DC fans - specials

Information

DC axial fans

DC centrifugal fans

DC fans - specials

ACmaxx / GreenTech
EC-Compact fans

AC axial fans

AC centrifugal fans

Accessories

Representatives

ebm**papst**

DC fans - specials

Cooling capacity and efficiency

Greater power density, increasing miniaturisation and extreme electronic component density are posing increased demands on the cooling capacity and efficiency of fans. The intelligent and space-saving integration of the fan in the device configuration is therefore of major importance:

• Tailor-made cooling adapted to the situation as and when required.

• Programmable cooling by defining speed profiles.

• Transparency of function thanks to complete, interactive monitoring in all operating conditions.

Standard fans in electronics cooling have proven themselves millions of times.

With a constant speed and a correspondingly high noise level, they continuously provide the air flow needed for extreme cases. These extreme situations, however, occur extremely rarely, if at all, during the operating period. An intelligent fan is needed, which adapts automatically to the currently required level of cooling.

ebm-papst provides intelligent cooling concepts which are optimally adapted to requirements. For example:

1. Speed adjustment via temperature sensor

ebm-papst answers with a complete range of DC fans with temperature-controlled speed adjustment via a temperature sensor, available in a variety of standard dimensions.

Installation is very simple. The control electronics receive thermal information for the speed adjustment continuously and without losses, either externally via a freely designed and positionable strand, or internally directly in the fan hub in the air flow. A range of temperature sensors can be found on page 174.

2. DC fans with separate control input

Open or closed-loop speed control is also possible with DC fans that have a separate control input. A variation in speed can thus be implemented via a control voltage or a pulse-width modulated signal. These possibilities are used primarily in devices that have appropriate standard interfaces and thus require a load-dependent variation of the fans.

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3. Speed signal
DC fans with speed signal.
The integrated „electronic tachometer" continuously provides an actual speed signal for external evaluation. The user is informed at all times of the current fan speed via an extremely simple signal evaluation on the customer side. The speed signal is via a separate lead.

4. Alarm signal
For applications which require monitored fan operation with alarm signal, ebm-papst has numerous alarm signal versions, either a static, pre-processed or interface-compatible high or low continuous signal depending on the type of fan.

5. Turbo drives
Fans with three-phase EC drives and microprocessor-controlled motor electronics. These three-phase motors whose torque is virtually non-reliant on the rotor position are used for extremely high running smooth-ness. The speed of these fans can be controlled over a very wide range with PWM, analogue voltage or temperature. Optionally, the fans can be supplied with reversible direction of rotation and active brake operation.

6. Vario-Pro fans
This high-end fan concept by ebmpapst with programmed intelligence and customer-specific integrated functions makes your electronics cooling even more versatile and competitive. Vario-Pro ensures a fresh economic breeze for all demanding cooling tasks – e.g. where greater reliability, more flexibility and intelligent function features such as alarm function, speed control etc. are required.

The successful concept of Vario-Pro is: Tailor-made software instead of fixed hardware, because programmed software modules for motor control and application intelligence are responsible for the work that analogue components were responsible for in the past. This central control unit of the Vario-Pro comprises a microcontroller and an EEPROM, on which all characteristics are stored.

### 7. Protection against environmental influences
Some applications place particular demands on the fans resistance to ambient influences, such as dust, moisture, water and salt. ebm-papst offer solutions for adapting fans to these ambient conditions.
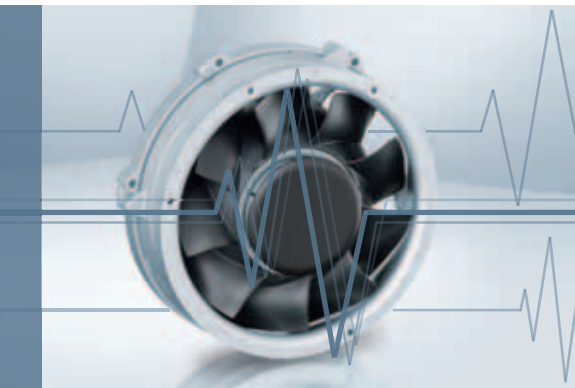
ebmpapst

- Speed-proportional rectangular pulse for external speed monitoring of fan motor
- 2, 3 or 6 pulses per revolution
- Open collector signal output
- Extremely wide operating voltage range
- Easy adaptation to user interface
- Connection via separate lead
- The sensor signal also serves as a major comparison variable for setting and maintaining the setpoint speed for interactive or controlled cooling with one or several interconnected fans.
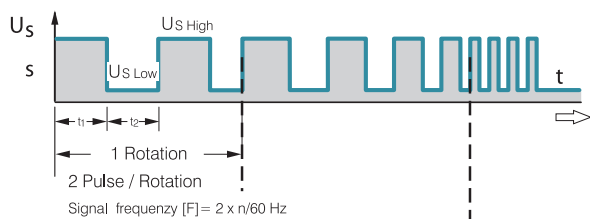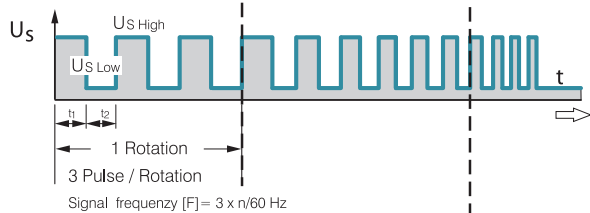
Electrical connection

Fan   Customer

(+) Power — U_B

output

(-) Power
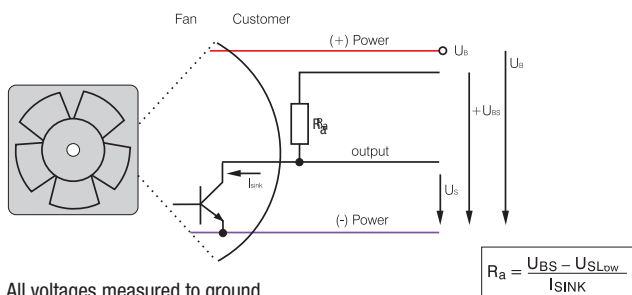
All voltages measured to ground.
External load resistor R_a / U_S / U_{BS} required.

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

Signal output voltage
Standard signal for all models (exceptions see below)

U_S

$U_{S\ High}$
$U_{S\ Low}$

1 Rotation
2 Pulse / Rotation
Signal frequenzy [F] = 2 x n/60 Hz

only for 4100 NH7 and NH8

U_S

$U_{S\ High}$
$U_{S\ Low}$

1 Rotation
3 Pulse / Rotation
Signal frequenzy [F] = 3 x n/60 Hz

Alle TD Lüfter. Bsp.: 6400 TD

U_S

$U_{S\ High}$
$U_{S\ Low}$

1 Rotation
6 Pulse / Rotation
Signal frequenzy [F] = 6 x n/60 Hz

Fan Speed

n

n_{min} n_{max}

Signal data	Speed signal $U_{S\ Low}$	Condition: I_{sink}	Speed signal $U_{S\ High}$	Condition: I_{source}	Sensor operating voltage U_{BS} max.	Perm. sink current I_{sink} max.	Pulses per revolution	Fan description Basic type
Type	VDC	mA	VDC	mA	VDC	mA		Page
250	≤ 0,4	2	≤ 30	0	30	2	2	31
400 F	≤ 0,4	1	≤ 30	0	30	2	2	32
400	≤ 0,4	1	≤ 30	0	30	2	2	33
420 J	≤ 0,4	2	≤ 15	0	15	4	2	34
500 F	≤ 0,4	1	≤ 30	0	30	2	2	35
600 F	≤ 0,4	1	≤ 30	0	30	2	2	36
620	≤ 0,4	2	≤ 30	0	30	4	2	37
630 U	≤ 0,4	2	≤ 30	0	30	4	2	38
600 N	≤ 0,4	2	≤ 28	0	28	4	2	39
600 J	≤ 0,4	2	≤ 30	0	30	4	2	41
700 F	≤ 0,4	2	≤ 30	0	30	4	2	42
8450	≤ 0,4	2	≤ 28	0	28	4	2	43
8400 N	≤ 0,4	2	≤ 28	0	28	4	2	44
8400 N VARIOFAN	≤ 0,4	2	≤ 30	0	30	4	2	45
8300	≤ 0,4	2	≤ 30	0	30	4	2	46
8200 J	≤ 0,4	2	≤ 30	0	30	4	2	47
3400 N	≤ 0,4	2	≤ 28	0	28	4	2	48
3400 N VARIOFAN	≤ 0,4	2	≤ 30	0	30	4	2	49
3300	≤ 0,4	2	≤ 30	0	30	4	2	50
3300 N	≤ 0,4	2	≤ 30	0	30	4	2	51
3212 J / 3214 J	≤ 0,4	2	≤ 30	0	30	4	2	52
3218 J	≤ 0,4	2	≤ 60	0	60	4	2	52
3250 J	≤ 0,4	2	≤ 60	0	60	4	3	53
4412 F / 4414 F	≤ 0,4	2	≤ 30	0	30	4	2	54
4418 F	≤ 0,4	2	≤ 60	0	60	4	2	54
4400 FN	≤ 0,4	2	≤ 30	0	30	4	2	55
4312 / 4314	≤ 0,4	2	≤ 30	0	30	4	2	56
4318	≤ 0,4	2	≤ 60	0	60	4	2	56
4312 / 4314 VARIOFAN	≤ 0,4	2	≤ 30	0	30	4	2	57
4318 VARIOFAN	≤ 0,4	2	≤ 60	0	60	4	2	57
4400	≤ 0,4	2	≤ 30	0	30	4	2	58/59
4100 N	≤ 0,4	2	≤ 30	0	30	4	2	60
4100 NHH...NH6	≤ 0,4	2	≤ 60	0	60	10	2	61
4100 NH7...NH8	≤ 0,4	2	≤ 60	0	60	20	3	62
DV 4100	≤ 0,4	2	≤ 30	0	30	4	2	63

Subject to alternations

ebm**papst**

Information

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AC axial fans

AC centrifugal fans

Accessories

Representatives

Available on request:
– Electrically isolated sensor and signal circuit
– Varying voltage potentials for power and logic circuit

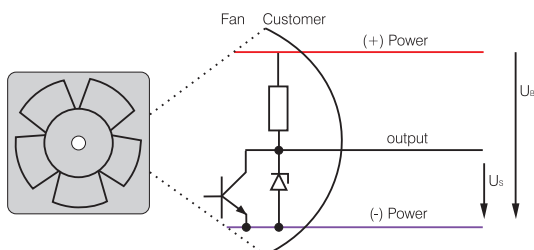| Signal data	Speed signal U_S Low	Condition: I_{sink}	Speed signal U_S High	Condition: I_{source}	Sensor operating voltage U_{BS} max.	Perm. sink current I_{sink} max.	Pulses per revolution	Fan description Basic type
Type	VDC	mA	VDC	mA	VDC	mA		Page
5200 N	≤ 0,4	2	≤ 30	0	30	4	2	64
DV 5200	≤ 0,4	2	≤ 30	0	30	4	2	65
5112 N	≤ 0,4	2	≤ 15	0	5	20	2	66
5114 N / 5118 N	≤ 0,4	2	≤ 60	0	60	20	2	66
5300	≤ 0,4	2	≤ 72	0	72	4	2	67
5300 TD	≤ 0,4	2	≤ 72	0	72	20	6	68
7112 N / 7118 N	≤ 0,4	2	≤ 60	0	60	20	2	69
7114 N	≤ 0,4	2	≤ 30	0	30	20	2	69
7200 N	≤ 0,4	2	≤ 15	0	15	20	2	70
6300	≤ 0,4	2	≤ 72	0	72	20	2	72
6300 TD	≤ 0,4	2	≤ 72	0	72	20	6	73/74
DV 6300	≤ 0,4	2	≤ 72	0	72	20	6	75
6400	≤ 0,4	2	≤ 60	0	60	20	2	76
2200 FTD	≤ 0,4	2	≤ 72	0	72	20	6	80
RL 48	≤ 0,4	2	≤ 30	0	30	4	2	95
RL 65	≤ 0,4	2	≤ 30	0	30	4	2	96
RL 90 N	≤ 0,4	2	≤ 30	0	30	4	2	97
RLF 100	≤ 0,4	2	≤ 30	0	30	4	2	98
RG 90 N	≤ 0,4	2	≤ 30	0	30	4	2	99
RG 125 N	≤ 0,4	2	≤ 30	0	30	4	2	100
RG 160 N	≤ 0,4	2	≤ 30	0	30	20	2	101
RG 160 NTD	≤ 0,4	2	≤ 60	0	60	20	6	102
RG 190 TD	≤ 0,4	2	≤ 72	0	72	20	6	103
RG 220 TD	≤ 0,4	2	≤ 72	0	72	20	6	104
RG 225 TD	≤ 0,4	2	≤ 72	0	72	20	6	105
RET 97 TD	≤ 0,4	2	≤ 72	0	72	20	6	106
REF 100	≤ 0,4	2	≤ 30	0	30	4	2	107
RER 120 TD	≤ 0,4	2	≤ 72	0	72	20	6	109
RER 133 TD	≤ 0,4	2	≤ 72	0	72	20	6	113
RER 160 NTD	≤ 0,4	2	≤ 60	0	60	20	6	115
REF 175 TD	≤ 0,4	2	≤ 72	0	72	20	6	116
RER 175 TD	≤ 0,4	2	≤ 72	0	72	20	6	117
RER 190 TD	≤ 0,4	2	≤ 72	0	72	20	6	118
RER 220 TD	≤ 0,4	2	≤ 72	0	72	20	6	124
RER 225 TD	≤ 0,4	2	≤ 72	0	72	20	6	125

Subject to alternations

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

ebm**papst**
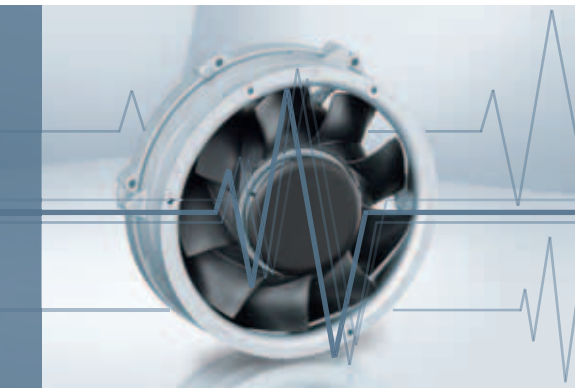
- Speed-proportional rectangular pulse for external speed monitoring of fan motor
- 2, 3 or 6 pulses per revolution
- TTL-compatible
- Integrated pull-up resistor
- Connection via separate lead
- The sensor signal also serves as a major comparison variable for setting and maintaining the setpoint speed for interactive or controlled cooling with one or more interconnected fans.
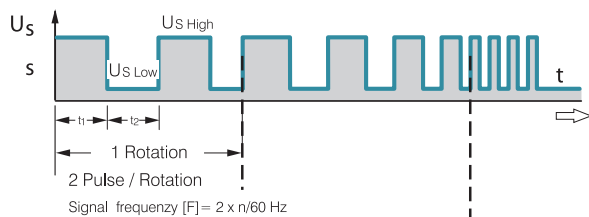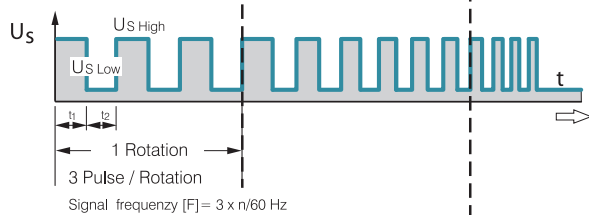
Electrical connection

Fan   Customer

(+) Power

output

(-) Power

U_a

U_s

All voltages measured to ground.

Signal output voltage
Standard signal for all models (exceptions see below)

U_S

$U_{S High}$

$U_{S Low}$

t_1 t_2

1 Rotation

2 Pulse / Rotation

Signal frequenzy [F] = 2 x n/60 Hz

only for 4100 NH7 and NH8

U_S

$U_{S High}$

$U_{S Low}$

t_1 t_2

1 Rotation

3 Pulse / Rotation

Signal frequenzy [F] = 3 x n/60 Hz

Alle TD Lüfter. Bsp.: 6400 TD

U_S

$U_{S High}$

$U_{S Low}$

t_1 t_2

1 Rotation

6 Pulse / Rotation

Signal frequenzy [F] = 6 x n/60 Hz

Fan Speed

n

n_{min}

n_{max}

t

Signal data	Speed signal U_S Low	Condition: I_{sink}	Speed signal U_S High	Condition: I_{source}	Perm. sink current I_{sink} max.	Fan description Basic type
Type	VDC	mA	VDC	mA	mA	Page
614 N/12 GM	≤ 0,4	1	2,5–5,5	1	1	39
618 N/12 N	≤ 0,4	1	2,5–5,5	1	1	39
8412 N/12 H	≤ 0,4	1	2,5–5,5	1	1	44
4412 F/12 GM	≤ 0,4	1	2,5–5,5	1	1	54
4418 F/12	≤ 0,4	1	2,5–5,5	1	1	54
4312 /12 M	≤ 0,4	1	2,5–5,5	1	1	56
4314 /12	≤ 0,4	1	2,5–5,5	1	1	56
4182 N/12 X	≤ 0,4	1	2,5–5,5	1	1	60

Subject to alternations

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

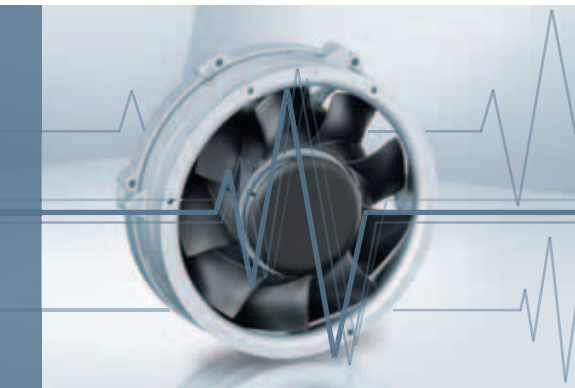ebmpapst

Available on request:
– Electrically isolated sensor and signal circuit
– Varying voltage potentials for power and logic circuit

Signal data	Speed signal U_S Low	Condition: I_{sink}	Speed signal U_S High	Condition: I_{source}	Perm. sink current I_{sink} max.	Fan description Basic type
Type	**VDC**	**mA**	**VDC**	**mA**	**mA**	**Page**
7214 N/12	≤ 0,4	2	2,5–5,5	1	≤ 20	70
6424/12 H	≤ 0,4	2	2,5–5,5	1	≤ 20	76
DV 6424/12	≤ 0,4	2	4,5–5,25	2	≤ 12	78
DV 6448/12	≤ 0,4	2	4,5–5,25	2	≤ 12	78
RG 125-19/12 N/12	≤ 0,4	1	2,5–5,5	1	≤ 1	100
RG 160-28/12 N/12	≤ 0,4	2	2,5–5,5	1	≤ 5	101
RG 160-28/18 N/12	≤ 0,4	2	2,5–5,5	1	≤ 20	101
RER 125-19/12 N/12	≤ 0,4	1	2,5–5,5	1	≤ 1	112
RER 160-28/12 N/12	≤ 0,4	2	2,5–5,5	1	≤ 5	114
RER 160-28/18 N/12	≤ 0,4	2	2,5–5,5	1	≤ 20	114

Subject to alternations

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

Information

DC axial fans

DC centrifugal fans

DC fans - specials

ACmaxx / GreenTech EC-Compact fans

AC axial fans

AC centrifugal fans

Accessories

Representatives

ebm**papst**

- Alarm signal for speed monitoring
- Signal output via open collector
- The fan emits a high continuous signal during trouble-free operation within the permissible voltage range.
- Low signal when speed limit is not reached
- After elimination of fault, the fan returns to its setpoint speed; the alarm signal reverts to high.
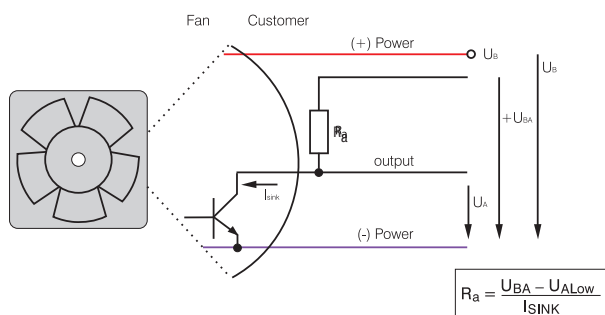
Alarm signal data / Type	Alarm output voltage U_A Low VDC	Condition:	Condition: I_{sink} = mA	Alarm output-voltage U_A High VDC	Condition:	Condition: I_{source} mA	Alarm operating-voltage U_{BA} max. VDC	Max. permissible Sink current mA	Alarm delay time t_2 s	Condition:	Speed limit n_G RPM	Fan description Basic type Page
8318 /17	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	1500 ± 100	46
8318 /17 H	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	1500 ± 100	46
3314 /17	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	1500 ± 100	50
4318 /17	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	850 ± 100	56
4184 N /17 X	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	1500 ± 100	60

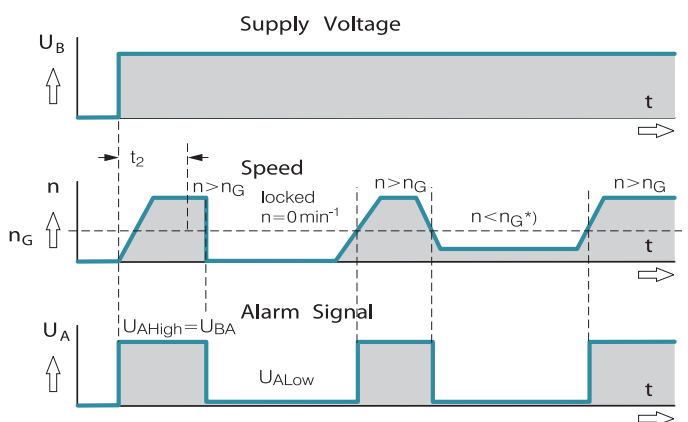Subject to alternations

Note:
With these fan specials, deviations as regards temperature range,
voltage range and power consumption are possible compared with standard fans.

Electrical connection

$$R_a = \frac{U_{BA} - U_{ALow}}{I_{SINK}}$$

All voltages measured to ground.
External load resistor R_a from U_A to U_{BA} required.

t_2 = Alarm signal suppression during start-up
* n < speed limit n_G by braking or locking.

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Information

DC axial fans

DC centrifugal fans

DC fans - specials

ACmaxx / GreenTech EC-Compact fans

AC axial fans

AC centrifugal fans
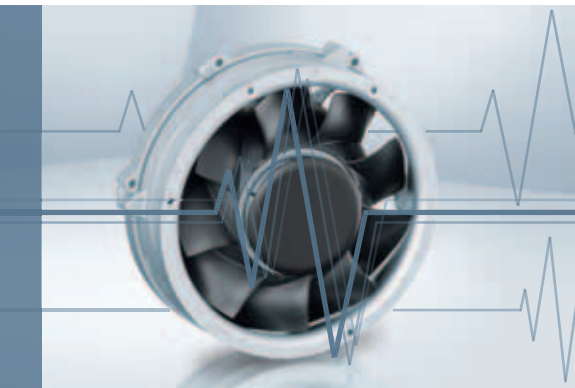
Accessories

Representatives

Available on request:
– With integrated signal latching for subsequent recognition of short-time faults
– Alarm circuit open collector or TTL
– Electrically isolated for maximum device safety
   Defects in the power circuit do not affect the alarm circuit.

Alarm signal data	Alarm output voltage U_A Low	Condition:	Condition: I_{sink} =	Alarm output-voltage U_A High	Condition:	Condition: I_{source}	Alarm operating-voltage U_{BA} max.	Max. permissible Sink current	Alarm delay time t_2	Condition:	Speed limit n_G	Fan description Basic type
Type	**VDC**		**mA**	**VDC**		**mA**	**VDC**	**mA**	**s**		**RPM**	**Page**
4312/17 MT VARIOFAN	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	1500 ± 100	57
4312/17 T VARIOFAN	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	1500 ± 100	57
4314/17 T VARIOFAN	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	1150 ± 100	57
4318/17 T VARIOFAN	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	20	≤ 15	*	850 ± 100	57
7214 N/17	≤ 0,4	n < nG	2	≤ 60	n > nG	0	60	15	≤ 15	*	1330 ± 60	70

Subject to alternations

* After switching on U_B

Note:
With these fan specials, deviations as regards temperature range,
voltage range and power consumption are possible compared with standard fans.

ebm**papst**

- Alarm signal for speed monitoring
- Signal output via open collector
- The fan emits a low continuous signal during trouble-free operation within the permissible voltage range.
- High signal when speed limit is not reached
- After elimination of fault, the fan returns to its setpoint speed; the alarm signal reverts to low.

Alarm signal data / Type	Alarm output voltage U_A Low VDC	Condition:	Condition: $I_{sink} =$ mA	Alarm output-voltage U_A High VDC	Condition:	Condition: I_{source} mA	Alarm operating-voltage U_{BA} max. VDC	Max. permissible Sink current mA	Alarm delay time t_2 s	Condition:	Speed limit n_G RPM	Fan description Basic type Page
8314/19 H	≤ 0,4	n > nG	2	≤ 60	n < nG	0	60	20	≤ 15	*	1500 ± 100	46
4312/19	≤ 0,4	n > nG	2	≤ 60	n < nG	0	60	20	≤ 15	*	1500 ± 100	56
7214 N/19	≤ 0,4	n > nG	2	≤ 60	n < nG	0	60	10	10 ± 4	*	1800 ± 20	70
RLF 100-11/14/19	≤ 0,4	n > nG	2	≤ 28	n < nG	0	28	10	10 ± 4	*	1900 ± 100	98
RER 101-36/18N/19 HH	≤ 0,4	n > nG	2	≤ 28	n < nG	0	28	10	10 ± 4	*	1900 ± 100	108

Subject to alternations

* After switching on U_B

Note:
With these fan specials, deviations as regards temperature range,
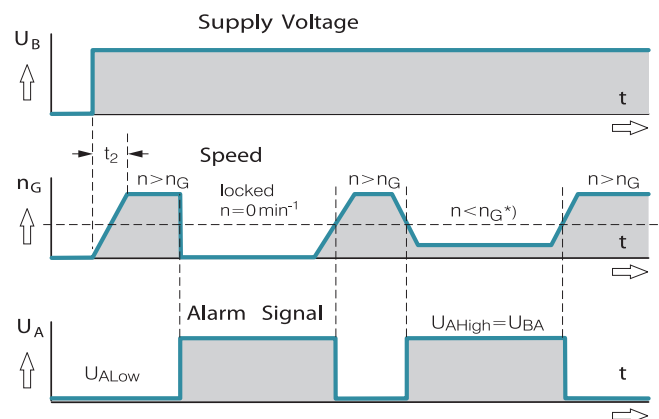voltage range and power consumption are possible compared with standard fans.

Available on request:
- With integrated signal latching for subsequent recognition of short-term faults.
- Alarm circuit open collector or TTL.
- Electrically isolated for max. device safety; defects in power circuit have no effect on the alarm circuit.

Electrical connection
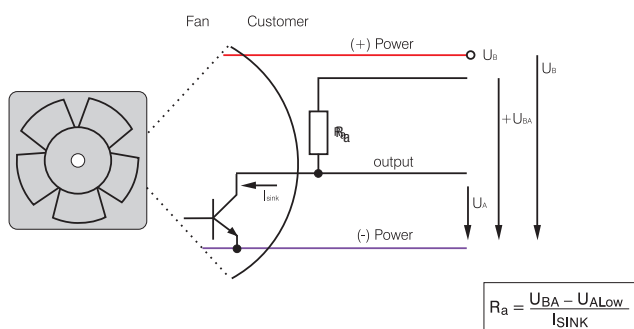
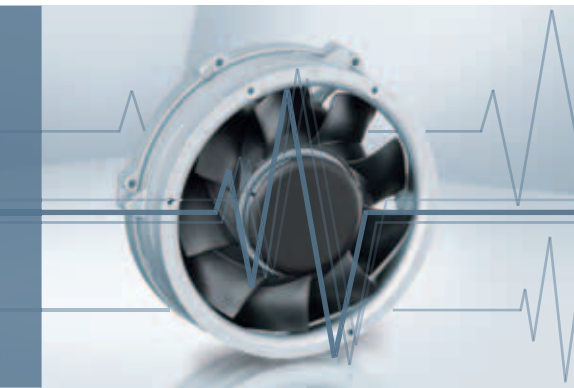$$R_a = \frac{U_{BA} - U_{ALow}}{I_{SINK}}$$

All voltages measured to ground.
External load resistor R_a from U_A to U_{BA} required.

$t_2 =$ Alarm signal suppression during start-up.
* n < Speed limit n_G by braking or locking.

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DC axial fans

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ACmaxx / GreenTech
EC-Compact fans

AC axial fans

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Accessories

Representatives

Alarm signal /37
Go / No-go alarm

– Alarm signal for speed monitoring
– Signal output via open collector
– The fan emits a high continuous signal during trouble-free operation within the permissible voltage range.
– Low signal when speed limit is not reached
– After elimination of fault, the fan returns to its setpoint speed; the alarm signal reverts to high.

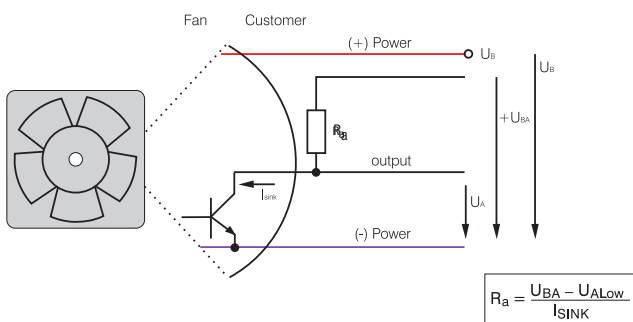| Alarm signal data	Alarm output voltage U_A Low	Condition:	Condition: $I_{sink} =$	Alarm output- voltage U_A High	Condition:	Condition: I_{source}	Alarm operating- voltage U_{BA} max.	Max. permissible Sink current	Alarm delay time t_2	Condition:	Speed limit n_G	Fan description Basic type
Type	VDC		mA	VDC		mA	VDC	mA	s		RPM	Page
8412 N/37 GMLV	≤ 0,4	n ≤ nG	2	≤ 28	n > nG	0	28	10	<1	*	0	45
3412 N/37 GV	≤ 0,4	n ≤ nG	2	≤ 28	n > nG	0	28	10	<1	*	0	49

Subject to alternations

* After switching on U_B

Note:
With these fan specials, deviations as regards temperature range,
voltage range and power consumption are possible compared with standard fans.

Available on request:
– Alarm circuit TTL compatible.

Electrical connection

$$R_a = \frac{U_{BA} - U_{ALow}}{I_{SINK}}$$

All voltages measured to ground.
External load resistor R_a from U_A to U_{BA} required.

t_2 = Alarm signal suppression during start-up.
* n < Speed limit n_G by braking or locking.

Alarm signal /39
Go / No-go alarm

- Alarm signal for speed monitoring
- Signal output via open collector
- The fan emits a low continuous signal during trouble-free operation within the permissible voltage range.
- High signal when speed limit is not reached
- After elimination of fault, the fan returns to its setpoint speed; the alarm signal reverts to low.

Alarm signal data	Alarm output voltage U_A Low	Condition:	Condition: $I_{sink} =$	Alarm output-voltage U_A High	Condition:	Condition: I_{source}	Alarm operating-voltage U_{BA} max.	Max. permissible Sink current	Alarm delay time t_2	Condition:	Speed limit n_G	Fan description Basic type
Type	**VDC**		**mA**	**VDC**		**mA**	**VDC**	**mA**	**s**		**RPM**	**Page**
412/39	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	33
612 F/39 H	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	36
614 N/39 M	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	39
618 N/39 N	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	39
3412 N/39 H	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	48
3414 N/39 HH	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	48
4412 F/39 GL	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	54
4412 F/39 M	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	54
4414 F/39	≤ 0,5	n > nG	2	≤ 28	n = nG	0	28	10	<1	*	0	54
4414 FN/39 H	≤ 0,4	n > nG	2	≤ 30	n = nG	0	30	4	<1	*	0	55

Subject to alternations

* After switching on U_B

Note:
With these fan specials, deviations as regards temperature range,
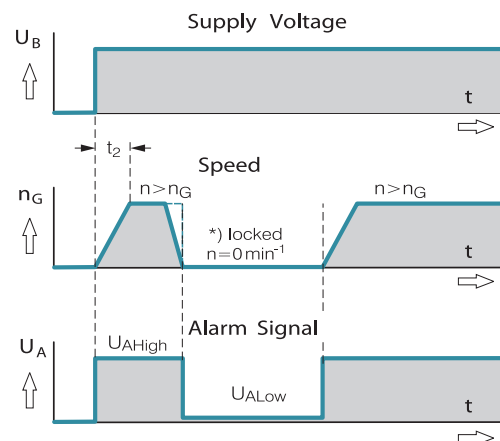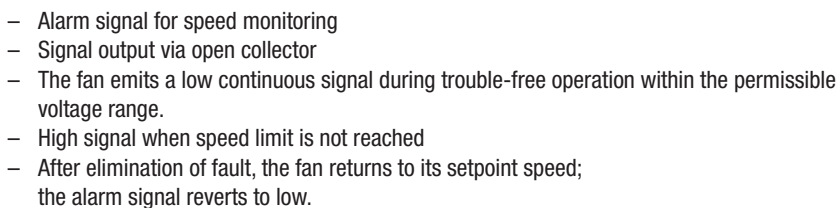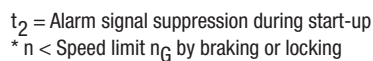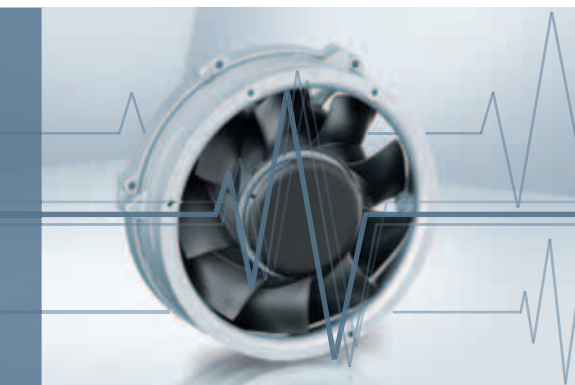voltage range and power consumption are possible compared with standard fans.

Electrical connection

All voltages measured to ground
External load resistor Ra from U_A to U_{BA} required.

$$R_a = \frac{U_{BA} - U_{ALow}}{I_{SINK}}$$

t_2 = Alarm signal suppression during start-up
* n < Speed limit n_G by braking or locking

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Vario-Pro®

Information

DC axial fans

DC centrifugal fans

DC fans - specials

ACmaxx / GreenTech EC-Compact fans

AC axial fans

AC centrifugal fans

Accessories

Representatives

– "Software instead of hardware" – aptly describes the unique fan concept, equipped at the plant with tailor-made intelligence for cooling electronics.
– Flexible configuration using software, allows quicker availability, sampling from the factory and the ability to supply customer-specific solutions in any quantity.

Vario-Pro-Features

External Speed setting
– Speed setting via temperature, PWM or analogue control voltage
  See page 174 (Speed setting)
– Description of speed curve with up to 14 selectable interpolation points
  Linear interpolation between the points
– Zero speed possible
– Recognition of sensor failure: In case of loss of sensor, the fan operates at programmable (fail-safe) speed.

Alarm and tachometer functions
– Optional alarm and/or tachometer function
– Selectable alarm speed limit (with hysteresis) and alarm delay time
– Latching of alarm signal
– Delay only when starting or permanently active
– "High" or "Low" output signal in case of alarm
– Optional alarm if temperature sensor fails
– Optional alarm in case of excess temperature

Motor management
– High control accuracy due to digital motor management
– Higher operating efficiency due to optimum adaptation of motor hardware and software

Fan series	Page
620	37
8400 N	44
8300	46
8200 J	47
3400 N	48
3300	50
3300 N	51
3200 J	52
3250 J	53
4400 FN	55
4300	56
4100 N	60

Fan series	Page
4100 NH...NH6	61
4100 NH 7-8	62
DV 4100	63
5200 N	64
DV 5200	65
5100 N	66
5300	67
7100 N	69
7200 N	70
6100 N	71
6300	72
DV 6300	75

| Fan series	Page
6400	76
DV 6400	78
RL 90 N	97
RLF 100	98
RG 90 N	99
RG 125 N	100
RG 160 N	101
REF 100	107
RER 101	108
RER 125 N	112
RER 160 N	114

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Speed setting via temperature sensor
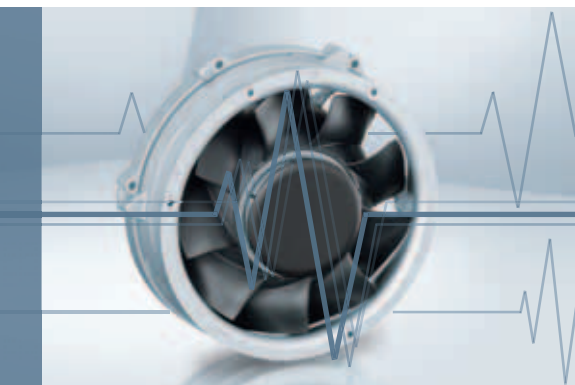
– The control variable is a temperature sensor which is either integrated into the fan or connected to an additional control wire.
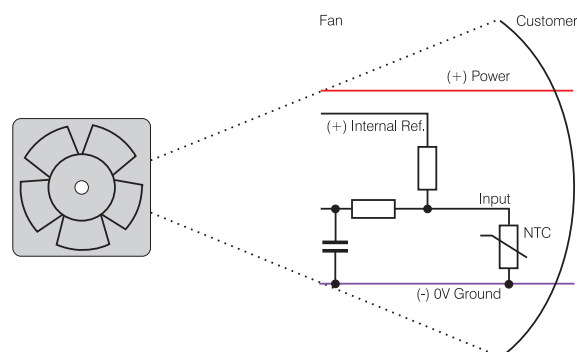
External temperature sensor Type T

– Ext. NTC type LZ370 (p. 253) is required
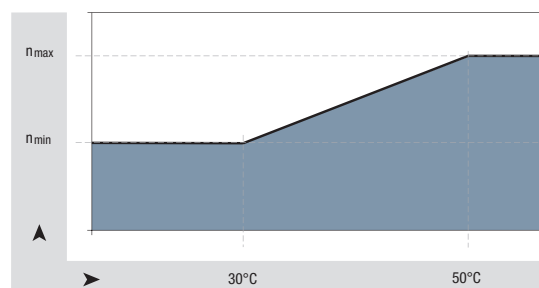 (to be ordered seperatly)
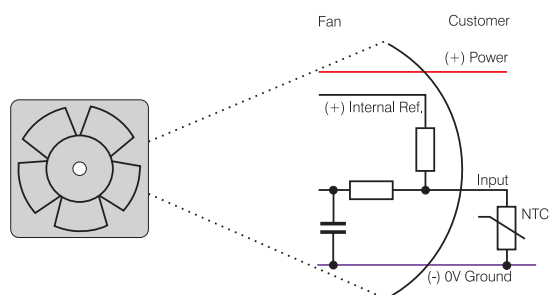
Internal temperature sensor Type I

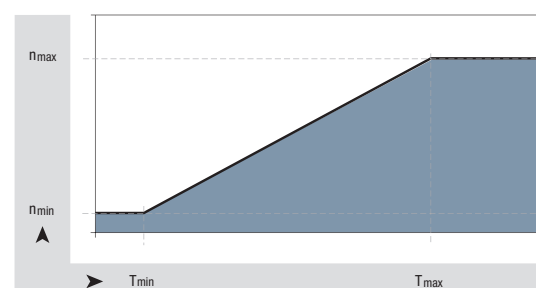– NTC integrated into the fan hub

Standard speed-temperature curve for type T and type I

$n_{min} \approx {}^{1}/_{2}\, n_{max}$
$T_{min} \approx 30\ °C;\ T_{max} = 50\ °C$

Optionally available with customer specific temperature-speed control curve
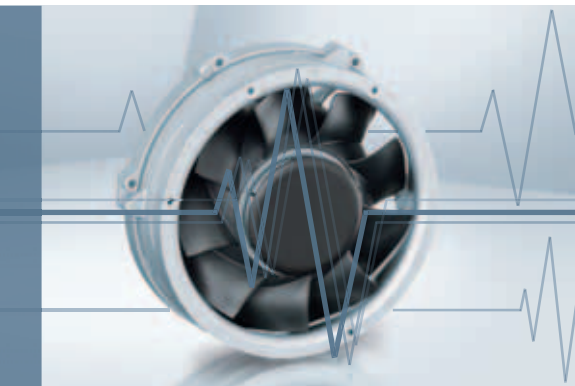

$n_{min} \approx 800\ {}^{1}/_{min}$ n_{max} model-dependent
$T_{min} \approx 5\ °C$ $T_{max} \leq 85\ °C$, model-dependent
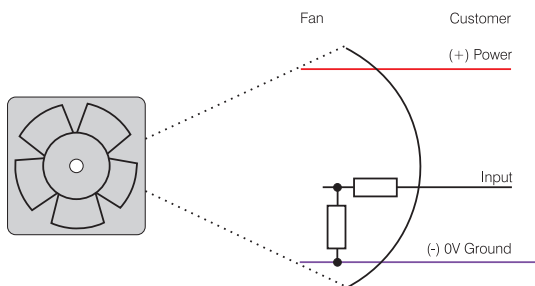
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Speed setting with control voltage or PWM

– The control variable is a PWM signal or analogue control voltage.

Speed setting via control voltage Type A

– Standard control range 0 ... 10 V

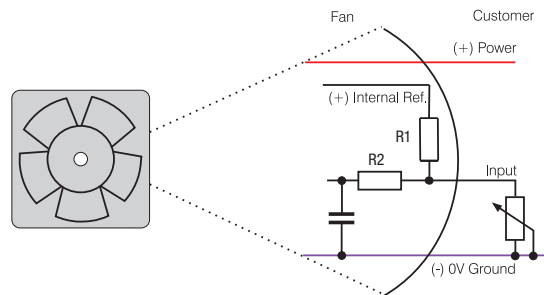Fan   Customer

(+) Power

Input

(-) 0V Ground

Typical input resistance >10 kΩ

Drehzahlvorgabe mittels PWM Typ P

– Standard PWM signal in two versions
  a) PWM frequency, mainly 1– 10 kHz (0–100%),
     Open collector input
  b) Four-wire interface in accordance with Intel specifications
     for 12 VDC fans, PWM frequency 25 kHz, incl. speed signal /2

Fan   Customer

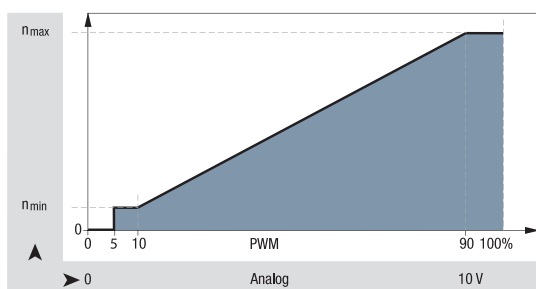(+) Power

(+) Internal Ref.

R1

R2

Input

(-) 0V Ground
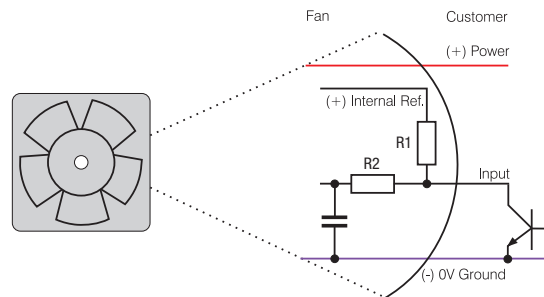
– Optional with potentiometer

Fan   Customer

(+) Power

(+) Internal Ref.

R1

R2

Input

(-) 0V Ground

Internal reference = +5V
R1 typical 4.7...10 kΩ
R2 typical 100 kΩ

Standard curve P / A

n_{max}

n_{min}

0

0 5 10   PWM   90 100%

0   Analog   10 V

Optionally available with customer specific P / A speed control curve

n_{max}

n_{min}

0   PWM   100 %

0   Analog   10 V

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Accessories

Representatives
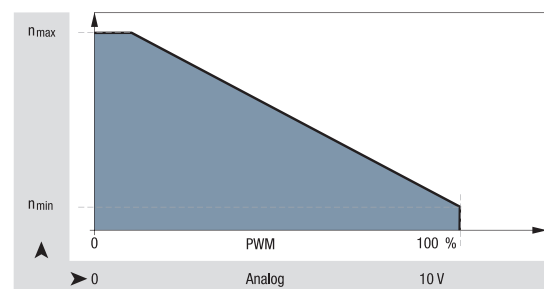
Speed setting via multi-option control input
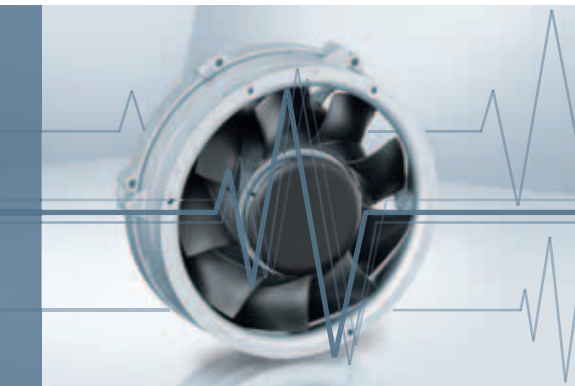
– Customer can operate input either with PWM signal, analogue voltage, external temperature control module or resistor.
– The control signal-speed characteristics of the fan differ from the standard curve of the A and P inputs .
– To attain the maximum speed, the control wire must be switched against UB.
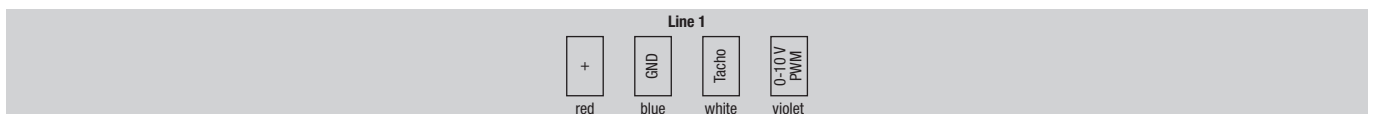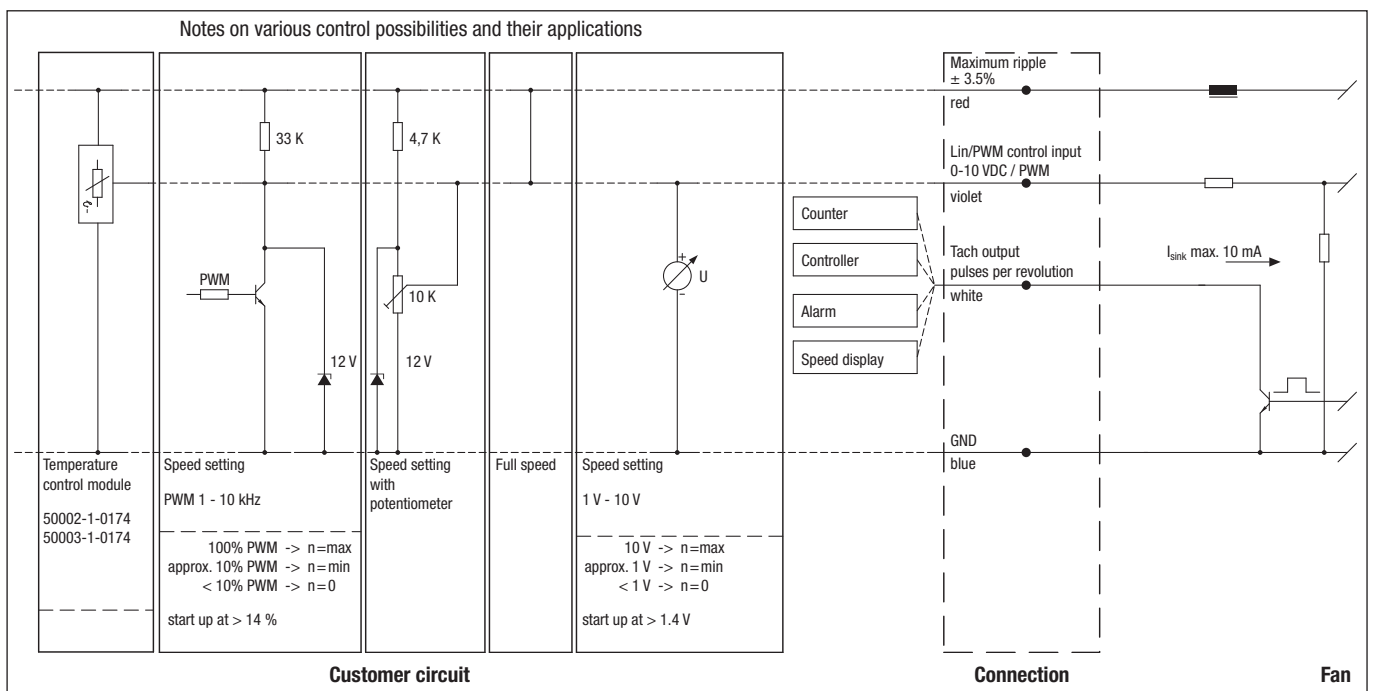– The control input is usually combined with an open collector tachometer .

Speed setting via multi-option control input

Notes on various control possibilities and their applications

33 K	4,7 K		Maximum ripple ± 3.5% red
	10 K		Lin/PWM control input 0-10 VDC / PWM violet
PWM		Counter	Tach output pulses per revolution white I_{sink} max. 10 mA
		Controller	
12 V	12 V	Alarm	
		Speed display	
			GND blue
Temperature control module 50002-1-0174 50003-1-0174	Speed setting PWM 1 - 10 kHz 100% PWM -> n=max approx. 10% PWM -> n=min < 10% PWM -> n=0 start up at > 14 %	Speed setting with potentiometer	Full speed	Speed setting 1 V - 10 V 10 V -> n=max approx. 1 V -> n=min < 1 V -> n=0 start up at > 1.4 V

Customer circuit — **Connection** — **Fan**

Line 1

+	GND	Tacho	0-10 V PWM
red	blue	white	violet

Line	Connection	Colour	Assignment / function
1	+	red	Maximum ripple ± 3.5 %
	GND	blue	GND

Line	Connection	Colour	Assignment / function
1	Tach	white	Tach output:
			3 pulses / revolution
	0-10 V / PWM	violet	Control input (Impedance 100 kΩ)

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Representatives

Protected fans
against environmental influences

– Capable to fulfil special requirements for a broad range of applications
– Resistant to environmental influences, such as dust, splash water, humidity, spray water and salt fog
– Highly competent solutions for adapting fans to environmental conditions

Moisture protection
Coated motor and printed circuit board protects against humidity and condensation.

Type of protection: IP 54 / IP 68
In the type of protection IP 54, the motor and circuit boards are coated and therefore protected against spray water and moisture.
The type of protection IP 68 is important for ebm-papst products, as it ensures a high degree of protection for the encapsulated motor and electronic against foreign bodies and water, whilst protecting the user against potential hazards upon contact. Types of protection higher than IP 68 are possible upon request.

The available solutions could be different depending on the fan size. We would be glad to develop solutions tailored to the demands of your application.

Salt fog protection
Salt fog is extremely demanding on the resistance of the product. ebm-papst makes use of technologies that protect fans and blowers from salt fog reliably and durably.

Stainless steel bearings
Special bearings made of stainless steel provide additional protection.

Type of protection – IP code			
	Protection against foreign bodies and accidental contact (first digit)		Water protection (second digit)
X	No protection	X	No protection
1	Protection against foreign bodies > 50 mm (back of the hand)	1	Protection against dripping water or condensation
2	Protection against foreign bodies > 12 mm (finger)	2	Protection against dripping water, fans tilted 15° from vertical
3	Protection against foreign bodies > 2,5 mm (tool)	3	Protection against water spray up to 60° from vertical
4	Protection against foreign bodies > 1 mm (wire)	4	Protection against water spray from all sides
5	Protection against dust in harmful quantities	5	Protection against low-pressure water jets
6	Dust-proof	6	Protection against high-pressure water jets
		7	Protection against temporary submersion (15 cm - 1 m)
		8	Protection against continuous submersion

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