

Product Data Sheet #DV6424/2TDP-815

ebm**papst**

The engineer's choice



#DV6424/2TDP-815

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1 General

Fan type	Mixed-flow fan	
Rotating direction looking at rotor	Counterclockwise	
Airflow direction	Air outlet over struts	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

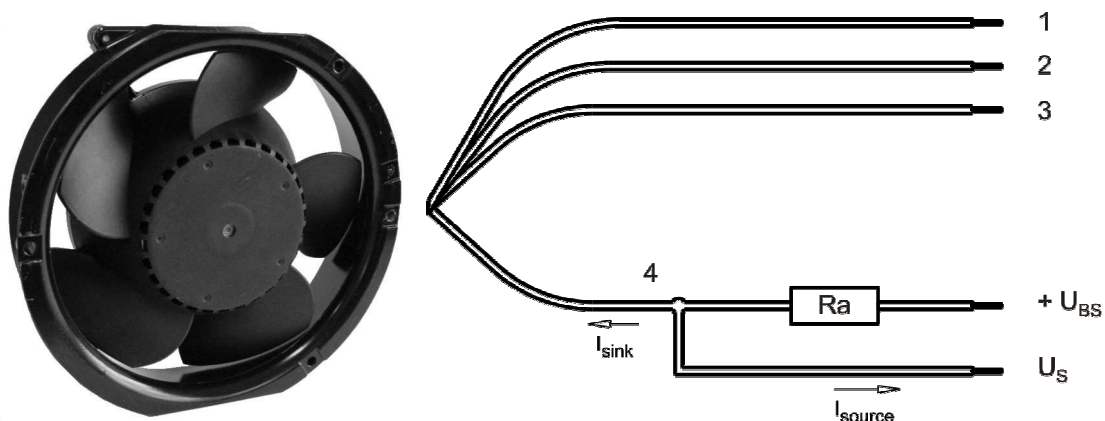
2 Mechanics

2.1 General

Width	160,0 mm	
Depth	51,0 mm	
Diameter	172,0 mm	
Mass	0,770 kg	
Housing material	Metal	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Lead wire length	L = 365 mm	
Tolerance	+/- 10,0 mm	
Tube length	S = 15 mm	
Tolerance	+/- 5,0 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	PWM	AWG 22	1,7 mm
4	white	Tacho	AWG 22	1,7 mm

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

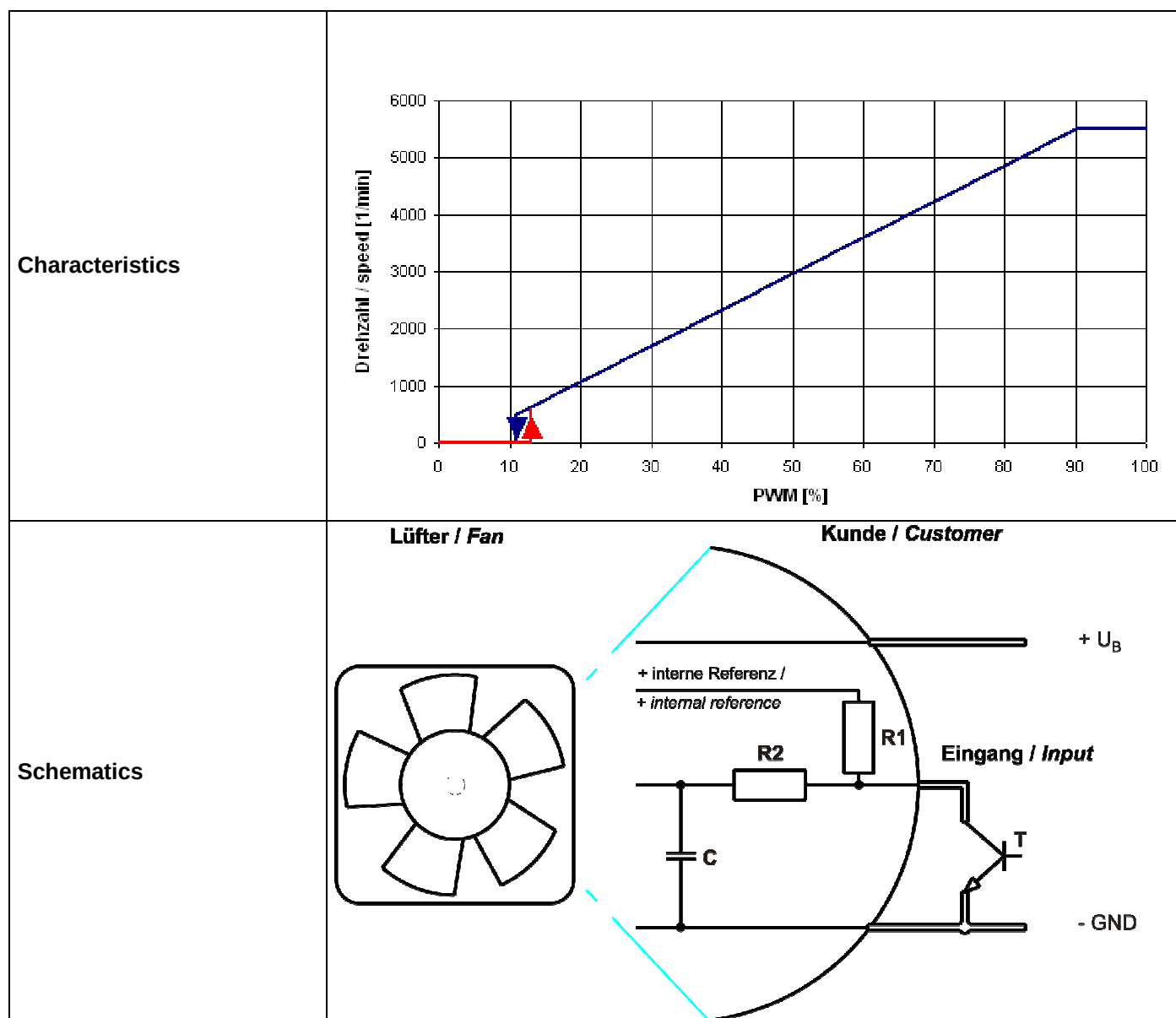
3 Operating Data

3.1 Electrical Interface - Input

Control input	PWM
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Features

Input type	Open collector	
PWM - Frequency		typical: 2 kHz



Speed control:

0...100 % PWM; open collector in relation to signal-ground
 $f = 2 \text{ kHz} \pm 20\%$

Information to the fan speed curve:

0% - ≤12% PWM:	0 1/min
13% PWM:	600 1/min (Fan on, coming from 0% PWM)
13% - 90% PWM:	linear increasing curve
90% - 100% PWM:	5.500 1/min (corresponding to max. fan speed)
11% PWM:	500 1/min (Fan off, coming from 100% PWM)

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.

$\Delta p = 0$: corresp. to free air flow (see chapter aerodynamics)
 I: corresp. to arithm. mean current value

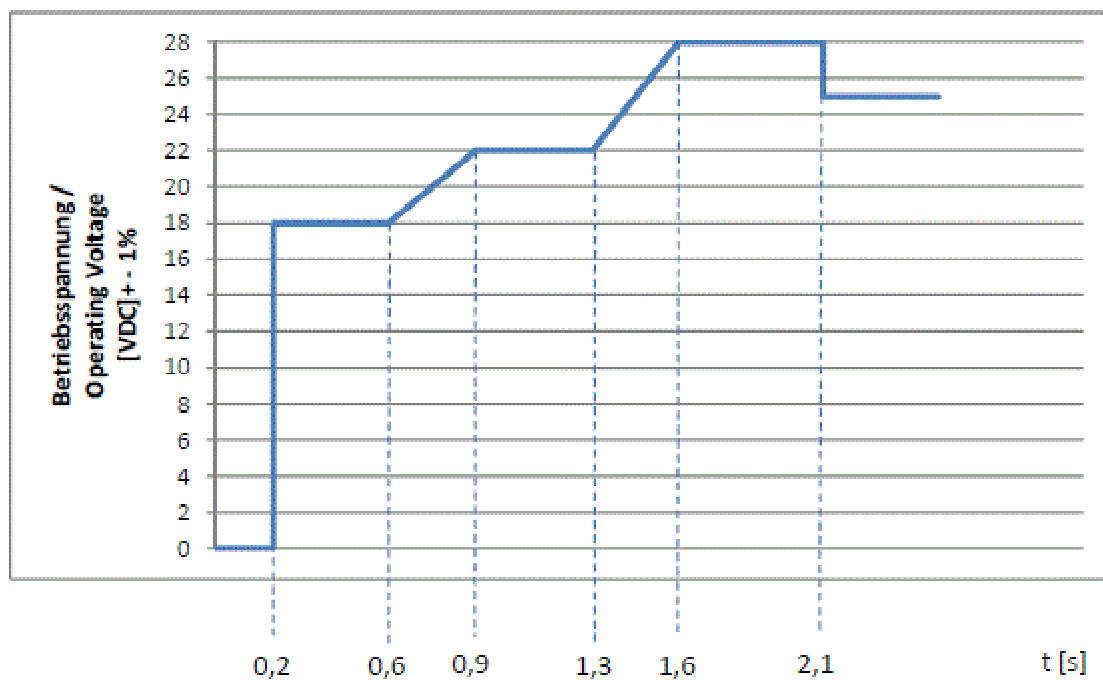
Name	Condition
PWM 0001	PWM: > 90 %; f: 2 kHz

Features	Condition	Symbol	Values		
Voltage range		U	16 V		28,0 V
Nominal voltage		U _N		24,0 V	
Power consumption	$\Delta p = 0$	P	41,1 W	89 W	97,4 W
Tolerance	PWM 0010		+/- 12,5 %	+/- 10,0 %	+/- 12,5 %
Current consumption	$\Delta p = 0$	I	2.570 mA	3.700 mA	3.480 mA
Tolerance	PWM 0010		+/- 12,5 %	+/- 10,0 %	+/- 12,5 %
Speed	$\Delta p = 0$	n	4.200 1/min	5.550 1/min	5.550 1/min
Tolerance	PWM 0010		+/- 10,0 %	+/- 7,5 %	+/- 7,5 %

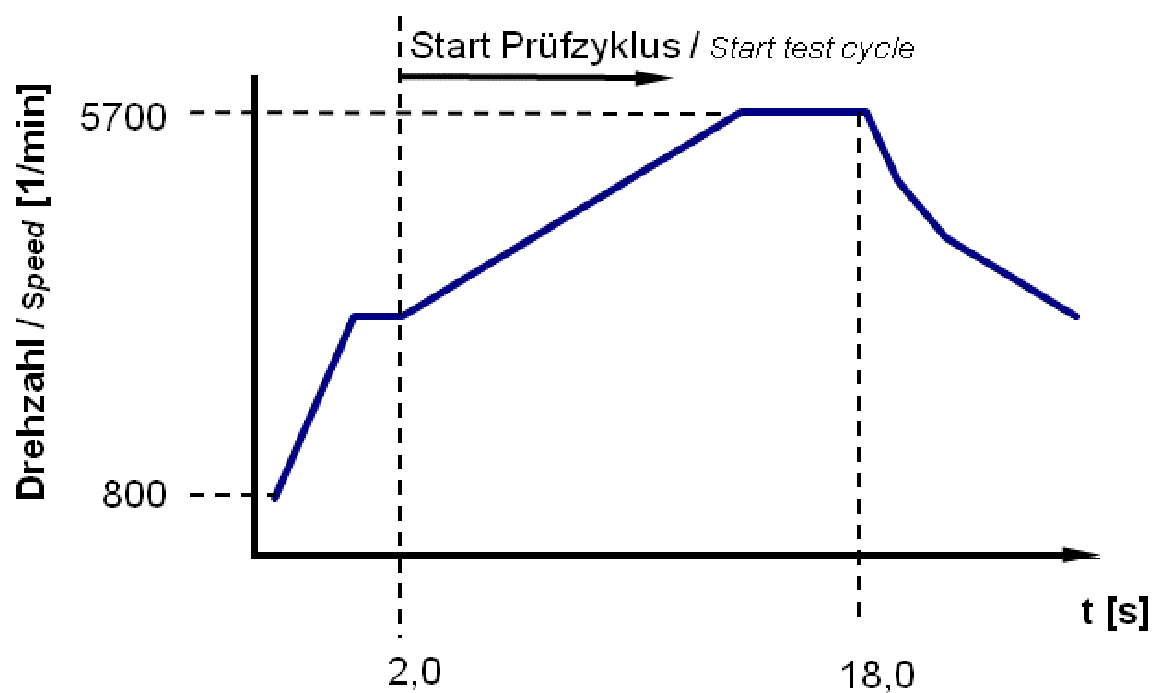
Motor testing

The motor testing relates to a fan, operating with horizontal shaft, at free air flow. It is possible to run this motor in an uncontrolled state. For some testings the motor may set in a test cycle by connecting to a voltage follower as below mentioned.

Voltage graph to start the test cycle



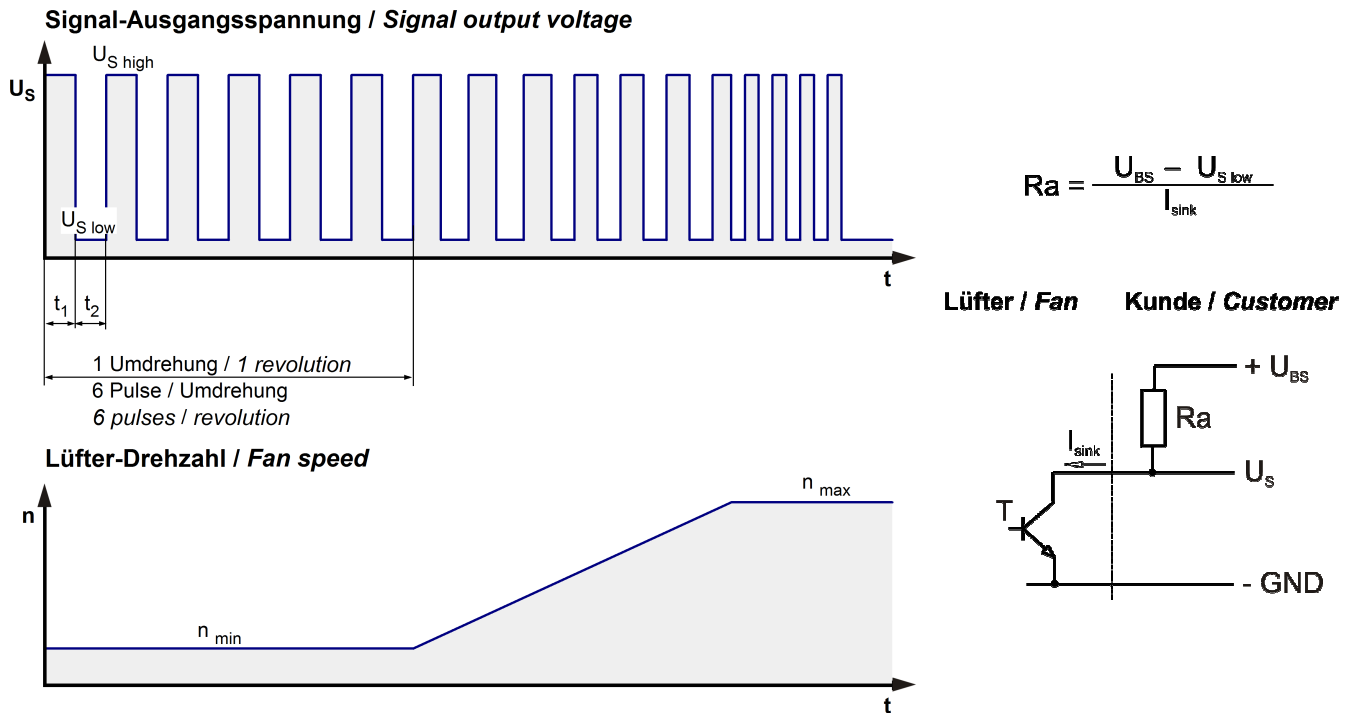
Speed graph after starting the test cycle



Voltage	25,0 V
Power consumption	105 W
Tolerance	+ - 15,0 %
Current consumption	4.200 mA
Tolerance	+ - 15,0 %
Speed	5.700 1/min
Tolerance	+ - 7,5 %

3.3 Electrical Interface - Output

Tacho type	/2 (open collector)
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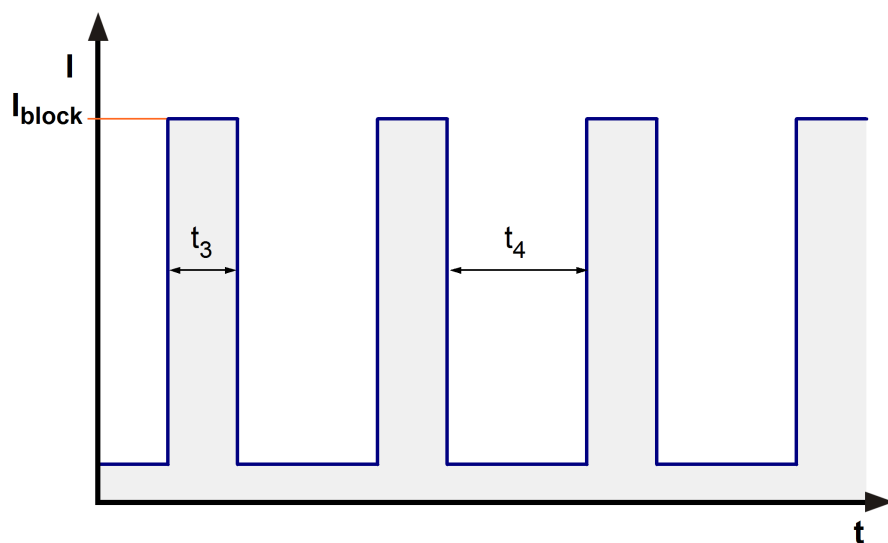


Features	Note	Values
Tacho operating voltage	U_{BS}	Min.: 4 V Max.: 40 V
Tacho signal Low	$U_{S\ low}$	$I_{sink}: 2\text{ mA}$ $\leq 0,4\text{ V}$
Tacho signal High	$U_{S\ high}$	$I_{source}: 0\text{ mA}$ 40 V
Maximum sink current	I_{sink}	$\leq 20\text{ mA}$
External resistor	External resistor R_a from UBS to US required. All voltages measured to GND.	
Tacho frequency	$(6 \times n) / 60$	
Tacho isolated from motor	No	
Slew rate		$\geq 0,5\text{ V/us}$

n = revolutions per minute (1/min)

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at U_N		
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block}	
Clock signal at locked rotor	t_3 / t_4 typical: 1 s / 3,1 s	



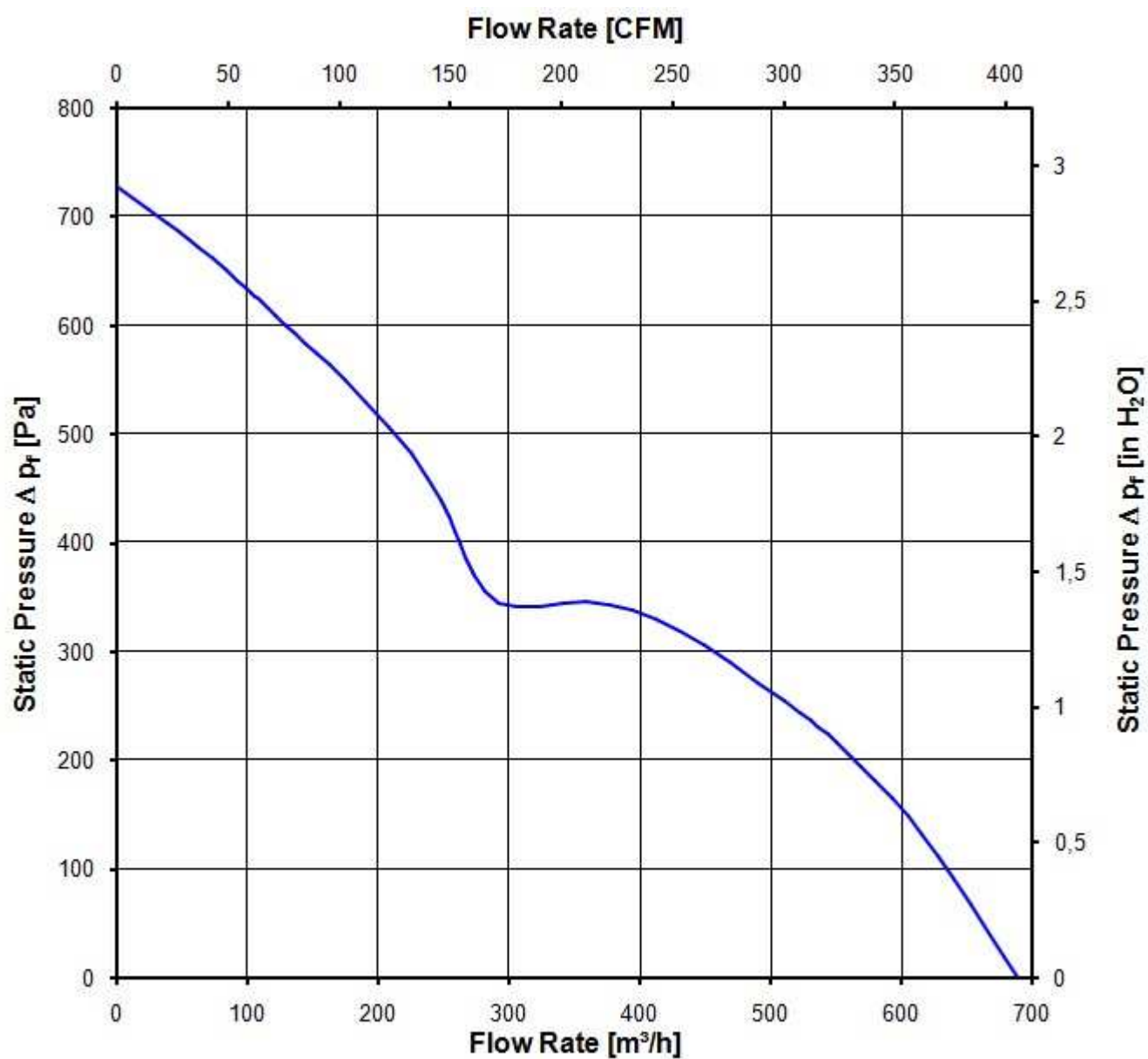
3.5 Aerodynamics

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.

a.) Operation condition:

5.550 1/min at free air flow	PWM > 90 %; f: 2 kHz		
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Max. free-air flow ($\Delta p = 0$ / $\dot{V} = \max.$)	690,0 m ³ /h	
Max. static pressure ($\Delta p = \max.$ / $\dot{V} = 0$)	730 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 $L_p(A) < 5 \text{ dB(A)}$
 For further measurement conditions see chapter aerodynamics.

a.) Operation condition:

5.550 1/min at free air flow	PWM > 90 %; f: 2 kHz		
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Optimal operating point	460,0 m ³ /h @ 266 Pa	
Sound power level at the optimal operating point	8,0 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	74,0 dB(A)	

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.

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	65.000 h	
Life expectancy L10 at TU max.	40.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	110.000 h	

