

List of symbols and parameter descriptions, by Armin Hauer, ebm papst ISO 12759 versus AMCA 205 and “ErP” (EU 327/2011)

ISO 12759		AMCA 205 difference to ISO 12759		ErP difference to ISO 12759		Relevance in ISO 12759
Description	Symbol	Description	Symbol	Description	Symbol	
Part load compensation factor	C_c					Factor increases the reference efficiency in case certain high-efficiency variable speed drives are used.
Compensation factor for suboptimal matching of components	C_m					Factor decreases the reference efficiency in case no actual test data of the complete assembly are used.
fan impeller efficiency with bearings	η_a		η_{sh}			The difference between η_r and η_a is the fan bearing loss and is mostly neglected.
Variable speed drive efficiency	η_c					Efficiency is declared by the VSD manufacturer for use with the calculation method.
Overall efficiency for fans without variable speed drives	η_e					Can be derived from measurement data and it can include the compensation factor C_c . Can be calculated from compounded component efficiencies and compensation factors.
Overall efficiency for fans with variable speed drives	η_{ed}					Efficiency of the complete fan assembly based on air test with ducted fan discharge and electrical input test

Overall static efficiency for fans without drives	η_{es}					Efficiency of the complete fan assembly based on air test with unducted fan discharge and electrical input test
Overall static efficiency for fans with drives	η_{esd}					Efficiency of the complete fan assembly based on air test with ducted fan discharge and electrical input test.
Motor efficiency	η_m					Efficiency is declared by the motor supplier or is according to relevant regulation for use with the calculation method.
Optimum efficiency of various levels of the fan assembly	η_{opt}	Maximum fan total efficiency (or optimum total efficiency) Does not include motor or drive efficiency.	η_{pk}			In case of FEG it is based purely on measurement data. In case of FMEG it may be based on calculations and include compensation factors.
Fan impeller efficiency without bearings. Total pressure is considered.	η_r	Used with fans that are mounted directly to a motor shaft	η_i			This factor is based on air test and shaft power test. It is used directly in the FEG determination. It is the most significant factor in the FMEG determination.
Reference efficiency	η_{ref}					It is the product of several measured factors and of assumed factors found in Fig. B.3 of ISO 12759.
Fan impeller efficiency without bearings. Static pressure considered.	η_{rs}					This factor is based on air test and shaft power test. It is the most significant factor in the FMEG determination.
Mechanical drive mechanism (transmission) efficiency	η_T					This factor is determined based on the type of transmission and based on the nominal motor power.
Fan pressure	p_f	Fan total pressure	P_t			This pressure is the basis for FMEG

						declarations of the total efficiency category. It is the result from air tests with ducted fan discharges. It includes the velocity component of the fan output.
Fan static pressure	p_{sf}	Fan static pressure	P_s			It is used for FMEG declarations of the static efficiency category
Motor electrical input power	P_e				P	
Drive / control electrical input power	P_{ed}				P	
Nominal motor output power	P_N					The nameplate motor output power is used in the determination of the transmission losses in ISO 12759.
Fan air power	P_u		H_o			The product of airflow and fan total pressure is used in the numerator of fan efficiency calculations
Fan static air power	P_{us}					The product of airflow and fan static pressure is used in the numerator of fan efficiency calculations.
Grade number (integer) of the FMEG	N_G			Efficiency Grade	N	
				Target Efficiency	η_{target}	Calculated from electrical input power and a mandated efficiency grade with equations that depend on the fan type.