

# EC axial panel fan - HyBlade

sickle-shaped blades (S series)

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Nominal data

|                          |                   |            |
|--------------------------|-------------------|------------|
| Type                     | A3G990-AY22-71    |            |
| Motor                    | M3G150-IF         |            |
| Phase                    |                   | 3~         |
| Nominal voltage          | VAC               | 400        |
| Nominal voltage range    | VAC               | 380 .. 480 |
| Frequency                | Hz                | 50/60      |
| Method of obtaining data |                   | ml         |
| Status                   |                   | prelim.    |
| Speed (rpm)              | min <sup>-1</sup> | 820        |
| Power consumption        | W                 | 1650       |
| Current draw             | A                 | 2.6        |
| Max. back pressure       | Pa                | 140        |
| Max. back pressure       | in. wg            | 0.56       |
| Min. ambient temperature | °C                | -40        |
| Max. ambient temperature | °C                | 70         |

ml = Max. load · me = Max. efficiency · fa = Free air · cs = Customer specification · oe = Customer equipment  
Subject to change

Occasional start-up at temperatures between -40 °C and -25 °C is permitted. For continuous operation at ambient temperatures below -25 °C (such as refrigeration applications), a fan design with special low-temperature bearings must be used.

Data according to Commission Regulation (EU) 327/2011 (prEN 17166)

|                                   |   | Actual | Req. 2015 |                               |                   |       |
|-----------------------------------|---|--------|-----------|-------------------------------|-------------------|-------|
| 01 Overall efficiency $\eta_{es}$ | % | 51.5   | 35        | 09 Power consumption $P_{ed}$ | kW                | 1.65  |
| 02 Measurement category           |   | A      |           | 09 Air flow $q_v$             | m³/h              | 20330 |
| 03 Efficiency category            |   | Static |           | 09 Pressure increase $p_{fs}$ | Pa                | 141   |
| 04 Efficiency grade N             |   | 56.5   | 40        | 10 Speed (rpm) n              | min <sup>-1</sup> | 825   |
| 05 Variable speed drive           |   | Yes    |           | 11 Specific ratio*            |                   | 1.00  |

Data obtained at optimum efficiency level.

The efficiency values displayed for achieving conformity with the Ecodesign Regulation EU 327/2011 has been reached with defined air duct components (e.g. inlet rings). The dimensions must be requested from ebm-papst. If other air conduction geometries are used on the installation side, the ebm-papst evaluation loses its validity/the conformity must be confirmed again. The product does not fall within the scope of Regulation (EU) 2019/1781 due to the exception specified in Article 2 (2a) (motors completely integrated into a product).

\* Specific ratio =  $1 + p_g / 100\,000\text{ Pa}$  LU-162869

## Technical description

|                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Weight                                                                     | 32 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Size                                                                       | 990 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Motor size                                                                 | 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Rotor surface                                                              | Painted black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Electronics housing material                                               | Die-cast aluminum, painted black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Blade material                                                             | Sheet aluminum insert, sprayed with PP plastic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Number of blades                                                           | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Blade pitch                                                                | -5°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Airflow direction                                                          | V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Direction of rotation                                                      | Clockwise, viewed toward rotor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Degree of protection                                                       | IP55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Insulation class                                                           | "F"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Moisture (F) / Environmental (H) protection class                          | H2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ambient temperature note                                                   | Occasional start-up between -40°C and -25°C is permissible.<br>For continuous operation at temperatures below -25°C (e.g. refrigeration applications) we recommend our fan design with special low-temperature bearings.                                                                                                                                                                                                                                                                                                                                                                                                          |
| Max. permitted ambient temp. for motor (transport/storage)                 | +80 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Min. permitted ambient temp. for motor (transport/storage)                 | -40 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Installation position                                                      | Shaft horizontal or rotor on bottom; rotor on top on request                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Condensation drainage holes                                                | On rotor side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Mode                                                                       | S1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Motor bearing                                                              | Ball bearing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Technical features                                                         | <ul style="list-style-type: none"> <li>- Output 10 VDC, max. 10 mA</li> <li>- Operation and alarm display</li> <li>- External 24 V input (parameter setting)</li> <li>- External release input</li> <li>- Alarm relay</li> <li>- Integrated PID controller</li> <li>- Motor current limitation</li> <li>- PFC, passive</li> <li>- RS-485 MODBUS-RTU</li> <li>- Soft start</li> <li>- Control input 0-10 VDC / PWM</li> <li>- Control interface with SELV potential safely disconnected from supply</li> <li>- Thermal overload protection for electronics/motor</li> <li>- Line undervoltage / phase failure detection</li> </ul> |
| Power Factor Correction (PFC)                                              | Passive (through low-capacitance DC link)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system) | ≤ 3.5 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Electrical hookup                                                          | Terminal box                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Motor protection                                                           | Reverse polarity and locked-rotor protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Protection class assignment                                                | I; If a protective earth is connected.<br>The built-in component has several local protection class assignments.<br>The final protection class is determined by the intended installation.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Conformity with standards                                                  | EN 61800-5-1; CE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

A3G990-AY22-71

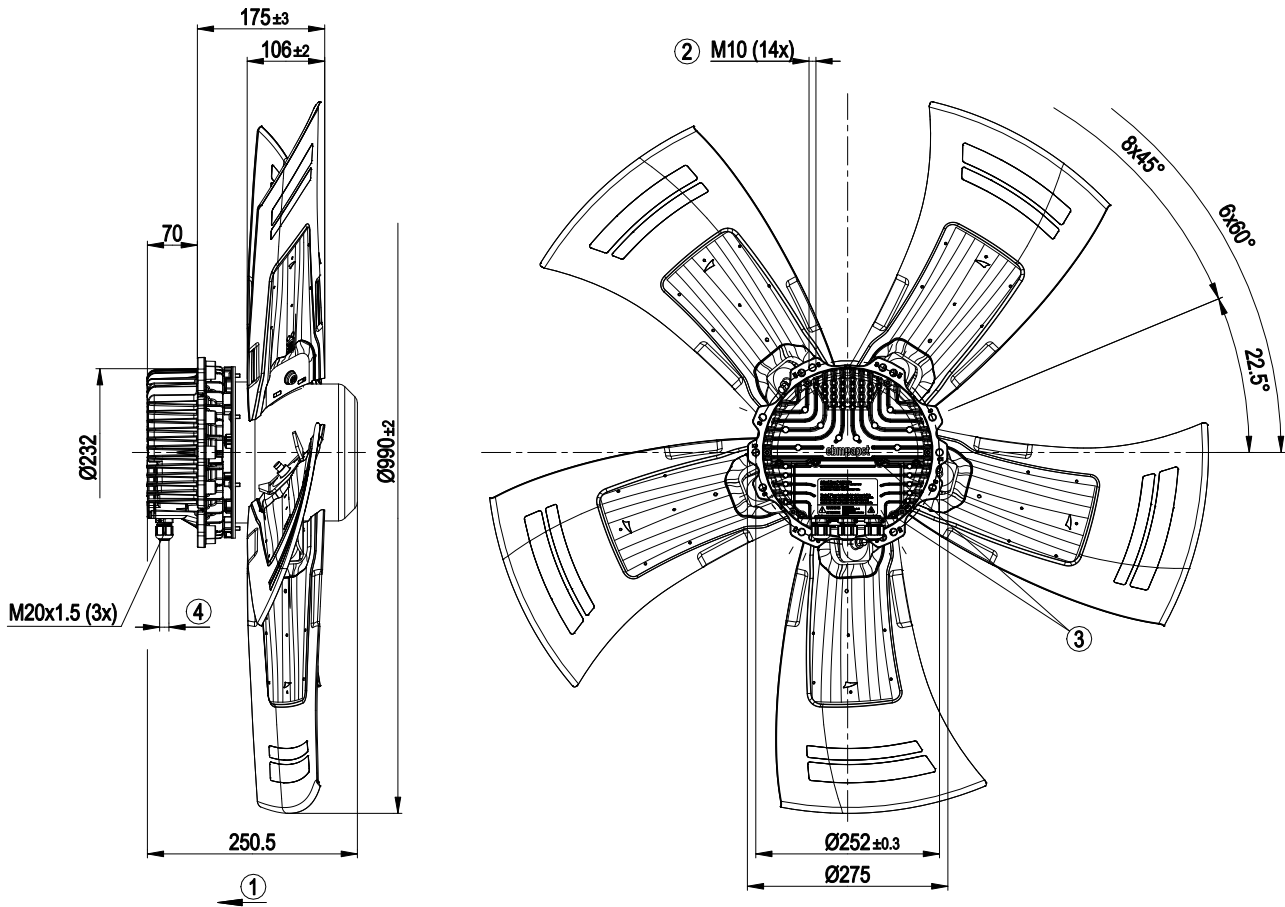
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sickle-shaped blades (S series)

Approval

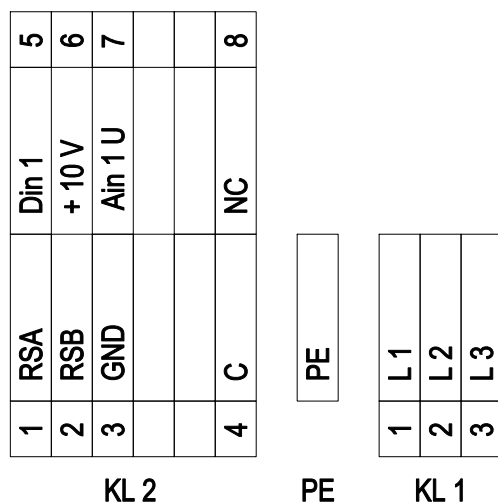
EAC

## Product drawing



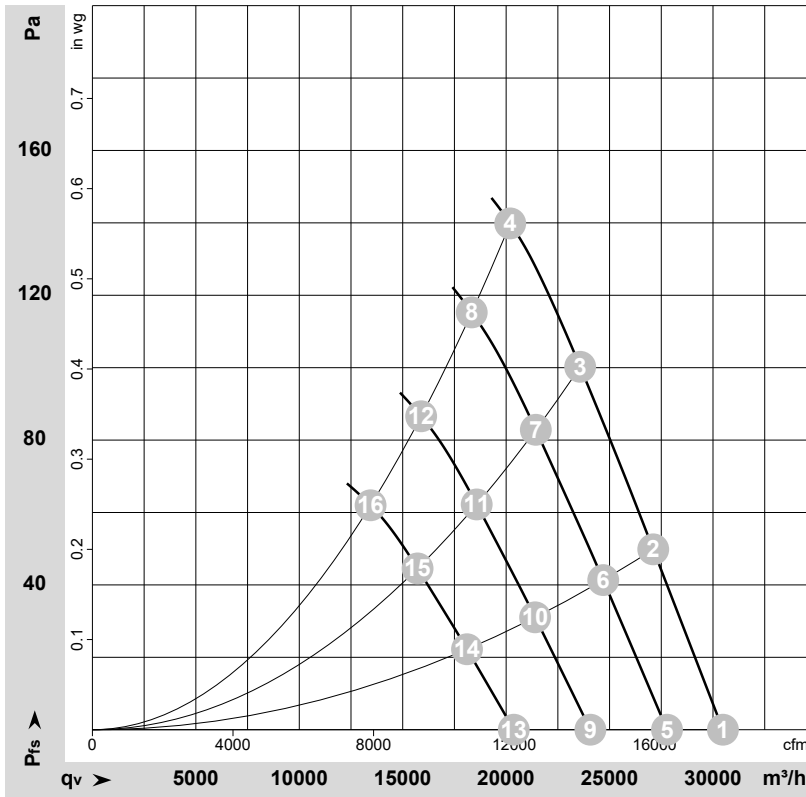
|   |                                                                        |
|---|------------------------------------------------------------------------|
| 1 | Direction of air flow "V"                                              |
| 2 | Max. clearance for screw 25 mm                                         |
| 3 | Tightening torque $3.5 \pm 0.5$ Nm                                     |
| 4 | Cable diameter min. 4 mm, max. 10 mm, tightening torque $4 \pm 0.6$ Nm |

## Connection diagram



| No.  | Conn. | Designation | Function/assignment                                                                                                                                                                                                     |
|------|-------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KL 1 | 1     | L1          | Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz                                                                                                                                                           |
| KL 1 | 2     | L2          | Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz                                                                                                                                                           |
| KL 1 | 3     | L3          | Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz                                                                                                                                                           |
| PE   |       | PE          | Ground connection, PE connection                                                                                                                                                                                        |
| KL 2 | 1     | RSA         | Bus connection RS485, RSA, MODBUS-RTU; SELV                                                                                                                                                                             |
| KL 2 | 2     | RSB         | Bus connection RS485, RSB, MODBUS-RTU; SELV                                                                                                                                                                             |
| KL 2 | 3     | GND         | Reference ground for control interface; SELV                                                                                                                                                                            |
| KL2  | 4     | C           | Status relay, floating status contact, break for failure; contact rating 250 VAC / max. 2 A (AC1) / min. 10 mA                                                                                                          |
| KL 2 | 5     | Din1        | Digital input 1 enable electronics,<br>enable: pin open or applied voltage 5-50 VDC<br>disable: bridge to GND or applied voltage < 1 VDC<br>reset function: triggers software reset after a level change to < 1 V; SELV |
| KL 2 | 6     | + 10 V      | Fixed voltage output 10 VDC, +10 V ±3%, max. 10 mA, short-circuit-proof, power supply for external devices (e.g. pot); SELV<br>Or: +24 VDC input for parameter setting via MODBUS without line voltage                  |
| KL 2 | 7     | Ain1 U      | Analog input 1 (set value) 0-10 V, Ri = 100 kΩ, adjustable curve; SELV                                                                                                                                                  |
| KL2  | 8     | NC          | Status relay, floating status contact, break for failure                                                                                                                                                                |

## Curves: Air performance 50 Hz



$$\rho = 1.15 \text{ kg/m}^3 \pm 2 \%$$

Measurement: LU-162869-1  
Date: 2014-05-12  
Housing: 38998-2-4037

Air performance measured according to ISO 5801 installation category A. For detailed information on the measurement setup, contact ebm-papst. Intake sound level: Sound power level according to ISO 13347 / sound pressure level measured at 1 m distance from fan axis. The values given are valid under the specified measuring conditions and may vary due to conditions of installation. For deviations from the standard configuration, the parameters have to be checked on the installed unit.

## Measured values

|    | Wired | U   | f  | n                 | P <sub>ed</sub> | I    | LpA <sub>in</sub> | LwA <sub>in</sub> | LwA <sub>out</sub> | q <sub>v</sub>    | p <sub>fs</sub> | q <sub>v</sub> | p <sub>fs</sub> |
|----|-------|-----|----|-------------------|-----------------|------|-------------------|-------------------|--------------------|-------------------|-----------------|----------------|-----------------|
|    |       | V   | Hz | min <sup>-1</sup> | W               | A    | dB(A)             | dB(A)             | dB(A)              | m <sup>3</sup> /h | Pa              | cfm            | in. wg          |
| 1  | Y     | 400 | 50 | 820               | 947             | 1.61 | 72                | 80                | 80                 | 30480             | 0               | 17940          | 0.00            |
| 2  | Y     | 400 | 50 | 820               | 1224            | 1.99 | 70                | 77                | 77                 | 27110             | 50              | 15960          | 0.20            |
| 3  | Y     | 400 | 50 | 820               | 1465            | 2.34 | 71                | 78                | 78                 | 23580             | 100             | 13880          | 0.40            |
| 4  | Y     | 400 | 50 | 820               | 1650            | 2.60 | 73                | 80                | 80                 | 20200             | 140             | 11890          | 0.56            |
| 5  | Y     | 400 | 50 | 750               | 717             | 1.22 | 70                | 77                | 77                 | 27775             | 0               | 16350          | 0.00            |
| 6  | Y     | 400 | 50 | 750               | 927             | 1.51 | 67                | 75                | 75                 | 24695             | 42              | 14535          | 0.17            |
| 7  | Y     | 400 | 50 | 750               | 1100            | 1.76 | 68                | 76                | 76                 | 21435             | 83              | 12615          | 0.33            |
| 8  | Y     | 400 | 50 | 750               | 1233            | 1.94 | 71                | 78                | 78                 | 18335             | 116             | 10795          | 0.47            |
| 9  | Y     | 400 | 50 | 650               | 467             | 0.79 | 66                | 74                | 74                 | 24075             | 0               | 14170          | 0.00            |
| 10 | Y     | 400 | 50 | 650               | 603             | 0.98 | 64                | 72                | 71                 | 21400             | 31              | 12595          | 0.12            |
| 11 | Y     | 400 | 50 | 650               | 716             | 1.14 | 65                | 72                | 72                 | 18575             | 62              | 10935          | 0.25            |
| 12 | Y     | 400 | 50 | 650               | 803             | 1.27 | 67                | 74                | 74                 | 15890             | 87              | 9355           | 0.35            |
| 13 | Y     | 400 | 50 | 550               | 283             | 0.48 | 62                | 70                | 69                 | 20370             | 0               | 11990          | 0.00            |
| 14 | Y     | 400 | 50 | 550               | 365             | 0.59 | 59                | 67                | 67                 | 18110             | 22              | 10660          | 0.09            |
| 15 | Y     | 400 | 50 | 550               | 434             | 0.69 | 61                | 68                | 68                 | 15720             | 45              | 9250           | 0.18            |
| 16 | Y     | 400 | 50 | 550               | 486             | 0.77 | 63                | 70                | 70                 | 13445             | 62              | 7915           | 0.25            |

Wired = Wiring · U = Voltage · f = Frequency · n = Speed (rpm) · P<sub>ed</sub> = Power consumption · I = Current draw · LpA<sub>in</sub> = Sound pressure level intake side · LwA<sub>in</sub> = Sound power level intake side  
LwA<sub>out</sub> = Sound power level outlet side · q<sub>v</sub> = Air flow · p<sub>fs</sub> = Pressure increase