**612 NHHR-147**

Customer specification: No
Version: 1.0
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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<br>Tolerance | any | |
| Balancing grade | 40,0 | **FK** |
| Impeller weight | 23,0 g | |

## 2 Mechanics

### 2.1 General

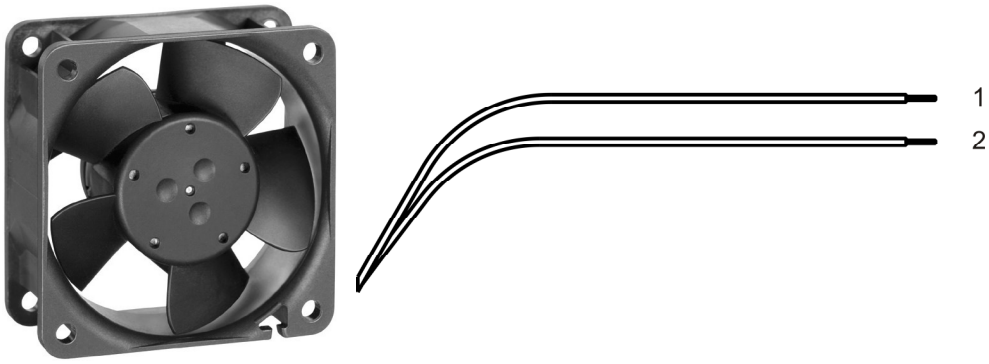
| | | |
|---|---|---|
| Width | 60,0 mm | |
| Height | 60,0 mm | |
| Depth | 25,0 mm | |
| Diameter | 0,0 mm | |
| Weight | 0,066 kg | |
| Housing material | Plastic | |
| Impeller material | Plastic | |

### 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<br>Tolerance | 160 mm<br>+- 10,0 mm | |
| Length of tube<br>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<br>Tolerance | Δp = 0<br>0001 | P | 1,2 W<br>+- 17,5 % | 2,9 W<br>+- 12,5 % | 4,8 W<br>+- 17,5 % |
| Current consumption<br>Tolerance | Δp = 0<br>0001 | I | 145 mA<br>+- 17,5 % | 240 mA*)<br>+- 12,5 % | 320 mA<br>+- 17,5 % |
| Speed<br>Tolerance | Δp = 0<br>0001 | n | 4.950 1/min<br>+- 10,0 % | 6.800 1/min*)<br>+- 7,5 % | 8.300 1/min<br>+- 10,0 % |
| Starting current consumption | | | | 970 mA | |

*) Attention: Marked values are "FK" features

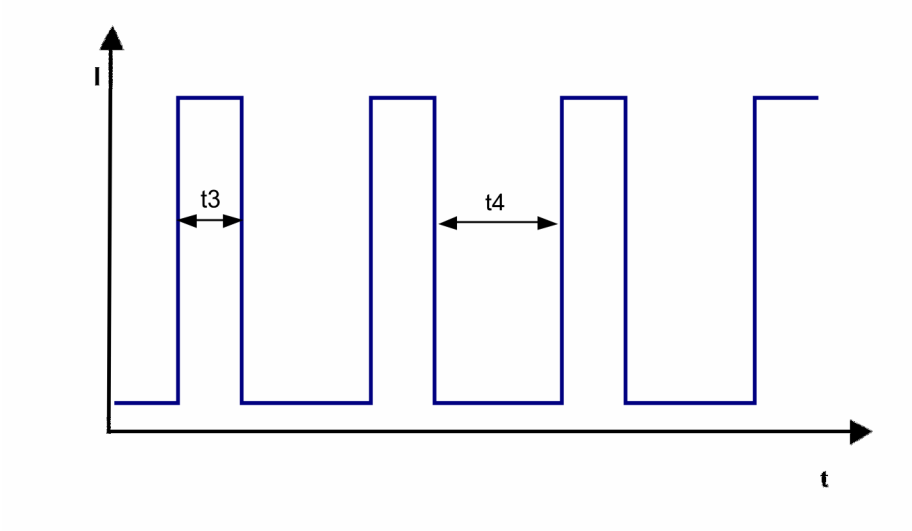
### 3.3 Operating Data - Electrical Interface -Output

| | |
|---|---|
| Tacho type | None |

| | |
|---|---|
| Alarm type | None |

### 3.4 Electrical Features

| | | |
|---|---|---|
| Electronic function | None | |
| Reversed polarity protection<br>Max. residual current at Un | Rectifying diode<br>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<br>t3: 0,05 s... 0,35 s<br>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<br>DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700)<br>A.) Type test<br>Measuring conditions: After 48h of storage at 95% R.H. and 25°C.<br>No arcing or breakdown is allowed!<br>All connections together to ground.<br>B.) Routine test<br>Measuring conditions: At indoor climate.<br>No arcing or breakdown is allowed!<br>All connections together to ground. | Not applicable<br><br>Not applicable | **A** |
| Isolation resistance<br>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