Product Data Sheet RG190-39/14/2TDMO-221

ebmpapst

Die Wahl der Ingenieure



GREEN TECH

RG190-39/14/2TDMO-221

INDEX

1 General 3

2 Mechanics 3

2.1 General 3
2.2 Connections 3

3 Operating Data 5

3.1 Operating Data - Electrical Interface - Input 5
3.2 Electrical Operating Data 8
3.3 Operating Data - Electrical Interface - Output 9
3.4 Electrical Features 10
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

5 Safety 13

5.1 Electrical Safety 13
5.2 Approval Tests 13

6 Reliability 13

6.1 General 13

1 General

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

2 Mechanics

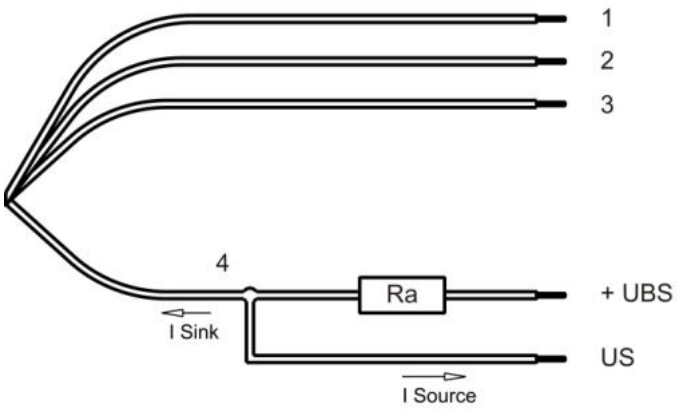
2.1 General

Width	225 mm	
Height	225 mm	
Depth	85 mm	
Mass	1,2 kg	
Housing material	Plastic	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Lead wire length Tolerance	L = 350 mm +- 10,0 mm	
Tube length Tolerance	S = 36 mm +- 5 mm	
Wire size (AWG)	18 22	
Insulation diameter	2,20 mm 1,30 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 2,20 mm)
Lead wire 3 - 4: AWG22 (Insulation diameter 1,30 mm)

Note:
It must be ensured that the power supply is applied before the control signal (U Contr) is turned on.

3 Operating Data

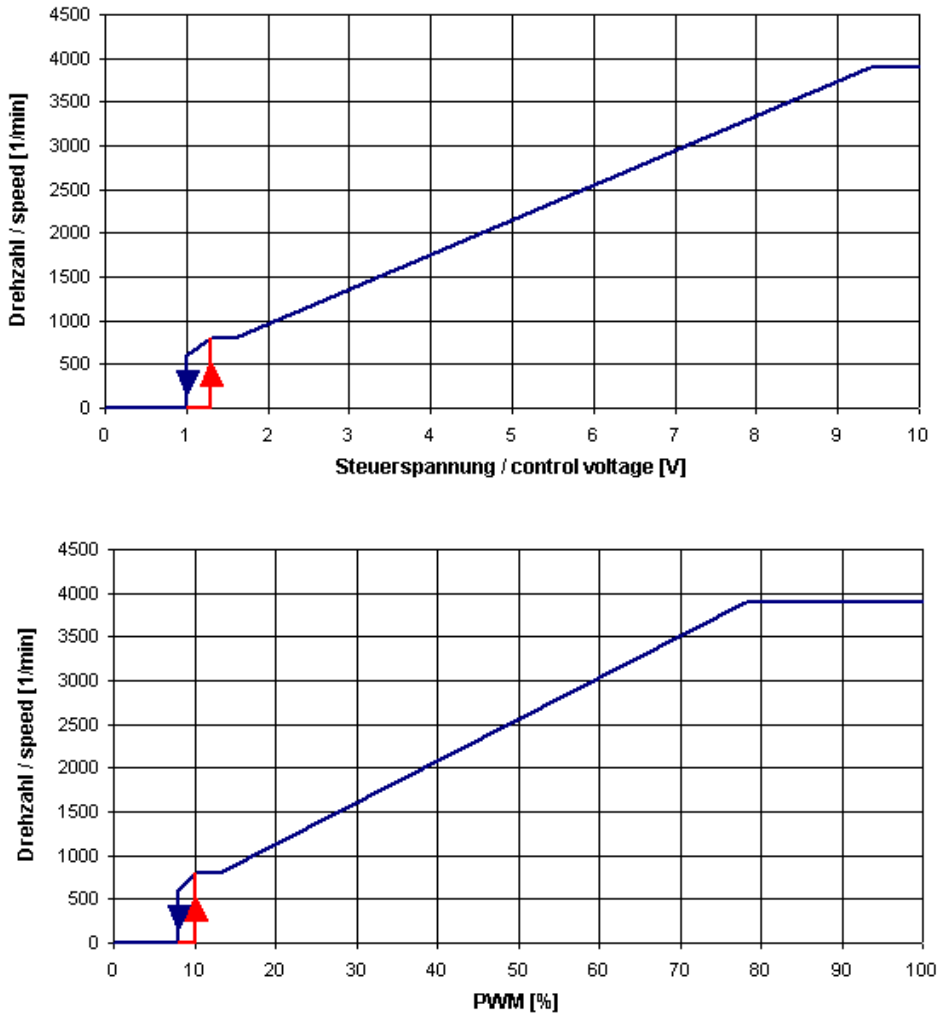
3.1 Operating Data - Electrical Interface - Input

Control input	Analog

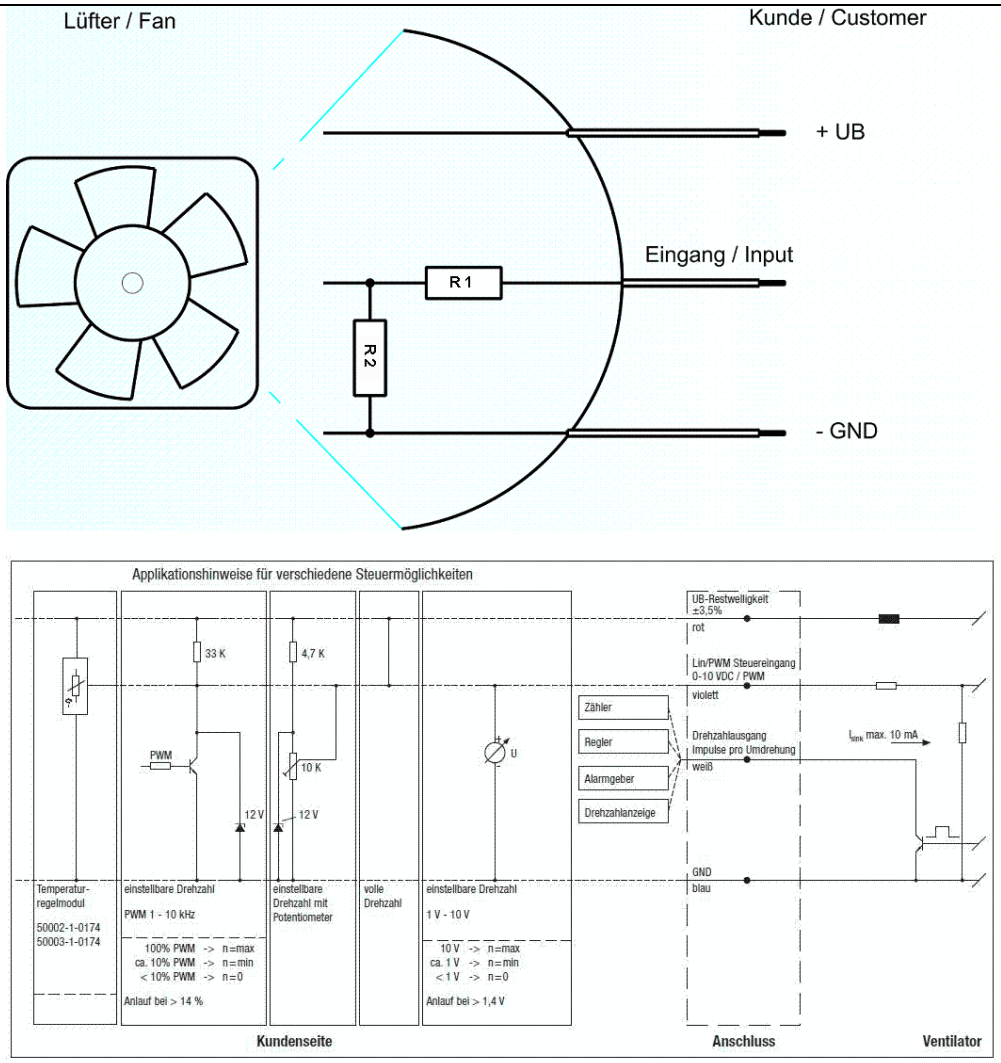
Features

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

Characteristics



Schematics



Input voltage divider:
R1 = 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:	3.900 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:	3.900 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)

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 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	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. 0001	P	65,0 W +- 10,0 %	105,5 W +- 10,0 %	106,0 W +- 10,0 %
Current consumption Tolerance	Δp = 0 U Contr. 0001	I	4.080 mA +- 10,0 %	4.430 mA +- 10,0 %	2.930 mA +- 10,0 %
Speed Tolerance	Δp = 0 U Contr. 0001	n	3.350 1/min +- 10,0 %	3.900 1/min +- 5,0 %	3.900 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)					

No sensor break detection. Speed is 0 1/min with open control input.

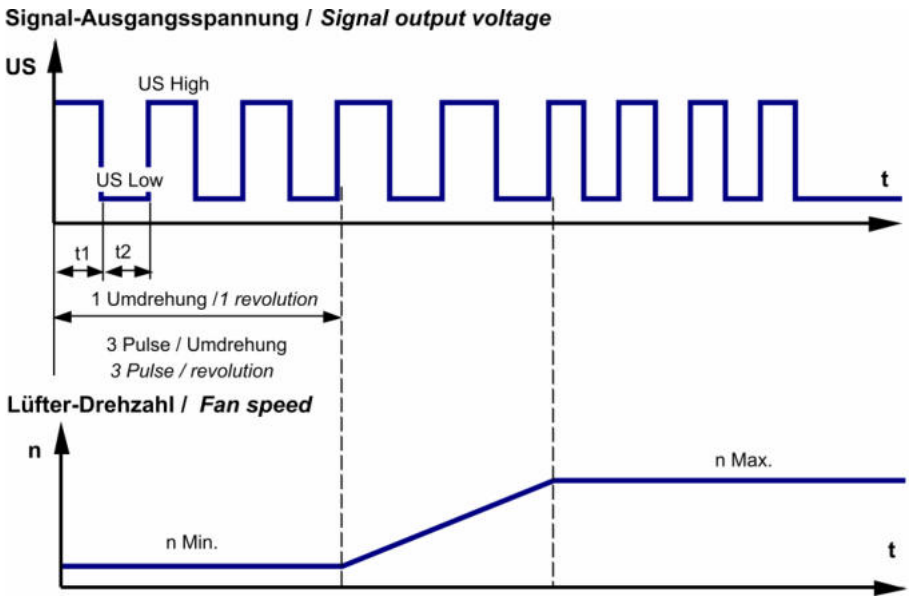
Built into the fan is an additional under- and overvoltage control, which switches the power stage and the fan off if the following conditions are reached.
At U <= 13 V and / or U >= 42 V is n= 0 1/min.

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	19,7 W +- 10,0 %	20,0 W +- 10,0 %	22,0 W +- 10,0 %
Current consumption Tolerance	Δp = 0 U Contr. 0002	I	1.230 mA +- 10,0 %	830 mA +- 10,0 %	600 mA +- 10,0 %
Speed Tolerance	Δp = 0 U Contr. 0002	n	2.250 1/min +- 5,0 %	2.250 1/min +- 5,0 %	2.250 1/min +- 5,0 %

3.3 Operating Data - Electrical Interface - Output

Tacho type	/2 (open collector)



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

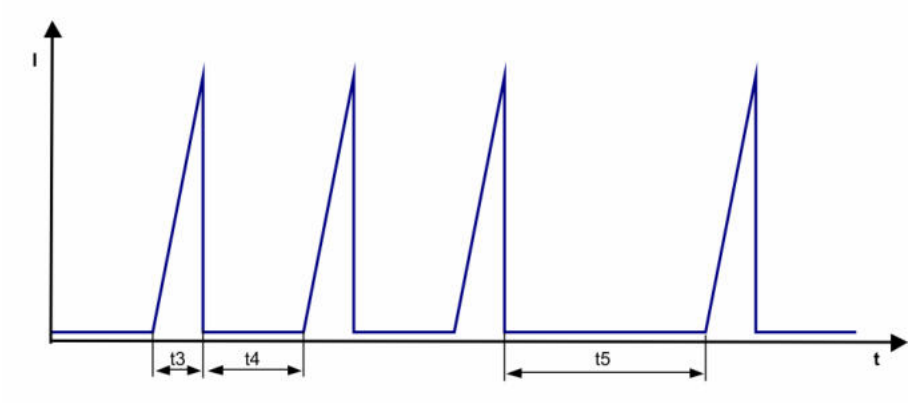
Features	Note	Values
Tacho operating voltage (UBS)		<= 60,0 V
Tacho signal Low	I sink: 2 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	<= 60,0 V
Maximum sink current		<= 20 mA
Maximum source current		0 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	(3 x n) / 60	195 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. 2.400 mA	
Clock signal t3/t4 at locked rotor	Typical: 2,6 s / 10,0 s	



Locked rotor signal t5:

After 4 failed start-ups there is an extended timeout of 40,0s.

3.5 Data According ErP Directive

Installation / Efficency category	A / static
Speed control	integrated
Specific ratio	1,00473
Target overall efficiency 2015	41,4 %
Overall efficiency	51,7 %
Efficiency grade	61
Power input	135,6 W
Speed	3.900 1/min

All values measured in optimum energy efficiency point.

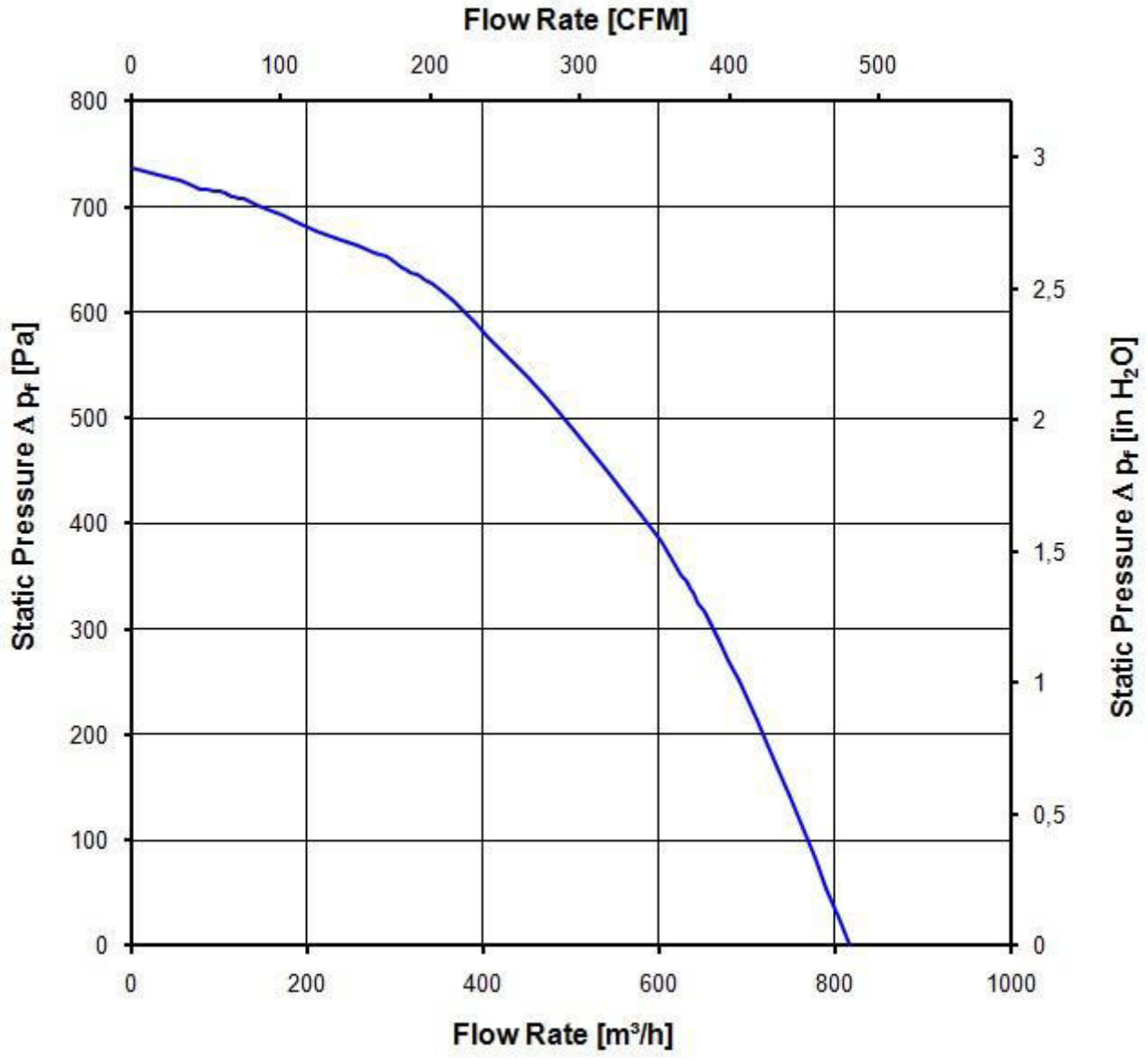
3.6 Aerodynamics

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.

a.) Operation condition:

3.900 1/min at free air flow	U Contr. 10,0 V		

Max. free-air flow (Δp = 0 / V̇ = max.)	815,0 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	740 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:

3.900 1/min at free air flow	U Contr. 10,0 V		

Optimal operating point	500,0 m3/h @ 444 Pa	
Sound power level at the optimal operating point	7,9 bel(A)	

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, 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

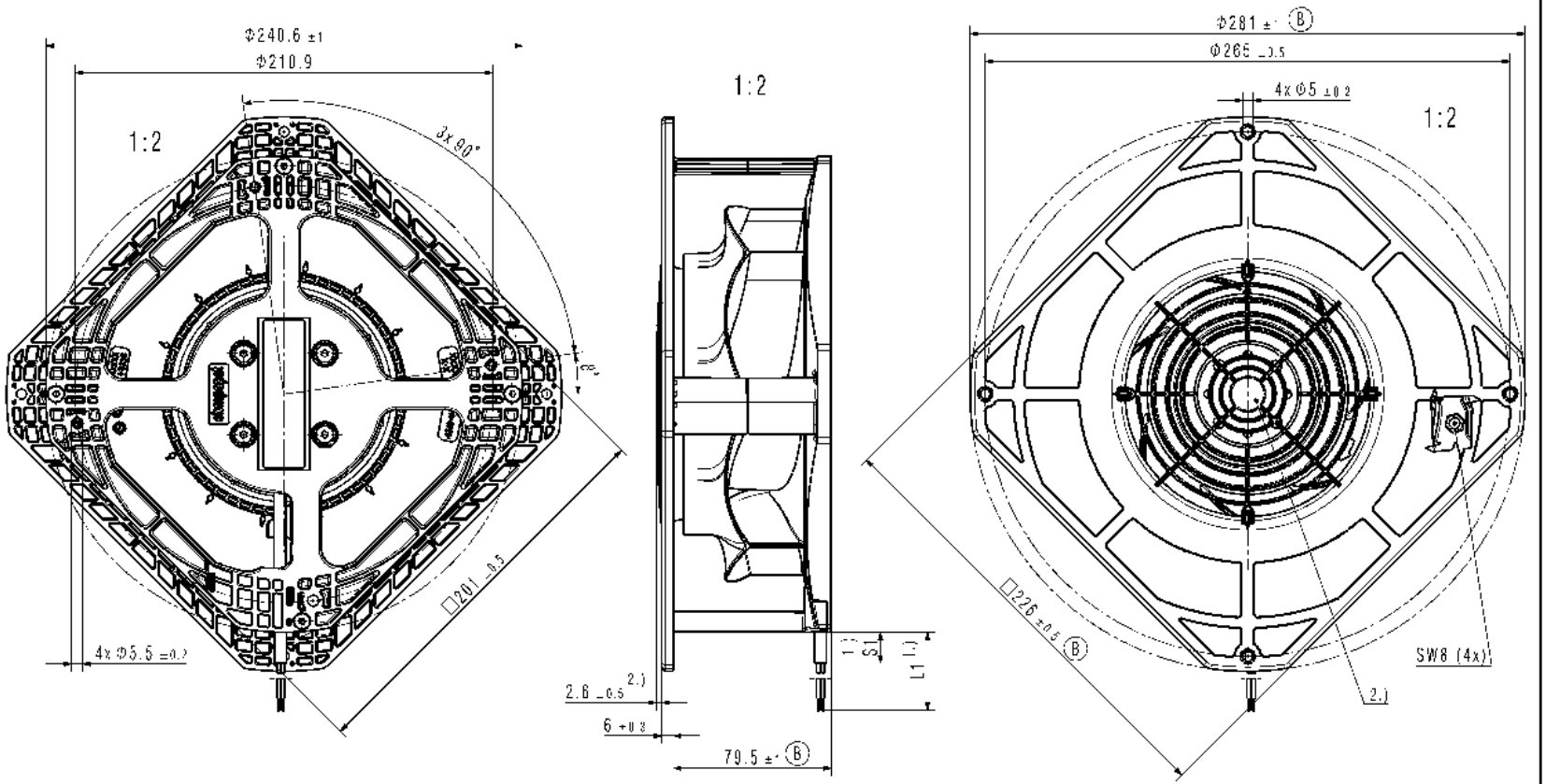
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association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

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	52.500 h	
Life expectancy L10 at TU max.	30.500 h	
Life expectancy L10 IPC (40 °C)	87.500 h	

Ansicht mit Schutzgitter / view with finger guards



1.) Anzahl und Länge der Litzen sowie Länge des Schlauches ab Flanschrand siehe Produktspezifikation
2.) Schutzgitter, nur wenn im Lieferumfang enthalten

1.) length and number of wires and length of tube from flange edge see design specification
2.) finger guards, only if included in delivery

SAP Status/Stufe					Werkstoff / Material:	Maßstab / Scale: 1:2
						Gewicht / Mass:
					Artikel / Title:	
Toleranz / Tolerances:		Datum	Name			
Allgemeintoleranzen / Gen. Tolerances:	Gezeichnet / Drawn				Zeichnungs-Nr. / Drawing No.:	Ers. für/Repl. for: Ersetzt durch/Replaced by:
	Geprüft / Checked					
	Freigabe / Released					
ebmpapst					Ersatz für / Replaces:	Ersetzt durch / Replaced by:
ebm-papst St. Georgen GmbH & Co. KG					Ersetzt durch / Replaced by:	Format / Size: A3