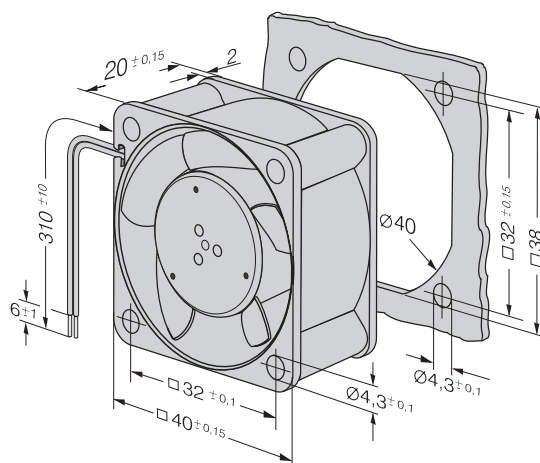


ebmpapst

- DC fans with electronically commutated external rotor motor.
- Fully integrated commutation electronics.
- With electronic protection against reverse polarity. The fan only operates when the polarity is correct. Impedance-protected against blocking and overloading.
- Type 412H and 414H with electronic protection against blocking
- Fan of fibreglass reinforced plastic. PBT housing, PA impeller.
- Air exhaust over struts. Rotational direction CW/looking at rotor.
- Electrical connection via 2 leads AWG 28, TR 64. Stripped and tinned ends.
- Mass 27 g.

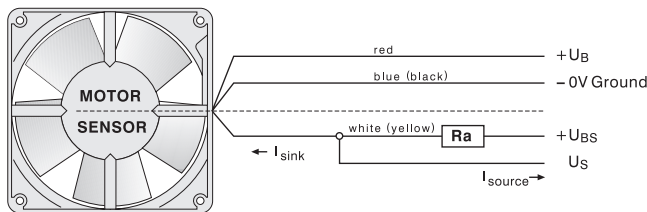




- Speed-proportional rectangular pulse for external speed monitoring of fan motor
- 2 pulses per revolution
- Open-Collector signal output
- Extremely wide operating voltage range (5 ... 60 V)
- Easy adaptation to user interface
- Connection via separate lead
- The sensor signal also serves as a major comparison variable for setting and maintaining the desired speed for interactive or controlled cooling with one or several interconnected fans.

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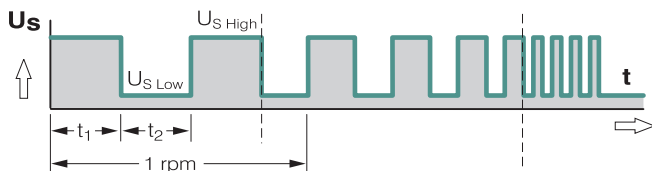
Electrical connection



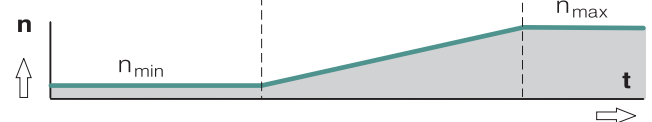
$$R_a = \frac{U_{BS} - U_{SLOW}}{I_{SINK}}$$

All voltages measured to ground.
External load resistance R_a from U_S to U_{BS} required.

Signal output voltage



Fan speed



Signal symmetry $[t_1, t_2] = 0.8 \dots 1.2$
Signal frequency $[F] = 2 \times n/60 \text{ Hz}$

Attention:

With these fan options, deviations in regard to temperature range, voltage range and power consumption are possible compared with standard fan data.

Signal data	Sensor signal $U_{S \text{ Low}}$		Condition: I_{SINK}		Sensor signal $U_{S \text{ High}}$		Condition: I_{SOURCE}		Sensor operating voltage U_{BS}		Perm. sink current $I_{SINK \text{ max.}}$	
Type	V DC	mA	V DC	mA	V DC	mA	V DC	mA	V DC	mA	V DC	mA
255 N/2	≤ 0.4	≤ 2	30	0	≤ 30	2						
255 H/2	≤ 0.4	≤ 2	30	0	≤ 30	2						
252 N/2	≤ 0.4	≤ 2	30	0	≤ 30	2						
405 F/2	≤ 0.4	1	30	0	≤ 30	≤ 2						
405 F/2 H	≤ 0.4	1	30	0	≤ 30	≤ 2						
412 F/2 H	≤ 0.4	1	30	0	≤ 30	≤ 2						
414 F/2	≤ 0.4	1	30	0	≤ 30	≤ 2						
405 /2	≤ 0.4	1	30	0	≤ 30	≤ 2						
412 /2	≤ 0.4	1	30	0	≤ 30	≤ 2						
414 /2	≤ 0.4	1	30	0	≤ 30	≤ 2						
414 /2 H	≤ 0.4	1	30	0	≤ 30	≤ 2						
412 J/2 H	≤ 0.4	1	30	0	≤ 30	≤ 4						
412 J/2 HH	≤ 0.4	1	30	0	≤ 30	≤ 4						
414 J/2 H	≤ 0.4	2	30	0	≤ 30	≤ 4						
414 J/2 HH	≤ 0.4	2	30	0	≤ 30	≤ 4						
512 F/2	≤ 0.4	1	30	0	≤ 30	≤ 2						
514 F/2	≤ 0.4	1	30	0	≤ 30	≤ 2						
612 F/2	≤ 0.4	1	30	0	≤ 30	≤ 2						
612 F/2 H	≤ 0.4	1	30	0	≤ 30	≤ 2						
614 F/2	≤ 0.4	1	30	0	≤ 30	≤ 2						
612 N/2 H	≤ 0.4	1	30	0	≤ 30	≤ 2						
612 N/2 NHH-120	≤ 0.4	1	30	0	≤ 30	≤ 2						
612 N/2 N	≤ 0.4	1	30	0	≤ 30	≤ 2						
614 N/2 H	≤ 0.4	1	30	0	≤ 30	≤ 2						
614 N/2 HH-121	≤ 0.4	1	30	0	≤ 30	≤ 2						
614 N/2 M	≤ 0.4	2	28	0	≤ 30	≤ 4						
712 F/2 L	≤ 0.4	1	30	0	≤ 30	≤ 2						
712 F/2 M	≤ 0.4	1	30	0	≤ 30	≤ 2						
8412 N/2 GL	≤ 0.4	2	28	0	≤ 28	≤ 4						
8412 N/2 GM	≤ 0.4	2	28	0	≤ 28	≤ 4						
8412 N/2 G	≤ 0.4	2	28	0	≤ 28	≤ 4						
8414 N/2 GL	≤ 0.4	2	28	0	≤ 28	≤ 4						
8414 N/2 GM	≤ 0.4	2	28	0	≤ 28	≤ 4						
8414 N/2 G	≤ 0.4	2	28	0	≤ 28	≤ 4						
8414 N/2	≤ 0.4	2	28	0	≤ 28	≤ 4						
8412 N/2	≤ 0.4	2	28	0	≤ 28	≤ 4						
8412 N/2 H	≤ 0.4	2	28	0	≤ 28	≤ 4						
8414 N/2 H	≤ 0.4	2	28	0	≤ 28	≤ 4						
8312 /2 HL	≤ 0.4	2	30	0	≤ 30	≤ 4						
8314 /2	≤ 0.4	2	30	0	≤ 30	≤ 4						
8314 /2 H	≤ 0.4	2	30	0	≤ 30	≤ 4						

Available on request:

- Galvanically separated sensor signal circuit
- Varying voltage potentials for power and logic circuit.

Signal data	Sensor signal U _{S Low}	Condition: I _{Sink}	Sensor signal U _{S High}	Condition: I _{Source}	Sensor operating voltage U _{BS}	Perm. sink current I _{Sink max.}
Type	V DC	mA	V DC	mA	V DC	mA
8318 /2	≤ 0.4	2	30	0	≤ 30	≤ 4
8318 /2 HL	≤ 0.4	2	30	0	≤ 30	≤ 4
8318 /2 H	≤ 0.4	2	30	0	≤ 30	≤ 4
3412 N/2 GL	≤ 0.4	2	28	0	≤ 28	≤ 4
3412 N/2 GM	≤ 0.4	2	28	0	≤ 28	≤ 4
3412 N/2	≤ 0.4	2	28	0	≤ 28	≤ 4
3412 N/2 G	≤ 0.4	2	28	0	≤ 28	≤ 4
3412 N/2 HH	≤ 0.4	2	28	0	≤ 28	≤ 4
3412 N/2 GHH	≤ 0.4	2	28	0	≤ 28	≤ 4
3412 N/2 H	≤ 0.4	2	28	0	≤ 28	≤ 4
3414 N/2 GH	≤ 0.4	2	28	0	≤ 28	≤ 4
3414 N/2	≤ 0.4	2	28	0	≤ 28	≤ 4
3312 /2	≤ 0.4	2	30	0	≤ 30	≤ 4
3318 /2	≤ 0.4	2	30	0	≤ 30	≤ 4
4412 F/2 GL	≤ 0.4	2	30	0	≤ 30	≤ 4
4412 F/2 GML	≤ 0.4	2	30	0	≤ 30	≤ 4
4412 F/2 M	≤ 0.4	2	30	0	≤ 30	≤ 4
4412 F/2	≤ 0.4	2	30	0	≤ 30	≤ 4
4414 F/2 L	≤ 0.4	2	30	0	≤ 30	≤ 4
4414 F/2 M	≤ 0.4	2	30	0	≤ 30	≤ 4
4414 F/2 G	≤ 0.4	2	30	0	≤ 30	≤ 4
4414 F/2	≤ 0.4	2	30	0	≤ 30	≤ 4
4418 F/2	≤ 0.4	2	30	0	≤ 30	≤ 4
4312 N/2 H	≤ 0.4	2	30	0	≤ 30	≤ 4
4312 N/2 HH	≤ 0.4	2	30	0	≤ 30	≤ 4
4312 /2	≤ 0.4	2	30	0	≤ 30	≤ 4
4314 /2 G	≤ 0.4	2	30	0	≤ 30	≤ 4
4314 /2	≤ 0.4	2	30	0	≤ 30	≤ 4
4318 /2 G	≤ 0.4	2	30	0	≤ 30	≤ 4
4318 /2 M	≤ 0.4	2	30	0	≤ 30	≤ 4
4318 /2	≤ 0.4	2	30	0	≤ 30	≤ 4
4212 N/2 GN	≤ 0.4	2	30	0	≤ 30	≤ 4
4212 N/2 H	≤ 0.4	2	30	0	≤ 30	≤ 4
4214 N/2 GN	≤ 0.4	2	30	0	≤ 30	≤ 4
4214 N/2 H	≤ 0.4	2	30	0	≤ 30	≤ 4
4218 N/2 GN	≤ 0.4	2	30	0	≤ 30	≤ 4
4218 N/2 H	≤ 0.4	2	30	0	≤ 30	≤ 4
4212 /2 M	≤ 0.4	2	30	0	≤ 30	≤ 4
4212 /2	≤ 0.4	2	30	0	≤ 30	≤ 4
4212 /2 H	≤ 0.4	2	30	0	≤ 30	≤ 4
4214 /2	≤ 0.4	2	30	0	4- 30	≤ 4

Signal data	Sensor signal U _{S Low}	Condition: I _{Sink}	Sensor signal U _{S High}	Condition: I _{Source}	Sensor operating voltage U _{BS}	Perm. sink current I _{Sink max.}
Type	V DC	mA	V DC	mA	V DC	mA
4214 /2 H	≤ 0.4	2	30	0	4- 30	≤ 4
4218 /2	≤ 0.4	2	30	0	4- 30	≤ 4
4218 /2 H	≤ 0.4	2	30	0	4- 30	≤ 4
4182 N/2 X	≤ 0.4	2	30	0	4- 30	≤ 4
4184 N/2 GX	≤ 0.4	2	30	0	4- 30	≤ 4
4184 N/2 X	≤ 0.4	2	30	0	4- 30	≤ 4
4184 N/2 XH	≤ 0.4	2	30	0	4- 30	≤ 4
5112 N/2	≤ 0.4	2	15	0	≤ 5	≤ 20
5114 N/2	≤ 0.4	2	60	0	≤ 60	≤ 20
5118 N/2	≤ 0.4	2	60	0	≤ 60	≤ 20
5212 N/2 H	≤ 0.4	2	30	0	4- 30	≤ 2
5212 N/2 N	≤ 0.4	2	30	0	4- 30	≤ 2
5214 N/2 N	≤ 0.4	2	30	0	4- 30	≤ 2
5218 N/2 H	≤ 0.4	2	30	0	4- 30	≤ 2
7112 N/2	≤ 0.4	2	60	0	≤ 60	≤ 20
7114 N/2	≤ 0.4	2	30	0	≤ 30	≤ 20
7118 N/2	≤ 0.4	2	60	0	≤ 60	≤ 20
6224 N/2	≤ 0.4	8	30	0	≤ 30	≤ 20
6248 N/2	≤ 0.4	8	60	0	≤ 30	≤ 20
DV 6224 /2	≤ 0.4	2	30	0	≤ 60	≤ 20
6424 /2	≤ 0.4	2	60	0	≤ 60	≤ 20
6448 /2	≤ 0.4	2	60	0	≤ 60	≤ 20
6448 /2 T	≤ 0.4	2	60	0	≤ 60	≤ 20
RL 48-19/12/2	≤ 0.4	2	28	0	4- 30	≤ 4
RL 48-19/14/2	≤ 0.4	2	28	0	4- 30	≤ 4
RL 90-18/12N/2	≤ 0.4	2	30	0	≤ 30	≤ 4
RL 90-18/14N/2	≤ 0.4	2	30	0	≤ 30	≤ 4
RG 90-18/12N/2	≤ 0.4	2	30	0	≤ 30	≤ 4
RG 90-18/14N/2	≤ 0.4	2	30	0	≤ 30	≤ 4
RG 125-19/14N/2	≤ 0.4	2	30	0	≤ 30	≤ 4
RG 125-19/18N/2	≤ 0.4	2	60	0	≤ 30	≤ 4
RER 125-19/14N/2	≤ 0.4	2	30	0	≤ 30	≤ 4
RG 160-28/14N/2	≤ 0.4	2	30	0	≤ 30	≤ 20

Attention:

With these fan options, deviations in regard to temperature range, voltage range and power consumption are possible compared with standard fan data.