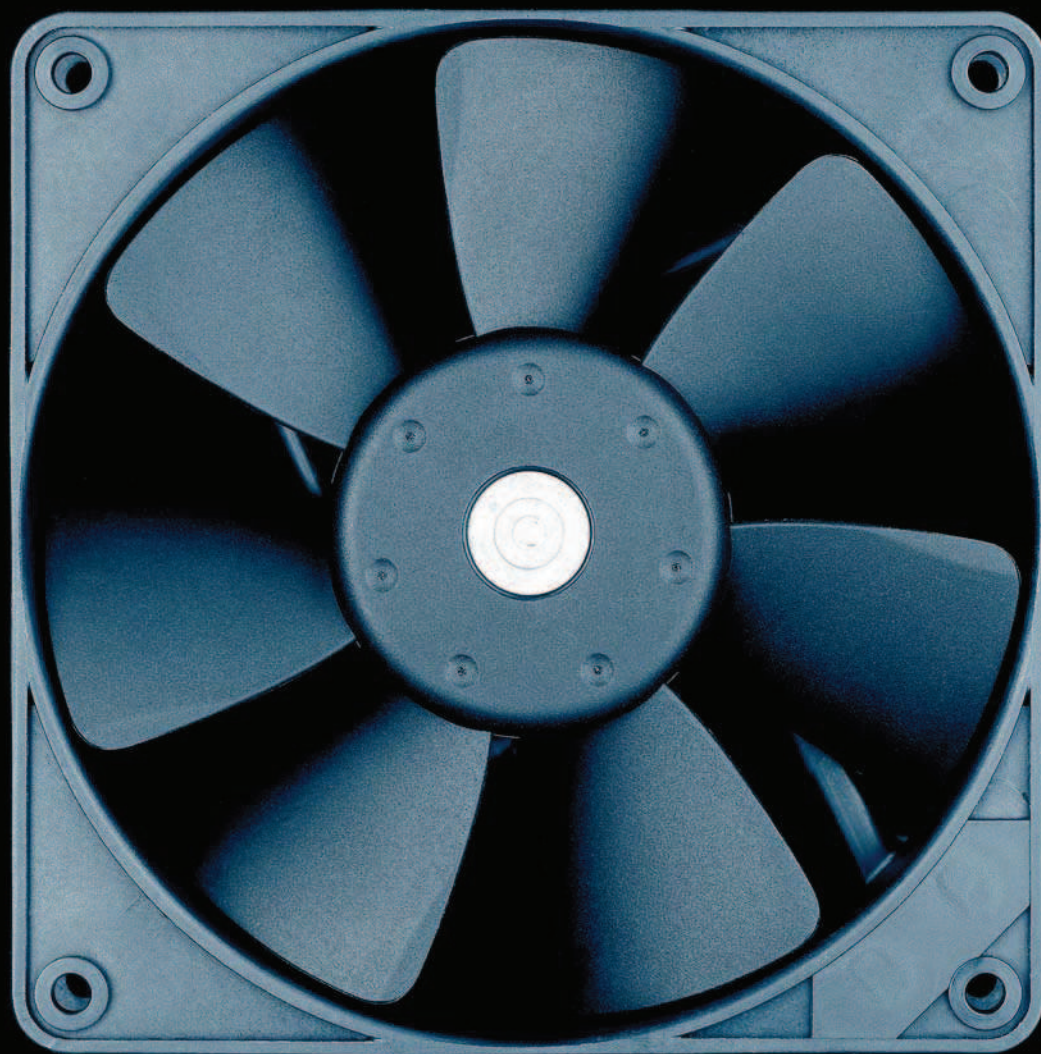


# DC Fans with Added Features

Sensor signal	84
Alarm signal	88
Vario-Pro / Speed setting	93 / 94
Protection against ambient influences	96



## Technical Information

### Cooling capacity and efficiency

Greater power density, increasing miniaturization 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 appliance 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

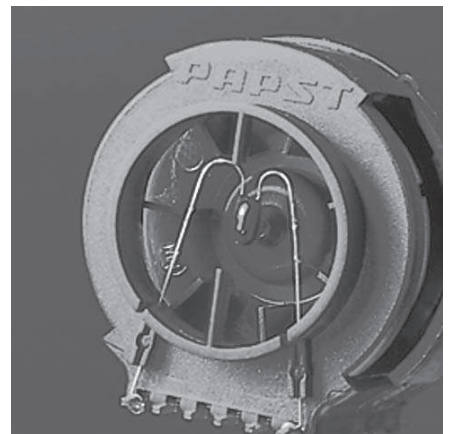
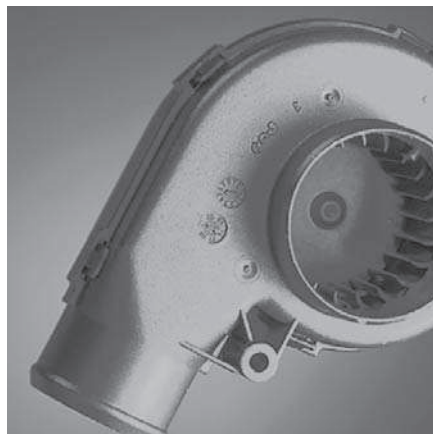
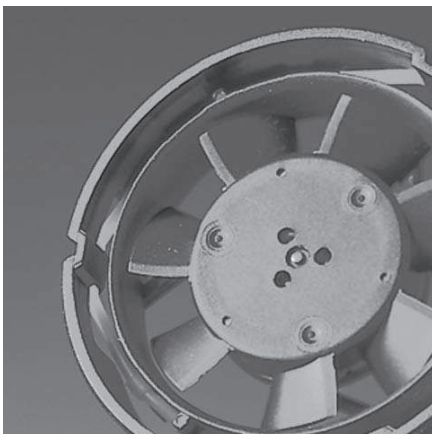
Standard fans in electronic cooling—millionfold tried and tested and nevertheless a temporary solution because standard fans have a distinct disadvantage: With constant speed and a corresponding high noise factor they continuously provide the airflow required in extreme cases. This extreme case only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

The ebmpapst 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 airflow.

#### 2. DC fans with separate control input

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



Fans with TD motor  
Programmable fans  
Vario-Pro®  
Fans with sensor signal  
Fans with alarm signal



## 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 by the customer. 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 long- or short-term signal depending on the type of fan.

### 5. Turbo drives

Fans with three-phase EC drives and fully integrated operating electronics. These three-phase motors whose torque is virtually non-reliant on the rotor position are used for extremely high power. These motors can also be operated in both directions of rotation so that in special cases reverse operation of the fans can be realized.

### 6. Vario-Pro fans

This High-end fan concept by ebmpapst with programmed intelligence and customer-specific integrated functions makes your electronic cooling even more variable and competitive. Vario-Pro ensures fresh impetus as far as economy is concerned for all demanding cooling tasks – e.g. where 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 a 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 of a microcontroller and an EEPROM, on which all characteristics are stored.

### 7. Protection against environmental influences

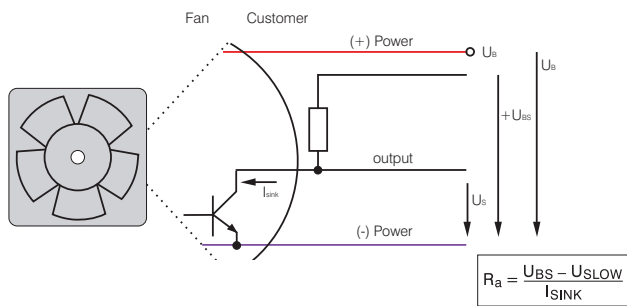
Some applications are demanding on the fans' resistance to ambient influences, such as dust, humidity, water and salt. ebm-papst offer solutions for adapting fans to various ambient conditions.

# Sensor signal /2 “tacho”



- Speed-proportional rectangular pulse for external speed monitoring of fan motor
- 2 pulses per revolution / 6 pulses per revolution with TURBOFANS.
- 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.

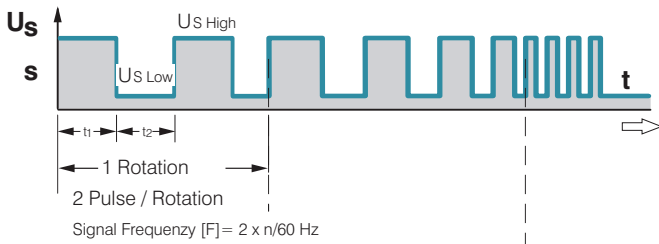
## Electrical connection



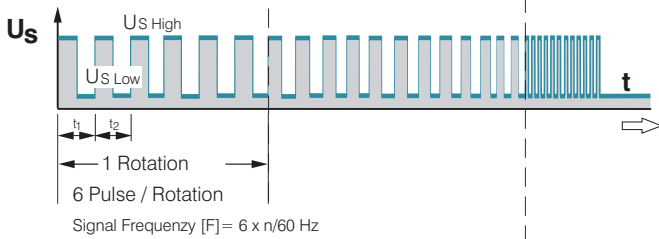
All voltages measured to ground.  
External load resistance  $R_a$  /  $U_s$  /  $U_{BS}$  required.

## Signal output voltage

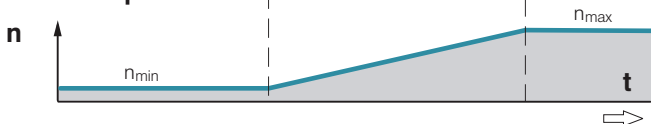
all models except TD-Fans



## only TD-Fans



## Fan speed



## Signal data

Type	Sensor signal $U_{S\ Low}$	Condition: $I_{sink}$	Sensor signal $U_{S\ High}$	Condition: $I_{source}$	Sensor operating voltage $U_{BS}$	Perm. sink current $I_{sink\ max}$	Fan description
Type	V DC	mA	V DC	mA	V DC	mA	Page
250	≤0.4	≤2	30	0	≤30	2	19
400 F	≤0.4	1	30	0	≤30	≤2	20
400	≤0.4	1	30	0	≤30	≤2	21
412 J	≤0.4	2	30	0	≤30	≤4	22
414 J	≤0.4	2	30	0	≤30	≤4	22
500 F	≤0.4	1	30	0	≤30	≤2	23
600 F	≤0.4	1	30	0	≤30	≤2	24
620	≤0.4	2	30	0	≤30	≤4	25
600 N	≤0.4	2	30	0	≤30	≤4	26
600 J	≤0.4	2	30	0	≤30	≤4	28
700 F	≤0.4	2	30	0	≤30	≤4	29
8400 N	≤0.4	2	28	0	≤28	≤4	30
8300	≤0.4	2	30	0	≤30	≤4	32
8200 J	≤0.4	2	30	0	≤30	≤4	33
3400 N	≤0.4	2	28	0	≤28	≤4	34
3300	≤0.4	2	30	0	≤30	≤4	36
3200 J	≤0.4	2	30	0	≤30	≤4	37
4400 F	≤0.4	2	30	0	≤30	≤4	39
4300 N	≤0.4	2	30	0	≤30	≤4	40
4300	≤0.4	2	30	0	≤30	≤4	41
4400	≤0.4	2	30	0	≤30	≤4	43
4212	≤0.4	2	30	0	≤30	≤4	44
4214	≤0.4	2	30	0	4-30	≤4	44
4218	≤0.4	2	30	0	4-30	≤4	44
4100 N	≤0.4	2	30	0	4-30	≤4	45/46
DV 4100	≤0.4	2	30	0	≤30	≤4	47
5200 N	≤0.4	2	30	0	4-30	≤4	48
DV 5200	≤0.4	2	30	0	≤30	≤4	49
5112 N	≤0.4	2	15	0	≤5	≤20	50
5114 N	≤0.4	2	60	0	≤60	≤20	50
5118 N	≤0.4	2	60	0	≤60	≤20	50
7112 N	≤0.4	2	60	0	≤60	≤20	51
7114 N	≤0.4	2	30	0	≤30	≤20	51
7118 N	≤0.4	2	60	0	≤60	≤20	51

**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 $U_{SS}$	Perm. sink current $I_{SINK,max}$	Fan description
Type	V DC	mA	V DC	mA	V DC	mA	Page
6224 N	≤0.4	8	30	0	≤30	≤20	53
6248 N	≤0.4	8	60	0	≤30	≤20	53
DV 6200	≤0.4	2	30	0	≤60	≤20	55
6400	≤0.4	2	60	0	≤60	≤20	57
RL 48	≤0.4	2	28	0	4–30	≤4	67
RL 65	≤0.4	2	30	0	≤30	≤4	68
RL 90 N	≤0.4	2	30	0	≤30	≤4	69
RLF 100	≤0.4	2	30	0	≤30	≤4	70
RG 90 N	≤0.4	2	30	0	≤30	≤4	71
RG 125 N	≤0.4	2	30	0	≤30	≤4	72
RG 160 N	≤0.4	2	30	0	≤30	≤20	73
REF 100	≤0.4	2	30	0	≤30	≤4	75

**Attention:**

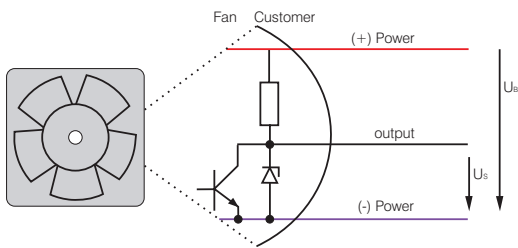
With these fan options, deviations in regard to temperature range, voltage range and power consumption are possible compared with standard fan data.

# Sensor signal /12 “tacho”



- Speed-proportional rectangular pulse for external speed monitoring of fan motor
- 2 pulses per revolution / 6 pulses per revolution with TURBOFANS.
- 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 desired speed for interactive or controlled cooling with one or more interconnected fans.

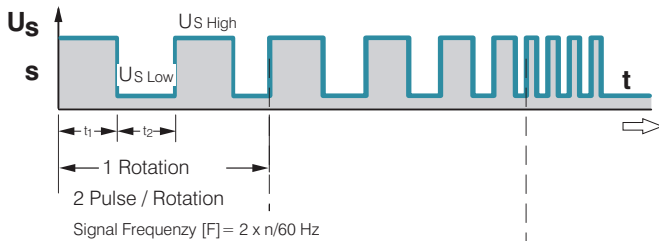
## Electrical connection



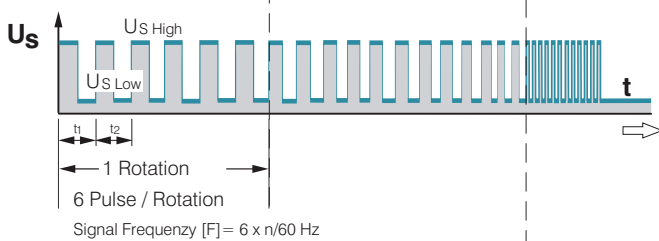
All voltages measured to ground.

## Signal output voltage

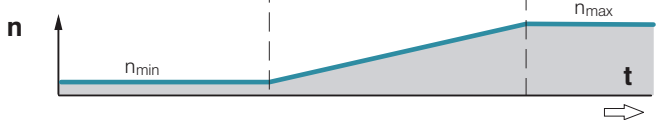
all models except TD-Fans



## only TD-Fans



## Fan speed



Signal data	Sensor signal $U_{S, Low}$	Condition: $I_{link}$	Sensor signal $U_{S, High}$	Condition: $I_{source}$	Perm. sink current $I_{link, max}$	Fan description
Type	V DC	mA	V DC	mA	mA	Page
614 N/12 GM	$\leq 0.4$	1	2.5–5.5	1	1	26
618 N/12 N	$\leq 0.4$	1	2.5–5.5	1	1	26
8412 N/12 H	$\leq 0.4$	1	2.5–5.5	1	1	30
8312 /12	$\leq 0.4$	1	2.5–5.5	1	1	32
8314 /12	$\leq 0.4$	1	2.5–5.5	1	1	32
8318 /12 HL	$\leq 0.4$	1	2.5–5.5	1	1	32
8318 /12 H	$\leq 0.4$	1	2.5–5.5	1	1	32
4412 F/12 GM	$\leq 0.4$	1	2.5–5.5	1	1	38
4414 F/12	$\leq 0.4$	1	2.5–5.5	1	1	38
4418 F/12	$\leq 0.4$	1	2.5–5.5	1	1	38
4312 /12 M	$\leq 0.4$	1	2.5–5.5	1	1	41
4314 /12	$\leq 0.4$	1	2.5–5.5	1	1	41
4318 /12	$\leq 0.4$	1	2.5–5.5	1	1	41
4212 /12	0.4	1	2.5–5.5	1	1	44
4212 /12 H	$\leq 0.4$	1	2.5–5.5	1	1	44
4214 /12	$\leq 0.4$	1	2.5–5.5	1	1	44
4214 /12 H	$\leq 0.4$	1	2.5–5.5	1	1	44
4218 /12	$\leq 0.4$	1	2.5–5.5	1	1	44
4218 /12 H	$\leq 0.4$	1	2.5–5.5	1	1	44
4182 N/12 X	$\leq 0.4$	1	2.5–5.5	1	1	45
4188 N/12 XM	0.4	1	2.5–5.5	1	1	45
5214 N/12 H	$\leq 0.4$	1	2.5–5.5	1	$\leq 1$	48

### 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:**

- Galvanically separated sensor and 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: $I_{Source}$	Perm. sink current $I_{Sink, max.}$	Fan description
Type	V DC	mA	V DC	mA	mA	Page
5118 N/12	$\leq 0.4$	2	2.5–5.5	1	$\leq 20$	50
5214 N/12 H	$\leq 0.4$	1	2.5–5.5	1	$\leq 1$	48
7118 N/12	$\leq 0.4$	2	2.5–5.5	1	$\leq 20$	51
7214 N/12	$\leq 0.4$	2	2.5–5.5	1	$\leq 20$	52
6224 N/12 M	$\leq 0.4$	2	2.5–5.5	1	$\leq 20$	53
6224 N/12	$\leq 0.4$	2	2.5–5.5	1	$\leq 20$	53
6248 N/12	$\leq 0.4$	2	2.5–5.5	1	$\leq 20$	53
DV 6224 /12	$\leq 0.4$	2	4.5–5.25	2	$\leq 12$	55
DV 6248 /12	$\leq 0.4$	2	4.5–5.25	2	$\leq 12$	55
6424 /12 H	$\leq 0.4$	2	2.5–5.5	1	$\leq 20$	57
DV 6424 /12	$\leq 0.4$	2	4.5–5.25	2	$\leq 12$	59
DV 6448 /12	$\leq 0.4$	2	4.5–5.25	2	$\leq 12$	59
RG 125-19/12N/12	$\leq 0.4$	1	2.5–5.5	1	$\leq 1$	72
RG 160-28/12N/12	$\leq 0.4$	2	2.5–5.5	1	$\leq 5$	73
RG 160-28/18N/12	$\leq 0.4$	2	2.5–5.5	1	$\leq 20$	73
RER 125-19/12N/12	$\leq 0.4$	1	2.5–5.5	1	$\leq 1$	77
RER 160-28/12N/12	$\leq 0.4$	2	2.5–5.5	1	$\leq 5$	78

**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



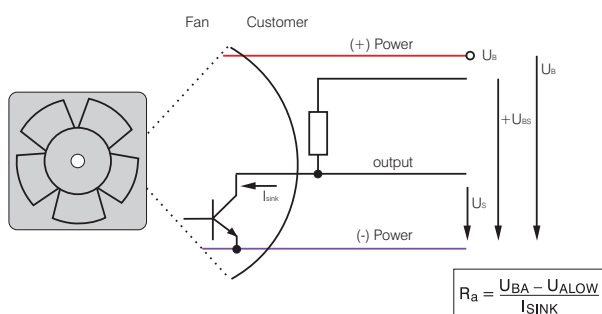
- Alarm signal for speed monitoring
- Signal output via open collector
- The fan emits a high continuous signal during trouble-free operation within the permissible voltage range
- Low signal when speed limit is not reached.
- After elimination of fault, the fan returns to its desired speed; the alarm 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 $U_{A,max}$	Max. permissible sink current	Alarm delay time $t_2$	Condition:	Speed limit $n_G$
Type	V DC		mA	V DC		mA	V DC	mA	S		min <sup>-1</sup>
8318 /17	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	1500 ± 100
8318 /17 H	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	1500 ± 100
3312 /17	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	1500 ± 100
3314 /17	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	1500 ± 100
3318 /17 H	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	1500 ± 100
4318 /17 M	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	1150 ± 100
4318 /17	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	850 ± 100
4214 /17	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	1150 ± 100
4184 N /17X	≤0.4	$n < n_G$	2	$U_{BS}$	$n > n_G$	0	≤60	20	≤15	*	1500 ± 100

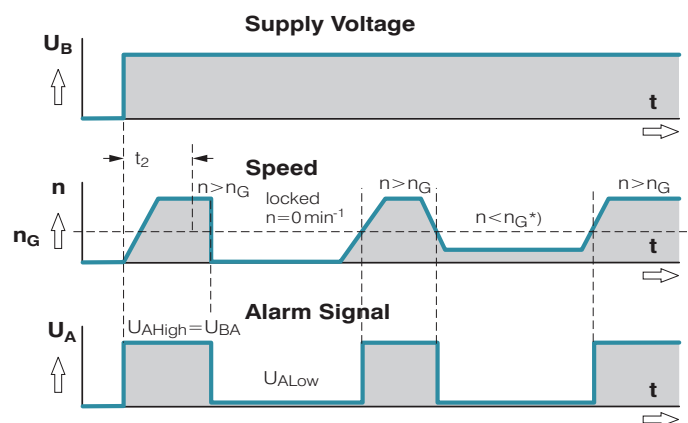
**Attention:** With these fan specials, deviations as regards temperature range, voltage range and power consumption are possible compared with standard fans.

\* After switching on  $U_B$

## Electrical connection



All voltages measured to ground.  
 External load resistance  $R_a$  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 blocking.



**Available on request:**

- With integrated signal latching for subsequent recognition of short-time faults
- Alarm circuit open collector or TTL
- Galvanically 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 $U_{A,max}$	Max. permissible sink current	Alarm delay time $t_2$	Condition:	Speed limit $n_c$	Fan description
Type	V DC		mA	V DC		mA	V DC	mA	S		min <sup>-1</sup>	Page
4312/17 MV VARIOFAN	≤ 0.4	n < nG	2	60	n > nG	0	≤ 60	20	≤ 15	*	1500 ± 100	42
4312/17 V VARIOFAN	≤ 0.4	n < nG	2	60	n > nG	0	≤ 60	20	≤ 15	*	1500 ± 100	42
4314/17 V VARIOFAN	≤ 0.4	n < nG	2	60	n > nG	0	≤ 60	20	≤ 15	*	1150 ± 100	42
4318/17 V VARIOFAN	≤ 0.4	n < nG	2	60	n > nG	0	≤ 60	20	≤ 15	*	850 ± 100	42
5112 N/17	≤ 0.4	n < nG	2	60	n > nG	0	≤ 60	20	≤ 15	*	1250 ± 50	50
7214 N/17	≤ 0.4	n < nG	2	60	n > nG	0	≤ 60	15	≤ 15	*	1330 ± 60	52
DV 6224/17	≤ 0.4	n < nG	2	60–28	n > nG	0	≤ 60	10	10 ± 4	*	1900 ± 100	55

\* After switching on

**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 desired 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 $n_G$
Type	V DC		mA	V DC		mA	V DC	mA	S		min <sup>-1</sup>
8314 /19 H	≤ 0.4	$n > n_G$	2	60	$n < n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100
4312 /19	≤ 0.4	$n > n_G$	2	60	$n < n_G$	0	≤ 60	20	≤ 15	*	1500 ± 100
7214 N /19	≤ 0.4	$n > n_G$	2	60	$n < n_G$	0	4.5–60	10	10 ± 4	*	1800 ± 20
6224 N /19	≤ 0.4	$n > n_G$	2	≤ 28	$n < n_G$	0	16–28	10	10 ± 4	*	1900 ± 100
RLF100-11/14 /19	≤ 0.4	$n > n_G$	2	≤ 28	$n < n_G$	0	16–28	10	10 ± 4	*	1900 ± 100
RER101-36/18N /19 H	≤ 0.4	$n > n_G$	2	≤ 28	$n < n_G$	0	16–28	10	10 ± 4	*	1900 ± 100

### Attention:

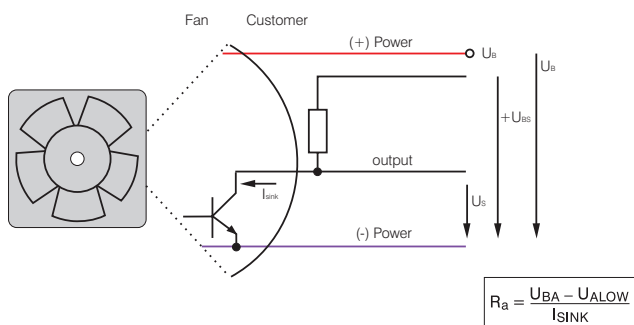
With these fan specials, deviations as regards temperature range, voltage range and power consumption are possible compared with standard fans.

\* After switching on  $U_B$

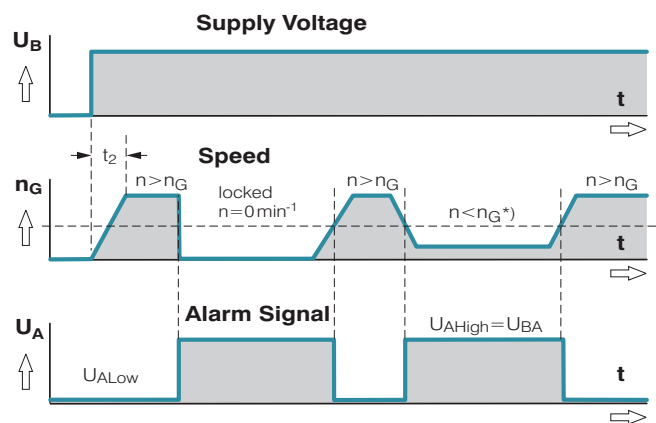
### Available on request:

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

### Electrical connection



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



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

## Alarm signal /37



- Alarm signal for speed monitoring
- Signal output for 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 desired speed; the alarm signal reverts to high.

### Available on request:

- Alarm circuit TTL compatible

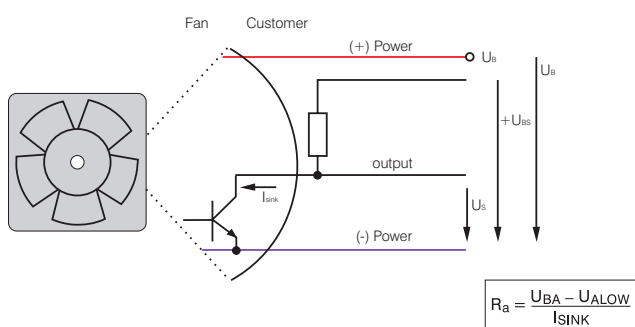
Alarm signal-data	Alarm output-voltage $U_{A,Low}$	Condition:	Condition: $I_{SINK} =$	Alarm output-voltage $U_{A,High}$	Condition:	Condition: $I_{SOURCE} =$	Alarm operating voltage $U_{A, max.}$	Max. permissible sink current $I_{SINK}$	Alarm delay time $t_2$	Condition:	Speed limit $n_6$	Fan description
Type	V DC		mA	V DC		mA	V DC	mA	S		min <sup>-1</sup>	Page
612 N/37 GNV	≤0.4	$n \leq n_G$	2	28	$n > n_G$	0	≤28	10	<1	*	0	27
8412 N/37 GMLV	≤0.4	$n \leq n_G$	2	28	$n > n_G$	0	≤28	10	<1	*	0	31
3412 N/37 GMV	≤0.4	$n \leq n_G$	2	28	$n > n_G$	0	≤28	10	<1	*	0	34
3412 N/37 GV	≤0.4	$n \leq n_G$	2	28	$n > n_G$	0	≤28	10	<1	*	0	34

### Attention:

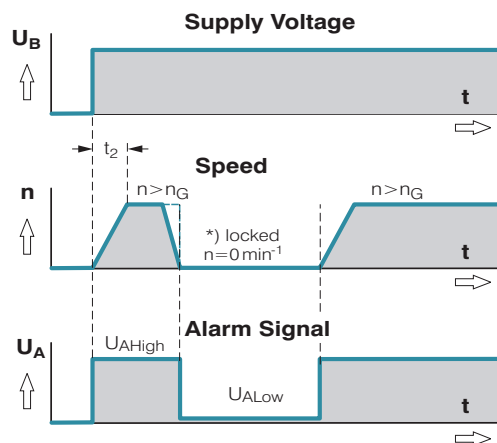
With these fan specials, deviations as regards temperature range, voltage range and power consumption are possible compared with standard fans.

\* After switching on  $U_B$

### Electrical connection



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



$t_2$  = Alarm signal suppression during start-up  
\*  $n < n_6$  by braking or blocking.

# Alarm signal /39



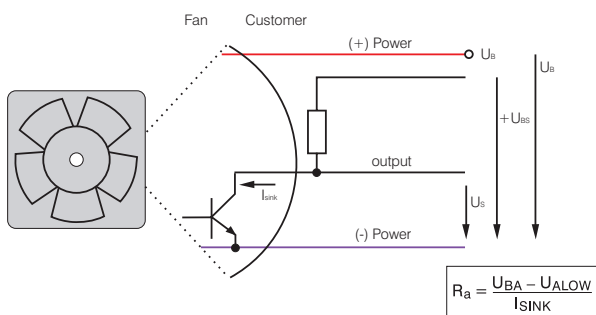
- Alarm signal for speed monitoring
- Signal output via open collector
- The fan emits a low continuous signal during trouble-free operation within the permissible voltage range.
- High signal when speed limit is not reached.
- After elimination of fault, the fan returns to its desired speed; the alarm 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 $U_{A, max.}$	Max. permissible sink current $I_{sink}$	Alarm delay time $t_2$	Condition:	Speed limit $n_6$	Fan description
Type	V DC		mA	V DC		mA	V DC	mA	S		min <sup>-1</sup>	Page
412 /39	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	21
412 /39H	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	21
612 /39FL	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	24
614 N /39GM	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	26
618 N /39 N	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	26
3412 N/39 H	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	34
3414 N/39 HH	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	34
4412 F/39 GL	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	38
4414 F/39	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	38
4418 F/39	≤0,5	n > nG	2	28	n = nG	0	≤28	10	<1	*	0	38

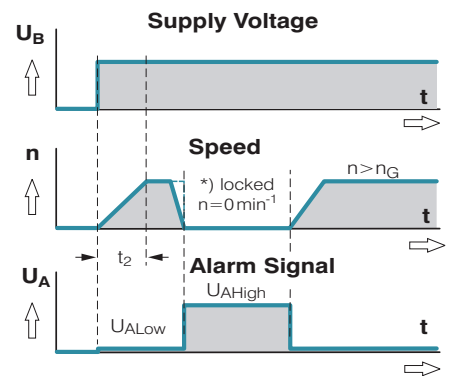
### Attention:

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 resistance  $R_a$  from  $U_A$  to  $U_{BA}$  required.



$t_2$  = Alarm signal suppression during start-up  
\*  $n <$  Speed limit  $n_6$  by braking or blocking

# 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

### Externally Speed setting

- Speed Setting via temperature, PWM or analog control voltage. On Page 94 (Speed setting).
- Description of speed curve with up to 14 selectable interpolation points. Linear interpolation between the points.
- 0 rpm. possible.
- Recognition of sensor failure: In case of loss of sensor, the fan operates at programmable (fail-safe) speed.

### Alarm- and tacho functions

- Optional alarm/or tacho function
- Selectable alarm speed limit (with hysteresis) and alarm delay time
- Latching of alarm signal
- Delay only when starting or permanently active
- Output signal "High" or "Low" in case of alarm
- Optional alarm when 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 adaption of motor hardware and software.

Fan series	Page
620	25
8400 N	30
8300	32
8200 J	33
3400 N	34
3300	36
3200 J	37
4400 FN	39
4300	41
4200	44
4100 N	45

Fan series	Page
4100 NH	46
DV 4100	47
5200 N	48
DV 5200	49
5100 N	50
7100 N	51
7200 N	52
6200 N	53
DV 6200	55
6400	57
DV 6400	59

Fan series	Page
RL 90 N	69
RLF 100	70
RG 90 N	71
RG 125 N	72
RG 160 N	73
REF 100	75
RER 101	76
RER 125 N	77
RER 160 N	78

# Speed setting

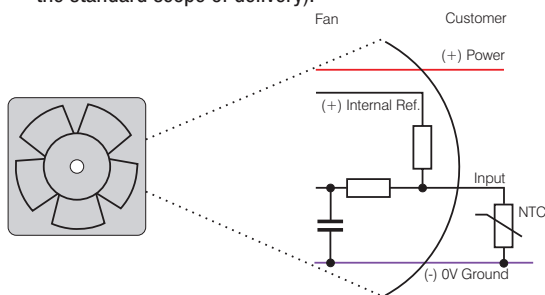
with temperature

- ebm-papst fans can come equipped with optional fan speed control.
- Temperature, analog voltage or a PWM can serve as control variables.



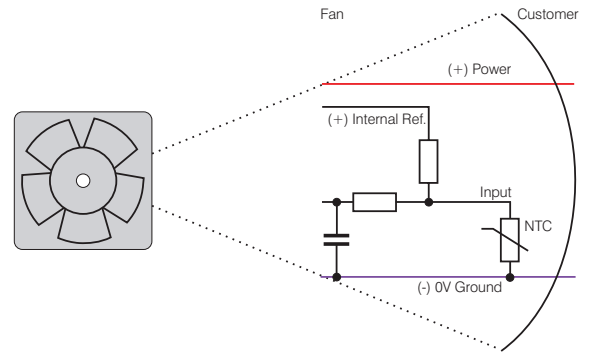
## External Temperature sensor Type T

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

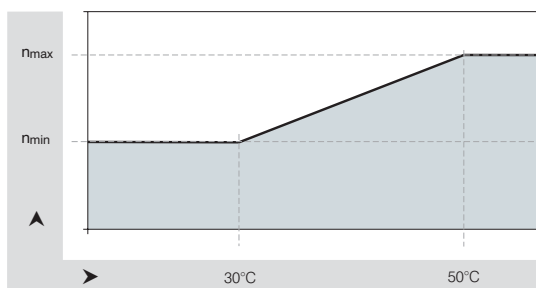


## Internal Temperature sensor Type I

- NTC integrated in fan hub.



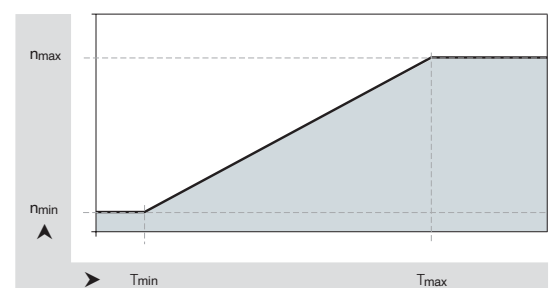
## Standard speed-temperature curve for type T and type I



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

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

## Optionally available with user-selectable temperature-speed curve control



$$n_{\min} \approx 800\text{ } \frac{1}{\text{min}}$$

$$T_{\min} \approx 5\text{ }^{\circ}\text{C}$$

$$n_{\max} \text{ model-dependent}$$

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

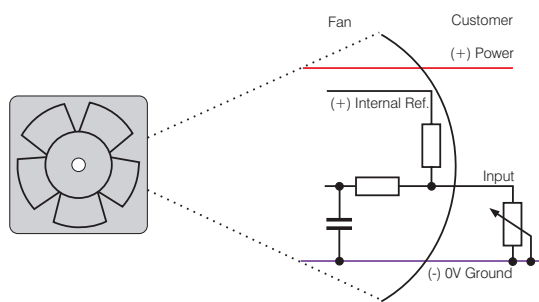
# Speed setting

with control voltage or PWM

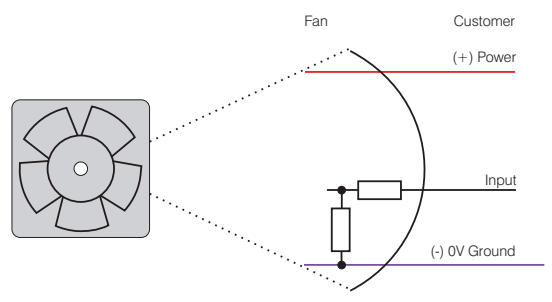


## Speed setting via control voltage Type A

– Standard control range 0 ... 5 V

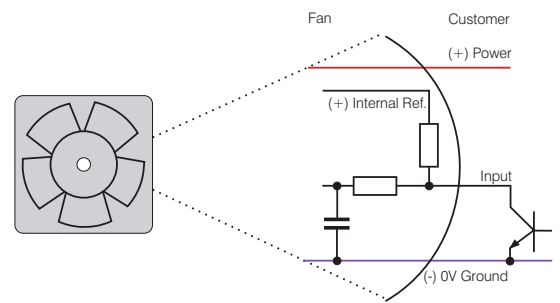


– Optional control range 0 ... 10 V

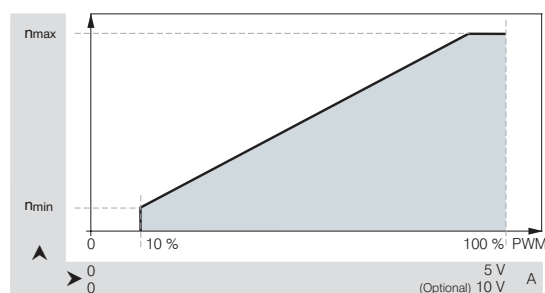


## Speed setting via PWM Type P

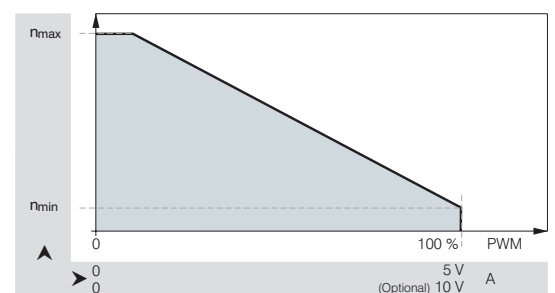
– Speed setting via PWM signal that is user generated as a controlled variable.  
 PWM signal: 2 KHz (0–100 %)  
 Open collector input



## Standard curve P / A



## Optional – selectable curve P / A



# 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 fog.
- Highly competent solutions for adapting fans to environmental conditions.

## Humidity 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 fog protection

Salt fog is extremely demanding on the resistance of the product. ebm-papst make 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.

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

