

Product Data Sheet 5314/2HP

ebm**papst**

The engineer's choice



5314/2HP**INDEX**

1	General	3
2	Mechanics	3
2.1	General	3
2.2	Connections	3
3	Operating Data	5
3.1	Electrical Interface - Input	5
3.2	Electrical Operating Data	6
3.3	Electrical Interface - Output	7
3.4	Electrical Features	8
3.5	Aerodynamics	9
3.6	Sound Data	10
4	Environment	10
4.1	General	10
4.2	Climatic Requirements	10
5	Safety	11
5.1	Electrical Safety	11
5.2	Approval Tests	11
6	Reliability	11
6.1	General	11

1 General

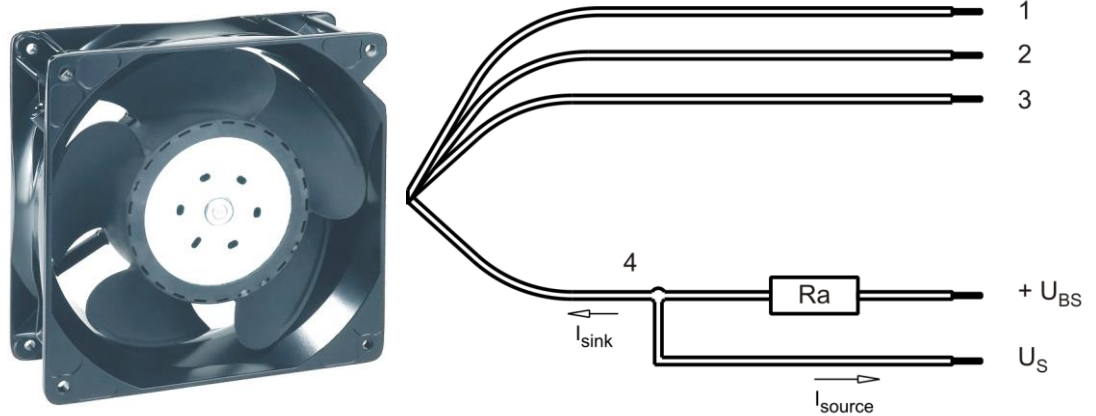
Fan type	Fan	
Rotating direction looking at rotor	Counterclockwise	
Airflow direction	Air intake over struts	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

2 Mechanics**2.1 General**

Width	140,0 mm	
Height	140,0 mm	
Depth	51,0 mm	
Mass	0,900 kg	
Housing material	Metal	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	Wire outlet corner: 440 Ncm Remaining corners: 600 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires	
Lead wire length	L = 310 mm	
Tolerance	+ - 10,0 mm	
Tube length	S = 0 mm	
Tolerance		
Wire size (AWG)	22	
Insulation diameter	1,7 mm	



Wire	Color	Operation
1	red	+ UB
2	blue	- GND
3	violet	PWM
4	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 Interface - Input

Control input	PWM
---------------	-----

Features

Input type	Open collector	
PWM - Frequency		1 kHz - 20 kHz typical: 2 kHz

Characteristics	<table border="1"> <caption>Speed vs PWM Data</caption> <thead> <tr> <th>PWM [%]</th> <th>Drehzahl / speed [1/min]</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>10</td><td>~700</td></tr> <tr><td>20</td><td>~1400</td></tr> <tr><td>30</td><td>~2100</td></tr> <tr><td>40</td><td>~2800</td></tr> <tr><td>50</td><td>~3500</td></tr> <tr><td>60</td><td>~4200</td></tr> <tr><td>70</td><td>~4900</td></tr> <tr><td>80</td><td>~5000</td></tr> <tr><td>90</td><td>~5000</td></tr> <tr><td>100</td><td>~5000</td></tr> </tbody> </table>	PWM [%]	Drehzahl / speed [1/min]	0	0	10	~700	20	~1400	30	~2100	40	~2800	50	~3500	60	~4200	70	~4900	80	~5000	90	~5000	100	~5000
PWM [%]	Drehzahl / speed [1/min]																								
0	0																								
10	~700																								
20	~1400																								
30	~2100																								
40	~2800																								
50	~3500																								
60	~4200																								
70	~4900																								
80	~5000																								
90	~5000																								
100	~5000																								
Schematics	Lüfter / Fan Kunde / Customer The schematic shows the fan's internal reference point connected to the customer's input circuit. The input signal is applied to the base of the transistor T through resistor R2. Resistor R1 is connected between the input and the internal reference point. The transistor T is connected to the fan's internal circuit, which is also connected to the power supply +UB and ground -GND. A capacitor C is connected between the input and ground.																								

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.

$\Delta p = 0$: corresp. to free air flow (see section 3.5)

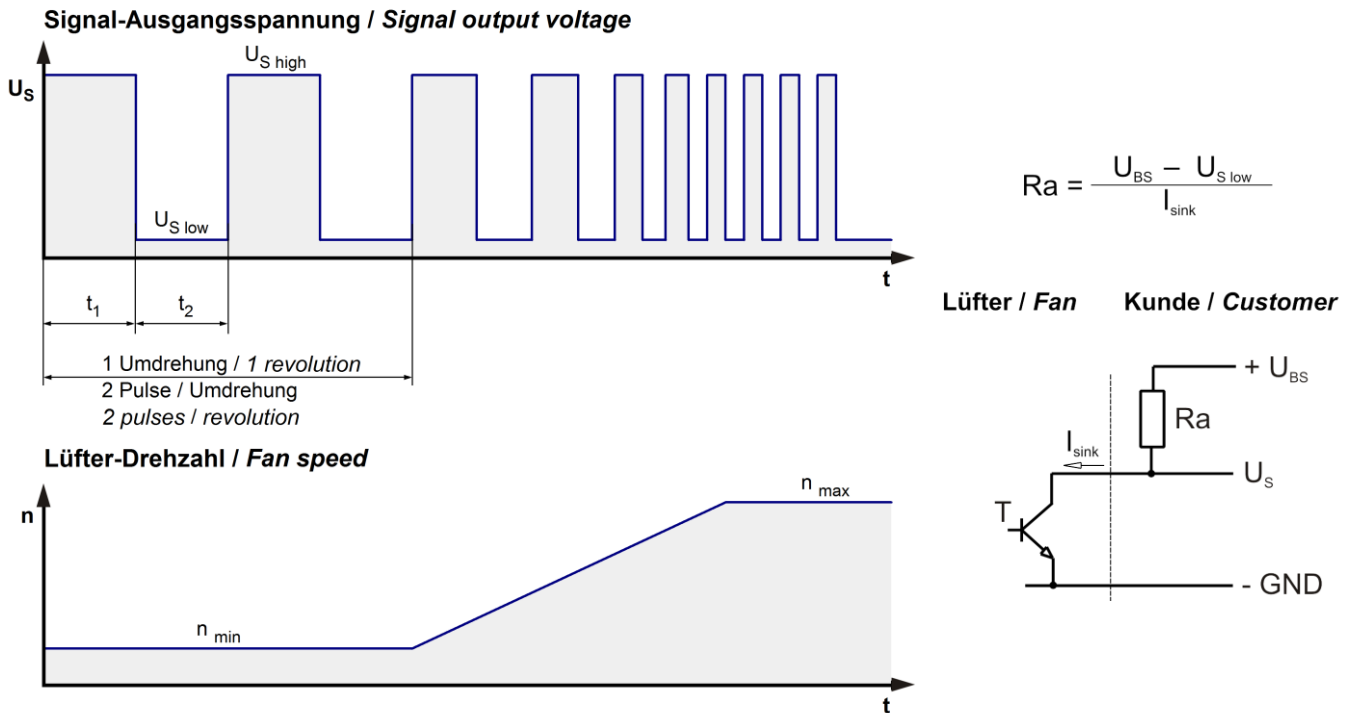
I: corresp. to arithm. mean current value

Name	Condition
PWM 0001	PWM: 100 %; f: 2 kHz

Features	Condition	Symbol	Values		
Voltage range		U	16,0 V		28,0 V
Nominal voltage		U_N		24,0 V	
Power consumption	$\Delta p = 0$	P	15,5 W	27 W	28,4 W
Tolerance	PWM 0010		+/- 10,0 %	+/- 10,0 %	+/- 10,0 %
Current consumption	$\Delta p = 0$	I	974 mA	1.100 mA	1.020 mA
Tolerance	PWM 0010		+/- 10,0 %	+/- 10,0 %	+/- 10,0 %
Speed	$\Delta p = 0$	n	3.950 1/min	5.000 1/min	5.000 1/min
Tolerance	PWM 0010		+/- 7,5 %	+/- 5,0 %	+/- 5 %

3.3 Electrical Interface - Output

Tacho type	/2 (open collector)
------------	---------------------

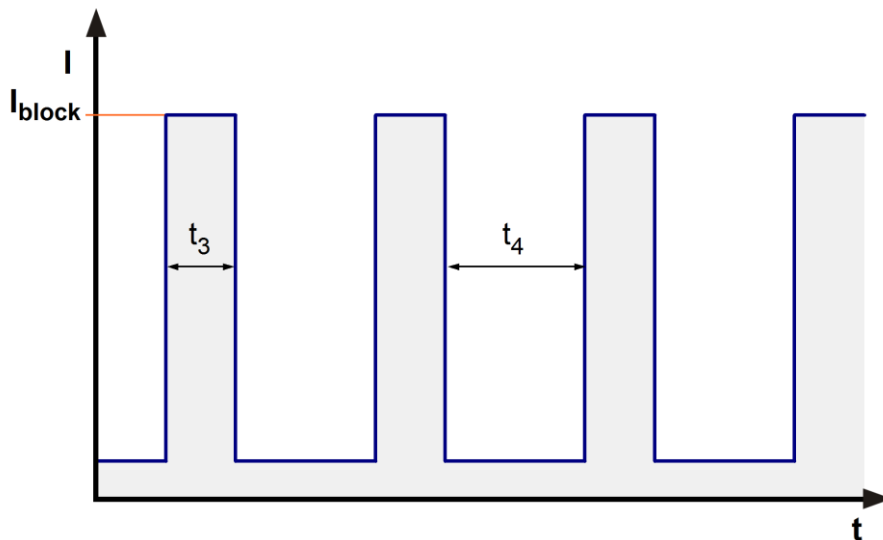


Features	Note	Values
Tacho operating voltage	U_{BS}	$\leq 32 \text{ V}$
Tacho signal Low	$U_{S \text{ low}}$	$\leq 0,4 \text{ V}$
Tacho signal High	$U_{S \text{ high}}$	$\leq 32 \text{ V}$
Maximum sink current	I_{sink}	$\leq 20 \text{ mA}$
External resistor	External resistor R_a from U_{BS} to U_S required. All voltages measured to GND.	
Tacho frequency	$(2 \times n) / 60$	
Tacho isolated from motor	No	
Slew rate		$\geq 0,5 \text{ V/us}$

n = revolutions per minute (1/min)

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at U_N	$I_F \leq 5 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 850 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 0,5 s / 7 s	



3.5 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;

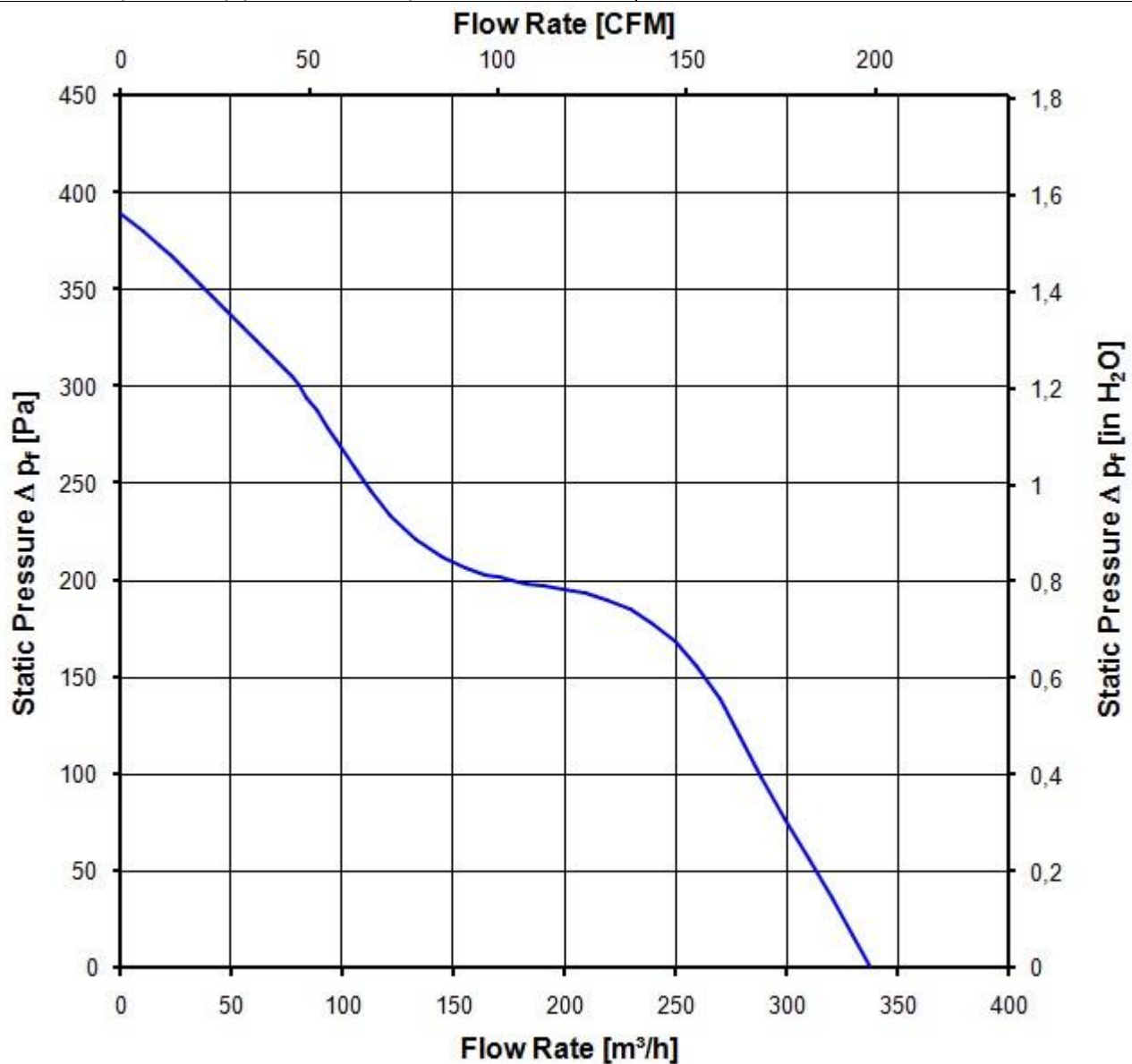
In the intake and outlet area should not be any solid obstruction within 0,5 m.

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:

5.000 1/min at free air flow	PWM 100 %; f: 2 kHz		
------------------------------	---------------------	--	--

Max. free-air flow ($\Delta p = 0$ / $\dot{V} = \text{max.}$)	340,0 m ³ /h	
Max. static pressure ($\Delta p = \text{max.}$ / $\dot{V} = 0$)	380 Pa	



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

a.) Operation condition:

5.000 1/min at free air flow	PWM 100 %; f: 2 kHz	PWM min.:	PWM max.:
------------------------------	---------------------	-----------	-----------

Optimal operating point	240,0 m ³ /h @ 160 Pa	
Sound power level at the optimal operating point	7,2 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	64,0 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	65 °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	
Dust requirements	None	
Salt fog 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.

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

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.	500 VAC / 1 Min.	
B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	500 VAC / 1 Sec.	
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	

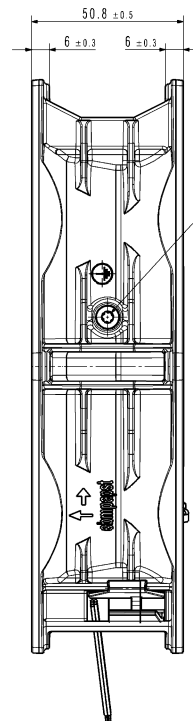
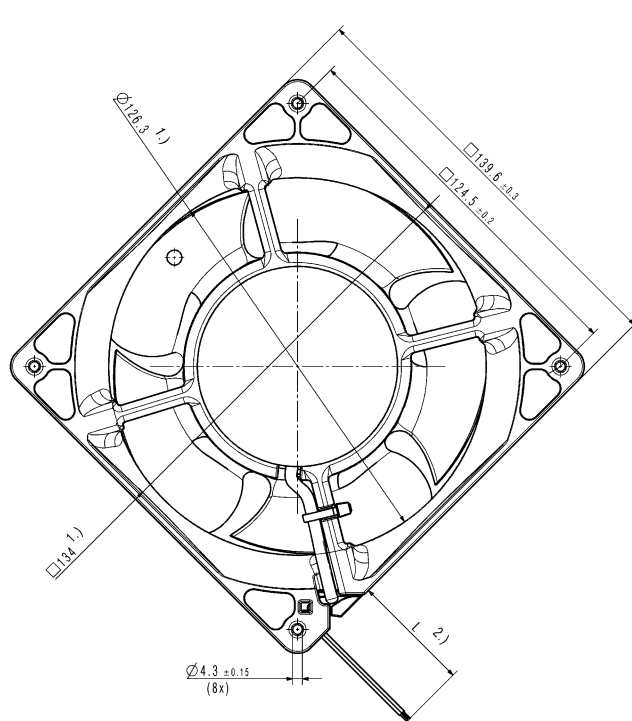
5.2 Approval Tests

CE	EC Declaration of Conformity	No
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL audited by CSA according to 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

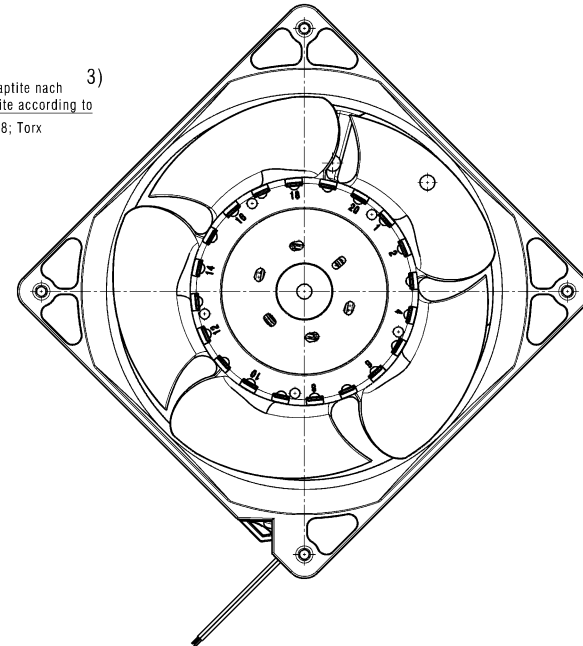
6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	77.500 h	
Life expectancy L10 at TU max.	40.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	130.000 h	



Schraube Duo-Taptilite nach
screw: Duo-Taptilite according to
DIN 7500; CM4x8; Torx



- 1.) Maße aus Montageausschnitt
- 2.) Anzahl und Länge der Litzen siehe Produktspezifikation
- 3.) nur wenn in Stückliste enthalten

- Axialspiel der Kugellager mit Feder spielfrei gelagert

- 1.) measures of mounting cut out
- 2.) length an number of wires see product specification
- 3.) only it is included in bill of material

- ball bearing without clearance by a pre-load spring

Zeichnung entspricht 3D-Modell:
Drawing is equivalent to 3D-Model:
9695490181_CPR_000_-
System: CATIA V5 R 16

AP-Status/Status		Ang.-Nr. / Drawing No.	3D-Modell / Version 3D-Model / Version	Gezeichnet / Designd	Revisiert / Revised		Bearbeitet / Material		Freigegeben / Released	
		Datum	Name	Artwork / Title		Gezeichnet / Designd		Freigegeben / Released		
Toleranzangabe / Tolerances:		Gezeichnet / Designd	Gezeichnet / Designd							
Allgemeintoleranzen / Gen. tolerances:				Ziellsg. A* / Drawing No.		Bsp. 1.200g / Weight:				
				Gezeichnet / Designd		Freigegeben / Released		Formel / Size		
ebm-papst St. Georgen GmbH & Co KG				Ziellsg. A* / Drawing No.		Bsp. 1.200g / Weight:				

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ebm-papst:](#)

[5314/2HP](#)