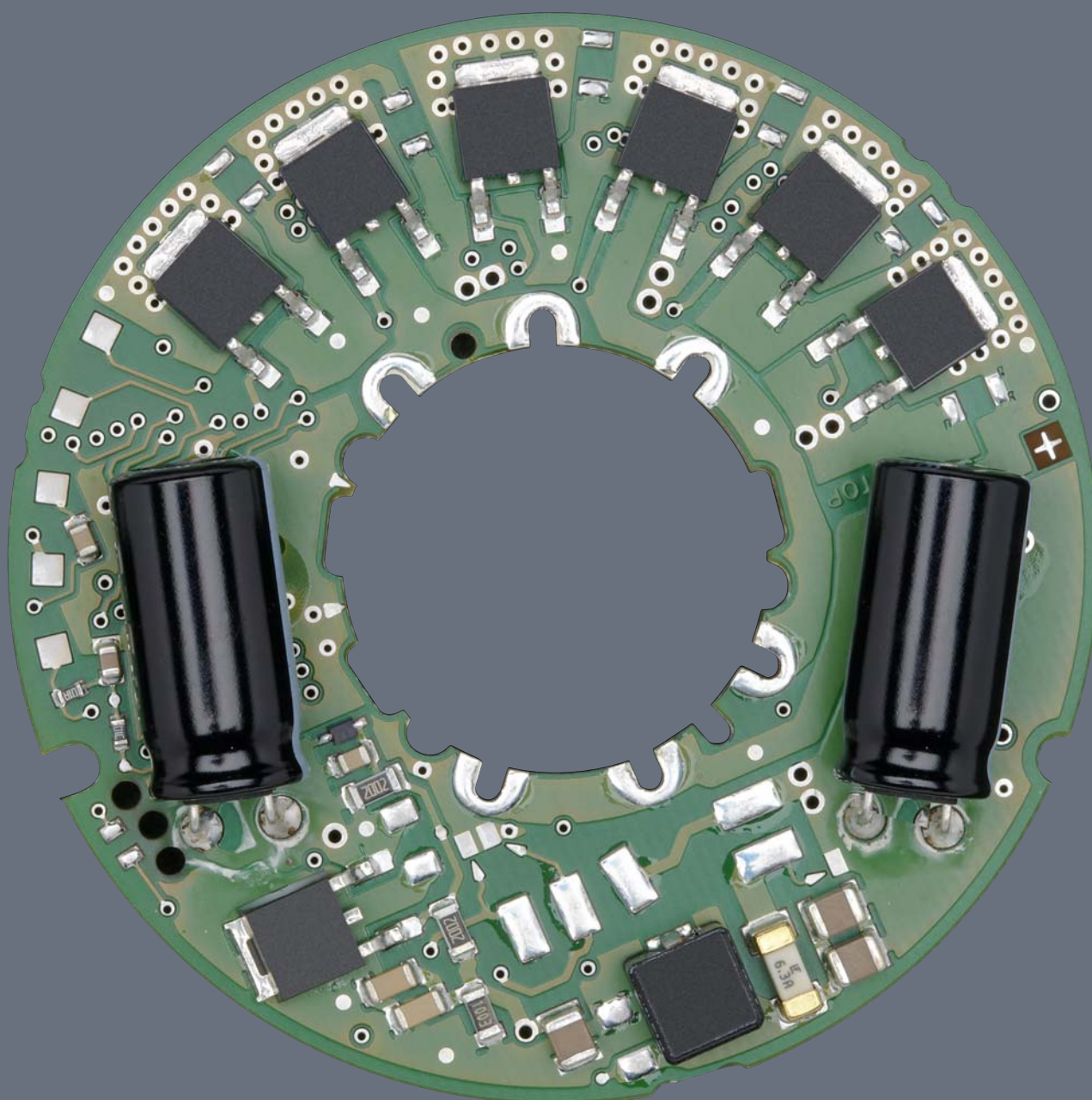


DC fans - specials

	Sensor signal	110
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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

DC fans - specials

Technical information

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.

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

1. Speed adaptation via NTC sensor

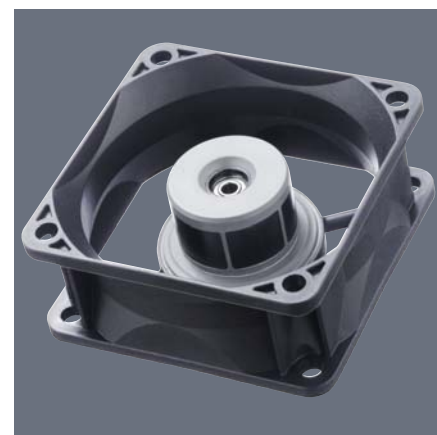
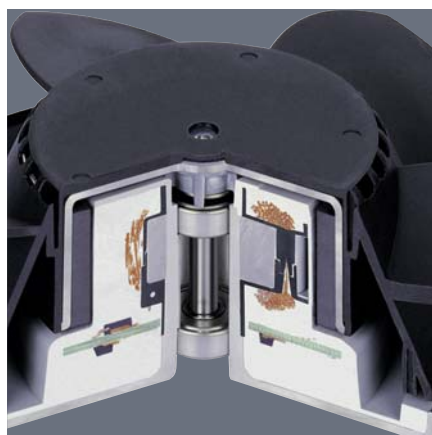
Standard fans in electronics cooling— tried and tested by the millions and nevertheless a temporary solution, because standard fans have a distinct disadvantage: With constant speed and a corresponding high noise factor, they continuously provide the air flow required in extreme cases. This extreme case only occurs-, if it occurs at all-, for a fraction of the service life. What is needed is an intelligent fan that automatically adapts to the current cooling requirements.

The ebm-papst answer: A complete range of DC fans with temperature-controlled speed adaptation - in all standard dimensions.

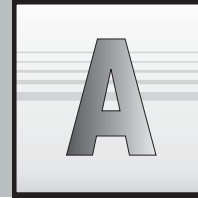
Installation is simple. The control electronics receive their thermal information for speed adaptation steplessly and loss-free via a temperature sensor either externally via a single lead, positioned as required, or internally directly in the fan hub in the air flow.

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.



DC fans - specials



Technical information

3. Sensor signal

DC fans with sensor 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 sensor 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 micro-processor-controlled motor electronics. These three-phase motors whose torque is virtually non-reliant on the rotor position are used for extremely high running smoothness. 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

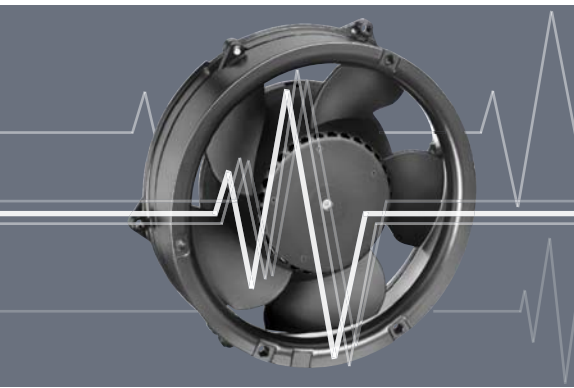
This high-end fan concept by ebmpapst with programmed intelligence and customer-specific integrated functions makes your electronics cooling even more versatile and competitive. Vario-Pro ensures a fresh economic breeze for all demanding cooling tasks – e.g. where greater reliability, more flexibility 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

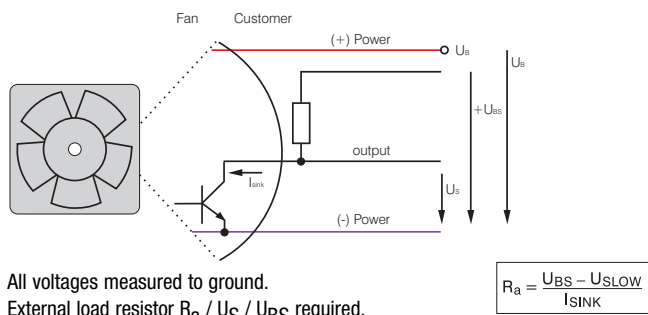
Some applications place particular demands on the fans' resistance to ambient influences, such as dust, moisture, water and salt. ebm-papst offer solutions for adapting fans to these ambient conditions.

Speed signal /2



- 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

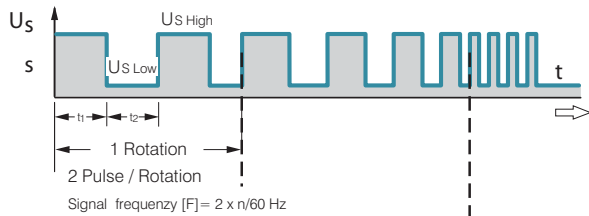


All voltages measured to ground.
External load resistor $R_a / U_S / U_{BS}$ required.

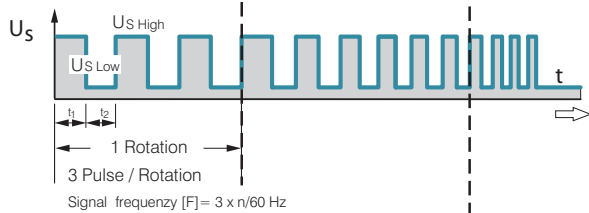
$$R_a = \frac{U_{BS} - U_{SLOW}}{I_{SINK}}$$

Signal output voltage

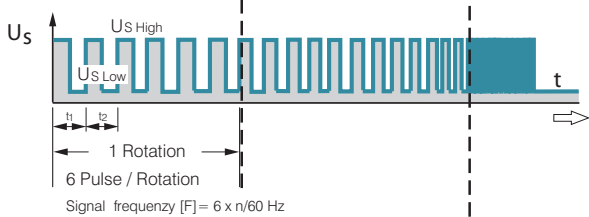
Standard signal for all models (exceptions see below)



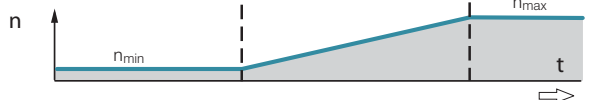
only for 4100 NH7 and NH8



All TD fans. Ex.: 6400 TD



Fan Speed



Signal data	Speed signal $U_{S\ Low}$	Condition: I_{sink}	Speed signal $U_{S\ High}$	Condition: I_{source}	Sensor operating voltage U_{BS}	Perm. sink current $I_{sink\ max.}$	Pulses per revolution	Fan description
Type	VDC	mA	VDC	mA	VDC	mA	Page	
250	≤ 0,4	≤ 2	30	0	≤ 30	2	2	23
400 F	≤ 0,4	1	30	0	≤ 30	≤ 2	2	24
400	≤ 0,4	1	30	0	≤ 30	≤ 2	2	25
400 J	≤ 0,4	2	30	0	≤ 30	≤ 4	2	26
500 F	≤ 0,4	1	30	0	≤ 30	≤ 2	2	27
600 F	≤ 0,4	1	30	0	≤ 30	≤ 2	2	28
620	≤ 0,4	2	30	0	≤ 30	≤ 4	2	29
630 U	≤ 0,4	2	30	0	≤ 30	≤ 4	2	30
600 N	≤ 0,4	2	28	0	≤ 28	≤ 4	2	31
600 J	≤ 0,4	2	30	0	≤ 30	≤ 4	2	33
700 F	≤ 0,4	2	30	0	≤ 30	≤ 4	2	34
8450	≤ 0,4	2	28	0	≤ 28	≤ 4	2	35
8400 N	≤ 0,4	2	28	0	≤ 28	≤ 4	2	36
8400 N VARIOFAN	≤ 0,4	2	30	0	≤ 30	≤ 4	2	37
8300	≤ 0,4	2	30	0	≤ 30	≤ 4	2	38
8200 J	≤ 0,4	2	30	0	≤ 30	≤ 4	2	39
3400 N	≤ 0,4	2	28	0	≤ 28	≤ 4	2	40
3400 N VARIOFAN	≤ 0,4	2	30	0	≤ 30	≤ 4	2	41
3300	≤ 0,4	2	30	0	≤ 30	≤ 4	2	42
3212 J / 3214 J	≤ 0,4	2	30	0	≤ 30	≤ 4	2	43
3218 J	≤ 0,4	2	60	0	≤ 60	≤ 4	2	43
4412 F / 4414 F	≤ 0,4	2	30	0	≤ 30	≤ 4	2	44
4418 F	≤ 0,4	2	60	0	≤ 60	≤ 4	2	44
4400 FN	≤ 0,4	2	30	0	≤ 30	≤ 4	2	45
4312 / 4314	≤ 0,4	2	30	0	≤ 30	≤ 4	2	46
4318	≤ 0,4	2	60	0	≤ 60	≤ 4	2	46
4312 / 4314 VARIOFAN	≤ 0,4	2	30	0	≤ 30	≤ 4	2	47
4318 VARIOFAN	≤ 0,4	2	60	0	≤ 60	≤ 4	2	47
4400	≤ 0,4	2	30	0	≤ 30	≤ 4	2	48
4100 N	≤ 0,4	2	30	0	≤ 30	≤ 4	2	49
4100 NHH...NH6	≤ 0,4	2	≤ 60	0	≤ 60	≤ 10	2	50
4100 NH7...NH8	≤ 0,4	2	≤ 60	0	≤ 60	≤ 20	3	51
DV 4100	≤ 0,4	2	30	0	≤ 30	≤ 4	2	52
5200 N	≤ 0,4	2	30	0	≤ 30	≤ 4	2	53

Available on request:

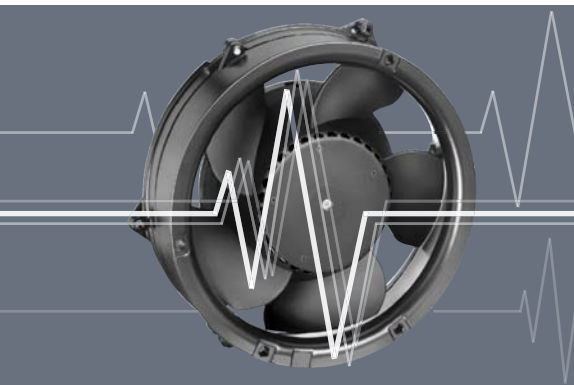
- Electrically isolated sensor and signal circuit.
- Varying voltage potentials for power and logic circuit.

Signal data	Speed signal U_S Low	Condition: I_{sink}	Speed signal U_S High	Condition: I_{source}	Sensor operating voltage U_{BS}	Perm. sink current I_{sink} max.	Pulses per revolution	Fan description
Type	VDC	mA	VDC	mA	VDC	mA	Page	
DV 5200	≤ 0,4	2	30	0	≤ 30	≤ 4	2	54
5112 N	≤ 0,4	2	15	0	≤ 5	≤ 20	2	55
5114 N / 5118 N	≤ 0,4	2	60	0	≤ 60	≤ 20	2	55
5300	≤ 0,4	2	≤ 72	0	≤ 72	≤ 4	2	56
5300 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	57
7112 N / 7118 N	≤ 0,4	2	60	0	≤ 60	≤ 20	2	58
7114 N	≤ 0,4	2	30	0	≤ 30	≤ 20	2	58
7200 N	≤ 0,4	2	15	0	≤ 15	≤ 20	2	59
6300	≤ 0,4	2	≤ 72	0	≤ 72	≤ 20	2	61
6300 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	62
DV 6200	≤ 0,4	2	30	0	≤ 60	≤ 20	2	64
6400	≤ 0,4	2	60	0	≤ 60	≤ 20	2	66
2200 FTD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	70
RL 48	≤ 0,4	2	3	0	≤ 30	≤ 4	2	81
RL 65	≤ 0,4	2	30	0	≤ 30	≤ 4	2	82
RL 90 N	≤ 0,4	2	30	0	≤ 30	≤ 4	2	83
RLF 100	≤ 0,4	2	30	0	≤ 30	≤ 4	2	84
RG 90 N	≤ 0,4	2	30	0	≤ 30	≤ 4	2	85
RG 125 N	≤ 0,4	2	30	0	≤ 30	≤ 4	2	86
RG 160 N	≤ 0,4	2	30	0	≤ 30	≤ 20	2	87
RG 160 TD	≤ 0,4	2	60	0	≤ 60	≤ 20	6	88
RG 190 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	89
RG 220 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	90
RG 225 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	91
RET 97 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	92
REF 100	≤ 0,4	2	30	0	≤ 30	≤ 4	2	93
RER 120 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	95
RER 133 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	97
RER 160 TD	≤ 0,4	2	60	0	≤ 60	≤ 20	6	99
REF 175 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	100
RER 175 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	101
RER 190 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	102
RER 220 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	103
RER 225 TD	≤ 0,4	2	72	0	≤ 72	≤ 20	6	104

Attention:

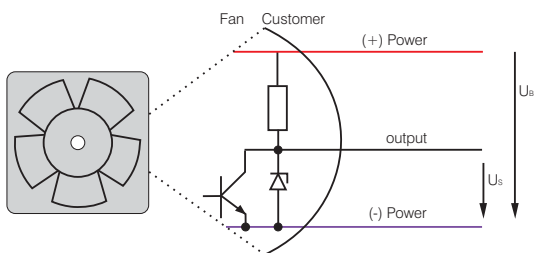
With these fan options, deviations in regard to temperature range, voltage range and power consumption are possible compared with standard fan data.

Speed signal /12



- 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.

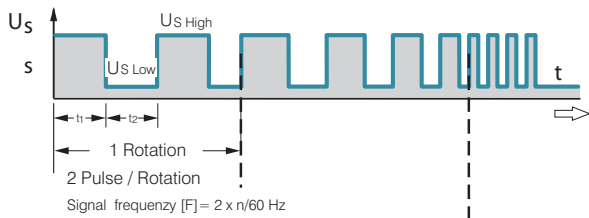
Electrical connection



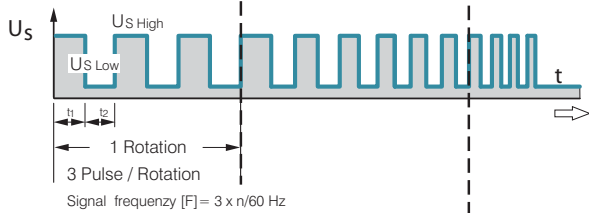
All voltages measured to ground.

Signal output voltage

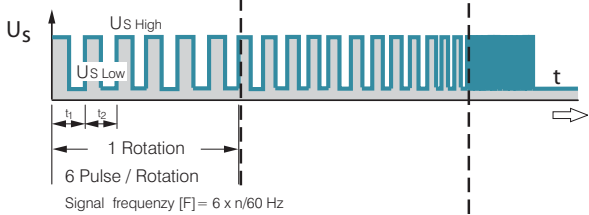
Standard signal for all models (exceptions see below)



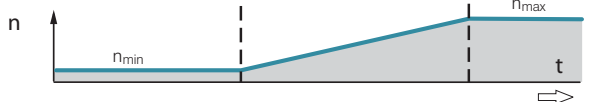
only for 4100 NH7 and NH8



All TD fans. Ex.: 6400 TD



Fan Speed



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
Type	VDC	mA	VDC	mA	mA	Page
614 N/12 GM	$\leq 0,4$	1	2,5–5,5	1	1	31
618 N/12 N	$\leq 0,4$	1	2,5–5,5	1	1	31
8412 N/12 H	$\leq 0,4$	1	2,5–5,5	1	1	36
4412 F/12 GM	$\leq 0,4$	1	2,5–5,5	1	1	44
4418 F/12	$\leq 0,4$	1	2,5–5,5	1	1	44
4312 /12 M	$\leq 0,4$	1	2,5–5,5	1	1	46
4314 /12	$\leq 0,4$	1	2,5–5,5	1	1	46
4182 N/12 X	$\leq 0,4$	1	2,5–5,5	1	1	49

Attention:

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

Available on request:

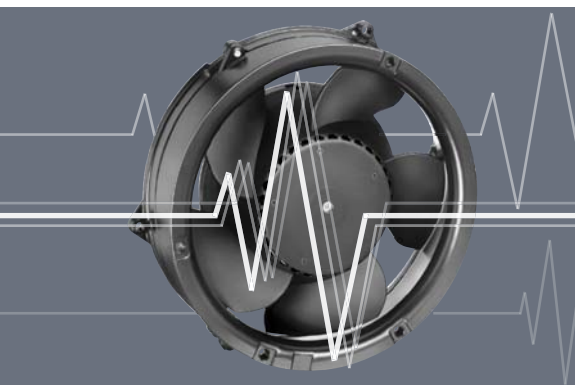
- Electrically isolated sensor and signal circuit.
- Varying voltage potentials for power and logic circuit.

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
Type	VDC	mA	VDC	mA	mA	Page
7214 N/12	≤0,4	2	2,5–5,5	1	≤20	59
DV 6224 /12	≤0,4	2	4,5–5,25	2	≤12	64
6424 /12 H	≤0,4	2	2,5–5,5	1	≤20	66
DV 6424 /12	≤0,4	2	4,5–5,25	2	≤12	68
DV 6448 /12	≤0,4	2	4,5–5,25	2	≤12	68
RG 125-19/12N/12	≤0,4	1	2,5–5,5	1	≤1	86
RG 160-28/12N/12	≤0,4	2	2,5–5,5	1	≤5	87
RG 160-28/18N/12	≤0,4	2	2,5–5,5	1	≤20	87
RER 125-19/12N/12	≤0,4	1	2,5–5,5	1	≤1	96
RER 160-28/12N/12	≤0,4	2	2,5–5,5	1	≤5	98
RER 160-28/18N/12	≤0,4	2	2,5–5,5	1	≤20	98

Attention:

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

Alarm signal /17

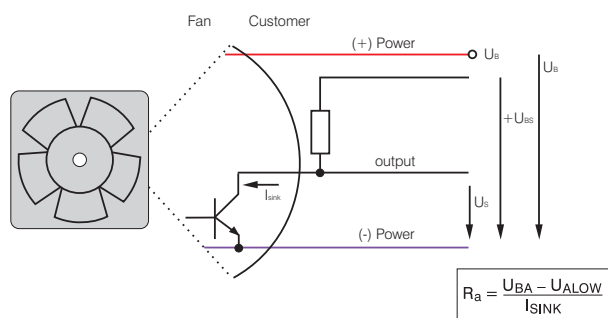


- Alarm signal for speed monitoring.
- Signal output via open collector.
- The fan emits a high continuous signal during trouble-free operation within the permissible voltage range.
- Low signal when speed limit is not reached.
- After elimination of fault, the fan returns to its setpoint speed; the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

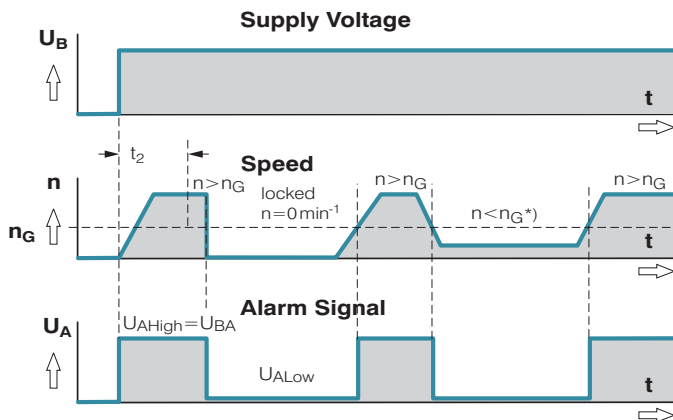
Alarm signal data	Alarm output voltage U_A Low	Condition:	Condition: $I_{sink} =$	Alarm output-voltage U_A High	Condition:	Condition: I_{source}	Alarm operating-voltage U_{BA} max.	Max. permissible Sink current	Alarm delay time t_2	Condition:	Speed limit n_G	Fan description
Type	VDC		mA	VDC		mA	VDC	mA	S		min^{-1}	Page
8318 /17	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100	38
8318 /17 H	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100	38
3314 /17	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100	42
3318 /17 H	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100	42
4318 /17	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	850 ± 100	46
4184 N /17 X	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100	49

Attention: 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 R_a from U_A to U_{BA} required.
 With VARIOFANs with external temperature sensor for controlling the motor speed, the NTC sensor is not included in the scope of delivery.
 Temperature sensor LZ 370, see Accessories.



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

Available on request:

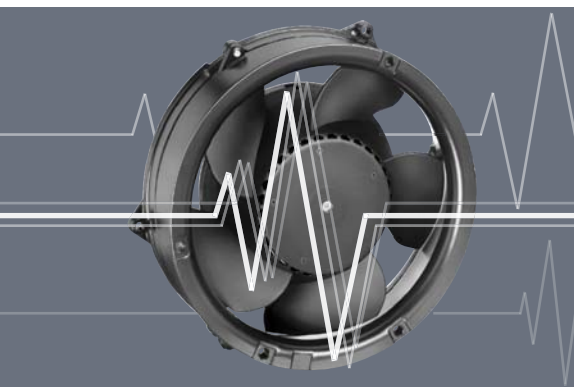
- With integrated signal latching for subsequent recognition of short-time faults.
- Alarm circuit open collector or TTL.
- Electrically isolated for maximum device safety;
Defects in the power circuit do not affect the alarm circuit.

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
Type	VDC		mA	VDC		mA	VDC	mA	S		min^{-1}	Page
4312/17 MV VARIOFAN	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100	47
4312/17 T VARIOFAN	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100	47
4314/17 T VARIOFAN	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	1150 ± 100	47
4318/17 V VARIOFAN	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	20	≤ 15	*	850 ± 100	47
7214 N/17	$\leq 0,4$	$n < n_G$	2	60	$n > n_G$	0	≤ 60	15	≤ 15	*	1330 ± 60	59

* After switching on U_B **Attention:**

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

Alarm signal /19



- 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
Type	VDC		mA	VDC		mA	VDC	mA	S		min ⁻¹	Page
8314 /19 H	≤0,4	$n > n_G$	2	60	$n < n_G$	0	≤60	20	≤15	*	1500 ± 100	38
4312 /19	≤0,4	$n > n_G$	2	60	$n < n_G$	0	≤60	20	≤15	*	1500 ± 100	46
7214 N /19	≤0,4	$n > n_G$	2	60	$n < n_G$	0	4,5–60	10	10 ± 4	*	1800 ± 20	59
RLF 100-11/14 /19	≤0,4	$n > n_G$	2	≤28	$n < n_G$	0	16–28	10	10 ± 4	*	1900 ± 100	84
RER 101-36/18N /19 HH	≤0,4	$n > n_G$	2	≤28	$n < n_G$	0	16–28	10	10 ± 4	*	1900 ± 100	94

* After switching on U_B

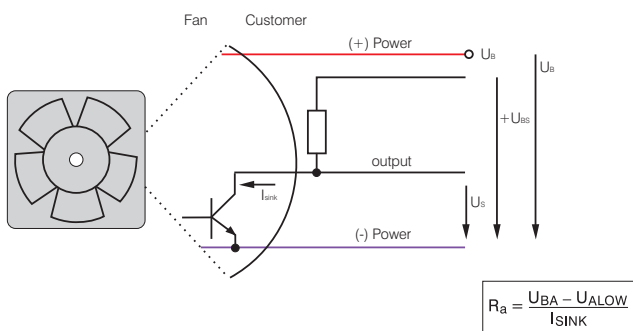
Attention:

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

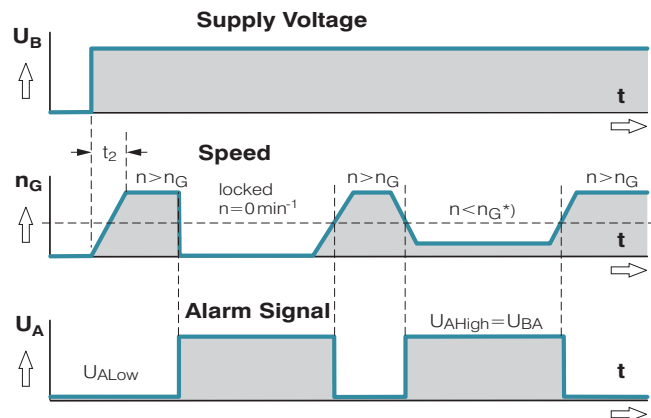
Available on request:

- 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

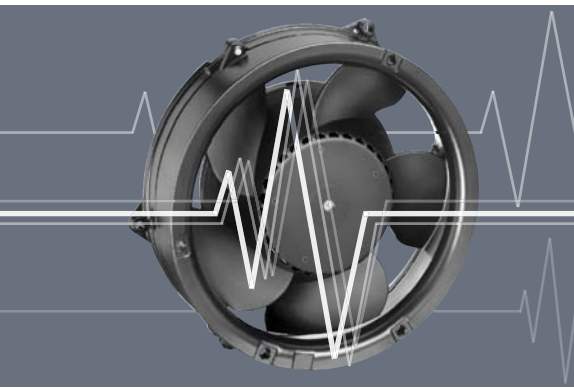


All voltages measured to ground.
External load resistor R_a from U_A to U_{BA} required.



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

Alarm signal /37



- 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.

Available on request:

- Alarm circuit TTL compatible.

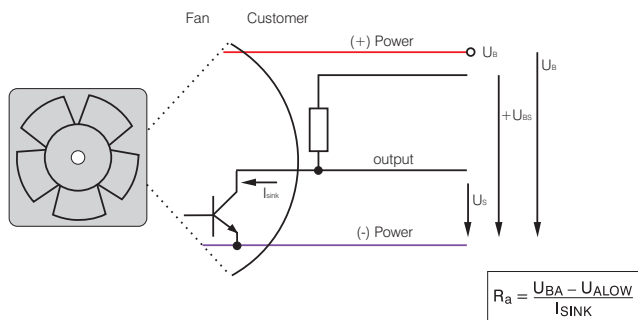
Alarm signal data	Alarm output voltage U_A Low	Condition:	Condition: $I_{sink} =$	Alarm output voltage U_A High	Condition:	Condition: $I_{source} =$	Alarm operating-voltage U_{BA} max.	Max. permissible Sink current I_{sink}	Alarm delay-time t_2	Condition:	Speed limit n_G	Fan description
Type	VDC		mA	VDC		mA	VDC	mA	S		min^{-1}	Page
8412 N/37 GMLV	$\leq 0,4$	$n \leq n_G$	2	28	$n > n_G$	0	≤ 28	10	< 1	*	0	36
3412 N/37 GV	$\leq 0,4$	$n \leq n_G$	2	28	$n > n_G$	0	≤ 28	10	< 1	*	0	40

* After switching on U_B

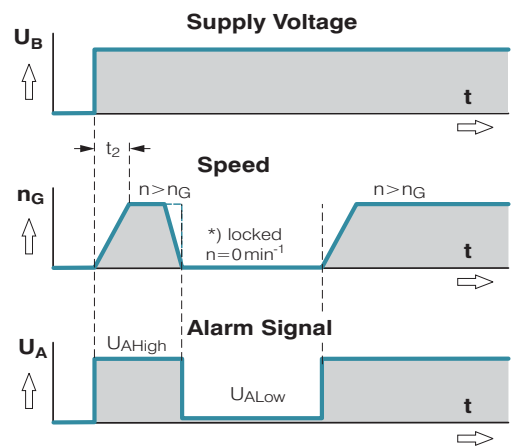
Attention:

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

Electrical connection

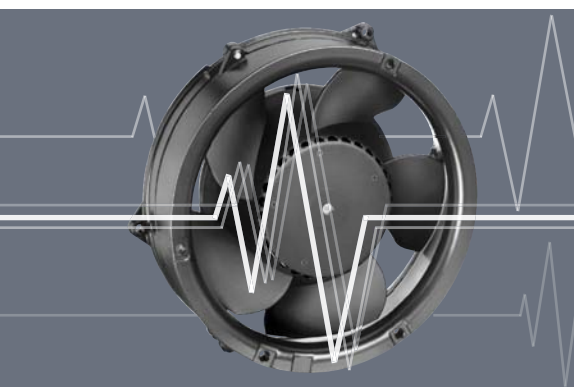


All voltages measured to ground.
External load resistor R_a from U_A to U_{BA} required.



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

Alarm signal /39



- 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.

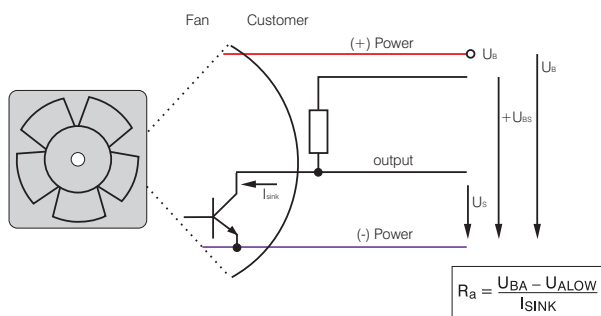
Alarm signal data	Alarm output voltage U_A Low	Condition:	Condition: $I_{sink} =$	Alarm output voltage U_A High	Condition:	Condition: $I_{source} =$	Alarm operating-voltage U_{BA} max.	Max. permissible Sink current I_{sink}	Alarm delay-time t_2	Condition:	Speed limit n_G	Fan description
Type	VDC		mA	VDC		mA	VDC	mA	S		min^{-1}	Page
412 /39	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	25
612 F/39 H	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	28
614 N /39 M	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	31
618 N /39 N	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	31
3412 N/39 H	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	40
3414 N/39 HH	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	40
4412 F/39 GL	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	44
4412 F/39 M	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	44
4414 F/39	$\leq 0,5$	$n > n_G$	2	28	$n = n_G$	0	≤ 28	10	< 1	*	0	44
4414 FN/39 H	$\leq 0,4$	$n > n_G$	2	≤ 30	$n = n_G$	0	≤ 30	4	< 1	*	0	44

* after switching on U_B

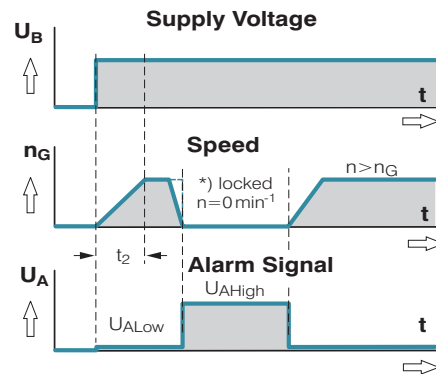
Attention:

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

Electrical connection

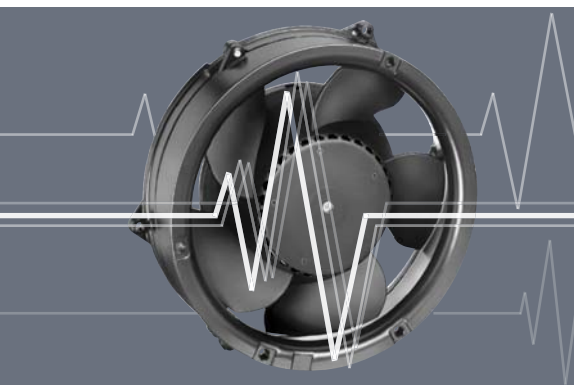


All voltages measured to ground
External load resistor R_a from U_A to U_{BA} required.



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

Vario-Pro®



- "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 120 (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	29
8400 N	36
8300	38
8200 J	39
3400 N	40
3300	42
3200 J	43
4400 FN	45
4300	40
4100 N	49
4100 NH	50
4100 NH 7-8	51

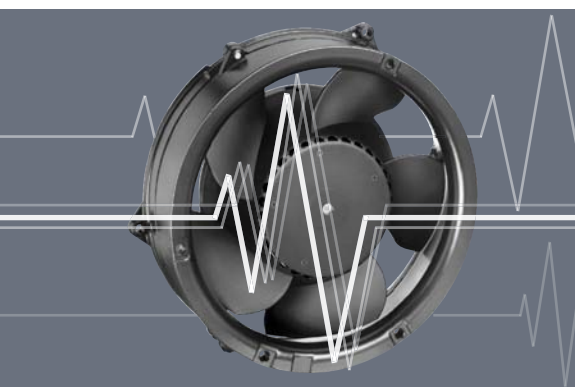
Fan series	Page
DV 4100	52
5200 N	53
DV 5200	54
5100 N	55
5300	56
7100 N	58
7200 N	59
6100	60
6300	61
DV 6200	64
6400	66
DV 6400	68

Fan series	Page
RL 90 N	83
RLF 100	84
RG 90 N	85
RG 125 N	86
RG 160 N	87
REF 100	93
RER 101	94
RER 125 N	96
RER 160 N	98

Speed setting via temperature sensor

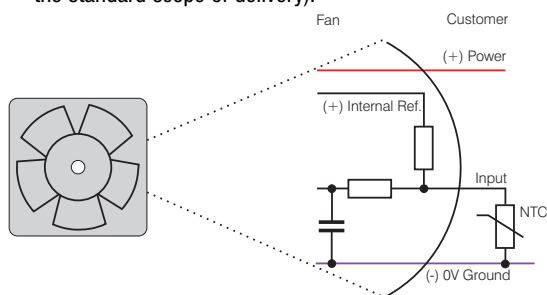


- The control variable is a temperature sensor that is either integrated into the fan or connected to an additional control wire.



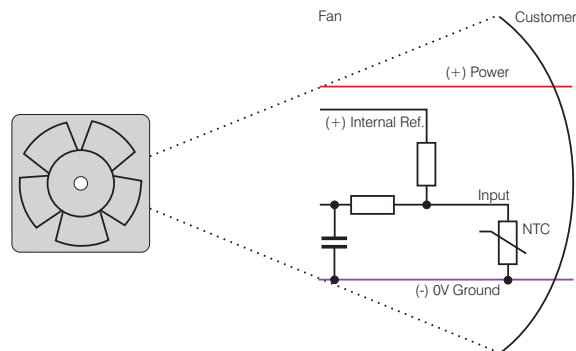
External temperature sensor Type T

- Ext. NTC type LZ370 is required (not included in the standard scope of delivery).

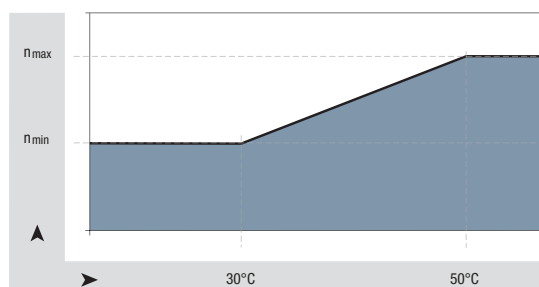


Internal temperature sensor Type I

- NTC integrated in fan hub.



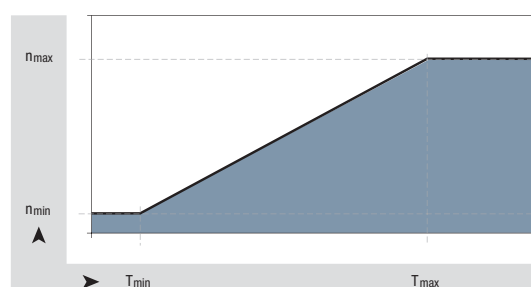
Standard speed-temperature curve for type T and type I



$$n_{\min} \approx \frac{1}{2} n_{\max}$$

$$T_{\min} \approx 30 \text{ }^{\circ}\text{C}; T_{\max} = 50 \text{ }^{\circ}\text{C}$$

Optionally available with user-selectable temperature-speed curve control



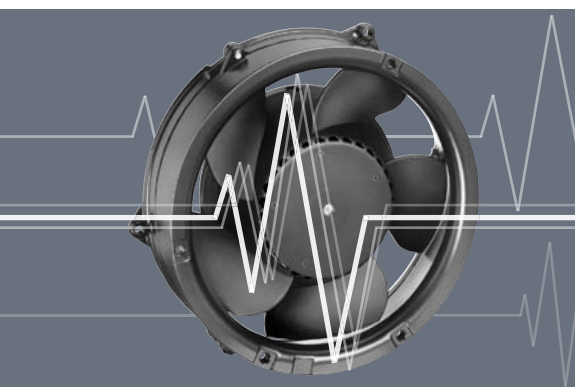
$$n_{\min} \approx 800 \text{ } \frac{1}{\text{min}} \quad n_{\max} \text{ model-dependent}$$

$$T_{\min} \approx 5 \text{ }^{\circ}\text{C} \quad T_{\max} \leq 85 \text{ }^{\circ}\text{C, model-dependent}$$

Speed setting with control voltage or PWM

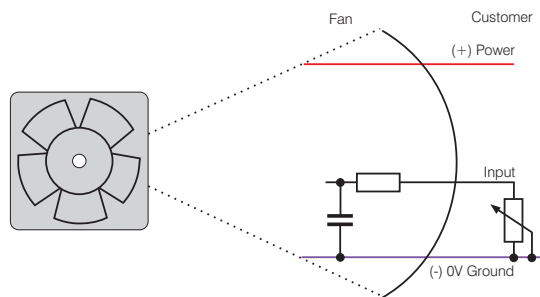


– The control variable is a PWM signal or analogue control voltage.

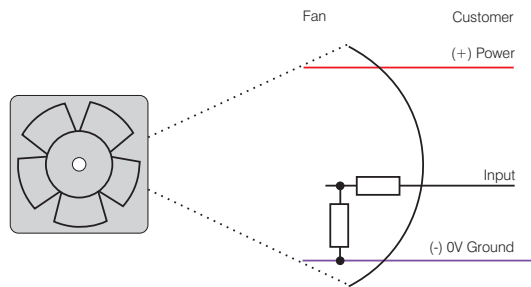


Speed setting via control voltage Type A

– Standard control range 0 ... 5 V.

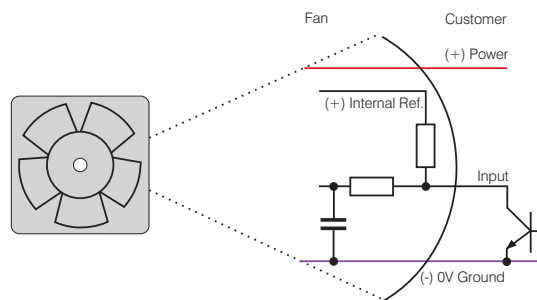


– Optional control range 0 ... 10 V.

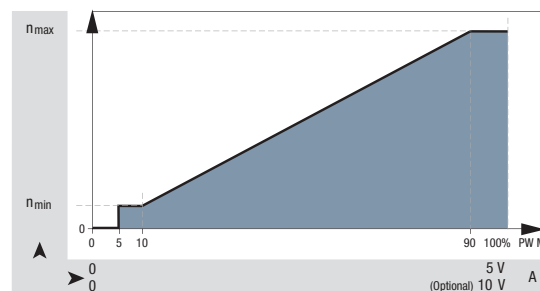


Speed setting via PWM Type P

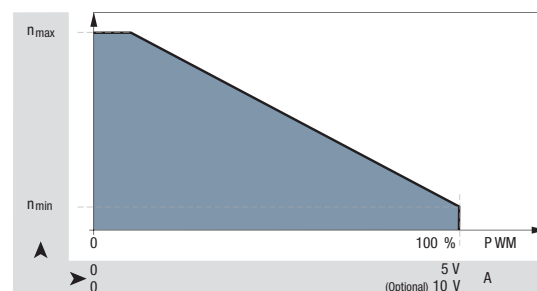
- Standard PWM signal in 2 versions
- a) PWM frequency 2kHz (0-100%), Open collector input
- b) 4-Wire interface to Intel specification for 12 VDC fan, PWM frequency 20 kHz, incl. speed signal /2



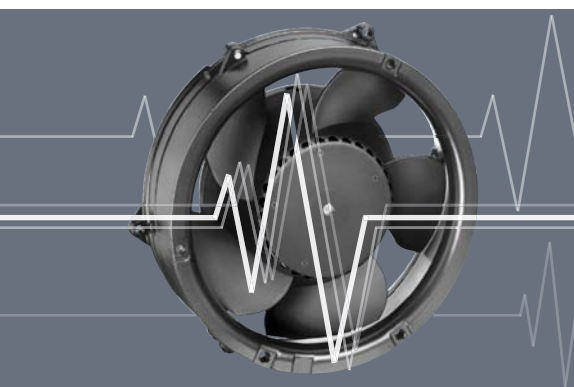
Standard curve P / A



Optional – selectable curve P / A

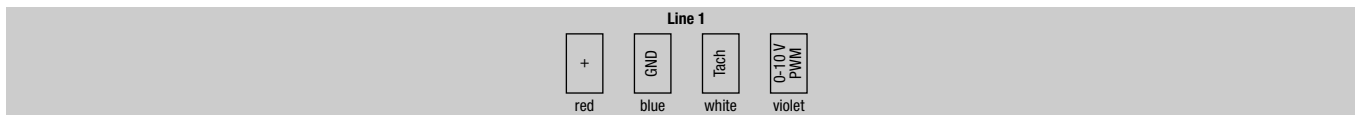
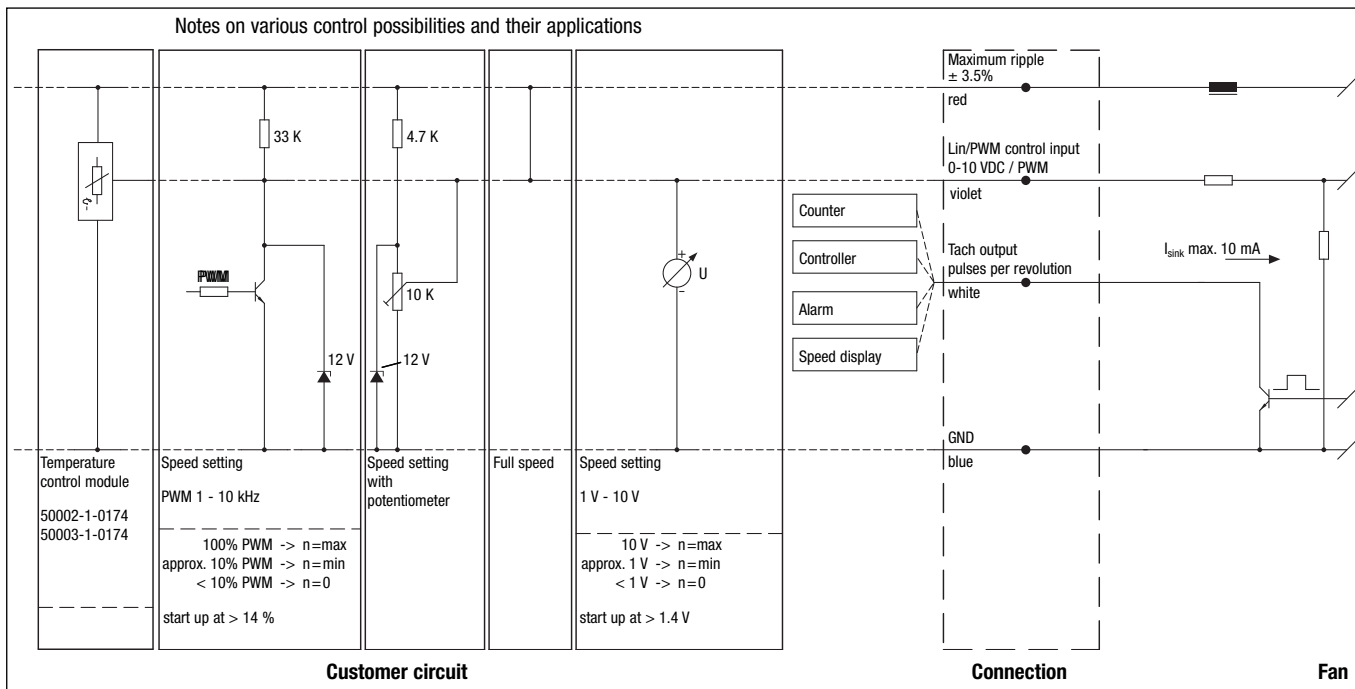


Speed setting via multi-option control input



- 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 (see p. 121).
- To attain the maximum speed, the control wire must be switched against UB.
- The control input is usually combined with an open collector tachometer (Type /2, see page 110).

Speed setting via multi-option control input

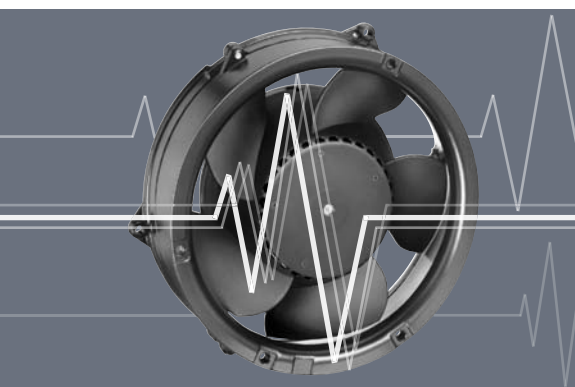


Line	Connection	Colour	Assignment / function
1	+	red	Maximum ripple ± 3.5 %
	GND	blue	GND

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

Protected fans

against environmental influences



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

Moisture protection

A coating on the motor and printed circuit board protects against humidity and condensation.

IP 54 protection

The motor and circuit board are coated to protect them against splash water and humidity. High protection classes up to IP 67 are available on request.

Salt spray fog protection

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

Stainless steel bearings

Special bearings made of stainless steel provide additional protection.

The solutions that are available and in use can differ depending on size. We would be glad to develop solutions tailored to the demands of your application.

