

# DC Axial Fans

ebmpapst

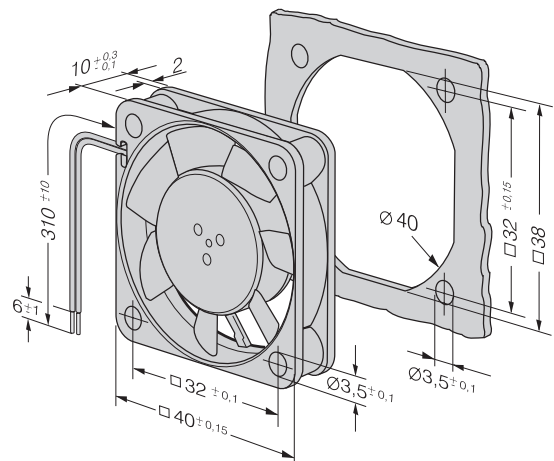
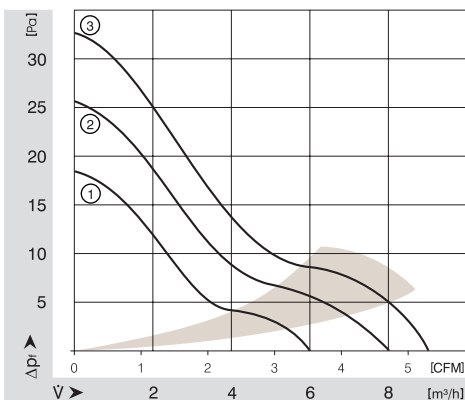
Series 400 F, Type 414 F 40 x 40 x 10 mm



- 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.
- Fan of fibreglass reinforced plastic. PBT housing, PA impeller.
- Air exhaust over struts. Rotational direction CCW looking at rotor.
- Electrical connection via 2 leads AWG 28, TR 64. Stripped and tinned ends.
- Mass 17 g.

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Nominal Data	Air Flow		Nominal Voltage	Voltage Range	Noise	Sinter-Sleeve Bearings Ball Bearings	Power Input	Nominal Speed	Temperature Range	Service Life L <sub>10</sub>		Curve
	m <sup>3</sup> /h	CFM								V DC	V DC	
405 F	8	4.7	5	4.5...5.5	22.1	4.4	0.7	5 400	-20...+70	45 000 / 15 000		2
405 FH	9	5.3	5	4.5...5.5	26.0	4.6	0.9	6 000	-20...+70	45 000 / 15 000		3
412 FM	6	3.5	12	10...14	16.5	3.8	0.6	4 300	-20...+70	45 000 / 15 000		1
412 F	8	4.7	12	10...14	22.1	4.4	0.7	5 400	-20...+70	45 000 / 15 000		2
412 FH	9	5.3	12	10...14	26.0	4.6	0.8	6 000	-20...+70	45 000 / 15 000		3
414 F	8	4.7	24	20...28	22.1	4.4	0.8	5 400	-20...+70	45 000 / 15 000		2
414 FH	9	5.3	24	21.6...26.4	26.0	4.4	0.9	6 000	-20...+70	45 000 / 15 000		3

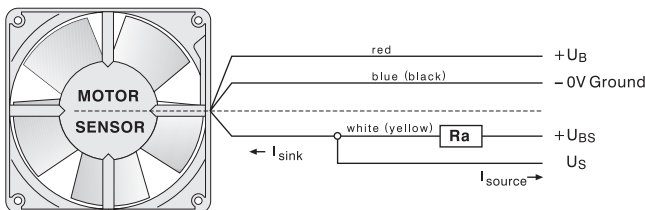




- Speed-proportional rectangular pulse for external speed monitoring of fan motor
- 2 pulses per revolution
- Open-Collector signal output
- Extremely wide operating voltage range (5 ... 60 V)
- Easy adaptation to user interface
- Connection via separate lead
- The sensor signal also serves as a major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

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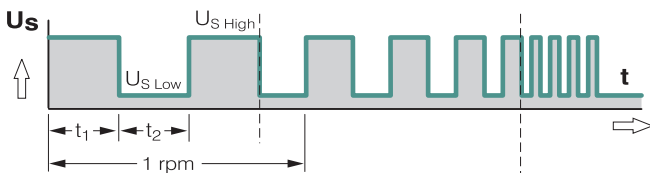
### Electrical connection



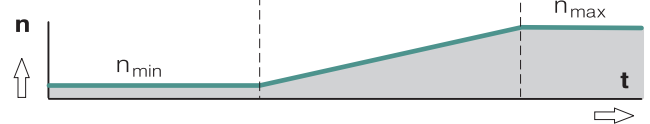
$$R_a = \frac{U_{BS} - U_{SLOW}}{I_{SINK}}$$

All voltages measured to ground.  
External load resistance Ra from US to UBS 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

Type	Sensor signal US Low V DC	Condition: Isink mA	Sensor signal US High V DC	Condition: Isource mA	Sensor operating voltage UBS V DC	Perm. sink current Isink max. 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 <sub>S, Low</sub>	Condition: I <sub>sink</sub>	Sensor signal U <sub>S, High</sub>	Condition: I <sub>source</sub>	Sensor operating voltage U <sub>BS</sub>	Perm. sink current I <sub>sink max.</sub>
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 <sub>S, Low</sub>	Condition: I <sub>sink</sub>	Sensor signal U <sub>S, High</sub>	Condition: I <sub>source</sub>	Sensor operating voltage U <sub>BS</sub>	Perm. sink current I <sub>sink max.</sub>
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.