414 F

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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	
Rotating direction looking at rotor	Counterclockwise	**FK**
Airflow direction	Air outlet over struts	**FK**
Bearing system	Sleeve bearing	
Lubrication	see sectional drawing of the bearing	
Mounting position Tolerance	Any	
Balancing grade	16,0	**FK**
Impeller weight	4,3 g	

2 Mechanics

2.1 General

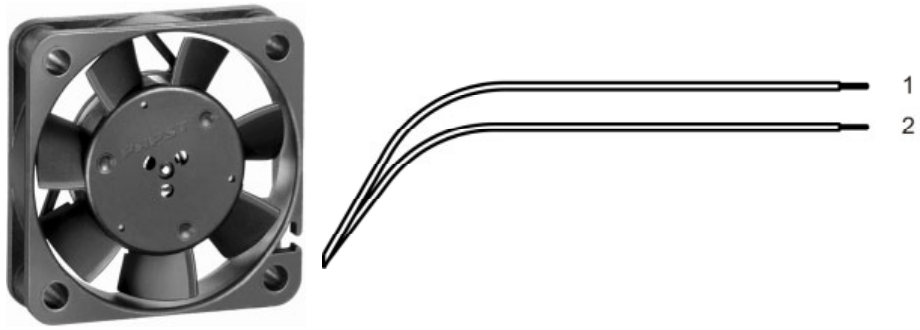
Width	40,0 mm	
Height	40,0 mm	
Depth	10,0 mm	
Diameter	0,0 mm	
Mass	0,017 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	wire outlet corner: 50 Ncm remaining corners: 70 Ncm ISO 4762 - M3 degreased, without an additional brace and without washer	

2.2 Motor

Type of motor	Electronically commutated jaw-shaped	
Diameter of the motor	17,0 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	
Lead wire length Tolerance	L = 310 mm +- 10,0 mm	
Tube length Tolerance	See drawing	
Wire size (AWG)	28	
Insulation diameter	1,40 mm	
Plug	See drawing	
Contact	See drawing	



	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- 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	20,0 V		28,0 V
Nominal voltage	Δp = 0	U_N		24,0 V	
Power consumption Tolerance	Δp = 0 0001	P	0,5 W +- 17,5 %	0,8 W +- 12,5 %	1,0 W +- 17,5 %
Current consumption Tolerance	Δp = 0 0001	I	27 mA +- 17,5 %	33 mA*) +- 12,5 %	35 mA +- 17,5 %
Speed Tolerance	Δp = 0 0001	n	4.400 1/min +- 15,0 %	5.400 1/min*) +- 10,0 %	6.300 1/min +- 15,0 %
Starting current consumption				52 mA	

*) Attention: Marked values are "FK" features

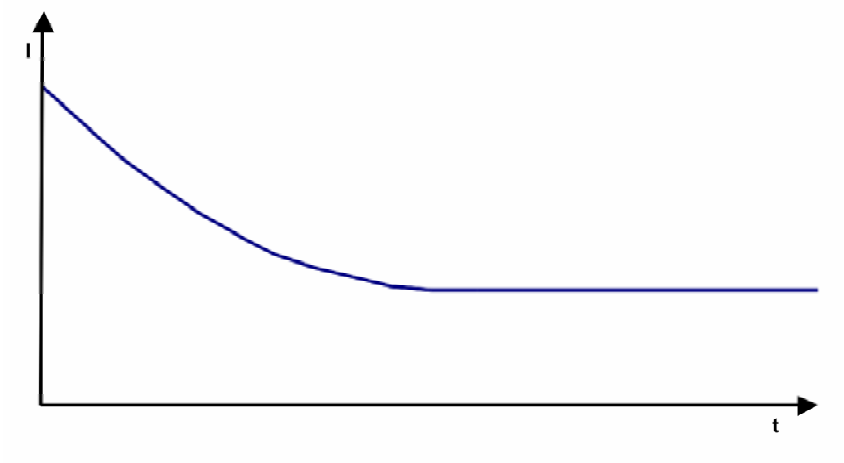
3.3 Operating Data - Electrical Interface - Output

Tacho type	None

Alarm type	None

3.4 Electrical Features

Electronic function	None	
Reversed polarity protection Max. residual current at Un	Rectifying diode IF <= 30 nA	**A**
Locked rotor protection	Impedance protected	**A**
Locked rotor current at Un		



3.5 Aerodynamics

Measurement conditions:	Measured with a double chamber intake rig. 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. The information is only valid under the specified test conditions and may be changed by the installation conditions. If there are deviations from the standard test conditions, the characteristic values must be checked under the installed conditions.

a.) Operation condition:

5.400 1/min at free air flow

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	9,0 m3/h	**FK**
Max. static pressure (Δp = max. / $\dot{V}$ =0)	33 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:

5.400 1/min at free air flow

Optimal operating point	9,0 m3/h @ 0 Pa	
Sound power level at the optimal operating point	4,2 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	22,0 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*)

Humidity requirements	humid heat, constant; according to DIN EN 60068-2-78, 14 days	
Water exposure	None	
Radiation exposure	None	
Dust requirements	None	
Salt fog requirements	None	
Harmful gas requirements	None	

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

Pollution degree 1 (according DIN EN 60664-1)
There is either no pollution or it occurs only dry, non-conductive pollution. The pollution has no negative impact.

4.3 Mechanical Requirements

Please require severity levels and specification parameters from the responsible development departments

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	
clearance / creepage distance	1,0 mm / 1,2 mm	
Protection class	III	

5.2 Approval Tests

CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	Yes / C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	No

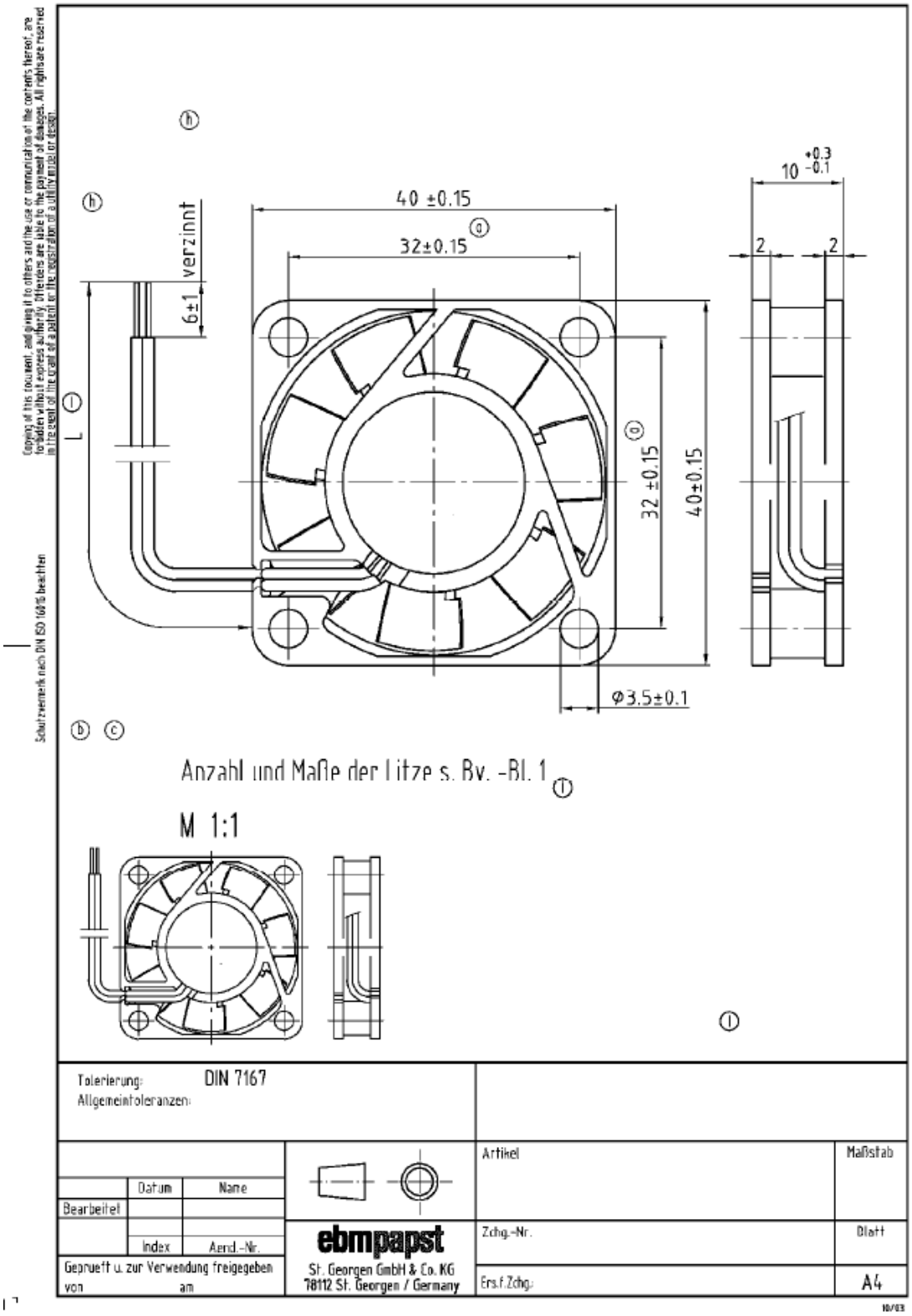
The approval tests are observed to:
U approval max.:28,0 V @ TU approval max.: 70,0 °C

6 Reliability

6.1 General

Life expectancy L10 at TU = 20 °C	45.000 h	
Life expectancy L10 at TU = 40 °C	30.000 h	
Life expectancy L10 at TU = 60 °C	15.000 h	
Life expectancy L10 at TU max.	10.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	50.000 h	

7 Drawing


40 ±0.15
32±0.15
verzinnt
6±1
32 ±0.15
40±0.15
10 +0.3 -0.1
2
2
φ3.5±0.1
Anzahl und Maße der Litze s. Bv. -Bl. 1
M 1:1
Toleranzierung: DIN 7167
Allgemeintoleranzen:
Artikel
Maßstab
Datum
Name
Bearbeitet
Index
Aend.-Nr.
Zchg.-Nr.
Blatt
Geprueft u. zur Verwendung freigegeben
von
am
ebmpapst
St. Georgen GmbH & Co. KG
78112 St. Georgen / Germany
Ers.f.Zchg.
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