

Important notes

- MAICO fans and associated control units comply with DIN VDE regulations within the framework of the Equipment and Product Safety Act.
- Pressure / volumetric flow characteristic curves and electrical data: The measurements are made using test stands that comply with DIN EN ISO 5167-1 and DIN 24163 or ISO 5801.
- The test stands are approved by TÜV Baden e.V. and/or by TÜV Bayern e.V. (German Technical Inspection Agency).

CE mark

- MAICO fans meet the basic requirements laid down in the EU 2006/95/EC Low Voltage Guidelines as well as the EU 2004/108/EC Electromagnetic Compatibility Guidelines.

Electrical connection

- Only qualified electricians are permitted to make the electrical connections.
- The fans are to be connected to a permanent electrical installation. This must be fitted with a mains isolation device that has contact openings of at least 3 mm at each pole.

Heat recovery

- Heat recovery coefficient: The relationship between supply and exhaust air enthalpy volumes according to VDI 2071.
- Degree of heat provision: The relationship between the recovered heat, including the heat that enters the room through electrical equipment with the supply air flow, and the enthalpy difference.

Product information as part of EU Regulation VO 327/11 (ErP)

- Product information as part of VO 327/11 is provided on the relevant web pages, main catalogue pages and in the general technical information.
- Explanations for the terms used are provided below:
- The **best efficiency point (BEP)** is the highest possible efficiency of a fan. The calculation is based on the ratio of electric power consumers to ventilation performance.
- The following data is collected and published in the energy efficiency optimum: Air volumes \dot{V}_{BEP} , Pressure p_{BEP} , Current consumption I_{BEP} , Power consumption P_{BEP} , Speed n_{BEP} and Sound power level LWA

Air volumes

- Unless noted elsewhere, all details about air volumes relate to the free suction/free blowing status.

Speed controller

- MAICO fans are suitable as standard for speed controllers using variable voltage with a constant frequency, i.e. for operations on transformers or in phase angles.
- There can be a physically induced humming noise at lower speeds, through the use of phase angle technology. 5-step transformers are therefore used for speed control in rooms requiring quiet fan operations.

Sound power level

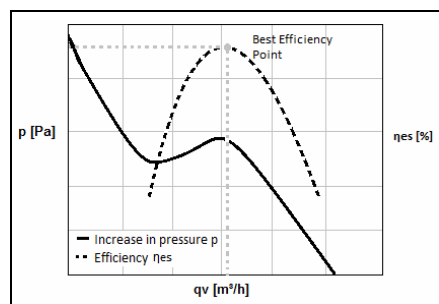
- The sound power levels are measured at the rated voltage.
- L_{WA2} = housing sound pressure level of duct fans in dB.
- L_{WA5} = free inlet sound pressure level of duct fans in dB.
- L_{WA6} = free outlet sound pressure level of duct fans in dB.
- L_{WA7} = housing and free inlet sound pressure level of wall fans.
- L_{WA8} = housing and free outlet sound pressure level of wall fans.

Sound power level centralised ventilation units with heat recovery

- L_{WA2} = housing sound pressure level in dB.
- L_{WA5} = free inlet sound pressure level in dB. Sound power level emitted to the free surroundings. Measured at an operating point on the connectors facing the room (exhaust air).
- L_{WA6} = free outlet sound pressure level in dB. Sound power level emitted to the free surroundings. Measured at an operating point on the connectors facing the room (supply air).

Sound measurements

- All measurements are made in an anechoic chamber using free-field conditions. The test equipment complies with DIN EN 60651 class 1.
- The sound power level L_{WA} is the acoustic power rating generated by a given sound source (fan). It is independent of the measuring distance or the room influences.
- The sound pressure level L_p varies relative to the distance of the sound source (fan) and the sound-absorbent properties of the environment.
- A-rated sound pressure level: The sound pressure levels indicated in the Technical Data apply to free inlet and free outlet wall fans, measured on the suction side. The values refer to free-field conditions with a distance of 1 m and a direction factor $Q = 2$.
- The sound power level L_{WA7} is the housing and free inlet sound power level in dB. Free inlet and free outlet for wall fans.



- The **overall efficiency η** is the fan's calculated static or total efficiency level depending on efficiency category.
- The calculated parameter N is used for comparison with the efficiency level specified by the EU. The calculated efficiency level N

must be greater than or equal to the specified efficiency level.

- The **measurement category** states how and with what tools the fan's efficiency was measured:
 - A: free inlet and outlet conditions
 - B: free inlet condition and with duct fitted to the outlet
 - C: duct fitted to inlet and free outlet conditions
 - D: ducts fitted to inlet and outlet
- The **efficiency category** describes the measurement process used to determine the energy-efficiency. Depending on measurement category, the static or total fan pressure is used.

General technical information

- The energy efficiency of all ErP-relevant Maico products was measured without additional **speed regulators**. For this reason, an additional VSD (Variable Speed Drive) for reaching the BEP values is not needed with Maico fans.
- Information about the disassembly and disposal of the fan can be found in the mounting instructions.
- Information about the installation, operation and servicing of the fan can also be found in the mounting instructions.
- When measuring the energy efficiency, only those objects described by the corresponding measurement category were used.

Notes regarding the following tables

- The indicated values serve as a guideline for calculating the ventilation systems. The values which depend on local conditions vary in the case of modified external influences.
- Indicated air exchange values are based purely on experience. They are intended solely to control the volumetric flows calculated from air flow rates or balances.
- The stated standards and guidelines must be taken into account during the planning and execution stages.
- The definitions between the customer and the planner must be taken into account before sizing a ventilation system in accordance with DIN EN 13779.

Guide values living areas, in accordance with EnEV (German Ordinance on energy saving in buildings), DIN 1946.6 and DIN 18017.3

		Volumetric flow (m ³ / h)	Hourly air exchange
entire apartment	–	–	0.4 - 1
per person	–	30	–
Bathrooms, WCs	–	–	–
–	Any ventilation period	60	–
–	Ventilation period > 12 hours	45	–
WC	–	–	–
–	Any ventilation period	30	–
–	Ventilation period > 12 hours	25	–
Kitchen	–	–	–
–	Any ventilation period	60	–
–	Ventilation period > 12 hours	45	–

Emission guide values for sound transfer

- Emission guide values = Guide values for sound pressure level L_p in dB (A).
- External measurement (in accordance with DIN VDI 2058, sheet 1) 0.5 m on the outside, just before the centre of an open window.

External guide values	Day time	L_p dB(A)
For areas with commercial premises only	–	70
For mixed areas with commercial and residential premises	during the day	60
	at night	45
For areas with exclusively residential premises	during the day	50
	at night	35
For health farms, hospitals, nursing homes	during the day	45
	at night	35

Guide values for non-residential buildings and workplaces

	Minimum outside air flow in accordance with DIN EN 15251, DIN EN 13779 Guideline for working places		Hourly air exchange	Permissible sound power level in accordance with DIN EN 13779	Standards and guidelines	Notes for special requirements
	per person $\text{m}^3 / \text{h}^{1)}$	per m^2 $\text{m}^3 / (\text{h} \times \text{m}^2)^{2)}$				
Garages: Low entrance / departure traffic Other garages	–	6 12	–	–	VDI 2053 and garage regulation of the countries	Reduction of pollutant concentration (CO)
Sports and multi purpose halls: per athlete per spectator exhibition halls	60 20 20	–	2 - 3	45 - 50	DIN 18032-1	–
Indoor swimming pool	–	–	3 - 4	45 - 50	VDI 2089	Dehumidification
Waiting rooms	–	–	4 - 7	40 - 45	–	–
Toilets	–	–	5	45	–	–
per urinal	25	–	–	–	–	–
per toilet	25	–	–	–	–	–
Changing room	–	–	4 - 8	35	–	–
Laboratory	–	25	6 - 15	52	VDI 2051 DIN 1946-7	Explosion protection Corrosion protection
Dye shops	–	–	5 - 15	55 - 65	–	Explosion protection
Foundries	–	–	8 - 15	55 - 65	VDI 3802	Heat balance, maximum workplace concentration value
Hardening shops	–	–	60 - 100	–	VDI 3802	Maximum workplace concentration value
Welding plants	–	–	20 - 50	–	VDI 2084	Local air extraction, maximum workplace concentration value
Assembly halls	20 - 50	–	5 - 7	–	ASR (guidelines for workplaces)	Dependant on usage conditions
Workshops	–	–	4 - 8	–	ASR (guidelines for workplaces)	–
Measurement and test rooms	–	–	8 - 10	50 - 65	ASR (guidelines for workplaces)	–
Compressor rooms, computer rooms, transformer rooms	–	–	300 m^3 / h per kWh heat loss	–	–	–
Cafeteria, restaurant	–	–	–	40 - 45	–	–
Non-smoking zone	45	30	–	–	–	–
Smoking zone	90	60	–	–	–	–
Shop, department store	45	11.3	–	40 - 45	–	–
Conference room	45	15	–	30 - 40	–	–
Classroom	45	18	–	35	–	–
Large office	45	3,8	–	40	–	–

1) DIN EN 13779, table A11

2) DIN EN 15251, standard values for the net floor space per person, in accordance with table B2

