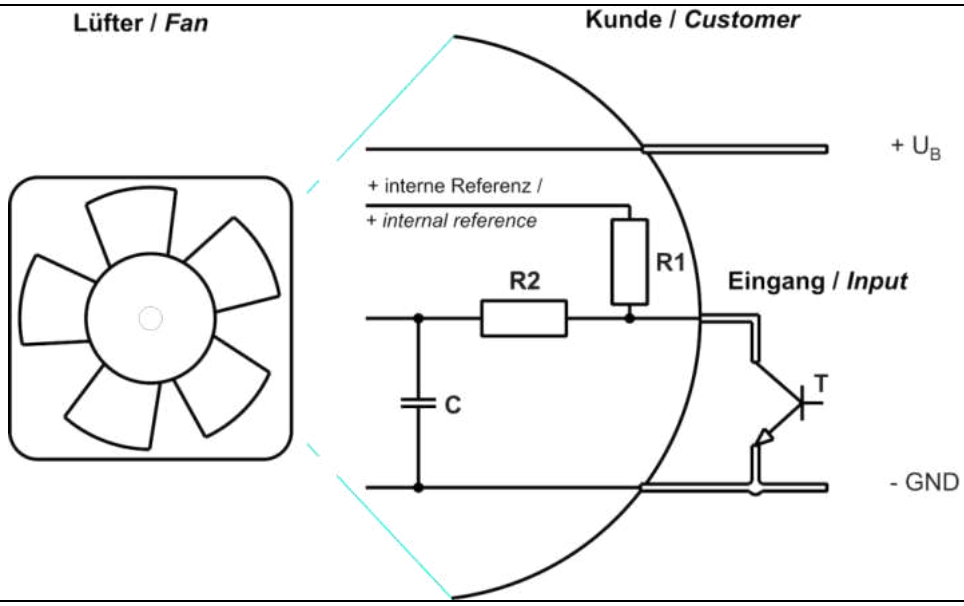
Features

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

Characteristics



Schematics



PWM input transistorrequirements:
U_{CE}max. => 12 V; I Sink max. > 5 mA; U_{CE}sat. < 0,15 V
With broken input signal wire fan is running at speed 2750rpm, open PWM input is equivalent to 80% PWM, internal pullup resistor 4k7 to 5V.

Information to the speed characteristic curve:

0 % - 10 % PWM:	3.400 1/min (corresponding to max. speed)
10 % - 75 % PWM:	linear decreasing curve
75 % - 85 % PWM:	750 1/min
> 86 % - <95 % PWM:	0 1/min
95 % - 100 % PWM:	2.750 1/min (corresponding to 80% of max. speed)

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		
PWM 0001	PWM: 100 %; f: 2 kHz		

Note:

Measure conditions:
Fan must be measured with inlet nozzle.

Inrush current limiter:

**)
To note inrush current @ U nom:
The internal electrolytic capacitor 2 x 270uF/80V has inrush current limitation, the existing peak depends on the included ceramic capacitors 2 x 2,2uF of the internal EMI-filter.

This confirms to BKV301514/2.
0 ... 100ms It = 8,8A
> 100ms It = 4,4A
to charge max. 5uF is allowed without limiting.

Contrary to the *) - marking in the top chart is to test as "FK" feature speed and the current at PWM = 0%.

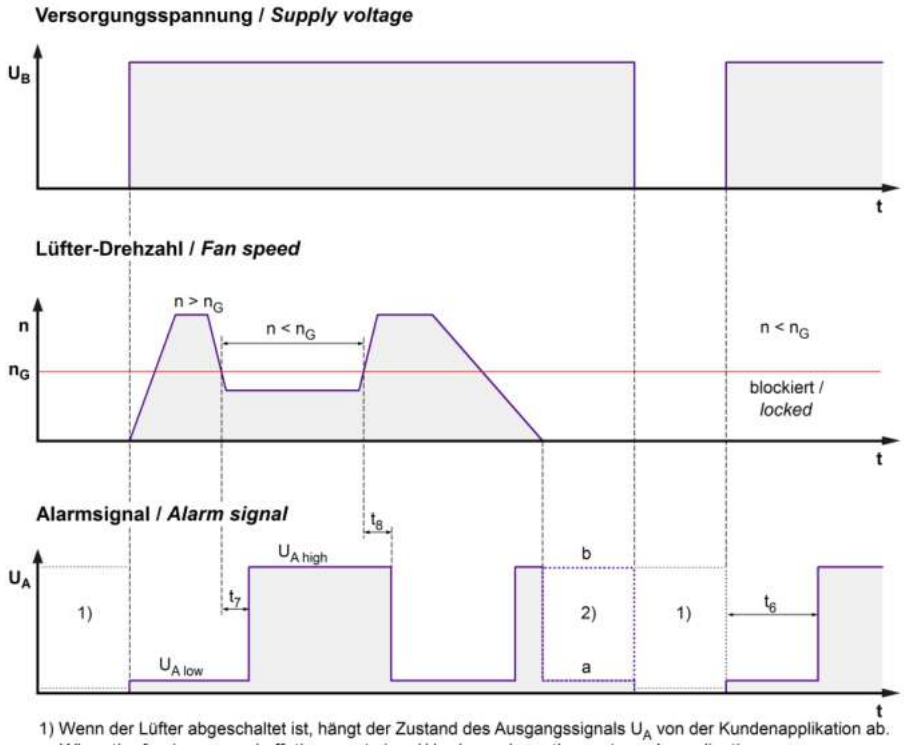
All the other information (PWM = 80% and PWM = 100%) serve only to further information.

Specified values on the label P = 173 W; I = 3,6A;
are refered to UB = 48V, because the fan family has been reported in the approval for this supply voltage.

Features	Condition	Symbol	Values		
Voltage range		U	38 V		58,5 V
Nominal voltage		U_N		48 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	140 W +- 12,5 %	173,0 W +- 10,0 %	175 W +- 10,0 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	3.680 mA +- 12,5 %	3.600 mA +- 10,0 %	2.960 mA +- 10,0 %
Speed Tolerance	Δp = 0 PWM 0010	n	3.200 1/min +- 7,5 %	3.400 1/min +- 5,0 %	3.400 1/min +- 5,0 %
Starting current consumption				< 4.300 mA	

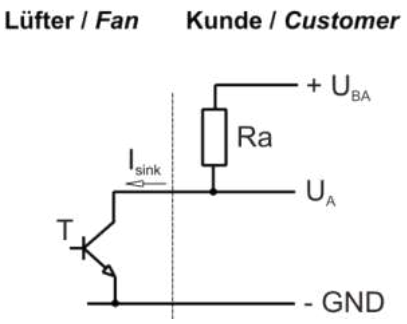
3.3 Electrical Interface - Output

Alarm type	/19 (low = ok, open collector inverse)



1) Wenn der Lüfter abgeschaltet ist, hängt der Zustand des Ausgangssignals U_A von der Kundenapplikation ab.
When the fan is powered off, the ouput signal U_A depends on the customer's application.
2) Für den gültigen Zustand (a oder b) siehe Alarmunterdrückung in der Tabelle.
For the valid condition (a or b) see alarm suppression in the table.

$$Ra = \frac{U_{BA} - U_{A\,low}}{I_{sink}}$$



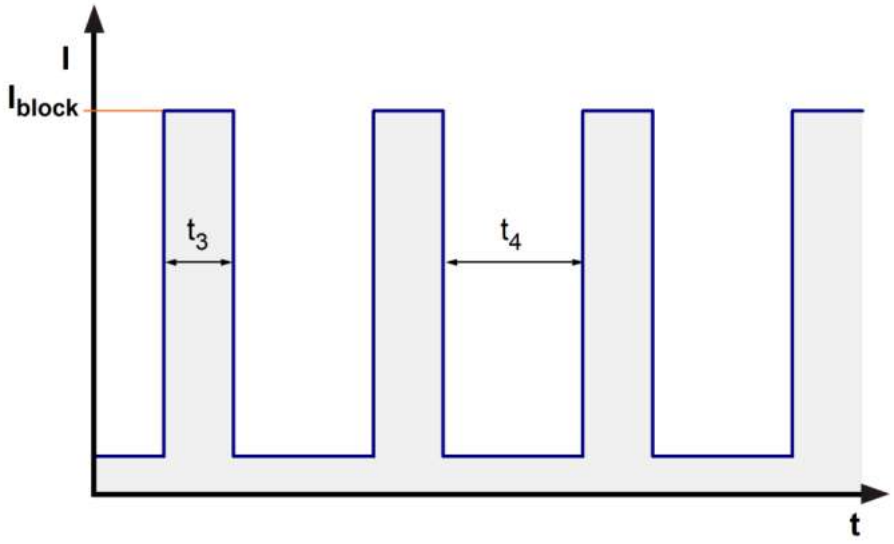
Features		Note	Values
Alarm operating voltage	U_{BA}		Min.: 4,0 V Max.: 60,0 V
Alarm signal Low	$U_{A\,low}$	I sink: 2 mA	<= 0,4 V
Alarm signal High	$U_{A\,high}$	I source: 0 mA	
Maximum sink current	I_{sink}		< 20 mA
External resistor		External resistor Ra from UBA to UA required. All voltage measured to GND.	
Alarm start-up delay time	t_6		10 s
Alarm delay time	t_7		10 s
Alarm delay time	t_9		10 s
Alarm trip speed limit of the nominal Speed	n_G		62 %
Alarm at sense failure		No	
Alarm latch		No	
Alarm isolated from motor		No	

The alarm limit of the speed has a 5% hysteresis to avoid alarm failures. I.e. below 62% of the speed setpoint, an alarm is always set (after expiry the alarm delay time). Above 67% of the speed setpoint, the alarm is always withdrawn. Between 62% and 67% is the hysteresis range, in that case the alarm could be set or not set, depending on the direction which the speed limit (62% or 67%) had been reached.

Note:
Alarm signal has already been tested in the basic fan RER 220
(1595420102), therefore this test is not necessary for RG220!

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_N	Rectifying diode I_F <= 10 mA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 2.000 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 0,5 s / 9,5 s	



Note:
Blocked rotor protection has already been tested in the basic fan RER 220(1595430300), therefore this test is not necessary for RG220!

Internal fuse:

Littlefuse NANO2(R) FUSE; Very fast acting 451 Series; 7,0 A (Art.-Nr.: 451007)

3.5 Data According ErP Directive

Installation / Efficency category	A / static
Speed control	integrated
Specific ratio	1,00710
Target overall efficiency 2015	43,0 %
Overall efficiency	48,2 %
Efficiency grade	61
Power input	195 W
Speed	3.400 1/min

All values measured in optimum energy efficiency point.

Productiondatecode is printed on the fan label.

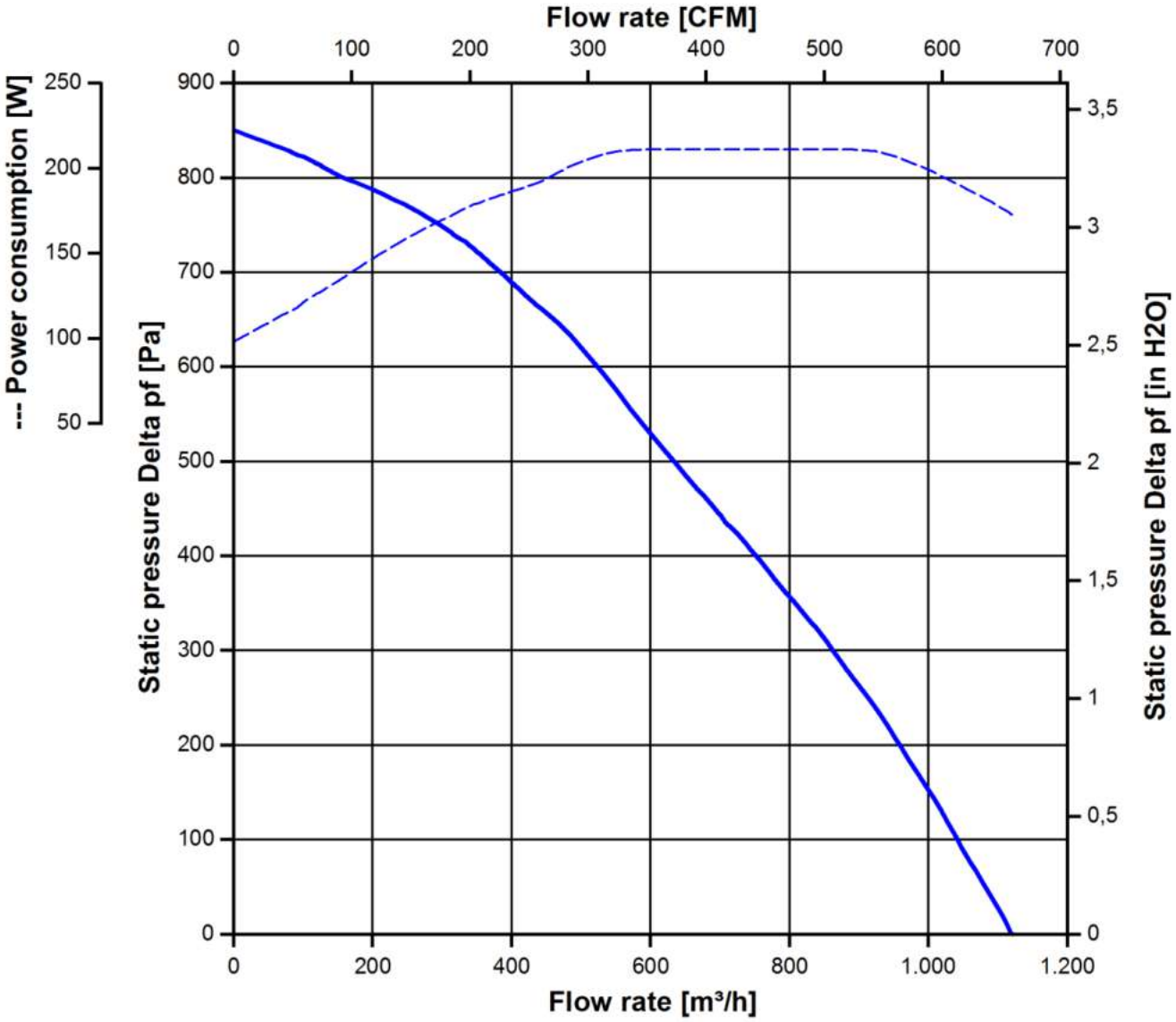
3.6 Aerodynamics

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. 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:

2.750 1/min at free air flow	PWM 100 %; f: 2 kHz		

Max. free-air flow (Δp = 0 / V̇ = max.)	1.120 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	850 Pa	



3.7 Sound Data

Measurement conditions:	Sound pressure level: 1 meter distance between microphone and the air intake. 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:

2.750 1/min at free air flow	PWM 100 %; f: 2 kHz		

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-40 °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

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	salt fog, cyclic, in operation; according to DIN EN 60068-2-52, 3 cycle	

Permitted application area:
The product is for the use in open and unsheltered areas. Direct exposure to water as well as saline ambient conditions are allowed provided that this does not prevent the normal operation.

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

4.3 Mechanical Requirements

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

Note:

EMV according Ericsson 1056-BKV 301 514/2 Uen Rev.D

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.		
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	

Note:
Dielectrical strength / type test and routine test: **750 VDC / 1s**
Because Y-Cs no AC test possible.

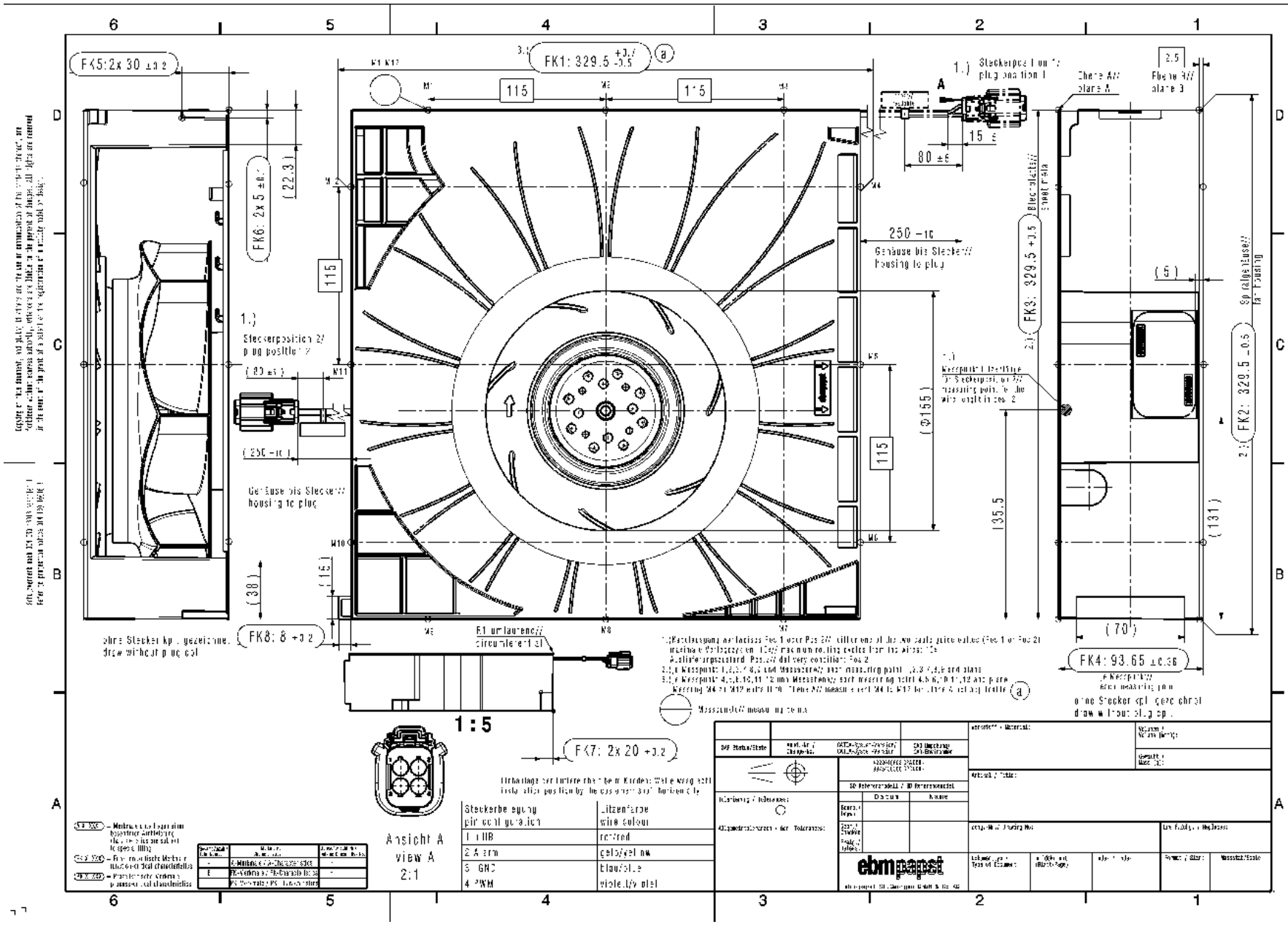
5.2 Approval Tests

CE	EC Declaration of Conformity	No
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

6 Reliability

6.1 General

Life expectancy L15 at TU = 45 °C	205.000 h	


FK5: 2x 30 ±0.2
FK1: 329.5 +0.5 -0.5
FK6: 2x 5 ±0.2
(22.3)
115
115
115
1:5
250 −10
Gehäuse bis Stecker
housing to plug
(Ø155)
FK3: 329.5 +0.5
FK2: 329.5 −0.5
Blechblende
sheet metal
Spulgehäuse
coil housing
(5)
(131)
135.5
(70)
FK4: 93.65 ±0.36
FK8: 8 +0.2
(38)
(15)
(80 ±5)
(250 −10)
Gehäuse bis Stecker
housing to plug
ohne Stecker kpl. gezeichnet
drawn without plug cpl.
1:5
FK7: 2x 20 +0.2
Ansicht A
view A
2:1
Steckerbelegung
pin configuration
Litzenfarbe
wire colour
1 UB
rot/red
2 Alarm
gelb/yellow
3 GND
blau/blue
4 PWM
violett/violet
ebmpapst