612 NHHR-147

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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 Tolerance	any	
Balancing grade	40,0	**FK**
Impeller weight	23,0 g	

2 Mechanics

2.1 General

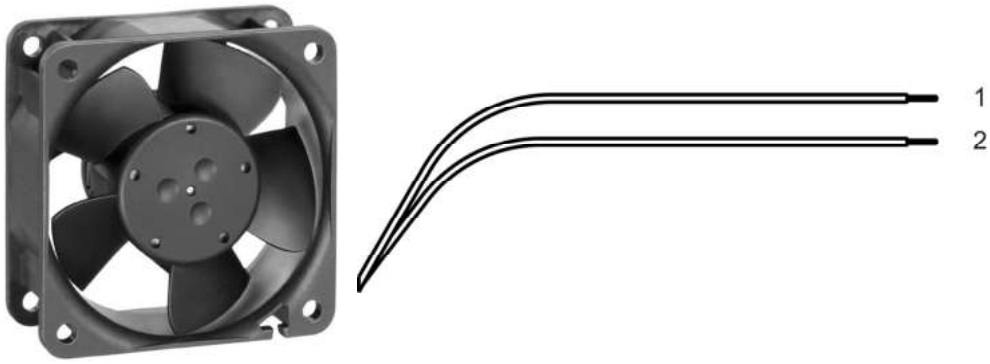
Width	60,0 mm	
Height	60,0 mm	
Depth	25,0 mm	
Diameter	0,0 mm	
Weight	0,066 kg	
Housing material	Plastic	
Impeller material	Plastic	

2.2 Motor

Type of motor	Electronically commutated external rotor	
Diameter of the motor	22,0 mm	
Height of the motor	6,0 mm	
Number of phases	1	
Number of windings	2	
Operating mode	Continuous duty	
Insulation material class	E	

2.3 Connections

Electrical connection	Wires - Plug	
Length of lead wire Tolerance	160 mm +- 10,0 mm	
Length of tube Tolerance		
Wire gauge (AWG)	22	
Insulation diameter	1,09 mm	
Plug	see drawing	
Contact	see drawing	



	Colour	Operation
Wire 1	red	+ UB
Wire 2	black	- GND

3 Operating Data

3.1 Operating Data - Electrical Interface - Input

Control input	None

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.

Δp = 0: corresp. to free air flow (see section 3.5)
I: corresp. to arithm. mean current value

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	8,0 V		15,0 V
Nominal voltage	Δp = 0	U_N		12,0 V	
Power consumption Tolerance	Δp = 0 0001	P	1,2 W +- 17,5 %	2,9 W +- 12,5 %	4,8 W +- 17,5 %
Current consumption Tolerance	Δp = 0 0001	I	145 mA +- 17,5 %	240 mA*) +- 12,5 %	320 mA +- 17,5 %
Speed Tolerance	Δp = 0 0001	n	4.950 1/min +- 10,0 %	6.800 1/min*) +- 7,5 %	8.300 1/min +- 10,0 %
Starting current consumption				970 mA	

*) Attention: Marked values are "FK" features

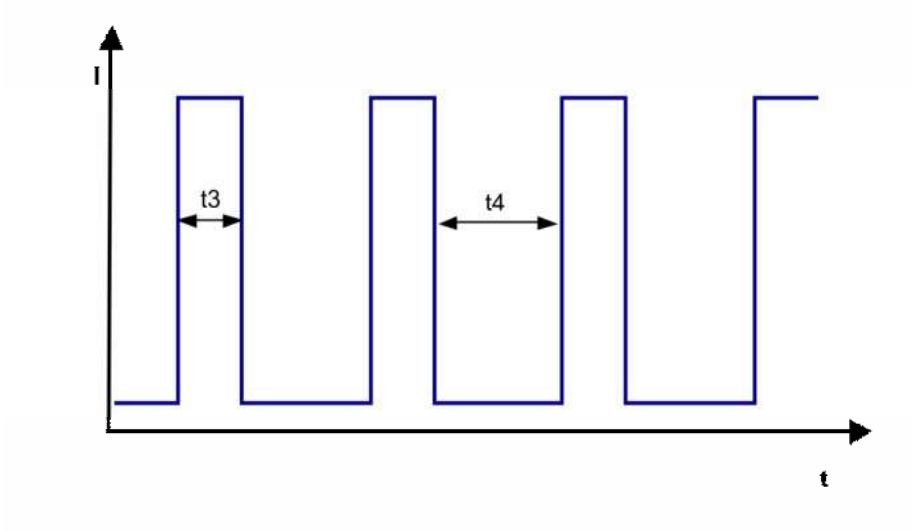
3.3 Operating Data - Electrical Interface -Output

Tacho type	None

Alarm type	None

3.4 Electrical Features

Electronic function	None	
Reversed polarity protection Max. residual current at Un	Rectifying diode IF <= 500 uA	**A**
Locked rotor protection	Auto restart	**A**
Locked rotor current at Un	approx. 970 mA	
Clock signal t3/t4 at locked rotor	Typical: 0,16 s / 1 s t3: 0,05 s... 0,35 s t4: 0,35 s... 2,1 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/m3; Temperature 23°C +/- 3°C;
In the intake and outlet area should not be any solid obstruction within 0,5 m.

a.) Operation condition:

6.800 1/min at free air flow

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	54,0 m3/h	**FK**
Max. static pressure (Δp = max. / $\dot{V}$ =0)	120 Pa	**FK**

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 Lp(A) < 5 dB(A)
For further measurement conditions see section 3.5

a.) Operation condition:

6.800 1/min at free air flow

Optimal operating point	34,0 m3/h @ 33 Pa	
Sound power level at the optimal operating point	5,6 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	42,0 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	

4.2 Climatic requirements*)

*) Permittet application area:
The product is for the use in sheltered rooms with limited controlled temperature. Occasionally condensed water is allowed. Directly exposure to water must be avoid. Saline ambient conditions must be avoid.

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.	Not applicable Not applicable	**A**
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	
Air and leakage distances	1,0 mm / 1,2 mm	
Protection class	III	

5.2 Approval Tests

CE	Yes
UL	Yes / 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	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		
Life expectancy L10 at TU = 40 °C	60.000 h	
Life expectancy L10 at TU = 60 °C	37.500 h	
Life expectancy L10 at TU max.	30.000 h	
Life expectancy L15 at TU = 45 °C		
Life expectancy L10 Delta (40 °C)	120.000 h	

6.2 Additional Data

not specified