

Product Data Sheet 6318/2TDH4P-007

ebmpapst

The engineer's choice



6318/2TDH4P-007

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1 General

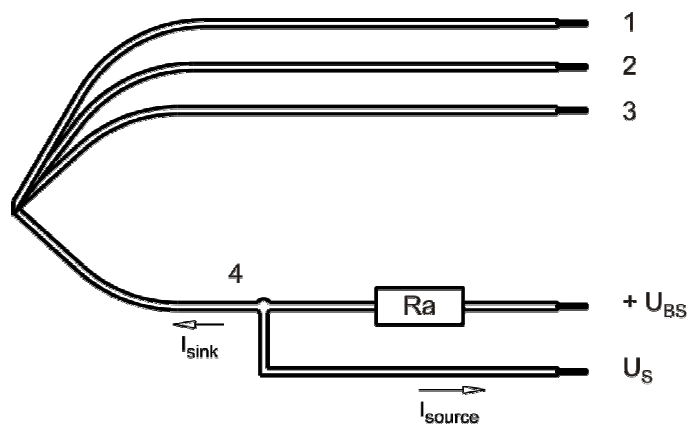
| | | |
|-------------------------------------|------------------------|--|
| Fan type | Fan | |
| Rotating direction looking at rotor | Counterclockwise | |
| Airflow direction | Air outlet over struts | |
| Bearing system | Ball bearing | |
| Mounting position - shaft | Any | |

2 Mechanics**2.1 General**

| | | |
|---|--|--|
| Width | 160,0 mm | |
| Depth | 51,0 mm | |
| Diameter | 172,0 mm | |
| Mass | 0,875 kg | |
| Housing material | Metal | |
| Impeller material | Plastic | |
| Max. torque when mounted across both mounting flanges Screw size | Wire outlet corner: 600 Ncm Remaining corners: 600 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer | |

2.2 Connections

| | | |
|-----------------------|-------------|--|
| Electrical connection | Wires | |
| Lead wire length | L = 365 mm | |
| Tolerance | + - 10,0 mm | |
| Tube length | S = 10 mm | |
| Tolerance | + - 2,0 mm | |



| Wire | Color | Operation | Wire size | Insulation diameter |
|------|--------|-----------|-----------|---------------------|
| 1 | red | + UB | AWG 18 | 2,2 mm |
| 2 | blue | - GND | AWG 18 | 2,2 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.

Lead wire 1 - 2: AWG18 (Insulation diameter 2,20 mm)
 Lead wire 3 - 4: AWG22 (Insulation diameter 1,70 mm)

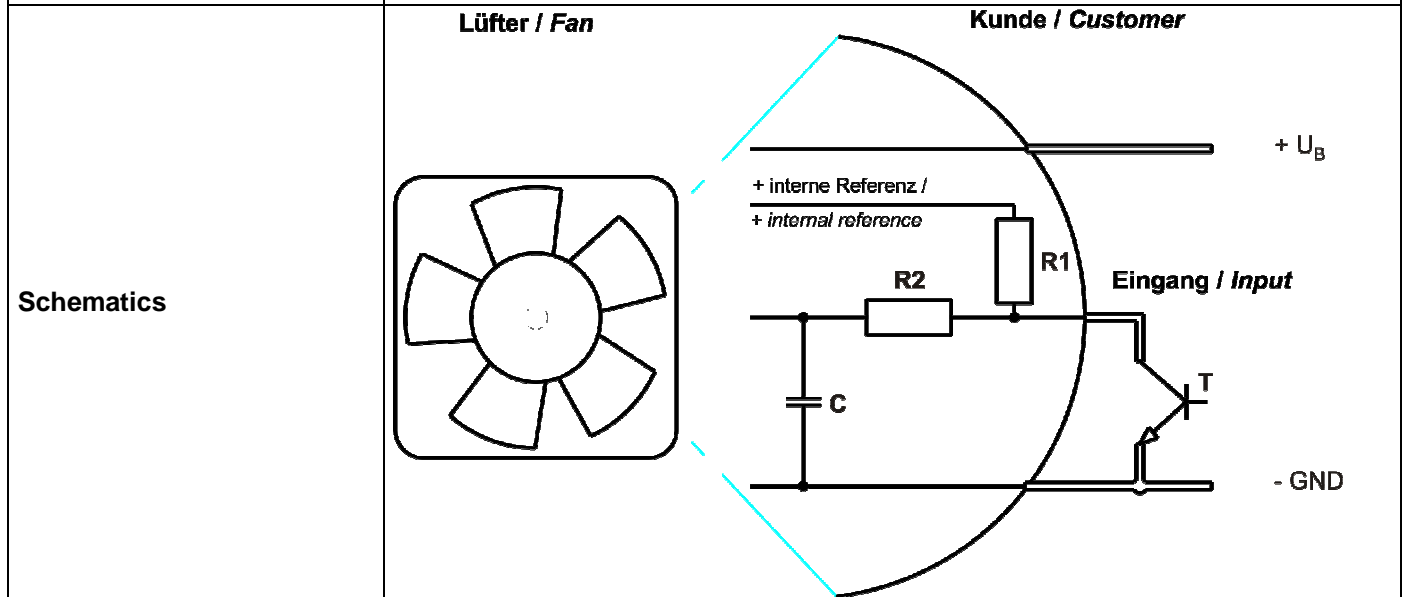
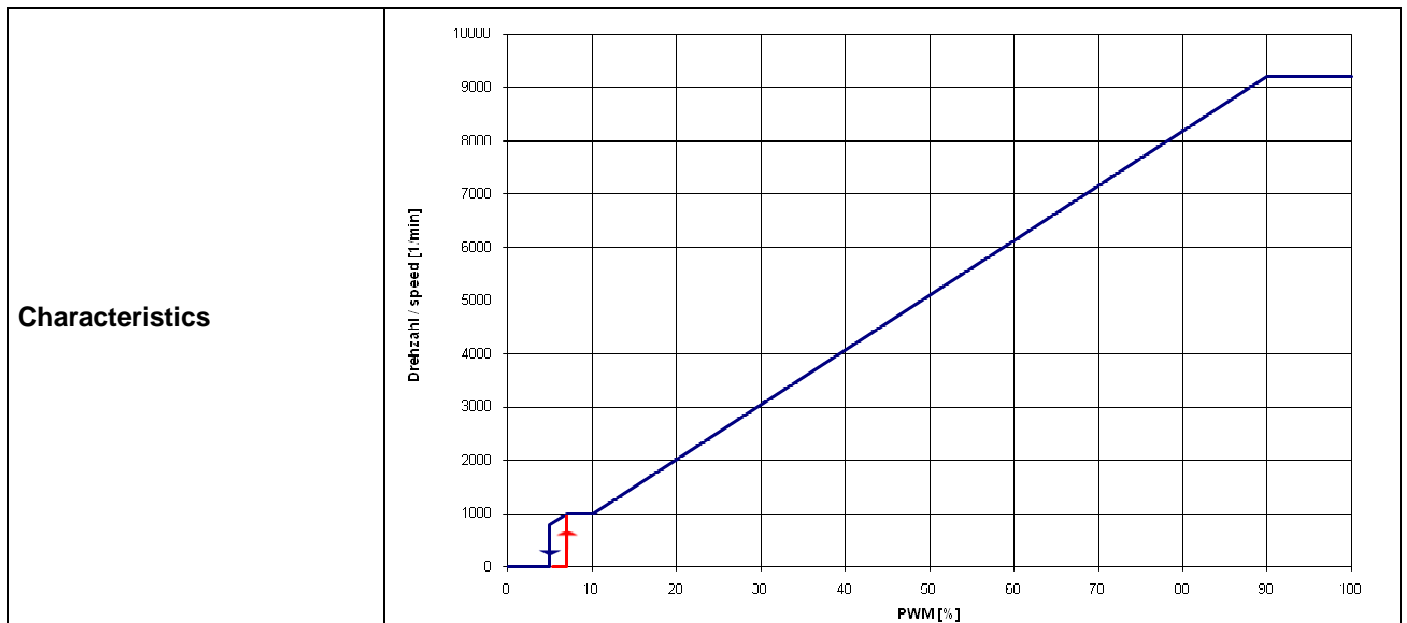
3 Operating Data

3.1 Electrical Interface - Input

| | |
|---------------|-----|
| Control input | PWM |
|---------------|-----|

Features

| | | |
|-----------------|----------------|----------------------------------|
| Input type | Open collector | |
| PWM - Frequency | | 1 kHz - 20 kHz typical: 2 kHz |



The shown pull-up resistor to the internal reference voltage (+5V) has 4.7kOhm.

Information to the curve:

- 0% - <=7% PWM: 0 1/min (Fan off)
- 7% PWM: 1.000 1/min (Start-up, comming from 0% PWM)

7% - 10 % PWM: 1.000 1/min (corresp. to min fan speed)
 10% - 90% PWM: Linear increasing curve
 90% - 100% PWM: 9.200 1/min (corresp. to max fan speed)
 5% PWM: 800 1/min or 0 1/min (Fan turns off, coming from 100% PWM)

Transistor Requirements:

VCE max. >= 12V
 Isink max > 5mA
 VCEsat < 0,15V

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: 95 %; f: 2 kHz |

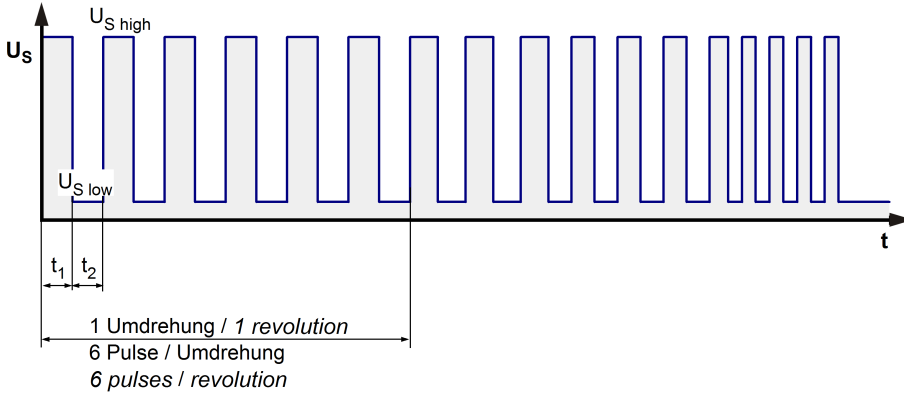
>90% PWM; f = 2 kHz or broken lead wire (open control input)

| Features | Condition | Symbol | Values | | |
|---------------------|----------------|----------------|-------------|-------------|-------------|
| Voltage range | | U | 36 V | | 72 V |
| Nominal voltage | | U _N | | 48 V | |
| Power consumption | $\Delta p = 0$ | P | 115 W | 150 W | 160 W |
| Tolerance | PWM 0010 | | +/- 10 % | +/- 10 % | +/- 10 % |
| Current consumption | $\Delta p = 0$ | I | 3.200 mA | 3.100 mA | 2.200 mA |
| Tolerance | PWM 0010 | | +/- 10 % | +/- 10 % | +/- 10 % |
| Speed | $\Delta p = 0$ | n | 8.500 1/min | 9.200 1/min | 9.200 1/min |
| Tolerance | PWM 0010 | | +/- 7,5 % | +/- 5 % | +/- 5 % |

3.3 Electrical Interface - Output

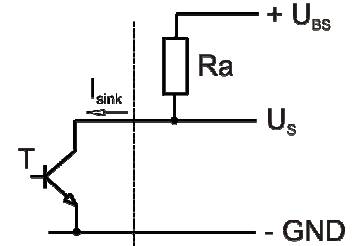
| | |
|------------|---------------------|
| Tacho type | /2 (open collector) |
|------------|---------------------|

Signal-Ausgangsspannung / Signal output voltage

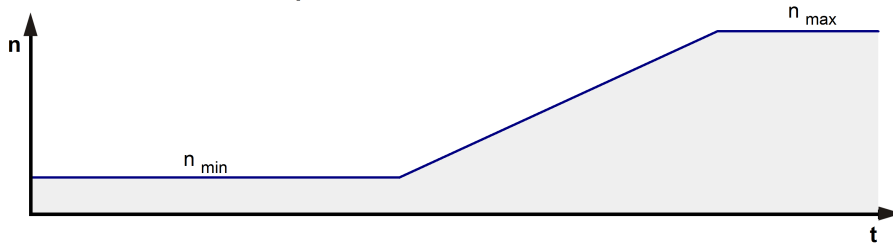


$$R_a = \frac{U_{BS} - U_{S\ low}}{I_{sink}}$$

Lüfter / Fan Kunde / Customer



Lüfter-Drehzahl / Fan speed

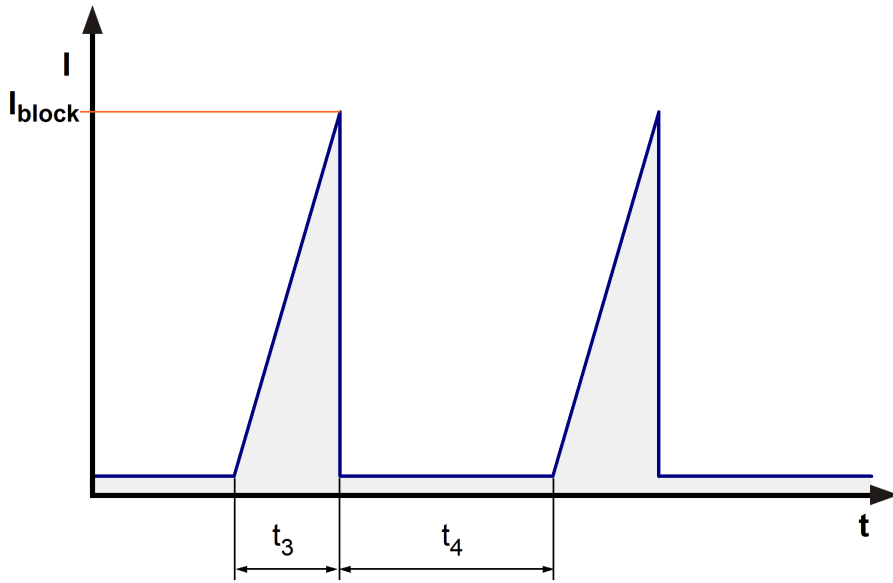


| Features | Note | Values |
|---------------------------|--|-------------------------------|
| Tacho operating voltage | U_{BS} | $\leq 60\text{ V}$ |
| Tacho signal Low | $U_{S\ low}$ | $\leq 0,4\text{ V}$ |
| Tacho signal High | $U_{S\ high}$ | $60,0\text{ V}$ |
| Maximum sink current | I_{sink} |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

n = revolutions per minute (1/min)

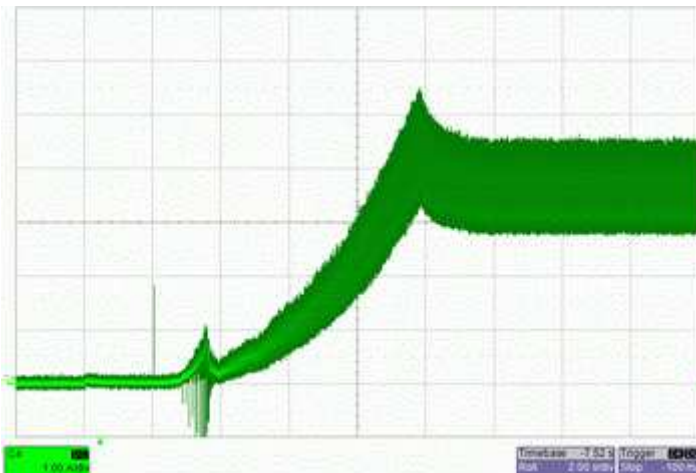
3.4 Electrical Features

| | | |
|--------------------------------|---|--|
| Electronic function | Speed-Controlled | |
| Reversed polarity protection | P-CH FET | |
| Max. residual current at U_N | $I_F \leq 5\text{ mA}$ | |
| Locked rotor protection | Auto restart | |
| Locked rotor current at U_N | I_{block} | |
| Clock signal at locked rotor | t_3 / t_4 typical: $1,5\text{ s} / 10,0\text{ s}$ | |

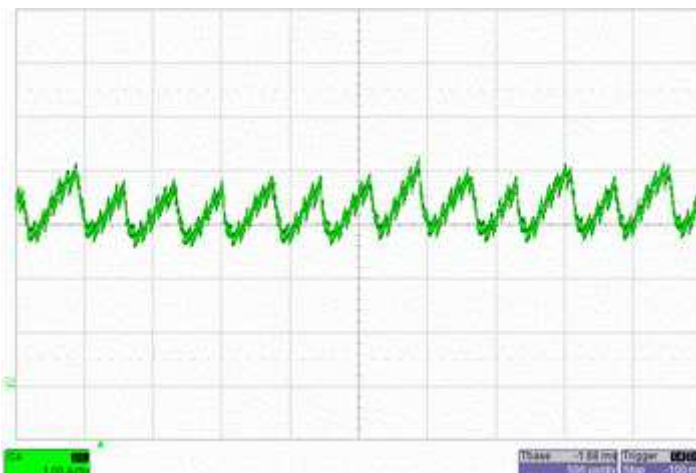


First locked rotor off time is reduced to 3 seconds.

This fan has a startup delay of 2 seconds after applying supply voltage.



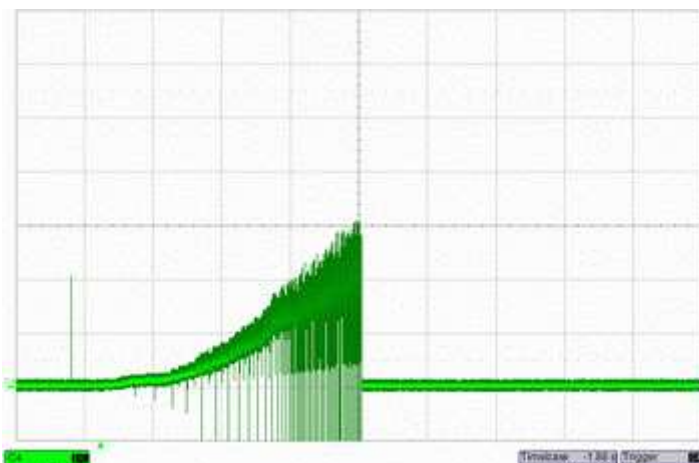
Start-up current @ 48 V (I = 1A/div ; t = 2s/div)



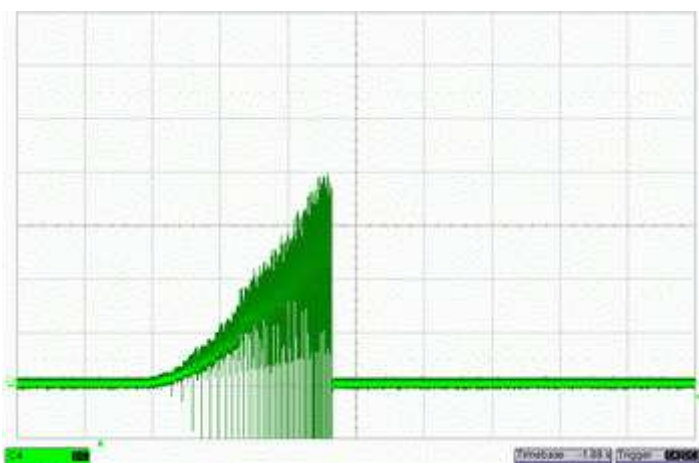
Running current @ 48 V (I = 1A/div ; t = 500us/div)



Locked rotor current @ 48 V (I = 500mA/div ; t = 500ms/div)



Locked rotor current @ 36 V (I = 500mA/div ; t = 500ms/div)



Locked rotor current @ 72 V (I = 500mA/div ; t = 500ms/div)

Internal Fuse:

Littelfuse Nano2 Fuse
Very Fast-Acting 451/453 Series

10A / 125V

3.5 Data According ErP Directive

| | |
|------------------------------------|-------------|
| Installation / Efficiency category | A / static |
| Speed control | integrated |
| Specific ratio | 1,00569 |
| Target overall efficiency 2015 | 29,8 % |
| Overall efficiency | 42,9 % |
| Efficiency grade | 40 |
| Power input | 245 W |
| Speed | 9.360 1/min |

All values measured in optimum energy efficiency point.

Productiondatecode is printed on the fan label.

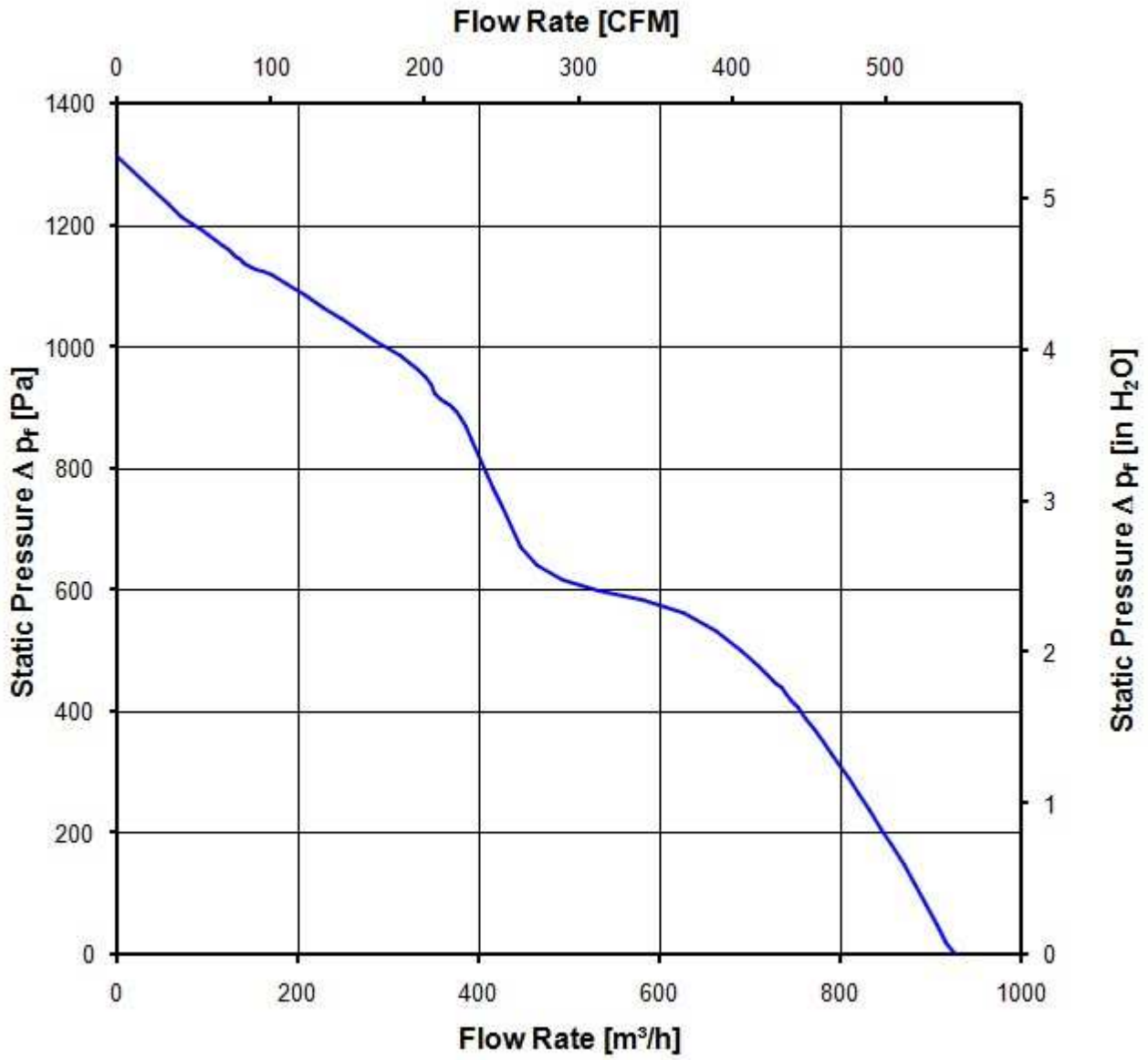
3.6 Aerodynamics

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.

a.) Operation condition:

| | | | |
|------------------------------|--------------------|--|--|
| 9.200 1/min at free air flow | PWM 95 %; f: 2 kHz | | |
|------------------------------|--------------------|--|--|

| | | |
|---|-------------------------|--|
| Max. free-air flow ($\Delta p = 0 / \dot{V} = \text{max.}$) | 930,0 m ³ /h | |
| Max. static pressure ($\Delta p = \text{max.} / \dot{V} = 0$) | 1.310 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 $L_p(A) < 5 \text{ dB(A)}$
 For further measurement conditions see chapter aerodynamics.

a.) Operation condition:

| | | | |
|------------------------------|--------------------|--|--|
| 9.200 1/min at free air flow | PWM 95 %; f: 2 kHz | | |
|------------------------------|--------------------|--|--|

| | | |
|---|--------------------|--|
| Optimal operating point | 910,0 m3/h @ 34 Pa | |
| Sound power level at the optimal operating point | 8,6 bel(A) | |
| Sound pressure level at free air flow, measured in rubber bands | 75,0 dB(A) | |

4 Environment

4.1 General

| | | |
|--|--------|--|
| Min. permitted ambient temperature TU min. | -20 °C | |
| Max. permitted ambient temperature TU max. | 75 °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. | 1000 VAC / 1 Min. | |
| B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground. | 1700 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 / 1,5 mm | |
| Protection class | I | |

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 | Yes / GB 12350 Safety Requirements for small Power Motors |

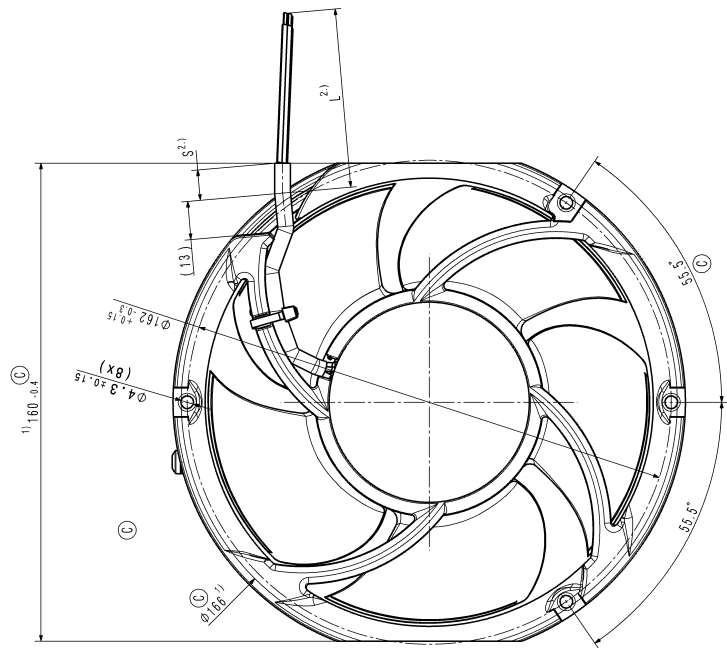
The approval tests are observed to:

U approval max.: 72,0 V @ TU approval max.: 75,0 °C

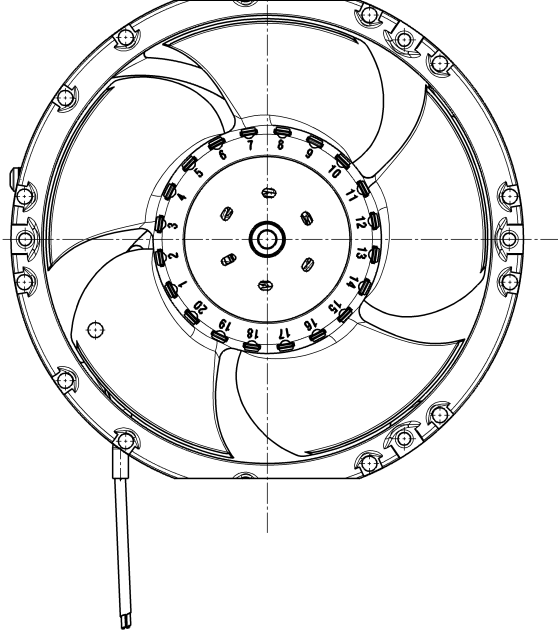
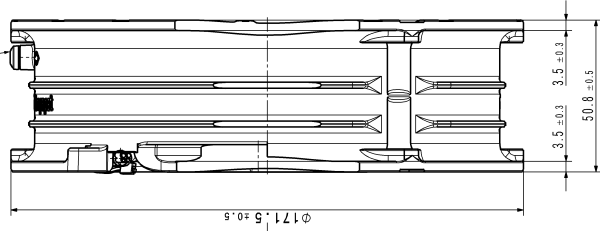
6 Reliability

6.1 General

| | | |
|--|-----------|--|
| Life expectancy L10 at TU = 40 °C | 52.500 h | |
| Life expectancy L10 at TU max. | 20.000 h | |
| Life expectancy L10 acc. to IPC 9591 at TU = 40 °C | 87.5 00 h | |



3.) Schraube: Duo-Tapfitte gemäß /
Screw: Duo-Tapfitte according to
DIN 7500; CM4x8; Torx



1.) Maße für Montageausschnitt. / Dimensions for assembly wall.
2.) Anzahl und Länge von Litzen u. Schlauch siehe Produktspezifikation. /
Length and number of wires and tube see product specification.
3.) Nur wenn in Stückliste enthalten. / Only it is included in bill of material.
- Axialspiel der Kugellager mit Feder spielfrei verspannt. /
Ball bearing without clearance by a preload spring.

| | | | | | | | | | | | | | | | | | | | |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| SP-Produktion | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. | Gepl. Nr. |
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Zeichnung entspricht 3D-Modell:
Drawing is equivalent to 3D-Model:
99542007_CPR_000_ .
SYSTEM: CATIA V5 R 19