



4656 ZH

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Special features according to 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	Clockwise	FK
Airflow direction	Air outlet over struts	FK
Bearing system	Ball bearing	
Lubrication	See sectional drawing of the bearing	
Mounting position - shaft	Any	
Tolerance		
Balancing grade	2,5	FK
Impeller weight		

2 Mechanics

2.1 General

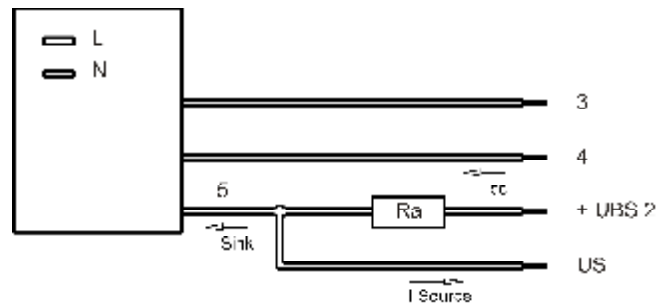
Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Diameter	0,0 mm	
Mass	0,540 kg	
Surface protection	see single part drawing of the housing, flange and impeller	
Housing material	Metal	
Impeller material	Metal	
Max. torque when mounted across both mounting flanges	Wire outlet corner: 120 Ncm Remaining corners: 350 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Motor

Type of motor	Shaded pole motor-extern rotor	
Diameter of the motor	40,0 mm	
Height of the motor	14,0 mm	
Operating mode	Continuous duty	
Insulation material class	F	

2.3 Connections

Electrical connection	Plug	
Lead wire length	L = 310,0 mm	
Tolerance	+ - 10,0 mm	
Tube length	See drawing	
Tolerance		
Wire size (AWG)	22	
Insulation diameter	1,20 mm	
Plug	See drawing	
Contact	See drawing	



	Color	Operation
3	violet	- GND Tacho
4	red	+ UB Tacho
5	white	Tacho

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

3 Operating Data

3.1 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.

$\Delta p = 0$: corresp. to free air flow (see section 3.4)

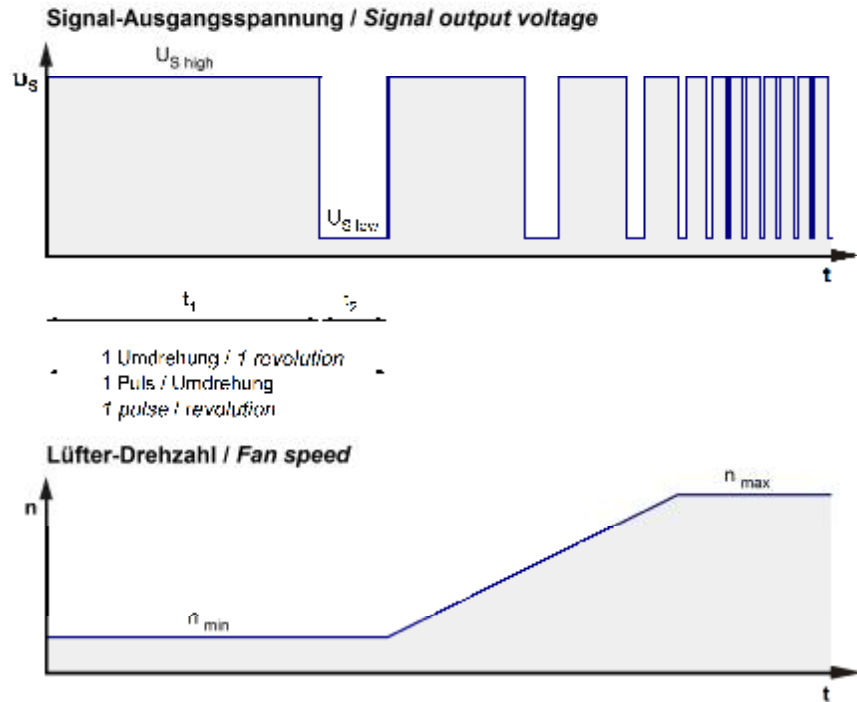
I: corresp. to RMS line current

Features	Condition	Symbol	Values	
Frequency	$\Delta p = 0$	f	50 Hz	60 Hz
Nominal voltage	$\Delta p = 0$	U_N	230,0 V	230,0 V
Tolerance			+ 6,0 % - 10,0 %	+ 6,0 % - 10,0 %
Power consumption	$\Delta p = 0$	P	19,0 W	17,0 W
Tolerance			+/- 10,0 %	+/- 10,0 %
Current consumption	$\Delta p = 0$	I	115 mA *)	100 mA *)
Tolerance			+/- 10,0 %	+/- 10,0 %
Speed	$\Delta p = 0$	n	2.650 1/min *)	3.100 1/min *)
Tolerance			+/- 3,0 %	+/- 3,0 %

*) Attention: Marked values are "FK" features

3.2 Electrical Interface - Output

Tacho type	Special-Tacho
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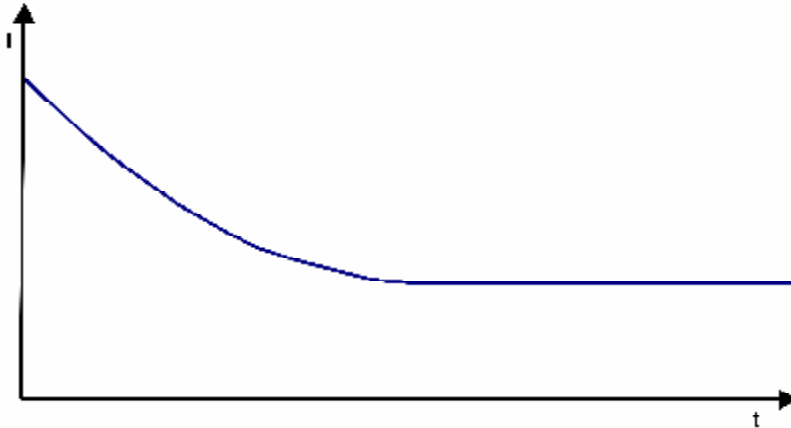
Features	Note	Values
Tacho operating voltage		4,5... 24 V
Tacho operating current (I cc at max. UBS 1)		$\leq 10\text{ mA}$
Tacho nominal voltage (UBS 2)		$< 30\text{ VDC}$
Tacho signal Low *)	I sink: 15 mA	$\leq 0,4\text{ V}$
Tacho signal High *)	I source: 0 mA	30 V
Maximum sink current		$\leq 20\text{ mA}$
tacho pulse time		Min: 0,28 s Max.: 1,5 s
External resistor	External resistor R_a from UBS to U_S required. All voltages measured to GND.	
Tacho frequency *)	$n/50$	
Tacho isolated from motor	Yes	

An intermediate impulse at $n \leq 15\text{ 1/min}$ "rotor brakes" is not allowed!

*) Attention: Marked values are "FK" features

3.3 Electrical Features

Locked rotor protection	Impedance	A
Locked rotor current at		



3.4 Aerodynamics

Measurement conditions: Measured with a double chamber intake rig acc. to DIN EN ISO 5801.
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:
2.650 1/min at free air flow Frequency: 50 Hz

Max. free-air flow ($\Delta p = 0 / \dot{V} = \max.$)	152,0 m ³ /h	FK
Max. static pressure ($\Delta p = \max. / \dot{V} = 0$)	70 Pa	FK

b.) Operation condition:
3.100 1/min at free air flow Frequency: 60 Hz

Max. free-air flow ($\Delta p = 0 / \dot{V} = \max.$)	180,0 m ³ /h	FK
Max. static pressure ($\Delta p = \max. / \dot{V} = 0$)	80 Pa	FK

3.5 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 $L_p(A) < 5 \text{ dB(A)}$
 For further measurement conditions see section 3.4

a.) Operation condition:
 2.650 1/min at free air flow Frequency: 50 Hz

Optimal operating point	130,0 m ³ /h @ 15 Pa	
Sound power level at the optimal operating point	5,1 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	37,0 dB(A)	

b.) Operation condition:
 3.100 1/min at free air flow Frequency: 60 Hz

Optimal operating point	148,0 m ³ /h @ 20 Pa	
Sound power level at the optimal operating point	5,5 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.	-40 °C / 50 Hz -40 °C / 60 Hz	
Max. permitted ambient temperature TU max.	75 °C / 50 Hz 85 °C / 60 Hz	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	100 °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	

Permitted 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.

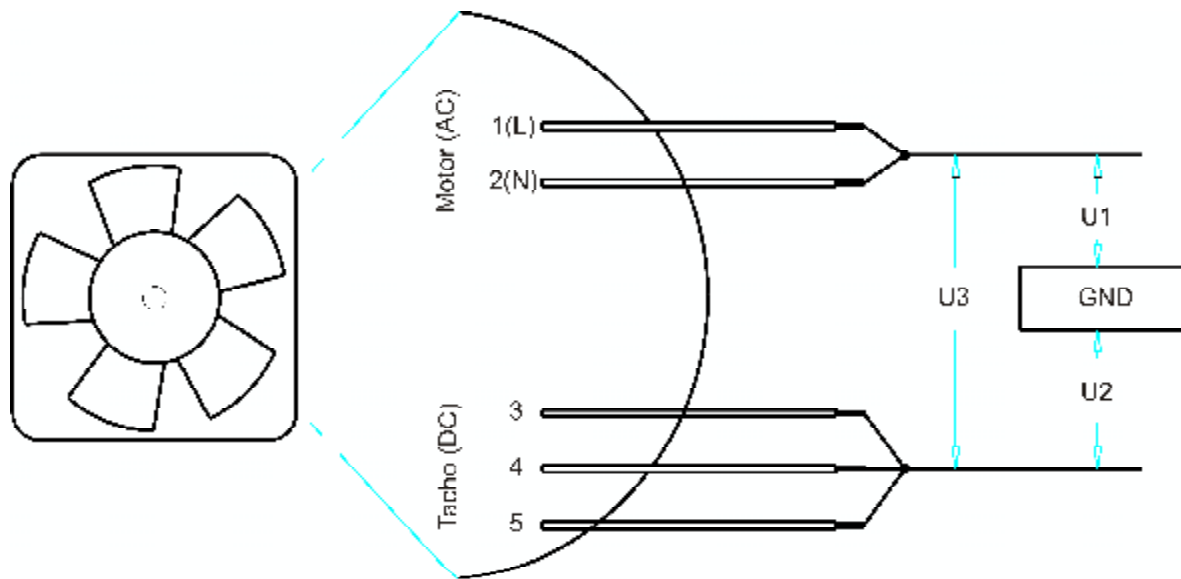
4.4 EMC

not specified

5 Safety

5.1 Electrical Safety

Dielectric strength DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700) A.) Type test (Motor to ground U1) Measuring conditions: After 48 h of storage at 95% r. h. and 25°C. No arcing or breakdown is allowed! All motor connections together to ground! B.) Routine test (Motor to ground U1) Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All motor connections together to ground!	1500 VAC / 1 Min. 1500 VAC / 1 Sec.	A
Insulation resistance (Motor to ground U1) Measuring conditions: After 48 h of storage at 95% r. h. and 25°C measured with U = 500 VDC for 1 min.	RI > 10 MOhm	
C.) Type test (Tacho to ground U2) Measuring conditions: After 48 h of storage at 95% r. h. and 25°C. No arcing or breakdown is allowed! All tacho connections together to ground! D.) Routine test (Tacho to ground U2) Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All tacho connections together to ground!	500 VAC / 1 Min. 600 VAC / 1 Sec.	A
E.) Type test (Tacho to Motor U3) Measuring conditions: After 48 h of storage at 95% r. h. and 25°C. No arcing or breakdown is allowed! All tacho connections together to all motor connections! F.) Routine test (Tacho to Motor U3) Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All tacho connections together to all motor connections!	3750 VAC / 1 Min. 4200 VAC / 1 Sec.	A
Insulation resistance (Tacho to Motor U3) Measuring conditions: After 48 h of storage at 95% r. h. and 25°C measured with U = 1000 VDC for 1 min.	RI > 20 MOhm	
Clearance / creepage distance	2,0 mm / 1,8 mm	
Protection class	I	



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	Yes / GB 12350 Safety Requirements for small Power Motors

The approval tests are observed to:

U approval max.: 230 V / f: 60 Hz @ TU approval max.: 85 °C

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	37.500 h / 50 Hz 40.000 h / 60 Hz	
Life expectancy L10 at TU max.	17.500 h / 50 Hz 15.000 h / 60 Hz	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C		

6.2 Additional Data

not specified