

# 4418/2 HHP

Version: 1.

## INDEX

<b>1</b>	<b>General .....</b>	<b>2</b>
<b>2</b>	<b>Mechanics .....</b>	<b>2</b>
2.1	GENERAL .....	2
2.2	MOTOR .....	2
2.3	CONNECTIONS.....	3
<b>3</b>	<b>Operating Data.....</b>	<b>4</b>
3.1	OPERATING DATA - ELECTRICAL INTERFACE - INPUT .....	4
3.2	ELECTRICAL OPERATING DATA.....	5
3.1	OPERATING DATA - ELECTRICAL INTERFACE -OUTPUT.....	5
3.2	ELECTRICAL FEATURES.....	7
3.3	AERODYNAMIC.....	7
3.4	SOUND DATA.....	7
<b>4</b>	<b>Environment.....</b>	<b>8</b>
4.1	GENERAL*).....	8
<b>5</b>	<b>Safety.....</b>	<b>8</b>
5.1	ELECTRICAL SAFETY.....	8
<b>6</b>	<b>Reliability.....</b>	<b>8</b>
6.1	GENERAL .....	8

**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	<b>FK</b>
Airflow direction	Air outlet over struts	<b>FK</b>
Bearing system	Ball bearing	
Lubrication	see sectional drawing of the bearing	
Mounting position	any	
Tolerance		

## 2 Mechanics

### 2.1 General

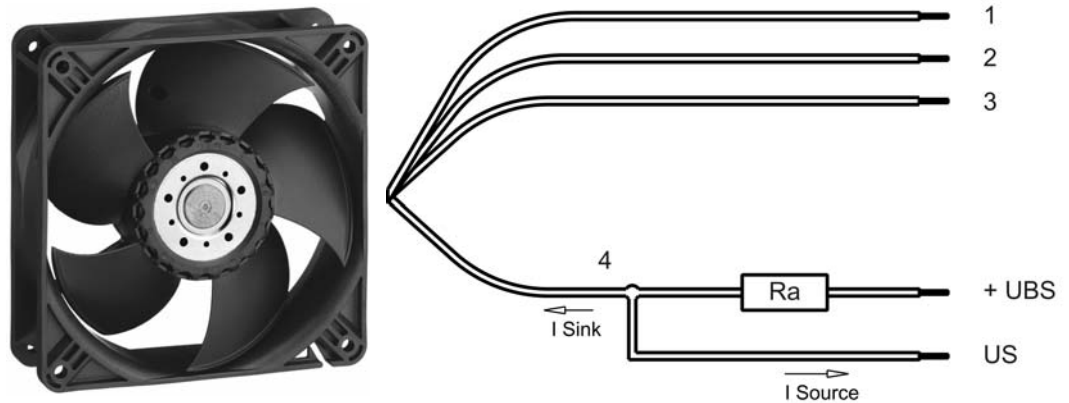
Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Weight	0,270 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 80 Ncm remaining corners: 80 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

### 2.2 Motor

Type of motor	Electronically commutated external rotor	
Diameter of the motor	35,0 mm	
Height of the motor	10,0 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	
Wire gauge (AWG)	24	
Insulation diameter	1,10 mm	



Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	PWM
Wire 4	white	Tacho

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

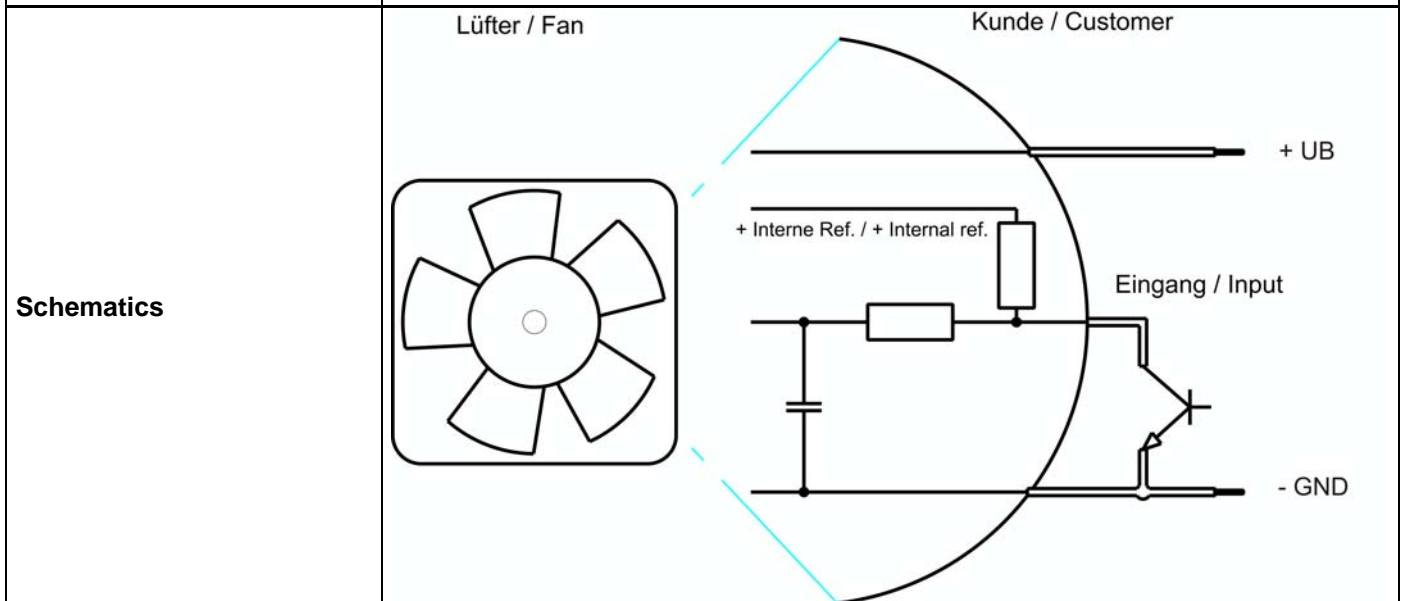
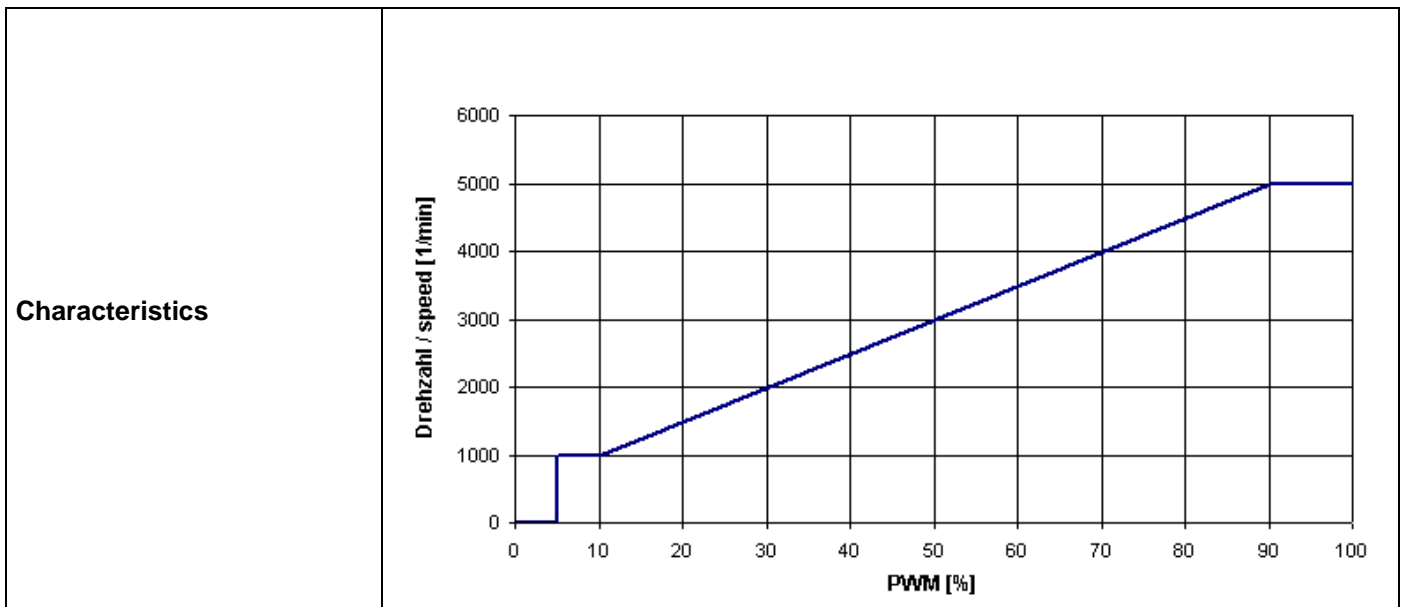
### 3 Operating Data

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

Control input	PWM
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#### Features

Input type	Open collector	
PWM - Frequency		1 kHz - 10 kHz



### 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

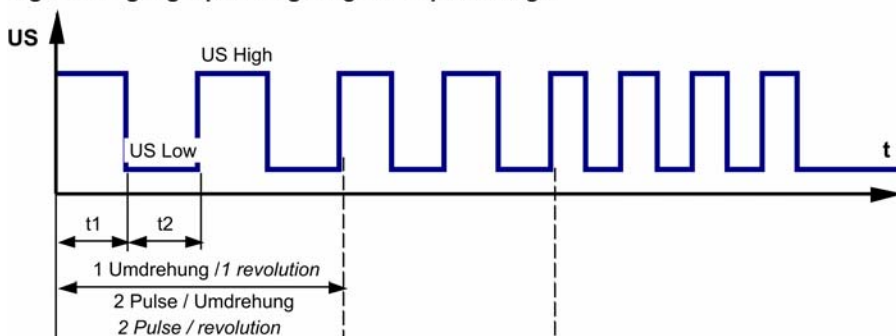
Name	Condition
PWM 0001	PWM: 100 %;

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	36,0 V		60,0 V
Nominal voltage	$\Delta p = 0$	$U_N$		48,0 V	
Power consumption	$\Delta p = 0$	P	7,1 W +/- 17,5 %	13,0 W +/- 25,0 %	13,5 W +/- 25,0 %
Tolerance	PWM 0001				
Current consumption	$\Delta p = 0$	I	196 mA +/- 17,5 %	270 mA*) +/- 25,0 %	225 mA +/- 25,0 %
Tolerance	PWM 0001				
Speed	$\Delta p = 0$	n	4.120 1/min +/- 12,5 %	5.000 1/min*) +/- 4,0 %	5.000 1/min +/- 4,0 %
Tolerance	PWM 0001				
Starting current consumption				1.200 mA	

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

### 3.1 Operating Data - Electrical Interface -Output

Signal-Ausgangsspannung / Signal output voltage



$$R_a = \frac{U_{BS} - U_{S \text{ Low}}}{I_{\text{Sink}}}$$

Lüfter-Drehzahl / Fan speed



Tacho type	/2 (Open collector)
Tacho operating voltage (UBS)	60 V
Tacho signal Low *)	I sink: 2 mA <span style="float:right">&lt;= 0,4 V</span>
Tacho signal High *)	I source: 0 mA <span style="float:right">60 V</span>
Maximum sink current	4 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.
Tacho frequency *)	$(2 \times n) / 60$
Tacho isolated from motor	No
Slew rate of the tacho output voltage	=> 0,5 V/us

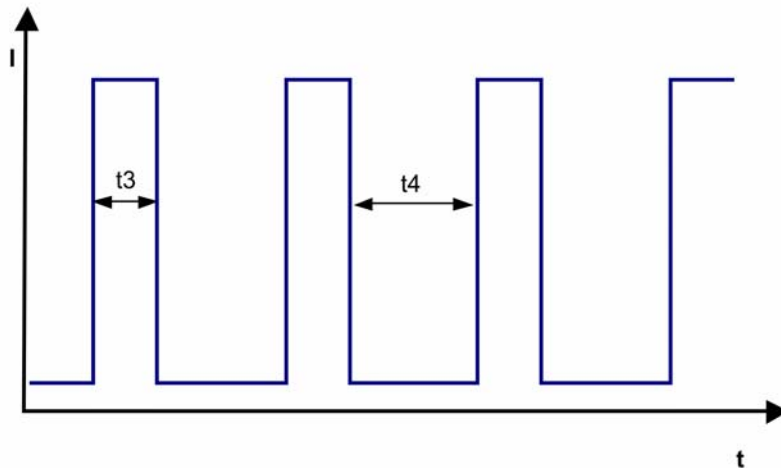
\*) Attention: Marked values are "FK" features

Alarm type	None
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\*) Attention: Marked values are "FK" features

**3.2 Electrical Features**

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	Polarity protected diode IF ≤ 50 uA	
Locked rotor protection	Electronically restart	<b>A</b>
Locked rotor current at Un	approx.	
Clock signal t3/t4 at locked rotor	Typical: 0,25 s / 20,0 s	



**3.3 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.

Operation condition:

5.000 1/min at free air flow	PWM 100 %	PWM min.: ; f: 1 kHz	PWM max.:; f: 10 kHz
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Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	280 m <sup>3</sup> /h	<b>FK</b>
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	190 Pa	<b>FK</b>

**3.4 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

Operation condition:

5.000 1/min at free air flow	PWM 100 %	PWM min.: ; f: 1 kHz	PWM max.:; f: 10 kHz
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Optimal operating point	170 m <sup>3</sup> /h @ 81,0 Pa	
Sound power level at the optimal operating point	6,4 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	55,0 dB(A)	



## 4 Environment

### 4.1 General\*)

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	70 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

## 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.	
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 / 1,5 mm	
Protection class	III	

## 6 Reliability

### 6.1 General

Life expectancy L10 at TU = 40 °C	50.000 hrs	
Life expectancy L10 at TU max.	25.000 hrs	
Life expectancy L10 Delta (40 °C)	100.000 hrs	