4414/2HHP-185

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INDEX

1 General 2

2 Mechanics 2

2.1 General 2
2.2 Motor 2
2.3 Connections 3

3 Operating Data 4

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

4 Environment 8

4.1 General 8
4.2 Climatic requirements 8
4.3 Mechanical requirements 8
4.4 EMC 8

5 Safety 9

5.1 Electrical Safety 9
5.2 Approval Tests 9

6 Reliability 9

6.1 General 9
6.2 Additional Data 9

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).

General

Fan type	Fan	
Rotational direction looking at rotor	clockwise	**FK**
Airflow direction	Air outlet over struts	**FK**
Bearing system	Ball bearing	
Mounting position Tolerance	any	
Balancing grade	16,0	**FK**
Impeller weight	118,0 g	

Mechanics

General

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

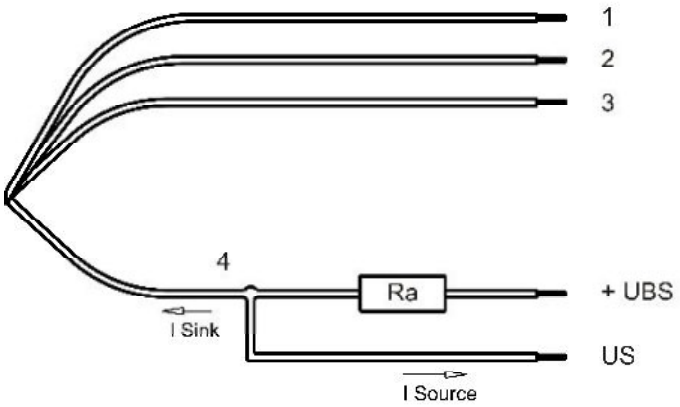
Motor

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	

Connections

Electrical connection	Wires	
Length of lead wire Tolerance	190 mm +- 10,0 mm	
Length of tube Tolerance		
Wire gauge (AWG)	24	
Insulation diameter	1,20 mm	
Plug	see drawing # 9693530185	
Contact	see drawing # 9693530185	





	Colour	Operation
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.

Operating Data

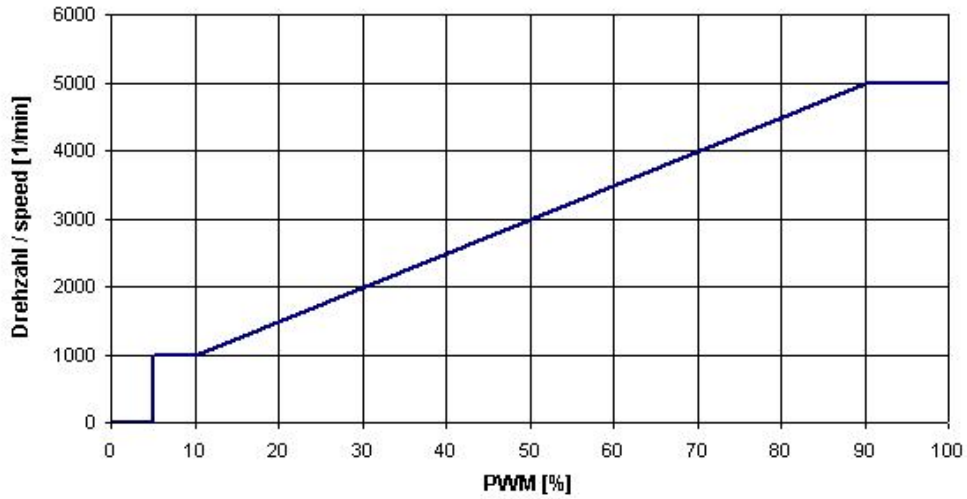
Operating Data - Electrical Interface - Input

Control input	PWM

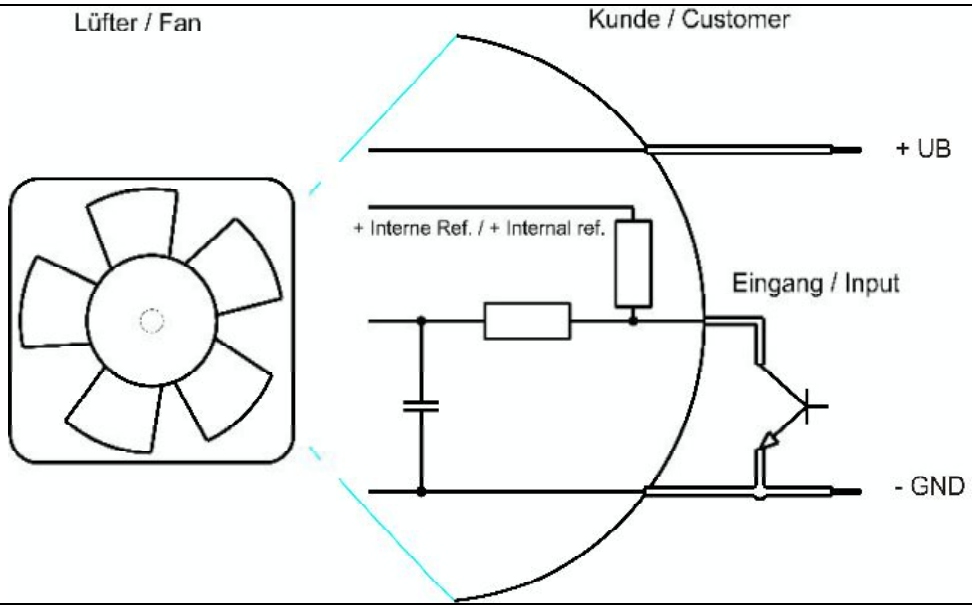
Features

Inpute type	Open collector	
PWM - Frequency		1 kHz - 30 kHz Typical: 5 kHz

Characteristics



Schematics



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 there may not be any solid obstruction within 0,5 m.

Δp = 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	Δp = 0	U	18,0 V		28,0 V
Nominal voltage	Δp = 0	U_N		24,0 V	
Power consumption Tolerance	Δp = 0 PWM 0001	P	7,3 W +- 17,5 %	11,6 W +- 25,0 %	11,8 W +- 25,0 %
Current consumption Tolerance	Δp = 0 PWM 0001	I	405 mA +- 17,5 %	485 mA*) +- 25,0 %	420 mA +- 25,0 %
Speed Tolerance	Δp = 0 PWM 0001	n	4.300 1/min +- 12,5 %	5.000 1/min*) +- 3,0 %	5.000 1/min +- 3,0 %
Starting current consumption				2.750 mA	

Name	Condition		
PWM 0002	PWM: 50 %;		

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	18,0 V		28,0 V
Nominal voltage	Δp = 0	U_N		24,0 V	
Power consumption Tolerance	Δp = 0 PWM 0002	P	2,8 W +- 25,0 %	3,1 W +- 25,0 %	3,4 W +- 25,0 %
Current consumption Tolerance	Δp = 0 PWM 0002	I	156 mA +- 25,0 %	128 mA*) +- 25,0 %	120 mA +- 25,0 %
Speed Tolerance	Δp = 0 PWM 0002	n	2.900 1/min +- 3,0 %	2.900 1/min*) +- 3,0 %	2.900 1/min +- 3,0 %

Name	Condition		
PWM 0003	PWM: 0 %;		

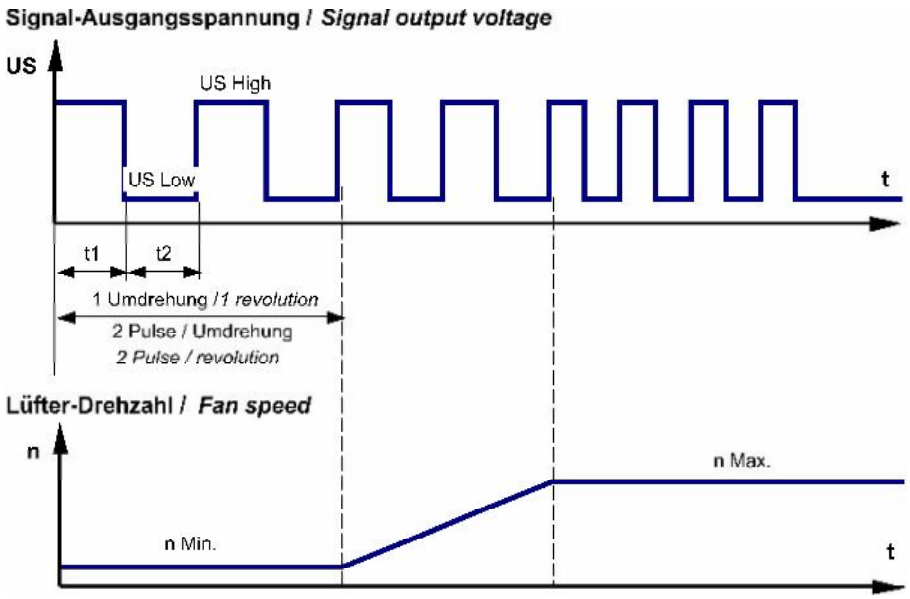
Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	18,0 V		28,0 V
Nominal voltage	Δp = 0	U_N		24,0 V	
Power consumption Tolerance	Δp = 0 PWM 0003	P	0,2 W	0,3 W	0,3 W
Current consumption Tolerance	Δp = 0	I	11 mA	12 mA*)	12 mA

	PWM 0003				
Speed Tolerance	Δp = 0 PWM 0003	n	0 1/min	0 1/min*)	0 1/min

*) Attention: Marked values are "FK" features

Operating Data - Electrical Interface -Output

Tacho type	/2 (Open collector)



$$Ra = \frac{UBS - US\ Low}{I\ Sink}$$

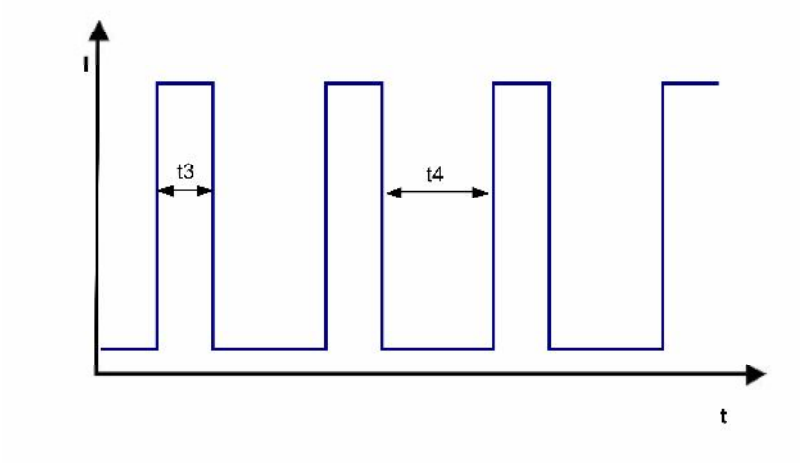
Features	Note	Values
Tacho operating voltage (UBS)		60 V
Tacho signal Low *)	I sink: 2 mA	<= 0,4 V
Tacho signal High *)	I source: 0 mA	60 V
Maximum sink current		<= 4 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency *)	(2 x n) / 60	
Tacho isolated from motor	No	
Slew rate of the tacho output voltage		=> 0,5 V/us

*) Attention: Marked values are "FK" features

Alarm type	None

Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	Polarity protected diode IF <= 100 uA	**A**
Locked rotor protection	Electronically restart	**A**
Locked rotor current at Un	approx. 2.750 mA	
Clock signal t3/t4 at locked rotor	Typical: 0,25 s / 20 s	



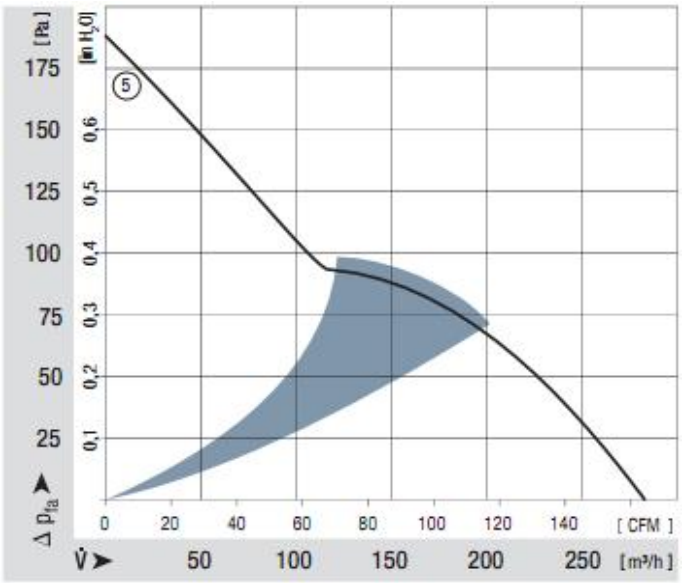
Aerodynamic

Measurement conditions: Measured with a double chamber intake rig acc. to DIN 24163 Part 3.
Normal air density = 1,2 kg/m3; 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:

5.000 1/min at free air flow	PWM 100 %;		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	285,0 m3/h	**FK**
Max. static pressure (Δp = max. / $\dot{V}$ =0)	190 Pa	**FK**



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

a.) Operation condition:

5.000 1/min at free air flow	PWM 100 %	PWM min.:	PWM max.:

Optimal operating point	170,0 m3/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)	

Environment

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	

Climatic requirements*)

*) Permittet application area:
The product is for the use in sheltered rooms with controlled temperature and controlled humidity. Directly exposure to water must be avoid.

Mechanical requirements

See drawing # 9693530185.

Safety

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	

Approval Tests

CE	No
UL	Yes / UL audited by CSA according to UL507, Electric Fans
VDE	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment - Part 1 Safety - Connection to a SELV circuit.
CSA	Yes / C22.2 No. 113-M1984 Fans and Ventilators
CCC	N/A

The approval tests are observed to:
U approval max.:28,0 V @ TU approval max.: 70,0 °C

Reliability

General

Service life L10 at TU = 40 °C	50.000 h	
Service life L10 at TU max.	25.000 h	
Life expectancy L10 Delta at TU = 40 °C	100.000 h	