Product Data Sheet REF100-11/14/2H-215

ebmpapst

The engineer's choice



GREEN TECH

REF100-11/14/2H-215

INDEX

1 General 3

2 Mechanics 3

2.1 General 3
2.2 Connections 3

3 Operating Data 4

3.1 Electrical Operating Data 4
3.2 Electrical Interface - Output 5
3.3 Electrical Features 6
3.4 Aerodynamics 7
3.5 Sound Data 8

4 Environment 8

4.1 General 8
4.2 Climatic Requirements 8
4.3 EMC 8

5 Safety 10

5.1 Electrical Safety 10
5.2 Approval Tests 10

6 Reliability 10

6.1 General 10

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	

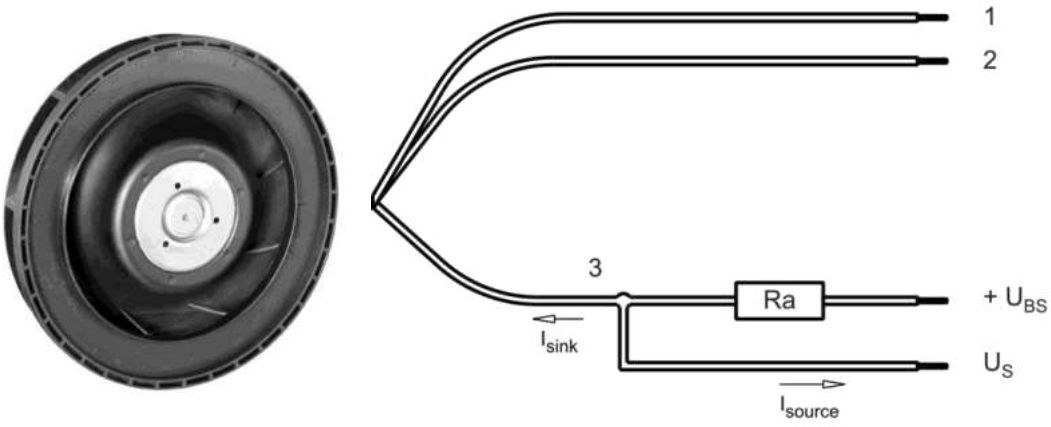
2 Mechanics

2.1 General

Depth	25,0 mm	
Diameter	104,0 mm	
Mass	0,170 kg	
Housing material		
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires - Plug	
Lead wire length Tolerance	L = 70 mm +- 10,0 mm	
Wire size (AWG)	22	
Insulation diameter	1,7 mm	
Plug	See drawing	
Contact	See drawing	



Wire	Color	Operation
1	red	+ UB
2	blue	- GND
3	white	Tacho

The auxilliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

3 Operating Data

3.1 Electrical Operating Data

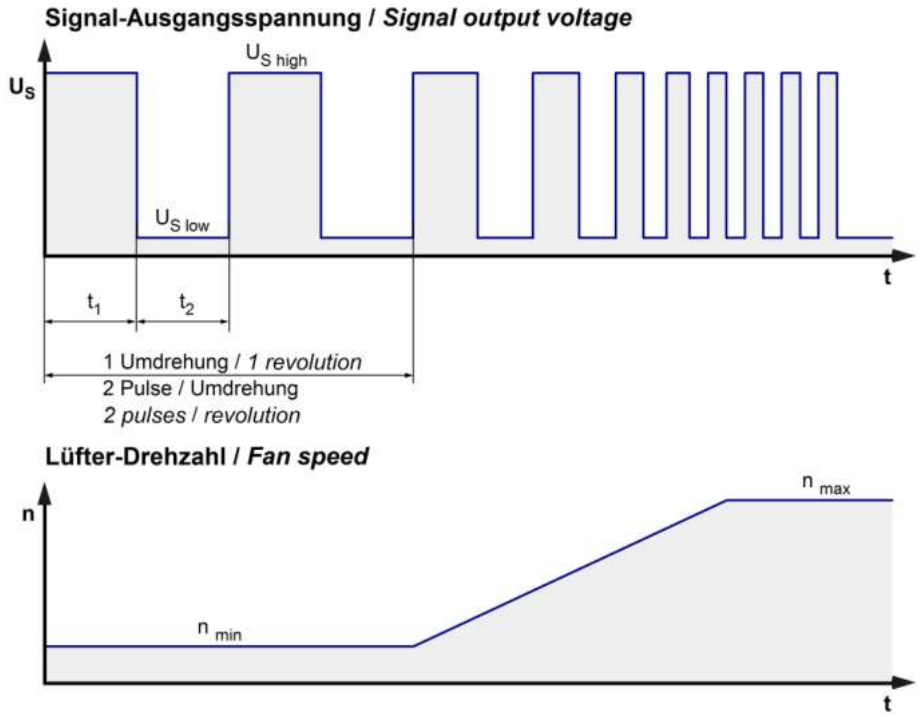
Measurement conditions: Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; Motor axis horizontal; warm-up time before measuring 5 minutes (unless otherwise specified). In the intake and outlet area should not be any solid obstruction within 0,5 m.

Δp = 0: corresp. to free air flow (see chapter aerodynamics)
I: corresp. to arithm. mean current value
optionally 25.2V can be approved for max. 70°C

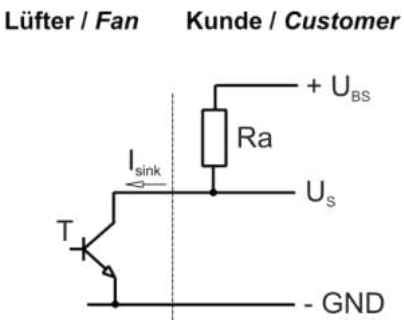
Features	Condition	Symbol	Values		
Voltage range		U	16 V		26,4 V
Nominal voltage		U_N		24 V	
Power consumption Tolerance	Δp = 0 0010	P	7,5 W +- 17,5 %	14,2 W +- 25 %	15,9 W +- 25 %
Current consumption Tolerance	Δp = 0 0010	I	470 mA +- 17,5 %	590 mA +- 25 %	600 mA +- 25 %
Speed Tolerance	Δp = 0 0010	n	5.080 1/min +- 12,5 %	6.400 1/min +- 3 %	6.400 1/min +- 3 %
Starting current consumption				<= 3.900 mA	

3.2 Electrical Interface - Output

Tacho type	/2 (open collector)



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

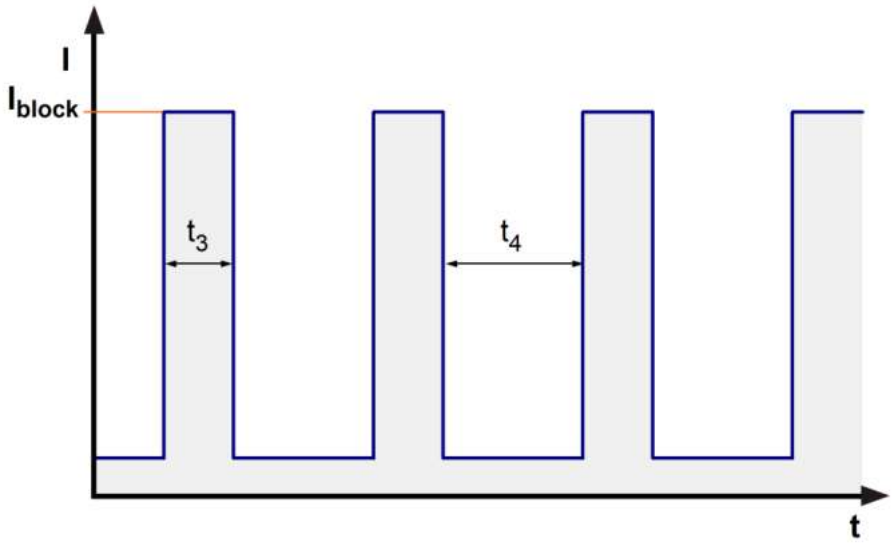


Features		Note	Values
Tacho operating voltage	U_{BS}		Max.: 30,0 V
Tacho signal Low	$U_{S\,low}$	I sink: 2 mA	<= 0,4 V
Tacho signal High	$U_{S\,high}$	I source: 0 mA	<=30,0 V
Maximum sink current	I_{sink}		<= 4 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(2 x n) / 60	
Tacho isolated from motor		No	
Slew rate			=> 0,5 V/us

n = revolutions per minute (1/min)

3.3 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_N	Rectifying diode I_F <= 1 mA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 3.500 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 0,25 s / 10,0 s	



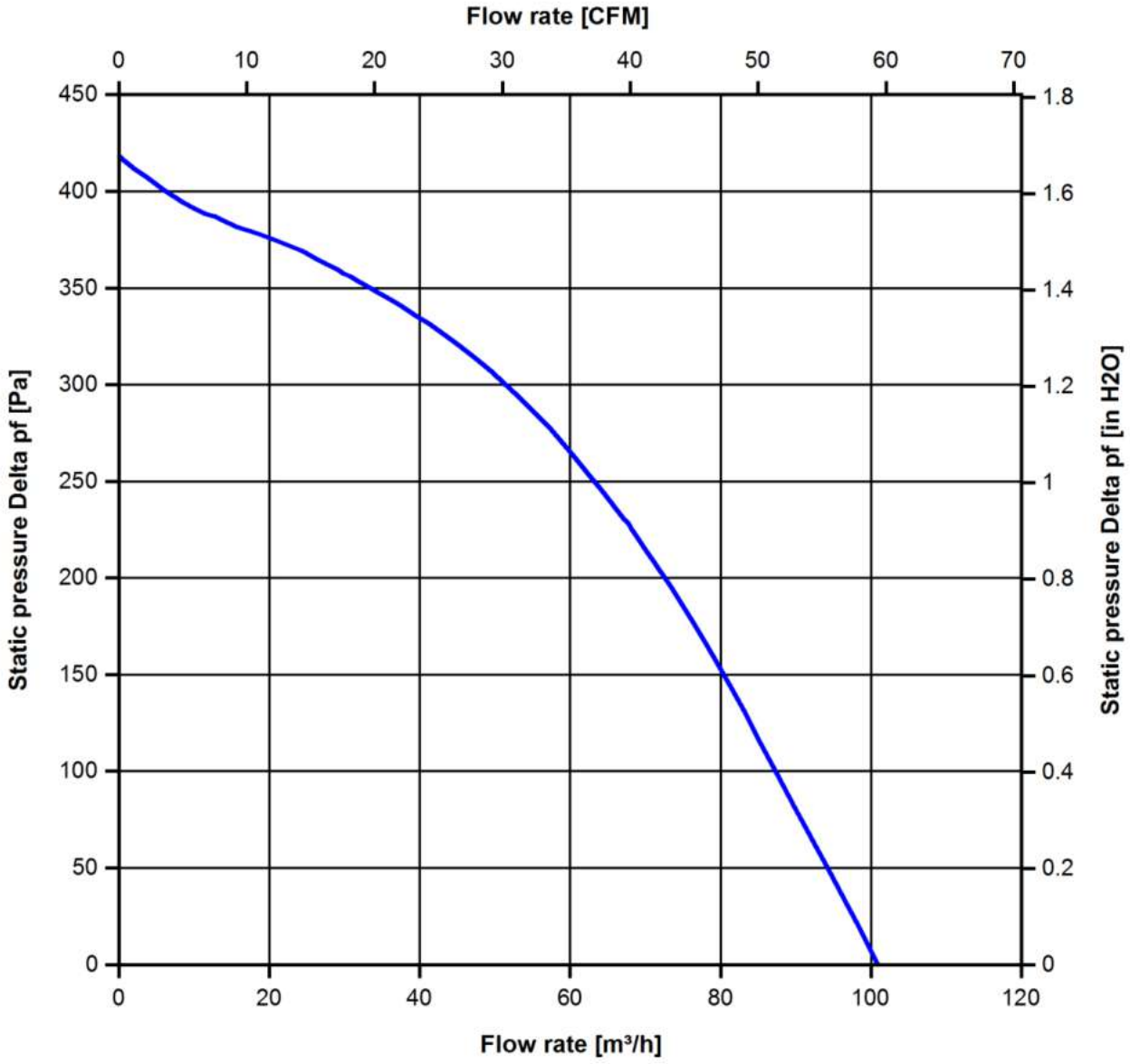
3.4 Aerodynamics

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.

a.) Operation condition:

6.400 1/min at free air flow

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	101,0 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	420 Pa	



3.5 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:

6.400 1/min at free air flow

Optimal operating point	62,0 m3/h @ 230 Pa	
Sound power level at the optimal operating point	6,8 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 °C	
Max. permitted ambient temperature TU max.	60 °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	

Permitted 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.

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

4.3 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	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

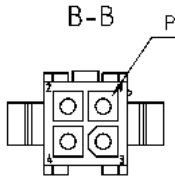
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	Yes / C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	Not applicable

6 Reliability

6.1 General

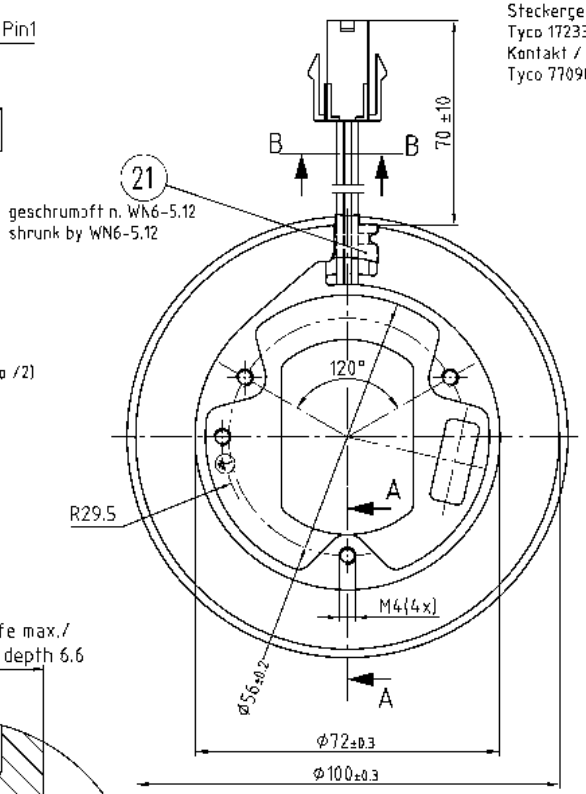
Life expectancy L10 at TU = 40 °C	67.500 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	115.000 h	

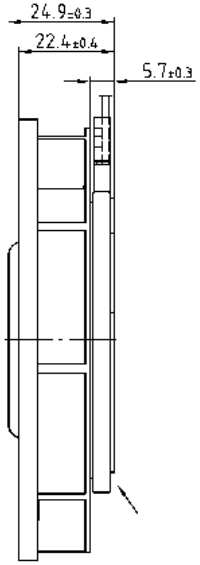
Schutzvermerk nach DIN 34 beachten
Protection note observed



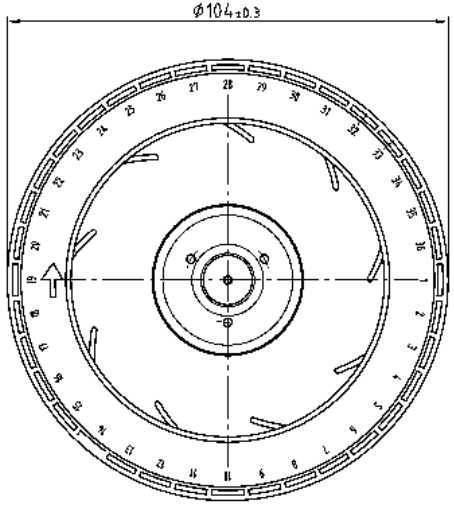
Steckerbelegung/
pin assignment
Pin1:
Pin2: blau / blue (Gnd-)
Pin3: rot / red (Ub +)
Pin4: weiss / white (Tacho /2)

Steckergehäuse / plug housing:
Tyco 172330-*
Kontakt / contact:
Tyco 770901-*

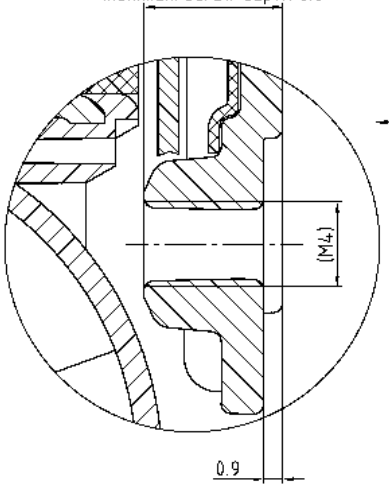




Flanschseite
flang side



A-A
M51 Einschraubtiefe max./
maximum screw depth 6.6



Axialspiel bei / Axial play
- Kugellagerung / bearings (K): 0 (mit Federausgleich / with spring-loaded)

			ebmpapst	Werkstoff/Material:	Volumen/Volume [cm³]
SAP-Status/Stade	Änd.-Nr./Change-Nr.	Art/CAD-Symbol-Version	CAD-Umgebung/ CAD Environment		Gewicht/Mass [g]
		Datum/Date	Name/Name		
		Bearb./ Drawn		Artikel/Title	
Toleranzen/Tolerances:		Gepr./ Checked			
Allgemeintoleranz/Gen. tolerance		Freig./ Released			
ebmpapst				Zeichn.-Nr./Drawing-No.	Ers. f. Zchg./Replaces
ebm-papst St. Georgen GmbH & Co. KG				Dokumentart/Type of Document / Kundenauftrag/Order No./Projekt	Format/Size / Blattzahl/Sheet