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**Special features according to QMH 2-5.4.7 and company standard 1-23.00 have the following definitions:**

**"A"** : Product features or process parameters which influence the safety of a product or the compliance of legal requirements. (Must not necessary verified and documented 100%. Standards and legal requirements must be considered.)

**"FK"** : Product features or process parameters which influence the fit and function of a product or which have to be controlled or documented for some other reasons (e.g. Customer requirements).



## 1 General

Fan type	Fan	
Rotational direction looking at rotor	clockwise	FK
Airflow direction	Air outlet over struts	FK
Bearing system	Ball bearing	
Lubrication	see sectional drawing of the bearing	
Mounting position	any	
Tolerance		
Balancing grade	16,0	FK
Impeller weight	94,0 g	

## 2 Mechanics

### 2.1 General

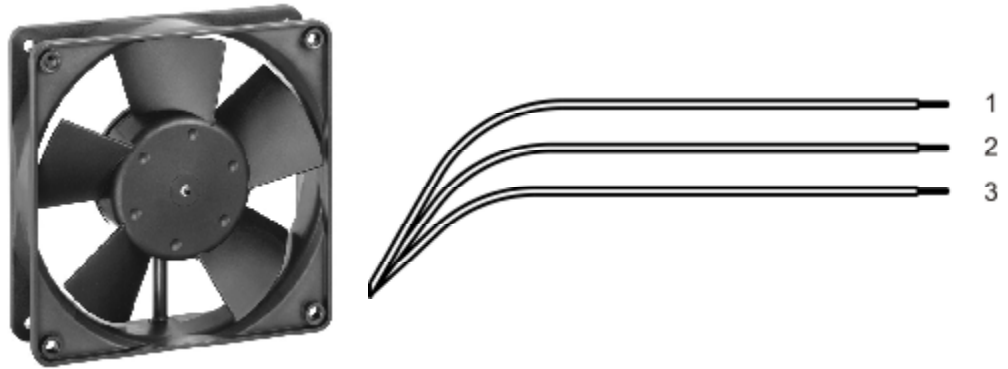
Width	119,0 mm	
Height	119,0 mm	
Depth	32,0 mm	
Diameter	0,0 mm	
Weight	0,200 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 20 Ncm remaining corners: 20 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

### 2.2 Motor

Type of motor	Electronically commutated external rotor	
Diameter of the motor	43,0 mm	
Height of the motor	5,0 mm	
Number of phases	1	
Number of windings	2	
Operating mode	Continuous duty	
Insulation material class	E	

### 2.3 Connections

Electrical connection	Wires	
Length of lead wire	310 mm	
Tolerance		+/- 10,0 mm
Length of tube		
Tolerance		
Wire gauge (AWG)	24	
Insulation diameter	1,55 mm	
Plug	see drawing	
Contact	see drawing	



	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	NTC:

### 3 Operating Data

#### 3.1 Operating Data - Electrical Interface - Input

Control input	cExternal Temperature Sensor
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#### Features

<p><b>Characteristics</b></p>	<table border="1"> <caption>Graph Data: Drehzahl / speed [r/min] vs Umgebungstemperatur / Ambient temperature [°C]</caption> <thead> <tr> <th>Umgebungstemperatur [°C]</th> <th>Drehzahl / speed [r/min]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>1100</td></tr> <tr><td>-10</td><td>1100</td></tr> <tr><td>0</td><td>1100</td></tr> <tr><td>10</td><td>1100</td></tr> <tr><td>20</td><td>1100</td></tr> <tr><td>25</td><td>1100</td></tr> <tr><td>30</td><td>1300</td></tr> <tr><td>40</td><td>1800</td></tr> <tr><td>50</td><td>2300</td></tr> <tr><td>60</td><td>2300</td></tr> </tbody> </table>	Umgebungstemperatur [°C]	Drehzahl / speed [r/min]	-20	1100	-10	1100	0	1100	10	1100	20	1100	25	1100	30	1300	40	1800	50	2300	60	2300
Umgebungstemperatur [°C]	Drehzahl / speed [r/min]																						
-20	1100																						
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40	1800																						
50	2300																						
60	2300																						
<p><b>Schematics</b></p>	<p>The schematic shows the electrical connection between the fan (Lüfter / Fan) and the customer's (Kunde / Customer) control circuit. The fan's input is connected to a network consisting of a resistor, a capacitor, and an NTC thermistor. The NTC is connected to the input terminal (Eingang / Input) and ground (- GND). The circuit is powered by + UB and includes an internal reference voltage (+ Interne Ref. / + Internal ref.) and a resistor.</p>																						

### 3.2 Electrical Operating Data

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

$\Delta p = 0$ : corresp. to free air flow (see section 3.5)

I: corresp. to arithm. mean current value

Name	Condition		
TU 0001	TU: $\geq 50$ °C		
NTC 0001	NTC: $\leq 34$ kOhm		

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	8,0 V		15,0 V
Nominal voltage	$\Delta p = 0$	$U_N$		12,0 V	
Power consumption	$\Delta p = 0$	P	1,3 W +/- 25,0 %	3,3 W +/- 25,0 %	5,6 W +/- 25,0 %
Tolerance	TU / NTC: 0001				
Current consumption	$\Delta p = 0$	I	160 mA +/- 25,0 %	275 mA*) +/- 25,0 %	370 mA +/- 25,0 %
Tolerance	TU / NTC: 0001				
Speed	$\Delta p = 0$	n	1.500 1/min +/- 15,0 %	2.300 1/min*) +/- 15,0 %	2.800 1/min +/- 15,0 %
Tolerance	TU / NTC: 0001				
Starting current consumption				1.200 mA	

Name	Condition		
TU 0002	TU: $\leq 25$ °C		
NTC 0002	NTC: $\geq 100$ kOhm		

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	8,0 V		15,0 V
Nominal voltage	$\Delta p = 0$	$U_N$		12,0 V	
Power consumption	$\Delta p = 0$	P	0,65 W +/- 25,0 %	1,1 W +/- 25,0 %	1,4 W +/- 25,0 %
Tolerance	TU / NTC: 0002				
Current consumption	$\Delta p = 0$	I	80 mA +/- 25,0 %	90 mA*) +/- 25,0 %	95 mA +/- 25,0 %
Tolerance	TU / NTC: 0002				
Speed	$\Delta p = 0$	n	1.100 1/min +/- 15,0 %	1.100 1/min*) +/- 15,0 %	1.100 1/min +/- 15,0 %
Tolerance	TU / NTC: 0002				

\*) Attention: Marked values are "FK" features

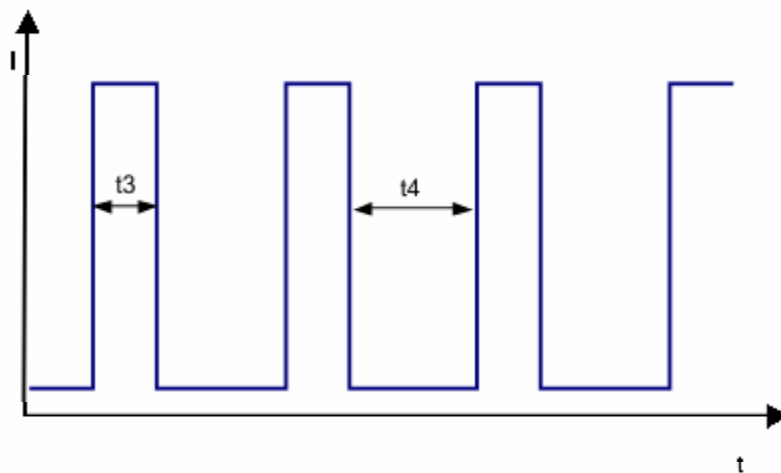
### 3.3 Operating Data - Electrical Interface -Output

Tacho type	None
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Alarm type	None
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### 3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Polarity protected diode	<b>A</b>
Max. residual current at Un	IF ≤ 10 mA	
Locked rotor protection	Electronically restart	<b>A</b>
Locked rotor current at Un	approx. 1.200 mA	
Clock signal t3/t4 at locked rotor	Typical: 1,0 s / 10 s	



### 3.5 Aerodynamic

Measurement conditions: Measured with a double chamber intake rig acc. to DIN 24163 Part 3.  
 Normal air density = 1,2 kg/m<sup>3</sup>; Temperature 23°C +/- 3°C;  
 In the intake and outlet area there may not be any solid obstruction within 0,5 m.

a.) Operation condition:



2.300 1/min at free air flow	TU $\geq$ 50 °C NTC: $\leq$ 34 kOhm		
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Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	138,0 m <sup>3</sup> /h	<b>FK</b>
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	50 Pa	<b>FK</b>

b.) Operation condition:

1.100 1/min at free air flow	TU $\leq$ 25 °C NTC: $\geq$ 100 kOhm		
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Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	65,0 m <sup>3</sup> /h	
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	15 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 section 3.5

a.) Operation condition:

2.300 1/min at free air flow	TU $\geq$ 50 °C NTC: $\leq$ 34 kOhm		
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Optimal operating point	118,0 m <sup>3</sup> /h @ 9 Pa	
Sound power level at the optimal operating point	5,3 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	39,0 dB(A)	

b.) Operation condition

1.100 1/min at free air flow	TU $\leq$ 25 °C NTC: $\geq$ 100 kOhm		
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Optimal operating point	65,0 m <sup>3</sup> /h @ 0 Pa	
Sound power level at the optimal operating point	3,9 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	25,0 dB(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\*)

\*) Permitted application area:

The product is for the use in sheltered rooms with controlled temperature and controlled humidity. Directly exposure to water must be avoided.

#### 4.3 Mechanical requirements

not specified

#### 4.4 EMC

not specified

### 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.	A
Insulation 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	
Air and leakage distances	1,0 mm / 1,2 mm	
Protection class	III	

#### 5.2 Approval Tests

CE	Yes
UL	No
VDE	No
CSA	No
CCC	No

The approval tests are observed to:

Maximal permitted operating voltage (see section 3.1) and max. permitted ambient temperature TU max.

### 6 Reliability

#### 6.1 General

Life expectancy L10 at TU = 20 °C		
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Life expectancy L10 at TU = 40 °C	70.000 hrs	
Life expectancy L10 at TU = 60 °C		
Life expectancy L10 at TU max.	40.000 hrs	
Life expectancy L15 at TU = 45 °C		
Life expectancy L10 Delta (40 °C)	142.500 hrs	

## 6.2 Additional Data

not specified