

Ventilation for buildings — Symbols and terminology

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National foreword

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the CR title page, pages 2 to 38 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

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English version

Ventilation for buildings – Symbols and terminology

This CEN REPORT has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings” and has been approved by CEN on 1997-01-17.

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CEN

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Foreword

This Technical Report is the result of the unambiguous and uniform use of symbols and terminology in European Standards produced by TC156 “Ventilation for buildings”.

This Technical Report is a preliminary result (up to 1996) as the development of European Standards in TC156 has not yet been completed.

After completion of the activities by TC156 a European Standard, based amongst others on this Technical Report, with symbols and terminology will be published for the benefit of all European Standards produced by TC156.

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1 Scope

The symbols and definitions for terminology in this Technical Report are based on the European Standards and the European pre-standards realized by TC156 "Ventilation for buildings" up to 1996.

2 Symbols and units

A

TERM	SYMBOL	UNIT
Absolute static pressure	p_{sa}	Pa
Absolute total pressure	<i>See stagnation pressure</i>	
Acceleration	a	m s^{-2}
Acceleration of free fall (or acceleration due to gravity)	g	m s^{-2}
Actual expansibility of a gas at constant pressure	β	K^{-1}
Air flow rate (see mass or volume flow rate)	q_v or q_m	$\text{m}^3 \text{s}^{-1}$ or kg s^{-1}
Air leakage factor	f	$\text{m}^3 \text{s}^{-1} \text{m}^{-2}$
Air leakage rate	q_{vl}	$\text{m}^3 \text{s}^{-1}$
Angle	α	radians (rad) or degrees
Angular acceleration	α_a	rad s^{-2}
Angular velocity	ω	rad s^{-1}
Area	A	m^2
Area ratio of a flow measuring device	$m = \beta^2$	—
Atmospheric pressure	p_a	Pa

B

TERM	SYMBOL	UNIT
Blade tangential velocity (within a fan impeller)	u	m s^{-1}
Breadth	b	m
Bulging/caving of a duct or enclosure	s	m

C

TERM	SYMBOL	UNIT
Celsius temperature	$\theta, (t)$	°C
Coefficient of thermal conductivity	λ	$\text{W m}^{-1} \text{K}^{-1}$
Compressibility. factor of a gas	Z	—
Convective heat transfer coefficient	h_c	$\text{W m}^{-2} \text{K}^{-1}$
Cross-sectional area of a duct	A_c	m^2

D

TERM	SYMBOL	UNIT
Darcy friction factor for a duct of constant area	λ	—
Deflection of a joint (ductwork)	c	m
Density	ρ	kg m^{-3}
Diameter	d, D	m
Diameter ratio of a flow measuring device	β	—
Distance to the $v \text{ m s}^{-1}$ isovel	L_v	m
Drop (of an air jet)	h_v	m
Dynamic pressure	p_d	Pa
Dynamic viscosity	μ	N s m^{-2}

E

TERM	SYMBOL	UNIT
Effective area of an air terminal device	A_k	m^2
Effective length	l	m
Efficiency	η	—
Energy	E	J
Energy loss per unit mass	ΔY	J kg^{-1}
Enthalpy per unit mass	$h, (i)$	J kg^{-1}
Entropy per unit mass	s	$\text{J kg}^{-1} \text{K}^{-1}$
Equivalent absorption area	A_e	m^2
Equivalent diameter of a straight parallel rectangular duct	d_e	m

F

TERM	SYMBOL	UNIT
Fan air power	P_f	W
Fan efficiency	η_R	—
Fan equivalent orifice	O	m ²
Fan head	H	m
Fan impeller power	P_R	W
Fan pressure	p_f	Pa
Fan shaft power	P_a	W
Flow coefficient of a subsonic flow in an orifice (or in a throat)	α	—
Fluid density upstream of a flow measuring device	ρ_u	kg m ⁻³
Force	F	N
Fourier number	F_O	—
Frequency (of a periodic phenomenon)	f	s ⁻¹
Froude number (or Reech number)	Fr	—

G

TERM	SYMBOL	UNIT
Grashof number	Gr	—

H

TERM	SYMBOL	UNIT
Heat capacity	C	J K ⁻¹
Heat flux (or thermal power)	Φ	W
Heat flux density	φ	W m ⁻²
Height	h	m
Height above datum	z	m
Height of the v m s ⁻¹ isovel	h_v	m
Hydraulic diameter of a straight parallel duct	d_h	m

I

TERM	SYMBOL	UNIT
Impeller tip diameter of a fan	D	m
Impeller tip radius of a fan	R	m
Insulation of clothing	I_{cl}	$\text{m}^2 \text{K} \cdot \text{W}^{-1}$
Internal diameter of a pipe	D	m
Internal energy per unit mass	u	J kg^{-1}
Isentropic exponent	k	—

K

TERM	SYMBOL	UNIT
Kinematic viscosity	ν	$\text{m}^2 \text{s}^{-1}$
Kinetic energy factor through a section of A_1	α_{A1}	—
Kinetic energy per unit mass	e_K	J kg^{-1}

L

TERM	SYMBOL	UNIT
Latent heat per unit mass (for the isothermal transformation of a phase)	l	J kg^{-1}
Length	L	m

M

TERM	SYMBOL	UNIT
Mach number	M_a	—
Mass	m	kg
Mass flow rate	q_m	kg s^{-1}
Mean flow velocity in the cross-section of a duct	V_m	m s^{-1}
Metabolic rate	M	W m^{-2}
Moment of inertia	I	kg m^2
Momentum	p	kg m s^{-1}
Motor input power	P_E	W
Motor output fan efficiency	η_M	—
Motor output power	P_M	W

N

TERM	SYMBOL	UNIT
Number of blades of a fan impeller	K, B	—
Nusselt number	Nu	—

O

TERM	SYMBOL	UNIT
Orifice diameter of a flow measuring device	d	m
Overall fan efficiency	η_F	—
Overall heat transfer coefficient	U	$\text{W m}^{-2} \text{K}^{-1}$
Overlap length (ductwork)	l_p	m

P

TERM	SYMBOL	UNIT
Partial pressure of water vapour	p_v	Pa
Percentage dissatisfied due to local discomfort	PD	%
Periodic time (of a periodic phenomenon)	T	s
Pipe Reynolds number	Re_d	—
Polytropic coefficient	n	—
Position of valve or induction damper setting	s	% or degree
Power	P	W
Prandtl number	Pr	—
Predicted Mean Vote	PMV	—
Predicted Percentage of Dissatisfied	PPD	%
Pressure difference between any two specified points	$\Delta p_t, \Delta p_s$ etc.	Pa
Pressure loss coefficient	ζ	—
Primary air flow rate	q_{vp}, q_{mp}	$\text{m}^3 \text{s}^{-1}$ or l s^{-1} , kg s^{-1}

Q

TERM	SYMBOL	UNIT
Quantity of heat	Q	J

R

TERM	SYMBOL	UNIT
Radiation heat transfer coefficient	h_r	$\text{W m}^{-2} \text{K}^{-1}$
Radius	r	m
Radius of curvature	r_m	m
Ratio of the specific heat capacities	γ	—
Relative fluid velocity (to the impeller of a fan)	w	m s^{-1}
Relative humidity	φ_p	—
Reverberation time	T	s
Reynolds number	Re	—
Reynolds number of a flow measuring device	Re_d	—
Rotational speed	n	s^{-1}

S

TERM	SYMBOL	UNIT
Saturation pressure of water vapour	p_{sat}	Pa
Secondary air flow rate	q_{vs}, q_{ms}	$\text{m}^3 \text{s}^{-1}$ or l s^{-1} , kg s^{-1}
Shaft power fan efficiency	η_A	—
Solid angle	Ω	sr
Sound power level	L_w	dB
Sound pressure level	L_p	dB
Specific heat capacity	c	$\text{J kg}^{-1} \text{K}^{-1}$
Specific heat capacity at constant pressure	c_p	$\text{J kg}^{-1} \text{K}^{-1}$
Specific heat capacity at constant volume	c_v	$\text{J kg}^{-1} \text{K}^{-1}$
Spread (of an air jet)	b_v	m
Stagnation (or absolute total) pressure	p_{ta}	Pa
Stanton number	S_t	—
Static gauge pressure	p_s	Pa
Straight duct surface area	A_i	m^{-2}
Surface heat transfer coefficient	h	$\text{W m}^{-2} \text{K}^{-1}$
Surface tension	σ	N m^{-2}

T

TERM	SYMBOL	UNIT
Tangential component of the fluid absolute velocity (within a fan impeller)	c_u	m s^{-1}
Temperature difference	$\Delta\theta, \Delta t, \Delta T$	K
Thermal bridging factor of a casing of an air handling unit	k_b	—
Thermal diffusivity	a	$\text{m}^2 \text{s}^{-1}$
Thermodynamic (or absolute) temperature	T	K
Thickness	t, d	m
Thickness of the dynamic boundary layer	δ	m
Thickness of the thermal boundary layer	δ_T	m
Throw	L_v	m
Time	t	s
Time constant (of an exponential change of a quantity)	τ	s
Tip Reynolds number of a fan impeller	Re_u	—
Tip speed of a fan impeller	U	m s^{-1}
Torque	T	N m
Total air flow rate	q_{vt}, q_{mt}	$\text{m}^3 \text{s}^{-1}$ or l s^{-1} , kg s^{-1}
Total gauge pressure	p_t	Pa
Turbulence intensity	T_u	%

U

TERM	SYMBOL	UNIT
Universal gas constant	R	$\text{J kg}^{-1} \text{K}^{-1}$

V

TERM	SYMBOL	UNIT
Velocity	v	m s^{-1}
Velocity of sound	c	m s^{-1}
Volume	V	m^3
Volume flow rate	q_v	$\text{m}^3 \text{s}^{-1}$ or l s^{-1}

W

TERM	SYMBOL	UNIT
Wave length (of a periodic phenomenon)	λ	m
Weight	G	N
Weighted sound pressure level	L_{pA} L_{pB} L_{pC}	dB (A) dB (B) dB (C)
Wetted perimeter of a duct	χ	m
Width	b	m
Work	W	J
Work per unit mass of a fan	y	J kg ⁻¹

Y

TERM	SYMBOL	UNIT
Young's modulus	E	N m ⁻²

3 TERMS AND DEFINITIONS

A

TERM	DEFINITION
Absolute humidity	The mass of water vapour present per unit mass of dry air.
Absolute total pressure (stagnation pressure)	The algebraic sum of the total static pressure and velocity pressure at any particular point in a fluid.
Accessibility	(As applied to equipment) Equipment is accessible when close approach is not prevented by locked doors, elevation or other effective means.
Accessories of distribution	See components of air distribution.
Acoustic environment	Characteristics of a room that determine the qualities of sound therein, relative to hearing.
Acoustic and/or thermal insulation	Treatment of the internal or external walls of the ducts so as to reduce the transmission of acoustic energy along the length and through the duct and/or the thermal energy across the walls.
Actuator	Device, either electrically, pneumatically or hydraulically operated, which acts as a motor to change the position of movable devices such as valves or dampers.
Adjustable flow rate air diffuser	Air diffuser which incorporates a device by means of which the air flow rate can be varied without affecting the direction or directions of the air delivered to the treated space. (Also see air diffuser)
Adjustable grille	See grille.
Adjustable pattern air diffuser	Air diffuser which incorporates an integral device by means of which the direction or directions of the air delivered to the treated space can be varied. (Also see air diffuser)