DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

OF 19 MAY 2010 ON THE ENERGY PERFORMANCE OF BUILDINGS (EPB)

ANNEX I – COMMON GENERAL FRAMEWORK FOR THE CALCULATION OF EPB

INDEX

INTRODUCTION

The **Annex 1.a)** of the ***Directive (EU) 2018/844*** *of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings (EPBB) and Directive 2012/27/EU on energy efficiency* amends Annex I of the EPBD replacing point 1 with the following text:

> '1.
>
> The energy performance of a building shall be determined on the basis of calculated or actual energy use and shall reflect typical energy use for space heating, space cooling, domestic hot water, ventilation, built-in lighting and other technical building systems.
>
> The energy performance of a building shall be expressed by a numeric indicator of primary energy use in kWh/(m2.y) for the purpose of both energy performance certification and compliance with minimum energy performance requirements. The methodology applied for the determination of the energy performance of a building shall be transparent and open to innovation.
>
> Member States shall describe their national calculation methodology following the national annexes of the overarching standards, namely ISO 52000-1, 52003-1, 52010-1, 52016-1, and 52018-1, developed under mandate M/480 given to the European Committee for Standardisation (CEN). This provision shall not constitute a legal codification of those standards.'

The present document hereby complies with the stated obligation to describe Spain´s national calculation methodology.

This document reflects some choices made within the Spanish regulations on the assessment of energy performance of buildings, both for certification and compliance.

The main references to these regulations concerning the scope of the present document are:

- Real Decreto 235/2013, de 5 de abril, por el que se aprueba el procedimiento básico para la certificación de la eficiencia energética de los edificios. (Royal decree on energy performace certificates)
  - https://www.boe.es/eli/es/rd/2013/04/05/235
  - Certificación energética de edificios. Documentos reconocidos. Specifically, on energy performance methodology and compliance:

- Documento reconocido para la certificación energética de edificios. "Condiciones técnicas de los procedimientos para la evaluación de la eficiencia energética de los edificios."
    - https://energia.gob.es/desarrollo/EficienciaEnergetica/CertificacionEnergetica/DocumentosReconocidos/normativamodelosutilizacion/20151119-Condiciones-tecnicas-procedimientos-para-valuacion-eficiencia-energetica.pdf

- Código Técnico de la Edificación, aprobado por el Real Decreto 314/2006, de 17 de marzo, modificado por el Real Decreto 732/2019, de 20 de diciembre. (Royal decree setting requirements on the energy efficiency of buildings)
    - https://www.boe.es/eli/es/rd/2019/12/20/732
    - Energy performance compliance section can be found in: Código Técnico de la Edificación. Documento Básico de Ahorro de Energía (CTE DB-HE)
    - https://www.codigotecnico.org/index.php/menu-ahorro-energia.html

1. ISO 52000-1: Overarching EPB assessment
Annex A Input and method selection data sheet

A.1 General

The template in Annex A to this standard shall be used to specify the choices between methods, the required input data and references to other standards.

NOTE 1 Following this template is not enough to guarantee consistency of data.

A.2 References

The references, identified by the module code number, are given in Table A.1.

Reference	Reference document	
	Number	Title
M1–1	ISO 52000-1	This standard
M1–2		See M1-1
M1–3		See M1-1
M1–4	ISO 52003-1	Energy performance of buildings – Indicators, requirements and certification– Part 1: General aspects and application to the overall energy performance
M1–5, M1-7		See M1-1
M1–8, M1-9		See M1-1
M1–10		
M1–6, M2-7	ISO 17772-1	Energy performance of buildings – Indoor environmental quality –Part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings (in preparation)
	EN 16798–1	Energy performance of buildings – Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics –Module M1–6; (in progress)
M1–11		See M1-6
M1–13	ISO 52010-1	Energy performance of buildings – Overarching assessment procedures of external environment conditions – Part 1: Calculation

Reference	Reference document	
	Number	Title
		procedures
M1–14	ISO 15459-1	Economic evaluation procedure for energy systems in buildings
M2-2	ISO 52016-1	Energy performance of buildings – Calculation of the energy needs for heating and cooling, internal temperatures and heating and cooling load in a building or building zone – Part 1: Calculation procedures
M2-3	ISO 52017-1	Energy performance of buildings – Calculation of the dynamic thermal balance in a building or building zone – Part 1: Generic calculation procedure
M2-4	ISO 52018-1	Energy performance of buildings – Indicators for partial EPB requirements related to thermal energy balance and fabric features – Part 1:Overview of options
M2–5.1	ISO 13789	Thermal performance of buildings – Transmission and ventilation heat transfer coefficients–Calculation method
M2–5.2	ISO 13370	Thermal performance of buildings – Heat transfer via the ground – Calculation methods
M2–5.3	ISO 6946	Building components and building elements – Thermal resistance and thermal transmittance – Calculation method
M2–5.4	ISO 10211	Thermal bridges in building construction –Heat flows and surface temperatures – Detailed calculations
M2–5.5	ISO 14683	Thermal bridges in building construction – Linear thermal transmittance – Simplified methods and default values
M2–5.6	ISO 10077-1	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: General
M2–5.7	ISO 10077-2	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames
M2–5.8	ISO 12631	Thermal performance of curtain walling – Calculation of thermal transmittance
M2–9	ISO 13786	Thermal performance of building components – Dynamic thermal characteristics – Calculation methods
M2–7		See M2–5
	ISO 10913	Calculation methods for the determination of air flow rates in buildings including infiltration
M2–8	ISO 52022-3	Energy performance of buildings – Thermal, solar and daylight properties of building components and elements – Part 3: Detailed calculation method of the solar and daylight characteristics for solar

Reference	Reference document	
	Number	Title
		protection devices combined with glazing
	ISO 52022-1	Energy performance of buildings – Thermal, solar and daylight properties of building components and elements – Part 1: Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing
M3–1	EN 15316–1	Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 1: General and Energy performance expression
M3–2		
M3–3	EN 12831–1	Heating systems in buildings — Method for calculation of the design heat load - Heating systems and water based cooling systems in buildings - Method for calculation of the design heat load - Part 1: Space heating load
M3–4	EN 15316–1	See M3–1
M3–5	EN 15316–2	Heating systems and water based cooling systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 2: Space emission systems (heating and cooling)
M3–6	EN 15316–3	Heating systems and water based cooling systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 3: Space distribution systems (DHW, heating and cooling)
M3–7	EN 15316–5	Heating systems and water based cooling systems in buildings – Method for calculation of system energy requirements and system efficiencies - Part 5: Space heating and DHW storage systems (not cooling)
M3–8	EN 15316–4-1	Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies—Part 4–1: M3–8-1 and M8–8 1 Space heating and DHW generation systems, combustion systems (boilers, biomass)
	EN 15316–4-2	Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 4–2: Space heating generation systems, heat pump systems
	EN 15316–4-3	Heating systems and water based cooling systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 4–3: Heat generation systems, thermal solar and photovoltaic systems

Reference	Reference document	
	Number	Title
	EN 15316–4-4	Heating systems and water based cooling systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 4–4: Heat generation systems, building-integrated cogeneration systems
	EN 15316–4-5	Heating systems and water based cooling systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 4–5: District heating and cooling
	EN 15316–4-8	Heating systems and water based cooling systems in buildings -Method for calculation of system energy requirements and system efficiencies – Part 4–8: Space heating generation systems, air heating and overhead radiant heating systems, including stoves (local)
M3–9		
M3–10	EN 15378–3	Energy performance of buildings – Module M3–10 and M8–10 – Heatng and domestic hot water measured energy performance
M3–11	EN 15378–1	Energy performance of buildings – Heating systems in buildings – Inspection of heating and domestic hot water systems
M3–12		
M4–1	EN 16798–9	Energy performance of buildings – Part 9: Ventilation for buildings – Module M4–1 – Calculation methods for energy requirements of cooling systems – General
M4–2		
M4–3	ISO 52016-1	See M2-2
M4–4	EN 16798–9	See M4–1
M4–5	EN 15316–2	See M3–5
M4–6	EN 15316–3	See M3–6
M4–7	EN 16798 – 15	Energy performance of buildings — Part 15: Module M4–7 – Calculation of cooling systems – Storage – General
M4–8	EN 16798–13	Energy performance of buildings – Part 13: Module M4–8 – Calculation of cooling systems – Generation
	EN 15316–4-5	See M3–8
M4–9		
M4–10		
M4–11	EN 16798–17	Energy performance of buildings — Part 17: Ventilation for buildings- Module M4–11, M5–11, M6–11, M7–11 – Guidelines for inspection of

Reference	Reference document	
	Number	Title
		ventilation and air conditioning systems
M4–12		
M5–1	EN 16798–3	Energy performance of buildings – Part 3: Ventilation for non-residential buildings – Performance requirements for ventilation and room-conditioning systems
M5–2		
M5–3		
M5–4	EN 16798–3	See M5–1
M5–5	EN 16798–7	Energy performance of buildings – Module M5–5 – Ventilation for buildings – Calculation methods for energy requirements of ventilation and air conditioning systems – Part 7: Emission (determination of air flow rates)
M5–6	EN 16798–5-1 and EN 16798 – 5-2	Energy performance of buildings – Modules M5–6, M5–8, M6–5, M6–8, M7–5, M7–8 – Ventilation for buildings – Calculation methods for energy requirements of ventilation and air conditioning systems – Part 5–1: Distribution and generation: Method 1 Energy performance of buildings – Modules M5–6, M5–8, M6–5, M6–8, M7–5, M7–8 – Ventilation for buildings – Calculation methods for energy requirements of ventilation systems – Part 5–2: Distribution and generation: Method 2
M5–7		
M5–8	EN 16798–5-1 and EN 16798 – 5-2	See M5–6
M5–9		
M5–10		
M5–11	EN 16798–17	See M4-11
M6–1		See M5-1
M6–2		See M5-2
M6–3		See M5-3
M6–4		See M5-4
M6–5	EN 16798–5-1 and EN 16798 – 5-2	See M5-6

Reference	Reference document	
	Number	Title
M6–6		See M5-6
M6–7		See M5-7
M6–8	EN 16798–5-1 and EN 16798 – 5-2	See M5-6
M6–9		See M5-9
M6–10		See M5-10
M6–11	EN 16798–17	See M5-11
M7–1		See M5-1
M7–2		See M5-2
M7–3		See M5-3
M7–4		See M5-4
M7–5	EN 16798–5-1 and EN 16798 – 5-2	See M5-6
M7–6		See M5-6
M7–7		See M5-7
M7–8	EN 16798–5-1 and EN 16798 – 5-2	See M5-6
M7–9		See M5-9
M7–10		See M5-10
M7–11	EN 16798–17	See M5-11
M8–1	EN 15316–1	See M3-1
M8–2	EN 12831–3	Domestic hot water systems heat load and characterization of needs
M8–3	EN 12831–3	See M8-2
M8–4	EN 15316–1	See M8-1
M8–5		
M8–6	EN 15316–3	See M3-6
M8–7	EN 15316–5	See M3-7
M8–8	EN 15316–4-1	See M3-8

Reference	Reference document	
	Number	Title
	EN 15316–4-3	See M3-8
	EN 15316–4-4	See M3-8
	EN 15316–4-5	See M3-8
	EN 15316–4-8	See M3-8
M8–9		
M8–10	EN 15378–3	See M3-10
M8–11	EN 15378–1	See M3-11
M9–1	EN 15193–1	Energy performance of buildings – Module M9 – Energy requirements for lighting – Part 1: Specifications
M9–2	EN 15193–1	See M9–1
M9–3		
M9–4	EN 15193–1	See M9–1
M9–5		
M9–6		
M9–8		
M9–10	EN 15193–1	See M9–1
M9-11	EN 15193–1	See M9–1
M10-1	EN 15232-1	Energy performance of buildings – Part 1: Contribution of Building Automation, Controls and Building Management. Módules M10-4,5,6,7,8,9,10
M10-2		
M10-3		
M10-4		
M10-5	EN 15232-1	See M10-1
M10-6	EN 15232-1	See M10-1
M10-7	EN 15232-1	See M10-1
M10-8	EN 15232-1	See M10-1
M10-11	EN 16946-1	Energy Performance of Buildings – Inspection for Building Automation and Control. Part 1: Module 10-11
M10-12	EN 16947-1	Energy Performance of Buildings – Building Management system. Part

Reference	Reference document	
	Number	Title
		1: Module 10-12
M11-1		
M11-4		
M11-8	EN 15316–4-3	See M3-8
	EN 15316–4-4	See M3-8
	EN 15316–4-5	See M3-8
	EN 15316–4-10	Heating systems and water based cooling systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 4-10: Wind power generation systems

A.3 Overarching preparation steps

Table A.2 — Energy performance assessment types according to building category and application a) (See 5.3)

Application	Building category	Assessment type	Conditions
Energy performance certificate	All categories	As built type	-
Building permit	All categories	Design type	-
Permit to use	All categories	As built type	-
Energy audit	All categories	Tailored type	-
NOTE Add rows in case of more assessment purposes.			

Table A.3 — Object types (See Clause 6 and 10.1)

EPB_OBJECT_TYPE			
Type	Description	Subset b	Comments
EPB_OBJECT_BLDNG_TOT	Whole building	1	
EPB_OBJECT_BLDNG_UNIT	Building unit	1	
EPB_OBJECT_BLDNG_PART	Part of a building (lacking one or	1	

EPB_OBJECT_TYPE			
Type	**Description**	**Subset b**	**Comments**
	more features of a complete building or building unit)		
EPB_OBJECT_ LCYCLE_NEW_DESIGN	New building design	2	
EPB_OBJECT_ LCYCLE_AS_BUILT	Existing building as built (without long term use data)	2	
EPB_OBJECT_ LCYCLE_EXIST_RENOV	Existing building after renovation (without long term use data)	2	
EPB_OBJECT_ LCYCLE_EXIST_EXTENS	Existing building extension (without long term use data)	2	
EPB_OBJECT_ LCYCLE_EXIST_IN_USE	Existing building in use	2	
EPB_OBJECT_CAT_RES	Residential building	3	
EPB_OBJECT_CAT_NRES	Non-residential building	3	
NOTE The type of object may have an effect on the choices in this overarching document and in the other EPB standards. This property is therefore inherited by the other EPB standards, where relevant.			

Table A.4 — Building categories (See Clauses 6 and 9)

BLDNGCAT_TYPE		
Type	**Description**	**Comments**
BLDNGCAT_RES_SINGLE	Single-family houses of different types	
BLDNGCAT_RES_APPBLOCK	Apartment blocks	
BLDNGCAT_RES_OTHER	Other residential buildings	
BLDNGCAT_ANY_PROT	Officially protected buildings	
BLDNGCAT_ANY_SA	Stand-alone buildings with less than 50m2	
BLDNGCAT_ANY_PROV	Buildings with an expected use of 2 or less years	
BLDNGCAT_NRES_MILIT	Non-residential military buildings	
BLDNGCAT_NRES_INDUS	Non-residential industrial buildings	

BLDNGCAT_TYPE		
Type	**Description**	**Comments**
BLDNGCAT_NRES_AGRIC	Non-residential agricultural buildings	
BLDNGCAT_NRES_OTHER	Other non-residential buildings	
NOTE The building category may have an effect on the choices in this overarching document and in the other EPB standards. This property is therefore inherited by the other EPB standards, where relevant.		

Table A.5 — Which building categories are included in EPB assessment (See 6.2.2)

Building categories	Identifier	Included in EPB assessment Yes/No
Residential buildings:		
Single family houses of different types	BLDNGCAT_RES_SINGLE	YES
Apartment block	BLDNGCAT_RES_APPBLOCK	YES
Other residential buildings	BLDNGCAT_RES_OTHER	YES
Officially protected buildings	BLDNGCAT_ANY_PROT	NO
Stand-alone buildings with less than 50m2	BLDNGCAT_ANY_SA	NO
Buildings with an expected use of 2 or less years	BLDNGCAT_ANY_PROV	NO
Non-residential buildings:		
Non-residential military buildings	BLDNGCAT_NRES_MILIT	YES
Non-residential industrial buildings	BLDNGCAT_NRES_INDUS	YES
Non-residential agricultural buildings	BLDNGCAT_NRES_AGRIC	YES
Other non-residential buildings	BLDNGCAT_NRES_OTHER	YES
Officially protected buildings	BLDNGCAT_ANY_PROT	YES
Stand-alone buildings with less than 50m2	BLDNGCAT_ANY_SA	YES
Buildings with an expected use of 2 or less years	BLDNGCAT_ANY_PROV	NO
[a] Building category for which this document applies, e.g. because there is an EPB requirement for this building category.		

Table A.6 — Differentiation of space categories (See Clauses 6, 9 and 10.1)

Choice		
Type	**Choice**	**Comments**
Differentiation of space categories in a building	YES	

In case differentiation Table S.7 has to be completed. Otherwise the list of space categories is equal to the list of building categories: (SPACECAT_X = BLDNGCAT_X).

Table A.7 — Space categories (See Clauses 6 and 9)

SPACECAT_TYPE		
Type	**Description**	**Comments**
SPACECAT_RES_COND	Residential individual thermally conditioned space	
SPACECAT_RES_UNCOND	Residential individual thermally unconditioned space	
SPACECAT _RES_UNOCCUPIED	REsidential individual unoccupied space	
SPACECAT_NRES_COND	Non-residendial thermally conditioned space	
SPACECAT_NRES_UNCOND	Non-residendial thermally unconditioned space	
SPACECAT _NRES_UNOCCUPIED	Non-residential unoccupied space	
NOTE 1 Each space category requires a set of conditions of use (temperature settings, ventilation, and lighting requirements, domestic hot water needs, etc.), to be specified in M1–6. NOTE 2 The space category may have an effect on the choices in this overarching document and in the other EPB standards. This property is therefore inherited by the other EPB standards, where relevant.		

Table A.8 — Application types (See Clauses 6, 9 and 10.1)

EPB_APPLIC_TYPE		
Type	**Description**	**Comments**
EPB_APPLIC_REQ	To check compliance with energy performance requirements	
EPB_APPLIC_CERTIF_BLD	Energy performance certification (building phase)	
EPB_APPLIC_CERTIF_USE	Energy performance certification (as built phase)	
EPB_APPLIC_AUDIT	Energy audit (tailored)	
NOTE The type of application may have an effect on the choices in this overarching document nd in the other EPB standards. This property is therefore inherited by the other EPB standars, where relevant.		

Table A.9 — EPB assessment types (See Clauses 6 and 9)

EPB_ASSESS_TYPE (see Table 3)		
Type	**Description**	**Comments**
EPB_ASSESS_CALC_DESIGN	Calculated, design	
EPB_ASSESS_CALC_ASBUILT	Calculated, as built	
EPB_ASSESS_CALC_ACTUAL	Calculated, actual	
EPB_ASSESS_CALC_TAILORED	Calculated, tailore	
EPB_ASSESS_MEAS_ACTUAL	Measured, actual	
EPB_ASSESS_MEAS_ CORR_CLIM	Measured, corrected for climate	
EPB_ASSESS_MEAS_ CORR_USE	Measured, corrected for use	
EPB_ASSESS_MEAS_STAND	Measured, standard (corrected for climate and use)	
NOTE 1 The type may be different for different object types, building types, building or space categories. NOTE 2 The type of assessment may have an effect on the choices in this overarching document and in the other EPB standards. This property is therefore inherited by the other EPB standards, where relevant.		

Table A.10 — Combination services types (See Clauses 6 and 9)

EPB_LISTSERVICES_TYPE		
Type	**Description**	**Comments**
EPB_LISTSERVICES_RES	Services included for the EPB assessment of residential buildings	
EPB_LISTSERVICES_NRES	Services included for the EPB assessment of non-residential buildings	
NOTE 1 The combination may be different for different building or space categories NOTE 2 The type of services combination may have an effect on the choices in this overarching document and in the other EPB standars. This property is therefore inherited by the other EPB standards, where relevant.		

A.4 Method

Table A.11 — Electricity use types (See 7.3.3.4.)

Electric energy use type	Identifier
All uses	EL_USE_ANY

Table A.12 — Electricity generation types (See 7.3.3.6 and 9.6.6.2.4)

Electric energy generation type	Identifier
Photovoltaic, wind turbine and other onsite produced electricty	EL_PROD_ONSITE
Cogeneration	EL_PROD_CHP

Table A.13 — Gross calorific value of some common solid fuels (See 7.3.4 and 9.6.2)

Fuel	Gross calorific value kWh/kg
Anthracite	8,9 – 9,7
Bituminous coal	4,7–6,9
Charcoal	8,22
Coke	7,8 – 8,6
Lignite	4,2 8,3
Peat	3,6 5,6
Wood (dry)	3,9 – 4,7

Table A.14 — Gross calorific value of some common liquid fuels (See 7.3.4 and 9.6.2)

Fuel	Density kg/l	Gross calorific value kWh/kg
Oil		
Heating oil, light	0,84 – 0,85	12,44
Heating oil, heavy	0,96	13,94 – 11,75
Liquid gas		
80 propane:20 butane	0,52	13,83
70 propane:30 butane	0,53	13,83
60 propane:40 butane	0,53	13,81
50 propane:50 butane	0,55	13,78
Commercial propane	0,51	13,89
[a] Confidence interval for liquid gas is about ± 0,1 MJ/kg.		

Table A.15 — Gross calorific values of some gaseous energy carriers (see 7.3.4 and 9.6.2)

Fuel	Density kg/m³	Gross calorific value kWh/m³
Natural gas L	0,64	9,75 9,78
Natural gas H	0,61	11,41 ,47
Methane	0,55	11,06 – 11,08
Propane	1,56	28,03
Butane	2,09	37,19
Hydrogene	0,09	39
Biogas	1,20	4 to 8[a]
a Depending on its methane content.		

Table A.16 — Weighting factors (based on gross or net calorific value)
(See 7.3.5, 9.5.1, 9.6.2, 9.6.5 and 9.6.6.3)

	Energy carrier		f_{Pnren}	f_{Pren}	f_{Ptot}	K_{CO2e} (g/kW h)
	Delivered from distant					
1	Fossil fuels	Solid	1,082	0,002	1,084	472
2		Liquid	1,179	0,003	1,182	311
3		LPG	1,201	0,003	1,204	254
4		Natural Gas	1,190	0,005	1,195	252
5	Bio fuels		0,085	1,028	1,113	18
6	Electricity		1,954	0,414	2,368	331
7	Electricity (Canary Islands)		2,924	0,070	2,994	776
8	Electricity (Balearic Islands)		2,968	0,082	3,050	932
9	Electricity (Ceuta & Melilla)		2,718	0,072	2,790	721
	Delivered from nearby					
10	District Heating [a]		1,300	0,000	1,300	300
11	District Cooling		1,300	0,000	1,300	300
12	Solid Biomass		0,034	1,003	1,037	18
13	Solid densified biomass (pellets)		0,085	1,028	1,113	18
	Delivered from on-site					
14	Solar	PV electricity	0,000	1,000	1,000	0
15		Thermal	0,000	1,000	1,000	0
16	Wind		0,000	1,000	1,000	0
17	Environment	Geo-, aero-, hydrothermal	0,000	1,000	1,000	0
	Exported					
18	Electricity	To the grid	1,954	0,414	2,368	331
19		To non EPB uses	1,954	0,414	2,368	331
20	Electricity (Canary Islands)	To the grid	2,924	0,070	2,994	776
21		To non EPB uses	2,924	0,070	2,994	776
22	Electricity (Balearic Islands)	To the grid	2,968	0,082	3,050	932
23		To non EPB uses	2,968	0,082	3,050	932

24	Electricity (Ceuta & Melilla)	To the grid	2,718	0,072	2,790	721
25		To non EPB uses	2,718	0,072	2,790	721
a Default value based on a natural gas boiler. Specific values are calculated according to M3–8.5. b It is possible to differentiate between different sources of electricity like wind or solar.						
NOTE 1 Add a column in case of other requirements, e.g., CO 2 requirement. NOTE 2 Add rows for each relevant energy carrier.						

Table A.17 — k exp -factor (See 7.3.5 and 11.6.2.1)

Description	Value
k exp factor that is used to control which part of the exported energy is included in the energy performance of the building	0

Table A.18 — Building services considered in the energy performance calculation (See 8.2 and 8.5)

Combination of services type	Choice: included in the energy performance calculation < one column per service mix type, see Table B.10 >	
Building service [a]	**EPB_LISTSERVICES_RES**	**EPB_LISTSERVICES_NRES**
Heating	Yes	Yes
Cooling	Yes	Yes
Ventilation	Yes	Yes
Humidification	Yes	Yes
Dehumidification	Yes	Yes
Domestic hot water	Yes	Yes
Lighting	No	Yes
External lighting	No	No
People transport (e.g., elevators, escalators)	No	No
Other services consuming electricity (e.g., appliances)	No	No
Others	No	No
[a] Add rows or edit the lines in case of other/more differentiated services.		

Table A.19 — Principle assumed presence of systems (See 9.2)

Method		**Choice Yes/No** [a]
1	Principle “Assumed system”	YES
2	Principle “Presence of system”	NO
3	Other principle	NO
In case of method 3:		
	Reference to procedure	< reference >
[a] Only one choice possible; choice may be differentiated per service. NOTE Consistency with the conditions of use (module M1–6) is required.		

Table A.20 — Specification of the useful floor area (See 9.3)

Specification and/or reference to document with more information
The useful floor area is equal to the area of the floor with the following specific rules: Excluded: The floor area under a load bearing construction is excluded. The open floor area in vides (no floor) is excluded. The floor area with height under the ceiling of less than 1,5 m (except for incidental beams). Included: The floor area under a non-load bearing construction at the boundary of the considered space or spaces: measured to the centre. The floor area under a non-load bearing construction inside the considered space or spaces

Table A.21 — Type or types of metric for the building size (See 9.3 and 9.4

Quantity	**Unit**	**Specification and/or reference to document with more information**
Reference floor area	m^2	Useful floor area as in Table A.20, with fractions accordimg to Table A.22
NOTE Add rows for each metric.		

Table A.22 — Which space categories are contributing to the reference size (See 9.4)

Space categories	**Contributing?**	**If YES: (Optional) fraction of-size contributing to ref. size ($f_{ref;cat,}$). Default value = 1** [a]
Occupied spaces, inside thermal envelope[b]	YES	1,0
Unoccupied spaces, inside thermal envelope	NO	
Spaces outside the thermal envelope	NO	

[a] The choices in this table are choices that actually cannot be made without the holistic view on all EPB standards. The categorization of spaces is directly related to the assumed conditions of use for each space category and to the specific rules for combining spaces into zones. For instance, a fine subdivision into different space categories, with for each space category different conditions of use (such as temperature settings, ventilation rates, lighting levels, etc.) could easily lead to unwanted complexities in the assessment.

[b] Occupied spaces are those with a specific need of thermal, acoustic and hygienic conditioning due to the frecuency of use and density of occupation by people. These spaces include: living spaces in residential buildings, classrooms, libraries, offices, bathrooms, etc.

This category is further described in the CTE DB-HE, within its Annex A - Terminology, under the term "Recinto habitable".

Table A.23 — Perimeter specification (See 9.5.1 and 9.6.1)

Energy carrier		**Specification of nearby perimeter (see 3.4.24)**
Bio fuels	Solid	Not specified further
	Liquid	Connected to the same branch of the distribution network or having a dedicated connection, requiring specific equipment for the assessed object to be connected to it.
	Gaseous	Connected to the same branch of the distribution network or having a dedicated connection, requiring specific equipment for the assessed object to be connected to it.
Electricity		Connected to the same branch of the distribution network, meaning medium voltage or lower, according to Royal Decree 25/2018 Art. 9, paragraph 2: *Real Decreto-ley 15/2018, de 5 de octubre, de medidas urgentes para la transición energética y la protección de los consumidores.*
District Heating		Always nearby
District Cooling		Always nearby

Table A.24 — Perimeter choice (See 9.5.1 and 9.7)

Perimeter choice	Choice – RER calculation (renewable energy)	Choice – RER calculation (total energy)	Choice – EPB calculation (delivered energy)
On-site	Yes	Yes	Yes
Nearby	Yes	Yes	Yes
Distant	No	Yes	Yes

Table A.25 — Conversion factors for net to gross calorific values for energy carriers (See 9.6.2)

Energy carrier	**Conversion factor f GCV/NCV**
Oil	1,06
Gas	1,11
LPG	1,09
Coal	1,04
Lignite	1,08
Wood	1,08

Table A.26 — Overheads included in the primary energy and CO 2 emission factors (See 9.6.2 and 9.6.3)

		Primary energy factors	Emission coefficients
Included overheads	Energy to extract the primary energy carrier	Yes	Yes
	Energy to transport the primary energy carrier	Yes	Yes
	Energy used for any other operations necessary for the delivery to the building (e.g., storage)	Yes	Yes
	Energy to build, operate and dismantle the transformation units	No	No
	Energy to build, operate and dismantle the transportation system	No	No
	Energy to clean up or dispose the wastes	No	No
	Energy embedded in materials	No	No
Other greenhouse gases than CO 2 included a		n.a.	Yes
Applicable for ratings based on		net calorific value	net calorific value
[a] It is possible to list the other greenhouse gases			

Table A.27 — Basis for the energy performance of buildings (See 9.6.2)

Basis for the building energy performance	Choice	Application type (see Table A.8)
Total energy performance ($E_P = E_{Ptot}$) or Non-renewable energy performance ($E_P = E_{Pnren}$)	$E_P = E_{Pnren}$	EPB_APPLIC_REQ[a]
Greenhouse gas emission factors ($E_P = E_{CO2}$)	$E_P = E_{CO2}$	EPB_APPLIC_CERTIF_BLD[b] EPB_APPLIC_CERTIF_USE[b]
NOTE Add lines in case of more assessment purposes. [a] Total energy performance is also evaluated and restricted in the energy performance building regulations. [b] Besides this main indicator, non-renewable energy performance is also evaluated.		

Table A.28 — Priority for generation system, export (See 7.3.3.6 and 9.6.6.2.4)

Priority level to export	Priority identifier	Generation type
Priority level 1 (highest)	EL_EXP_PRIO_LEVEL_1	EL_PROD_ONSITE
Priority level 2 (highest)	EL_EXP_PRIO_LEVEL_2	EL_PROD_CHP

Table A.29 — Subdivision rules (See 10.5.1)

Type of zone or service area [a]	General rule	Specific rules (if any)
Thermal zone	Useful floor area weighted	See ISO 52016-1
Heating system service area	Useful floor area weighted	
Cooling system service area	Useful floor area weighted	
Ventilation service area	Useful floor area weighted	
DHW service area	Useful floor area weighted	
Lighting service area	Useful floor area weighted	
[a] Add lines in case of more service areas.		

Table A.30 — Energy flows taken into account in the building balance (See 11.6.2.1)

System or component	Counted as delivered energy? (Yes/No) [a]	Exported energy taken into account under step B of the energy performance assessment (11.6.2.1) [b]
Needs		
Passive renewable energy	No	Not applicable
On-site		
Technical building systems located “on-site” and producing energy from renewable sources	Yes	No
Solar energy captured by thermal solar panel	Yes	No
Free cooling as renewable energy	Yes	Not applicable
Free heating as renewable energy	Yes	Not applicable
Heat from environment captured by heat pumps	Yes	Yes
Electricity produced by solar or wind power	Yes	Yes

System or component	Counted as delivered energy? (Yes/No) [a]	Exported energy taken into account under step B of the energy performance assessment (11.6.2.1) [b]
Nearby	[c]	
District heating	Yes	No
District cooling	Yes	No
Heat produced by biomass	Yes	No
Distant	[d]	
Electricity production from renewable sources	Yes	No

[A] A “No” in the second column implies “not applicable” in the third column.
[b] Only relevant if k exp > 0, see Table A.19.
[c] If choice of perimeter is “nearby” (see Table A.9).
[d] If choice of perimeter is “distant” (see Table A.9)

Table A.31 — Electrical uses not satisfied by on-site electricity production (See 11.6.2)

On-site electricity production type	Not allowed uses	Comment
All	None	Any EPB use of electricity can be satisfied by any type of on-site electricity production

Table A.32 — Matching factor of produced and used electricity (See 11.6.2.4)

Calculation interval	Case	Matching factor function and parameters
Hourly, Monthly	All building categories	$f_{match} = 1$

2. 52003-1: Indicators, requirements, ratings and certificates
Annex A Input and method selection data sheet

A.1 General

The template in Annex A to this standard shall be used to specify the choices between methods, the required input data and references to other standards.

NOTE 1 Following this template is not enough to guarantee consistency of data.

A.2 References

The references, identified by the module code number, are given in Table A.1.

Reference	Reference document	
	Number	Title
M1–1	ISO 52000-1	
M1–6	ISO 17772-1	Energy performance of buildings – Indoor environmental quality –Part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings (in preparation)
M1-6	EN 16798–1	Energy performance of buildings – Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics –Module M1–6;
M1–14	ISO 15459-1	Energy performance of buildings — Economic evaluation procedure for energy systems in buildings — Part 1: Calculation procedures,
M2-4	ISO 52018-1	Energy performance of buildings – Indicators for partial EPB requirements related to thermal energy balance and fabric features – Part 1:Overview of options
M3–4	EN 15316–1	Energy performance of buildings — Energy performance of buildings — Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads - Part 1: Calculation procedures (ISO 52016-1:2017)
M4–7	EN 16798 – 15	Energy performance of buildings — Part 15: Module M4–7 – Calculation of cooling systems – Storage – General

Reference	Reference document	
	Number	Title
M5–1	EN 16798–3	Energy performance of buildings – Part 3: Ventilation for non-residential buildings – Performance requirements for ventilation and room-conditioning systems
M5–4	EN 16798–3	Energy performance of buildings – Part 9: Ventilation for buildings – Module M4–1 – Calculation methods for energy requirements of cooling systems – General
M10-4	EN 15193-1	Energy performance of buildings – Part 1: Contribution of Building Automation, Controls and Building Management. Módules M10-4,5,6,7,8,9,10
M10-12	EN 16947-1	Energy Performance of Buildings – Building Management system. Part 1: Module 10-12

A.3 Energy performance requirements

Table A.2 should be seen in conjunction with all the partial EPB requirements (which are beyond the scope of this document, e.g. concerning technical systems). Partial EPB requirements related to the fabric are discussed in ISO 52018, which also provides reporting templates for the corresponding EPB features.

Table A.2 – Default choices with respect to the overall EPB requirements

Application		
Overall energy performance feature	**Requirement**	**Exceptions**
Total primary energy use	X	(1)
Non-renewable primary energy use	X	(1)
Renewable primary energy use	X (2)	(1)
Renewable energy ratio		
Greenhouse gas emissions		
Energy policy factors		
(1) The application of this performance indicator is regulated by Documento Básico de Ahorro de Energía (CTE DB-HE). The exceptions are those set by the EPBD Directive. (2) The application of this performance indicator is regulated by Documento Básico de Ahorro de Energía (CTE DB-HE4 and 5). The exceptions are those set by the EPBD Directive. The first and second requirements on the total and non-renewable primary energy use ensures that in a first instance energy saving techniques are applied to a sufficient extent, as well as expands the demands of renewable energy use. Both requirements ensures that renewable energy is applied toa an extent that is warranted.		

<table>
<tr><th colspan="3">Application</th></tr>
<tr><th>Overall energy performance feature</th><th>Requirement</th><th>Exceptions</th></tr>
<tr><td>Total primary energy use</td><td>
<table>
<tr><th rowspan="2">Winter climate zone</th><th colspan="2">Private residential use</th><th>Other use than private residential</th></tr>
<tr><th>New buildings and extensions</th><th>Changes of use to private residential and reforms</th><th></th></tr>
<tr><td>α</td><td>40</td><td>55</td><td>165 + 9 · CFI</td></tr>
<tr><td>A</td><td>50</td><td>75</td><td>155 + 9 · CFI</td></tr>
<tr><td>B</td><td>56</td><td>80</td><td>150 + 9 · CFI</td></tr>
<tr><td>C</td><td>64</td><td>90</td><td>140 + 9 · CFI</td></tr>
<tr><td>D</td><td>76</td><td>105</td><td>130 + 9 · CFI</td></tr>
<tr><td>E</td><td>86</td><td>115</td><td>120 + 9 · CFI</td></tr>
</table>
</td><td>In extrapeninsular territory (Illes Balears, Canarias, Ceuta and Melilla) the table values will be multiplied by 1.25</td></tr>
<tr><td>Non-renewable primary energy use</td><td>
<table>
<tr><th rowspan="2">Winter climate zone</th><th colspan="2">Private residential use</th><th>Other use than private residential</th></tr>
<tr><th>New buildings and extensions</th><th>Changes of use to private residential and reforms</th><th></th></tr>
<tr><td>α</td><td>20</td><td>40</td><td>70 + 8 · CFI</td></tr>
<tr><td>A</td><td>25</td><td>50</td><td>55 + 8 · CFI</td></tr>
<tr><td>B</td><td>28</td><td>55</td><td>50 + 8 · CFI</td></tr>
<tr><td>C</td><td>32</td><td>65</td><td>35 + 8 · CFI</td></tr>
<tr><td>D</td><td>38</td><td>70</td><td>20 + 8 · CFI</td></tr>
<tr><td>E</td><td>43</td><td>80</td><td>10 + 8 · CFI</td></tr>
</table>
</td><td>In extrapeninsular territory (Illes Balears, Canarias, Ceuta and Melilla) the table values will be multiplied by 1.25</td></tr>
<tr><td>Renewable primary energy use</td><td>DHW; 70% renewable coverage
PV; Pmin = 0.01S (s = constructed area)</td><td>DHW; 60% if demand less than 5000 l / d
PV; only buildings of more than 3,000 m2 of constructed area</td></tr>
<tr><td>Renewable energy ratio</td><td></td><td></td></tr>
<tr><td>Greenhouse gas emissions</td><td></td><td></td></tr>
<tr><td>Energy policy factors</td><td></td><td></td></tr>
</table>

Table A.3 - Numeric indicator used for the requirement on the total primary energy use

Application	Choice
Total primary energy use per useful floor area [kWh/m2]	X (1)
Total primary energy use Eptot [kWh]	
Ratio	
(1) The application of this performance indicator is regulated by Documento Básico de Ahorro de Energía (CTE DB-HE)	

Table A.4 - Numeric indicator used for the requirement on non-renewable primary energy use

Application	Choice
Total primary energy use per useful floor area [kWh/m2]	X (1)
Total primary energy use Eptot [kWh]	
Ratio	
(1) The application of this performance indicator is regulated by Documento Básico de Ahorro de Energía (CTE DB-HE)	

Table A.5 - Numeric indicator used for the requirement on renewable primary energy use

Application	Choice
Renewable primary energy use per useful floor area [kWh/m2]	
Renewable primary energy use Epren [kWh]	
Ratio	
DHW demand coverage (%)	X (1)
Photovoltaic minimum installed power (kW)	X (2)
(1) The application of this performance indicator is regulated by Documento Básico de Ahorro de Energía (CTE DB-HE4) (2) The application of this performance indicator is regulated by Documento Básico de Ahorro de Energía (CTE DB-HE5)	

A.4 Rating

Table A.6 - Energy rating methods

This rating is only used for EPC in accordance with RD 235/2013 of energy certification of buildings in Spain.

Method	**Choice**
1)Default energy rating method with two reference points	YES
2)Default energy rating method with a single reference point	
3)Other energy rating method	
In case of method 1:	**Parameters**
Subclasses to expand the classes	NO
Numbering of the classes 1 to 7	A to G
RESIDENTIAL	

A	$C_1 < 0.15$
B	$0.15 \leq C_1 < 0.5$
C	$0.5 \leq C_1 < 1.0$
D	$1.0 \leq C_1 < 1.75$
E	$C_2 < 1.0$
F	$1.0 \leq C_2 < 1.5$
G	$1.5 \leq C_2$

C1 = (R · Io/Ir) − 1 2(R − 1) + 0, 6
C2 = ((R' · Io/Is) − 1) / (2(R' − 1)) + 0,5

Io: It is the value of the indicator analyzed (annual CO2e emissions, annual primary energy consumption no renewable, heating demand, etc.) of the object building

Ir: It is the average value of the indicator of the reference park of new buildings for private residential use.

R: It is the ratio between the value of Ir and the value of the indicator corresponding to the 10% percentile of the park of reference of new buildings for private residential use.

Is: It is the average value of the indicator of the reference park of existing private residential buildings.

R': It is the ratio between the value of Is and the value of the indicator corresponding to the 10% percentile of the park of Reference of existing buildings for private residential use.

NON RESIDENTIAL	

A	C < 0, 40
B	0, 40 ≤ C < 0, 65
C	0, 65 ≤ C < 1, 00
D	1, 00 ≤ C < 1, 30
E	1, 30 ≤ C < 1, 60
F	1, 60 ≤ C < 2, 00
G	2, 00 ≤ C

C=Io/Ir

Io: It is the value of the indicator analyzed (annual CO2e emissions, annual primary energy consumption no renewable, heating demand, etc.) of the object building

Ir: It is the average value of the indicator of the reference park of new buildings.

A.5 Label model

Table A.7 - Graphical representation of the rating

Method	**Choice**
1)Default model for de graphical representtion of the rating	NO
1)Other model for de graphical representtion of the rating	YE
In case of method 2:	
Parameters	
Total primary energy use per useful floor area [kWh/m2]	X
Non-renewable primary energy use per useful floor area [kWh/m2]	X


ESCALA DE LA CALIFICACIÓN ENERGÉTICA
A más eficiente
B
C
D
E
F
G menos eficiente
95
32

3. ISO 52010-1 External climatic conditions

Annex A Input data sheet with default values and choices

A.1 General

The template in Annex A to this standard shall be used to specify the choices between methods, the required input data and references to other standards.

NOTE 1 Following this template is not enough to guarantee consistency of data.

A.2 References

The references, identified by the EPB module code number, are given in Table B.1.

Table A.1 —References

Reference	**Reference document**	
	Number	**Title**
Mx-y[a]	...	...
	...	...
In this document there are no choices in references to other EPB standards. The Table is kept to maintain uniformity between all EPB standards.		

A.3 Climatic input data

Table A.2a —Weather station and climatic data set (See 6.3.2)

Name	**Value**					
Identifier for climatic data set	Peninsular climates (A3, A4, B3, B4, C1, C2, C3, C4, D1, D2, E1)					
Station and/or name of data set	Climatic zone A4 for peninsular locations + Balearic Islands + Ceuta + Melilla Files (depending on climate zone): A3_peninsula.met, A4_peninsula.met, B3_peninsula.met, B4_peninsula.met, C1_peninsula.met, C2_peninsula.met, C3_peninsula.met, C4_peninsula.met, D1_peninsula.met, D2_peninsula.met, E1_peninsula.met					
	Symbol	**Unit**	**Value [a]**	**Validity interval**	**Origin**	**Varying [b]**
Latitude	φw	°	40.68	-90 to +90	synthetic	No

Name	Value					
Longitude [c]	λw		-4.13	-180 to +180	synthetic	No
Time zone	*TZ*	h	+1	-12 to +12	synthetic	No
Firts day of time series (day of the year)	^{n}day;start	-	1	1 to 366	synthetic	No
Last day of time series (day of the year)	^{n}day;end	-	365	1 to 366	1 to 366	No
Day of the week for January 1		-	Monday (day 1)	Monday to Sunday (day 1 to 7)	synthetic	No
Daylight saving time?						
Leap day included	No					
Specific other information	Time at this station: Winter: MST = UTC + 1 Summer: MDT = UTC +2 All data in the reference climate files (.MET format) is specified in solar time					

Name	Value
Reference to	Documentos de Apoyo del Código Técnico de la Edificación (CTE). Documento descriptivo de climas de referencia. https://www.codigotecnico.org/images/stories/pdf/ahorroEnergia/20170202-DOC-DB-HE-0-Climas%20de%20referencia.pdf Data files: https://www.codigotecnico.org/images/stories/pdf/ahorroEnergia/CTEdatosMET_20140418.zip Additional information on the intended application range: Documento reconocido para la certificación energética de edificios. Condiciones técnicas de los procedimientos para la evaluación de la eficiencia energética de los edificios. https://energia.gob.es/desarrollo/EficienciaEnergetica/CertificacionEnergetica/DocumentosReconocidos/normativamodelosutilizacion/20151119-Condiciones-tecnicas-procedimientos-para-valuacion-eficiencia-energetica.pdf

Table A.2b —Weather station and climatic data set (See 6.3.2)

Name	Value					
Identifier for climatic data set	Canary Islands climates (A1, A2, A3, A4, B3, B4, C1, C2, C3, C4, D1, D2, E1)					
Station and/or name of data set	Climatic zone A4 for peninsular locations + Balearic Islands + Ceuta + Melilla Files (depending on climate zone): alpha1_ canarias.met, alpha2_ canarias.met, alpha3_ canarias.met, alpha4_ canarias.met, A1_canarias.met, A2_canarias.met, A3_canarias .met, A4_canarias .met, B1_ canarias.met, B2_ canarias.met, B3_canarias .met, B4_canarias .met, C1_canarias .met, C2_canarias .met, C3_canarias .met, C4_canarias .met, D1_canarias .met, D2_canarias .met, D3_ canarias.met, E1_canarias .met					
	Symbol	**Unit**	**Value** [a]	**Validity interval**	**Origin**	**Varying** [b]
Latitude	φw	°	28.33	-90 to +90	synthetic	No
Longitude [c]	λw		-16.37	-180 to +180	synthetic	No
Time zone	*TZ*	h	+0	-12 to +12	synthetic	No
Firts day of time series (day of the year)	^{n}day;start	-	1	1 to 366	synthetic	No
Last day of time series (day of the year)	^{n}day;end	-	365	1 to 366	1 to 366	No
Day of the week for January 1		-	Monday (day 1)	Monday to Sunday (day 1 to 7)	synthetic	No
Daylight saving time?						
Leap day included	No					
Specific other information	Time at this station: Winter: MST = UTC +0 Summer: MDT = UTC +1 All data in the reference climate files (.MET format) is specified in solar time					
Name	**Value**					
Reference to	Documentos de Apoyo del Código Técnico de la Edificación (CTE). Documento descriptivo de climas de referencia. https://www.codigotecnico.org/images/stories/pdf/ahorroEnergia/20170202-DOC-DB-HE-0-Climas%20de%20referencia.pdf Data files: https://www.codigotecnico.org/images/stories/pdf/ahorroEnergia/CTEdatosMET_20140418.zip Additional information on the intended application range: Documento					

Name	Value
	reconocido para la certificación energética de edificios. Condiciones técnicas de los procedimientos para la evaluación de la eficiencia energética de los edificios. https://energia.gob.es/desarrollo/EficienciaEnergetica/CertificacionEnergetica/DocumentosReconocidos/normativamodelosutilizacion/20151119-Condiciones-tecnicas-procedimientos-para-valuacion-eficiencia-energetica.pdf

A.4 Calculation method

Table A.3 — Method to asses direct (beam) irradiance if not available from weather station (See 6.4.2)

Method		Choice Yes/No
1	Default method	YES
2	Other method	NO
In case of method 2:		
	Reference to procedure:	Not applicable

Table A.4 —Solar reflectivity of the ground (ρsol;grnd) (See 6.4.3)

Name	Value
Fixed value	YES
Dependent on ground condition, listed in climatic data file	NO
Dependent on local ground condition (near the inclined surface)	NO
Values available in climatic data file	NO

If fixed value:

Table A.5 — Solar reflectivity of the ground; if fixed value

Name	Value
Solar reflectivity of the ground, $\rho_{sol;grnd}$ [-]	0,2

If dependent on ground condition:
Not applicable and therfore **no Table A.6** given

Table A.7 — Choice between options and methods for calculation and shading by external objects (See 6.4.5.1)

Application [b]	**All applications**
Description	**Choice**
Effect of shading calculated in this document	No
In Yes:	**Choice**
Only method 1, Simplified method (shading of direct radiation)	No
Only method 2, Detailed method (shading of direct and diffuse radiation)	No
Both methods are allowed	Yes

Table A.8 — Number of skyline segments, nsh;segm for input solar shading objects

(See 6.4.5.2)

Application [b]	**All applications**	**….**
Description	**Value of $n_{sh;segm}$** [a]	**Value of $n_{sh;segm}$** [a]
Maximum number of segments over 360 degrees	15	
Fixed with (=360/ $n_{sh;segm}$)[c]	No	

[a] Practical range, informative

[b] Add more columns if needed to differentiate between applications (e.g. building categories, new or existing buildings, etc)

[c] If not fixed, the with of each element can be adapted to the with of the shading object, with limitation of maximun number of segments $n_{sh;segm}$

Table A.9 — Choice between methods for calculation of illuminance (See 6.4.6)

Application [a]	**All applications**	**….**
Description	**Choice**	**Choice**
Method 1, Default method, or method 2, Alternative method	Method 1	
If choice is method 2:	**Description**	**Description**
Describe Method 2	Nor applicable	

[a] Add more columns if needed to differentiate between applicatoons (e.g. building categories, new or existing buildings, etc)

4. ISO 52016-1: Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads
Annex A Input and method selection data sheet

A.1 General

The template in Annex A to this standard shall be used to specify the choices between methods, the required input data and references to other standards.

NOTE 1 Following this template is not enough to guarantee consistency of data.

A.2 References

The references, identified by the EPB module code number, are given in Table A.1.

Table A.1 —References

Reference	Reference document	
	Number	**Title**
M1-4	ISO 52003-1	Energy performance of buildings – Indicators, requirements, ratings and certificates – Part 1: General aspects and application to the overall energy performance
	ISO 17772-1	Energy performance of buildings - Indoor environmental Quality - part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings
M1-6	EN 16798-1	Energy performance of buildings – Ventilation for buildings – Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics (Module M1-6)
M1-8	ISO 52000-1	Energy performance of buildings – Overarching EPB assessment – Part 1: General framework and procedures
M1-13	ISO 52010-1	Energy performance of buildings - External climatic conditions - Part 1: Conversion of climatic data for energy calculations
M2-4	ISO 52018-1	Energy performance of buildings — Indicators for partial EPB requirements related to thermal energy balance and fabric features — Part 1: Overview of options
M2-5.1	ISO 13789	Thermal performance of buildings - Transmission and ventilation heat transfer coefficients - Calculation method

Reference	Reference document	
	Number	Title
M2-5.2	ISO 13370	Thermal performance of buildings – Heat transfer via the ground – Calculation methods
M2-5.3	ISO 6946	Building components and building elements – Thermal resistance and thermal transmittance – Calculation method
M2-5.4	ISO 10211	Thermal bridges in building construction – Heat flows and surface temperatures – Detailed calculations
M2-5.5	ISO 14683	Thermal bridges in building construction – Linear thermal transmittance – Simplified methods and default values
M2-5.6	ISO 10077-1	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: General
M2-5.7	ISO 10077-2	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames
M2-8	ISO 9050	Glass in building – Determination of light transmittance, solar direct transmittance, total solar energy transmittance, ultraviolet transmittance and related Thermal glazing performance factors [for windows, non-scattered doors and glazings]
	ISO 15099	Thermal performance of windows, doors and shading devices – Detailed calculations [for windows with scattering glazing and/or solar shading devices]
	ISO 52022-3	Energy performance of buildings – Thermal, solar and daylight properties of building components and elements – Part 3: Detailed calculation method of the solar and daylight characteristics for solar protection devices combined with glazing [for normal incidence angle] (or see Subjects 4, 5 and 6 in Table C.1)
M3-1	EN 15316-1	Energy performance of buildings – Method for calculation of system energy requirements and system efficiencies – Part 1: General and Energy performance expression, Module M3–1, M3–4, M3–9, M8–1, M8–4
M3-4b	EN 15316-1	See M3-1
M3-5	EN 15316-2	Energy performance of buildings – Method for calculation of system energy requirements and system efficiencies – Part 2: Space emission systems (heating and cooling), Module M3–5, M4–5
M4-1	EN 16798-9	Energy performance of buildings — Ventilation for buildings — Part 9: Calculation methods for energy requirements of cooling systems (Modules M4-1,M4-4, M4-9) — General

Reference	Reference document	
	Number	Title
M4-4[b]	EN 16798-9	See M4-1
M4-5	EN 15316-2	See M3-5
M5-1	EN 16798-3	Energy performance of buildings — Ventilation for buildings — Part 3:For non-residential buildings – Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)
M5-5	EN 16798-7	Energy performance of buildings — Ventilation for buildings — Part 7: Calculation methods for the determination of air flow rates in buildings including infiltration (Module M5-5)
M5-6	EN 16798-5-1	Energy performance of buildings — Ventilation for buildings – Part 5-1: Calculation methods for energy requirements of ventilation and air conditioning systems (Modules M5-6, M5-8, M6-5, M6-8, M7-5, M7-8) -– Method 1: Distribution and generation
	EN 16798-5-2	Energy performance of buildings — Ventilation for buildings — Part 5-2: Calculation methods for energy requirements of ventilation systems (Modules M5-6, M5-8, M6-5, M6-8, M7-5, M7-8) — Method 2: Distribution and generation
M6-1	EN 16798-3	See M5-1
M6-4[b]	EN 16798-3	See M5-1
M6-5	EN 16798-5-1 EN 16798-5-2	See M5-6
M7-1	EN 16798-3	See M5-1
M7-4[b]	EN 16798-3	See M5-1
M7-5	EN 16798-5-1 EN 16798-5-2	See M5-6
M9-1	EN 15193-1	Energy performance of buildings - Energy requirements for lighting - Part 1: pecifications, Module M9
M10-1	EN 15232-1	Energy performance of buildings – Part 1: Impact of Building Automation, Controls and Building Management - Modules M10-4,5,6,7,8,9,10
a If a reference comprises more than one document, the references can be differentiated. b Informative.		

A.3 Selection of main method

Table A.2 —Choice between hourly or monthly calculation method (see 5.2)

Type of object and/or application	**All applications**	[b]
Description	Choice [a]	
Only hourly method allowed	Yes	
Only monthly method allowed	No	
Both methods are allowed	No	

a Only one Yes per column possible.

b Add more columns if needed to differentiate between type of object, type of building or space, type of application or type of assessment. Use the list of identifiers from ISO 52000-1:2017, Tables A.2 to A.7 (normative template, with informative default choices in Tables B.2 to B.7).

A.4 Zoning

Table A.3 — Thermal zoning rules (see 6.4.2.12)

	Application: ….. [a]	
Description [b]	**Apply the described method?**	**If "No": Alternative method** If the described method is not used, describe details of the alternative method or give reference to source document
Zoning step 1. Assessment of thermal envelope	Yes	Not applicable
Zoning step 2. Grouping according to space category	Yes	Not applicable
Zoning step 3. Grouping in case of large openings	Yes	Not applicable
Zoning step 4. Split to have same combination of services	Yes	Not applicable
Zoning step 5. Further grouping according to similar thermal conditions of use	Yes	Not applicable
Zoning step 6. Split according to specific system or subsystem properties	Yes	Not applicable
Zoning step 7. (Further) split to have sufficient homogeneity in thermal balance	Yes	Not applicable

	Application: ….. [a]	
Description [b]	**Apply the described method?**	**If "No": Alternative method** If the described method is not used, describe details of the alternative method or give reference to source document
Zoning step 8. (Further) grouping of thermally unconditioned zones	Yes	Not applicable
Zoning step 9. Simplification in case of small thermal zones	Yes	Not applicable
Zoning step 10. Simplification in case of very small thermal zones	Yes	Not applicable
a Add more columns to differentiate per application, if needed. b Additional rows may be added for alternative steps.		

Table A.4 — Options of thermally unconditioned zone types and default values (see 6.4.5)

Situation	**Default value of $b_{ztu;m}$ in case of a thermally unconditioned zone, type: external** [a]
	No default values provided
Internal thermally unconditioned zone type allowed?	
Choice	Yes
If Yes: (optionally) specify default values for the adjustment factor (free text)	
Situation	**Default value of $b_{ztu;m}$ in case of a thermally unconditioned zone, type: internal** [a]
	No default values provided
a Add more rows if needed.	

Table A.5 — Default contribution of ventilation in external construction of a thermally unconditioned zone (see 6.4.5.4)

Application	All applications [a]	
Description	**Choice**	
Default allowed?	Yes	
If Yes:		
Coefficient for default contribution of ventilation, $c_{ztu;ve}$	0,5	
a Add more rows if needed.		

Table A.6 — Choice of spatial temperature averaging in residential buildings (see 6.4.6)

Description		**Choice** [a]
Application of the given formula for spatial temperature averaging		Yes
If No:		
No application of the given formula for spatial temperature averaging	It is assumed that the same temperature set-point for heating applies also to partly or moderately thermally conditioned residential spaces.	Not applicable
	Calculate the fully and partly or moderately thermally conditioned residential spaces as separate, thermally uncoupled thermal zones.	Not applicable
	Calculate the fully and partly or moderately thermally conditioned residential spaces as separate, thermally coupled thermal zones.	Not applicable
a Only one Yes possible.		
In case of application of the formula		**Value**
$f_{mod;t}$		0,8
$f_{mod;sp}$		0,5
$H_{int;spec}$ (W/K)		2,0

Table A.7 — Choice between calculations with thermally coupled or uncoupled thermal zones (see 6.4.7)

Application	All applications [a]	
Description	Choice [a]	[b]
Thermally uncoupled calculations	No	
Thermally coupled calculations	No	
Both methods are allowed	Yes	

[a] Only one Yes per column possible.
[b] Add more columns if needed to differentiate between applications (e.g. building categories, new or existing buildings, etc.). Note the link with the choice in Table A.9.

Table A.8 — Default thermal coupling properties in case of thermally coupled zones (see 6.4.7)

		Choice	
Heat transfer part	**Quantity**	**Default value**	**Unit**
Transmission heat transfer between zones z and y	H tr,zy		W/K
ventilation heat transfer from zone z to zone y	H ve,z→y		W/K
ventilation heat transfer from zone y to zone z	H ve,y→z		W/K

a Add more rows if needed.

A.5 Hourly calculation procedures

Table A.9 — Factor for consideration of internal heat gains in design heat load calculation (see 6.5.4.5.2)

Application	All applications	**…..** [a]
Description	**Choice**	**Choice**
Value for factor $f_{H;ig}$	0,5	Not applicable

a Add more rows if needed.

Table A.10 — Alternative choices in modelling (see 6.5.5.2, 6.5.6.3.1 and 6.5.7.1)

Description	Choice	If choice is No, describe or give reference to the applied alternative method
Use the method in 6.5.5.2 to calculate the actual temperatures and loads	Yes	Not applicable
Use method in 6.5.6.3.1 for the calculation of the thermal (longwave) radiation exchange	Yes	Not applicable
Use method in 6.5.7.1 for the conversion of physical properties of building elements into properties per layer (node)	Yes	Not applicable
NOTE In case of one or more “No”, the procedures are validated using the validation cases in 7.2, as described in that subclause.		

Table A.11 — Convective fractions (see 6.5.6.2)

$f_{int;c}$ [a]	$f_{sol;c}$	$f_{H;c}$	$f_{C;c}$
0,40 for all source types	0,10	0,40	0,40
a Can be differentiated per source type.			

Table A.12 — Specification of internal partitions (see 6.5.6.3.1)

	Choice
Internal partitions need to be specified?	Yes
If by default: specify the default thermal characteristics	
Default characteristics	**Specification** [a]
Not applicable	Not applicable
a Add more rows if needed.	

Table A.13 — Distribution of mass of opaque and ground floor elements (see 6.5.7.2 and 6.5.7.3)

Class	**Specification of the class**
Class I (mass concentrated at internal side)	Construction with external thermal insulation (main mass component near inside surface) , or equivalent
Class E (mass concentrated at external side)	Construction with internal thermal insulation (main mass component near outside surface) , or equivalent
Class IE (mass divided over internal and external side)	Construction with thermal insulation in between two main mass components, or equivalent
Class D (mass equally distributed)	Uninsulated construction (e.g. solid or hollow bricks, heavy or lightweight concrete, or lightweight construction with negligible mass (e.g. steel sandwich panel), or equivalent

Table A.14 — Specific heat capacity of opaque and ground floor elements (see 6.5.7.2 and 6.5.7.3)

Class	$\kappa_{m;op}$	Specification of the class
Very light	50 000	Construction containing no mass components, other than e.g. plastic board and/or wood siding, or equivalent
Light	75 000	Construction containing no mass components other than 5 to 10 cm lightweight brick or concrete, or equivalent
Medium	110 000	Construction containing no mass components other than 10 to 20 cm lightweight brick or concrete, or less than 7 cm solid brick or heavy weight concrete, or equivalent
Heavy	175 000	Construction containing 7 to 12 cm solid brick or heavy weight concrete, or equivalent
Very heavy	250 000	Construction containing more than 12 cm solid brick or heavy weight concrete, or equivalent

Table A.15 — Solar absorption coefficient of external opaque surfaces (see 6.5.7.2)

Differentiation in solar absorption coefficient?	**Choice**
	Yes
If Yes: specify the procedure to classify the three categories (free text)	
Category	**Specification**
Category 1 αsol **= 0,3** **(light colour)**	Not applicable
Category 2 αsol **= 0,6** **(intermediate colour)**	Not applicable
Category 3 αsol **= 0,9** **(darck colour)**	Not applicable
	Choice
If No: choose the default category	2

Table A.16 — Coefficient to limit assumed temperature in adjacent thermally unconditioned zone (see 6.5.9)

Application	All applications	..... [a]
	$C_{ztu,h;max}$	$C_{ztu,h;max}$
Value	1,0	Not applicable
a Add more columns if needed to differentiate between applications (e.g. building categories, new or existing buildings, etc.).		

Table A.17 — Specific heat capacity of air and furniture (see 6.5.11)

$K_{m;int}$ **J/(m²·K)**
Residential use: 54 000
Non-residential use: 36.000

Table A.18 — View factor to the sky (see 6.5.13.3)

	Unshaded tilted surface	**Unshaded horizontal roof**	**Unshaded vertical wall**
F_{sky}	$(1+\cos \beta_{ic})/2$	1,0	0,5

Table A.19 — Difference between external air temperature and sky temperature (see 6.5.13.3)

Climatic region [a]	**Sub-polar areas**	**Tropics**	**Intermediate zones**
$\Delta\theta_{sky;t}$ (K)	9 (fixed value)	13 (fixed value)	11 (fixed value)
a Add more columns if needed to differentiate between climatic regions.			

Table A.20 — Choice of method for moisture absorption and desorption in materials (see 6.5.14.1)

Application	All applications	**…..** [a]
Description	**Choice**	**Choice**
Moisture absorption and desorption calculated?	No	Not applicable
If No:	$G_{abs;zt;t} = 0$	$G_{abs;zt;t} = 0$
If Yes:	Not applicable	Not applicable
a Add more columns if needed.		

Table A.21 — Choice of glazing area or frame area fraction (see E.2.1)

Description	**Choice** [a]
For each window: free choice between glazing area or fixed frame fraction	No
For all windows the same choice: either glazing area or fixed frame fraction	Yes
For all windows: only glazing area allowed	No
For all windows: only fixed frame fraction	No
a Only one Yes per column possible.	
In case of frame fraction:	F_{fr}
Frame fraction fixed value	0,20

Table A.22 — Factors related to the solar energy transmittance (see E.2.2.1)

Correction and weighting factor for g-value non-scattering and scattering transparent glazings and blinds:		
F_w	a_g	altg °
0,90	0,75	45

Default values of the total solar energy transmittance at normal incidence, gn, for typical types of glazing [a]	
Type	**g_n**
Single glazing	0,85
Double glazing	0,75
Double glazing with selective low-emissivity coating	0,67
Triple glazing with two selective low-emissivity coatings	0,5
Double window	0,75

a Assuming a clean surface and normal, untainted and non-scattering glazing.

Default values of the reduction factor, for typical types of blinds [a]					
Blind type	**Type of glazing**	**Optical properties of blind**		**Reduction factor with**	
		reflexion for light colours	**transmission**	**blind inside**	**blind outside**
Shutters	Single glazing	0,5	0	0,43	0,11
	Double glazing			0,43	0,08
	Double glazing with selective low-emissivity coating			0,42	0,05
	Triple glazing with two selective low-emissivity coatings			0,34	0,05
Awnings (textiles)	Single glazing	0,4	0,2	0,51	0,27
	Double glazing			0,50	0,23
	Double glazing with selective low-emissivity coating			0,48	0,20
	Triple glazing with two selective low-emissivity coatings			0,36	0,15

Default values of the reduction factor, for typical types of blinds [a]					
Blind type	Type of glazing	Optical properties of blind		Reduction factor with	
		reflexion for light colours	transmission	blind inside	blind outside
Light curtains	Single glazing	0,3	0,4	0,59	0,43
	Double glazing			0,56	0,38
	Double glazing with selective low-emissivity coating			0,53	0,34
	Triple glazing with two selective low-emissivity coatings			0,38	0,25
a Add more rows or columns if needed.					

Table A.23 — Rules for operation of shutters (see G.2.2.1.2)

Application	All applications [a]	**…..** [a]
Control level	**Rules**	**Rules**
0 Manual operation	Closed: after sunset, if occupied Open: after sunrise, if occupied, but not during sleeping hours	Not applicable
1 Motorized operation with manual control	Same	Not applicable
2 Motorized operation with automatic control	Closed: after sunset Open: after sunrise	Not applicable
3 Combined light/blind/HVAC control	Same [b]	Not applicable

a Add more columns if needed.
b Conservative rule; a level 3 combined control is not covered in this table.

Table A.24 — Rules for operation of solar shading devices (see G.2.2.1.2)

Application	All applications [a]	**…..** [a]
Control level	**Rules**	**Rules**
0 Manual operation	Closed: if solar irradiance > 300 W/m² Open: if solar irradiance < 300 W/m²	Not applicable
1 Motorized operation with manual control	Same	Not applicable
2 Motorized operation with automatic control	Closed: if solar irradiance > 200 W/m² Open: if solar irradiance < 200 W/m²	Not applicable
3 Combined light/blind/HVAC control	Same [b]	Not applicable

a Add more columns if needed.
b Conservative rule; a level 3 combined control is not covered in this table.

Table A.25 — Choices between options and methods for calculation of shading by external objects (see F.1)

Application [b]	**All applications**			**Not applicable**		
Description	**Choice**			**Choice**		
Calculation of the effect of shading by distant objects included in this document?	Yes			n.a.		
When calculating solar shading on building elements: which types of distant shading objects (not on site) may or shall be taken into account or ignored NOTE For instance landscape (such as hills or dikes), vegetation (such as trees), other constructions (such as buildings)	Shall be taken into account:	May be taken into account:	Shall be ignored:	Shall be taken into account:	May be taken into account:	Shall be ignored:
	Other constructions (such as buildings)	Vegetation (such as trees) Landscape (such as hills or dikes), other	-	n.a.	n.a.	n.a.
When calculating solar shading on opaque building elements such as roofs or facades: which types of on site shading objects can or shall be ignored NOTE For instance rebates, overhangs or other shading objects from the own building(s) on site	Shall be taken into account:	May be taken into account:	Shall be ignored:	Shall be taken into account:	May be taken into account:	Shall be ignored:
	-	Other constructions (such as buildings) Rebates overhangs or other shading objects from the own building(s) on site	-	n.a.	n.a.	n.a.
When calculating solar shading on transparent elements: NOTE For instance window rebates, overhangs and side fins	Shall be taken into account:	May be taken into account:	Shall be ignored:	Shall be taken into account:	May be taken into account:	Shall be ignored:
	Window rebates, overhangs and side fins if depth	Other window rebates, overhangs and side fins	-	n.a.	n.a.	n.a.

	larger than 20% of window height resp. width					
Specific subdivision rules for the calculation of solar shading on building elements	None			n.a.		
Choice between the two methods for the solar shading calculation:	Choice [a]			Choice [a]		
Method 1, Shading of direct radiation	Yes			n.a.		
Method 2, Shading of direct and diffuse radiation	No			n.a.		
In case of method 2: give reference to calculation procedure	n.a.			n.a.		
a Only one Yes per column is possible. b Add more columns if needed to differentiate between applications (e.g. building categories, new or existing buildings, etc.).						

Table A.26 — Number of skyline segments, nsh;segm for input solar shading objects (see F.3.3.2)

Application [b]	**All applications**	**…..**
Description	Value of $n_{sh;segm}$ [a]	Value of $n_{sh;segm}$ [a]
Maximum number of segments over 360 degrees	15	
Fixed width (= 360 / $n_{sh;segm}$) [c]	No	
a Practical range, informative b Add more columns if needed to differentiate between applications (e.g. building categories, new or existing buildings, etc.). c If not fixed, the width of each segment can be adapted to the width of the shading object, with limitation of maximum number of segments $n_{sh;segm}$.		

A.6 Monthly calculation procedures

Table A.27 — Monthly ventilation heat transfer coefficient (see 6.6.6.2)

Application	**All applications**	**…..** [b]
Description	Choice [a]	Choice [a]
Method A	Yes	Not applicable
Method B [c]	No	Not applicable
Both methods [c]	No	Not applicable

a Only one Yes per column is posible.
b Add more columns if needed to differentiate between applications (e.g. building categories, new or existing buildings, etc.).
c Method B is oly allowed outside the CEN area.

Table A.28 — Dynamics correction factor for ventilation (see 6.6.6.2)

Dynamics correction factor for monthly mean air flow	**Value**
$f_{ve;dyn;k}$	1,0

Table A.29 — Solar absorption coefficient of external opaque surfaces (see 6.6.8.2)

	Choice
Differentiation in solar absorption coefficient?	Yes
If Yes: specify the procedure to classify the three categories (free text)	
Category	Specification
Category 1 **α_{sol} = 0,3** **(light colour)**	Not applicable
Category 2 **α_{sol} = 0,6** **(intermediate colour)**	Not applicable
Category 3 **α_{sol} = 0,9** **(dark colour)**	Not applicable
	Choice
If No: choose the default category	2

Table A.30 — View factor to the sky (see 6.6.8.3)

	Unshaded tilted surface	**Unshaded horizontal roof**	**Unshaded vertical wall**
F_{sky}	$(1+\cos \beta_{ic})/2$	1,0	0,5

Table A.31 — Difference between external air temperature and sky temperature (see 6.6.8.3)

Climatic region [a]	**Sub-polar areas**	**Tropics**	**Intermediate zones**
$\Delta\theta_{sky;m}$ (K)	9 (fixed value)	13 (fixed value)	11 (fixed value)
a Add more columns if needed to differentiate between climatic regions.			

Table A.32 — Choice between detailed or simple method to determine the internal effective heat capacity (monthly method; see 6.6.9)

Application	All applications	
Description	**Choice** [a]	[b]
Only detailed method allowed	No	
Only simple method allowed	No	
Both methods allowed	Yes	

a Only one Yes per column possible.
b Add more columns if needed to differentiate between applications (e.g. construction types or building categories).

Table A.33 — Simple method to determine the internal effective heat capacity. Specification of the classes (monthly method; see 6.6.9)

Class	**Specification of the class**
Very light	Construction type is dominated by very light constructions as specified in Table A.14
Light	Construction type is dominated by light constructions as specified in Table A.14
Medium	Construction type is dominated by medium constructions as specified in Table A.14
Heavy	Construction type is dominated by heavy constructions as specified in Table A.14
Very heavy	Construction type is dominated by very heavy constructions as specified in Table A.14

Table A.34 — Values of the reference numerical parameter $a_{H,0}$ and the reference time constant $\tau_{H,0}$ for the gain utilization factor (see 6.6.10.2)

$a_{H,0}$	$\tau_{H,0}$ **h**
1,0	15

Table A.35 — Values of the reference numerical parameter $a_{C,0}$ and the reference time constant $\tau_{C,0}$ for the loss utilization factor (see 6.6.10.3)

$a_{C,0}$	$\tau_{C,0}$ **h**
1,0	15

Table A.36 — Choice between methods A and B for heating intermittency (see 6.6.11.3)

Application	**All applications**	
Description	**Choice** [a]	[b]
Only Method A	Yes	
Only Method B	No	
Both methods allowed	No	

a Only one Yes per column possible.
b Add more columns if needed to differentiate between applications (e.g. construction types or building categories).

Table A.37 — Choice between methods A and B for cooling intermittency (see 6.6.11.4)

Application	**All applications**	
Description	**Choice** [a]	[b]
Only Method A	Yes	
Only Method B	No	
Both methods allowed	No	

a Only one Yes per column possible.
b Add more columns if needed to differentiate between applications (e.g. construction types or building categories).

If method A applies

Correlation factor for method A for intermittent cooling	**Value**
$b_{C;red}$	0,3

Table A.38 — Choice between methods A and B for overheating indicator (see 6.6.12)

Application	.....[b]
Description	**Choice** [a]
Method A	Yes
Method B	No
a Only one Yes per column possible. b Add more columns if needed to differentiate between applications (e.g. construction types or building categories).	
If method B applies	
Provide details or reference to details	Not applicable

Table A.39 — The monthly fraction of energy need for humidification (see 6.6.14)

	Monthly fraction of energy need for humidification $f_{HU;m}$		
Formula?	Yes		
If Yes, give formula	for each month m: $f_{HU;m} = Q_{H;nd;m}/Q_{H;nd;an}$ where $Q_{H;nd;m/an}$ is the monthly / annual energy need for heating, as determined in 6.5.4.1, in kWh		
If No, give fraction for each month (total = 1)	**Monthly fraction of energy need for humidification $f_{HU;m}$**		
January	Not applicable	July	Not applicable
February	Not applicable	August	Not applicable
March	Not applicable	September	Not applicable
April	Not applicable	October	Not applicable
May	Not applicable	November	Not applicable
June	Not applicable	December	Not applicable

Table A.40 — Efficiency of latent heat recovery (see 6.6.14)

Type of heat recovery unit	**Efficiency of latent heat recovery $\eta_{HU;rvd}$**
Provisions specifically made for transporting moisture from exhaust to supply air (such as a heat recovery wheel with moisture absorbing surface)	0,55
Other provisions	0
- a	-
a Add more columns if needed to differentiate between types.	

Table A.41 — Annually accumulated amount of moisture to be supplied per kg dry air supply (monthly method; see 6.6.14)

Space category [a]	**Annually accumulated amount of moisture to be supplied per kg dry air supply $\Delta x \cdot t_{a;sup}$ (kg h/kg)**
SPACECAT_RES_COND	0,17
SPACECAT_RES_UNCOND	0,00
SPACECAT_RES_UNOCCUPIED	0,00
SPACECAT_NRES_COND (offices, education, hospitals)	4,20
SPACECAT_NRES_COND (all other uses)	0,17
SPACECAT _NRES_UNCOND	0,00
SPACECAT_NRES_UNOCCUPIED	0,00
a Add more columns if needed to differentiate between types. NOTE The space categories are inherited from ISO 52000-1:2017, Annex B. The values are based on NEN 7120 (The Netherlands).	

Table A.42 — Choice of glazing area or frame area fraction (see E.2.1)

Description	**Choice** [a]
For each window: free choice between glazing area or fixed frame fraction	No
For all windows the same choice: either glazing area or fixed frame fraction	Yes
For all windows: only glazing area allowed	No
For all windows: only fixed frame fraction	No
a Only one Yes per column possible.	
In case of frame fraction:	F_{fr}
Frame fraction fixed value	0,20

Table A.43 — Factors related to the solar energy transmittance (see E.2.2.1)

Correction and weighting factor for g-value non-scattering and scattering transparent glazings and blinds:		
F_w	a_g	altg °
0,90	0,75	45

Default values of the total solar energy transmittance at normal incidence, gn, for typical types of glazing [a]	
Type	**g_n**
Single glazing	0,85
Double glazing	0,75
Double glazing with selective low-emissivity coating	0,67
Triple glazing with two selective low-emissivity coatings	0,5
Double window	0,75
a Assuming a clean surface and normal, untainted and non-scattering glazing.	

Default values of the reduction factor, for typical types of blinds [a]					
Blind type	**Type of glazing**	**Optical properties of blind**		**Reduction factor with**	
		reflexion for	**transmission**	**blind inside**	**blind outside**

		light colours			
Shutters	Single glazing	0,5	0	0,43	0,11
	Double glazing			0,43	0,08
	Double glazing with selective low-emissivity coating			0,42	0,05
	Triple glazing with two selective low-emissivity coatings			0,34	0,05
Awnings (textiles)	Single glazing	0,4	0,2	0,51	0,27
	Double glazing			0,50	0,23
	Double glazing with selective low-emissivity coating			0,48	0,20
	Triple glazing with two selective low-emissivity coatings			0,36	0,15
Light curtains	Single glazing	0,3	0,4	0,59	0,43
	Double glazing			0,56	0,38
	Double glazing with selective low-emissivity coating			0,53	0,34
	Triple glazing with two selective low-emissivity coatings			0,38	0,25
a Add more rows or columns if needed.					

Table A.44a — Movable shutter reduction factor, $f_{sht;with}$, and movable solar shading reduction factor $f_{sh;with}$ (see G.2.2.2.2)
For mainland climates, Balearic Islands, Ceuta and Melilla

CZ	Orientation	1	2	3	4	5	6	7	8	9	10	11	12
A3	E	0,60	0,64	0,63	0,65	0,67	0,70	0,71	0,71	0,67	0,69	0,57	0,59
	S	0,95	0,90	0,83	0,76	0,66	0,54	0,61	0,74	0,84	0,89	0,92	0,94
	W	0,59	0,64	0,65	0,66	0,71	0,69	0,70	0,71	0,67	0,66	0,59	0,56
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

CZ	Orientation	1	2	3	4	5	6	7	8	9	10	11	12
A4	E	0,60	0,64	0,63	0,65	0,67	0,70	0,73	0,74	0,69	0,66	0,60	0,57
	S	0,95	0,90	0,83	0,76	0,66	0,52	0,69	0,77	0,86	0,90	0,93	0,94
	W	0,59	0,64	0,65	0,66	0,71	0,70	0,75	0,73	0,67	0,66	0,61	0,59
	N	0,00	0,0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
B3	E	0,53	0,62	0,61	0,66	0,67	0,68	0,71	0,72	0,66	0,64	0,55	0,47
	S	0,92	0,88	0,81	0,73	0,66	0,52	0,65	0,74	0,83	0,88	0,92	0,91
	W	0,54	0,61	0,61	0,64	0,69	0,68	0,69	0,68	0,68	0,62	0,56	0,52
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
B4	E	0,53	0,62	0,61	0,66	0,67	0,71	0,75	0,73	0,69	0,62	0,57	0,47
	S	0,92	0,88	0,81	0,73	0,66	0,54	0,68	0,78	0,86	0,85	0,90	0,92
	W	0,54	0,61	0,61	0,64	0,69	0,69	0,72	0,73	0,69	0,64	0,56	0,49
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C1	E	0,45	0,47	0,54	0,61	0,63	0,61	0,67	0,67	0,60	0,54	0,47	0,38
	S	0,82	0,80	0,73	0,63	0,50	0,44	0,54	0,67	0,75	0,83	0,84	0,81
	W	0,48	0,50	0,54	0,57	0,53	0,61	0,62	0,64	0,55	0,56	0,51	0,37
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C2	E	0,45	0,47	0,54	0,61	0,63	0,69	0,72	0,69	0,64	0,57	0,52	0,34
	S	0,82	0,80	0,73	0,63	0,50	0,53	0,60	0,75	0,82	0,78	0,82	0,78
	W	0,48	0,50	0,54	0,57	0,53	0,64	0,67	0,69	0,65	0,51	0,46	0,38
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C3	E	0,45	0,47	0,54	0,61	0,63	0,69	0,73	0,72	0,69	0,59	0,48	0,37
	S	0,82	0,80	0,73	0,63	0,50	0,53	0,64	0,75	0,85	0,81	0,79	0,81
	O	0,48	0,50	0,54	0,57	0,53	0,65	0,70	0,69	0,67	0,52	0,37	0,34
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C4	E	0,45	0,47	0,54	0,61	0,63	0,71	0,75	0,74	0,70	0,51	0,42	0,40
	S	0,82	0,80	0,73	0,63	0,50	0,55	0,68	0,79	0,86	0,82	0,83	0,81
	W	0,48	0,50	0,54	0,57	0,53	0,71	0,73	0,73	0,67	0,56	0,45	0,40
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
D1	E	0,37	0,58	0,60	0,59	0,66	0,61	0,67	0,65	0,61	0,60	0,50	0,38
	S	0,80	0,81	0,79	0,70	0,53	0,47	0,58	0,69	0,76	0,84	0,81	0,84
	W	0,43	0,54	0,59	0,62	0,61	0,59	0,64	0,65	0,57	0,58	0,41	0,41
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
D2	E	0,37	0,58	0,60	0,59	0,66	0,66	0,72	0,70	0,62	0,59	0,49	0,35

CZ	Orientation	1	2	3	4	5	6	7	8	9	10	11	12
	S	0,80	0,81	0,79	0,70	0,53	0,52	0,61	0,74	0,81	0,83	0,82	0,82
	W	0,43	0,54	0,59	0,62	0,61	0,67	0,70	0,67	0,64	0,58	0,45	0,35
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
D3	E	0,37	0,58	0,60	0,59	0,66	0,67	0,71	0,70	0,67	0,55	0,44	0,4
	S	0,80	0,81	0,79	0,70	0,53	0,53	0,63	0,75	0,83	0,83	0,84	0,77
	W	0,43	0,54	0,59	0,62	0,61	0,67	0,73	0,71	0,67	0,64	0,45	0,35
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
E1	E	0,48	0,47	0,54	0,61	0,61	0,60	0,65	0,67	0,58	0,55	0,48	0,49
	S	0,80	0,78	0,78	0,67	0,57	0,46	0,56	0,69	0,74	0,81	0,81	0,84
	W	0,47	0,52	0,61	0,59	0,63	0,64	0,60	0,63	0,56	0,58	0,46	0,38
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Table A.44b — Movable shutter reduction factor, $f_{sht;with}$, and movable solar shading reduction factor $f_{sh;with}$ (see G.2.2.2.2)

For the Canary Islands

CZ	Orientation	1	2	3	4	5	6	7	8	9	10	11	12
α1c	E	0,64	0,69	0,68	0,69	0,69	0,60	0,64	0,64	0,60	0,67	0,65	0,63
	S	0,90	0,89	0,81	0,63	0,21	0,00	0,04	0,45	0,67	0,86	0,91	0,90
	W	0,62	0,68	0,66	0,70	0,67	0,59	0,63	0,60	0,59	0,65	0,64	0,61
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
α2c	E	0,64	0,69	0,68	0,69	0,69	0,66	0,69	0,67	0,67	0,69	0,64	0,61
	S	0,90	0,89	0,81	0,63	0,21	0,00	0,03	0,47	0,72	0,86	0,89	0,89
	W	0,62	0,68	0,66	0,70	0,67	0,65	0,69	0,67	0,64	0,66	0,64	0,60
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
α3c	E	0,64	0,69	0,68	0,69	0,69	0,68	0,70	0,71	0,63	0,66	0,64	0,62
	S	0,90	0,89	0,81	0,63	0,21	0,00	0,04	0,48	0,67	0,86	0,90	0,89
	W	0,62	0,68	0,66	0,70	0,67	0,68	0,68	0,69	0,67	0,65	0,65	0,61
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
α4c	E	0,64	0,69	0,68	0,69	0,69	0,68	0,71	0,73	0,68	0,67	0,65	0,61
	S	0,90	0,89	0,81	0,63	0,21	0,00	0,04	0,53	0,71	0,86	0,90	0,90
	W	0,62	0,68	0,66	0,70	0,67	0,68	0,72	0,73	0,65	0,68	0,66	0,60
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
A1c	E	0,56	0,62	0,63	0,66	0,63	0,61	0,63	0,62	0,61	0,62	0,52	0,57
	S	0,83	0,79	0,71	0,57	0,19	0,00	0,00	0,44	0,67	0,76	0,81	0,82
	W	0,57	0,58	0,60	0,65	0,61	0,60	0,64	0,63	0,56	0,55	0,64	0,51
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
A2c	E	0,56	0,62	0,63	0,66	0,65	0,61	0,70	0,69	0,63	0,63	0,60	0,53
	S	0,83	0,79	0,71	0,57	0,15	0,00	0,05	0,44	0,65	0,81	0,82	0,82
	W	0,57	0,58	0,60	0,65	0,68	0,62	0,67	0,67	0,58	0,61	0,50	0,53
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
A3c	E	0,56	0,62	0,63	0,66	0,65	0,67	0,70	0,72	0,64	0,63	0,53	0,59
	S	0,83	0,79	0,71	0,57	0,15	0,00	0,00	0,44	0,68	0,78	0,82	0,84
	W	0,57	0,58	0,60	0,65	0,68	0,65	0,69	0,70	0,64	0,56	0,53	0,50
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
A4c	E	0,56	0,62	0,63	0,66	0,65	0,66	0,71	0,72	0,67	0,60	0,56	0,55
	S	0,83	0,79	0,71	0,57	0,15	0,00	0,04	0,48	0,70	0,80	0,81	0,82
	W	0,57	0,58	0,60	0,65	0,68	0,67	0,72	0,71	0,65	0,57	0,57	0,55
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
B1c	E	0,49	0,57	0,60	0,66	0,65	0,64	0,65	0,65	0,61	0,59	0,57	0,48

CZ	Orientation	1	2	3	4	5	6	7	8	9	10	11	12
	S	0,81	0,76	0,67	0,54	0,16	0,00	0,04	0,41	0,65	0,78	0,80	0,78
	W	0,55	0,60	0,61	0,59	0,68	0,65	0,62	0,62	0,58	0,59	0,55	0,43
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
B2c	E	0,49	0,57	0,60	0,66	0,65	0,61	0,68	0,70	0,64	0,60	0,54	0,56
	S	0,81	0,76	0,67	0,54	0,16	0,00	0,02	0,44	0,66	0,75	0,80	0,77
	W	0,55	0,60	0,61	0,59	0,68	0,64	0,70	0,65	0,61	0,58	0,49	0,48
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
B3c	E	0,49	0,57	0,60	0,66	0,65	0,65	0,69	0,70	0,64	0,59	0,57	0,50
	S	0,81	0,76	0,67	0,54	0,16	0,00	0,03	0,47	0,69	0,77	0,78	0,82
	W	0,55	0,60	0,61	0,59	0,68	0,65	0,69	0,70	0,65	0,59	0,54	0,58
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
B4c	E	0,49	0,57	0,60	0,66	0,65	0,71	0,71	0,73	0,68	0,63	0,51	0,49
	S	0,81	0,76	0,67	0,54	0,16	0,00	0,03	0,50	0,69	0,75	0,80	0,79
	W	0,55	0,60	0,61	0,59	0,68	0,69	0,70	0,70	0,64	0,59	0,54	0,53
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C1c	E	0,48	0,47	0,58	0,59	0,60	0,57	0,63	0,64	0,60	0,52	0,49	0,44
	S	0,74	0,66	0,67	0,52	0,09	0,00	0,03	0,42	0,64	0,68	0,71	0,70
	W	0,42	0,48	0,55	0,53	0,60	0,57	0,65	0,62	0,52	0,54	0,41	0,39
	N	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00
C2c	E	0,48	0,47	0,58	0,59	0,60	0,65	0,70	0,68	0,67	0,53	0,47	0,42
	S	0,74	0,66	0,67	0,52	0,09	0,00	0,02	0,40	0,65	0,66	0,72	0,71
	W	0,42	0,48	0,55	0,53	0,60	0,63	0,67	0,63	0,59	0,52	0,48	0,47
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C3c	E	0,48	0,47	0,58	0,59	0,60	0,66	0,68	0,71	0,66	0,56	0,46	0,42
	S	0,74	0,66	0,67	0,52	0,09	0,00	0,02	0,41	0,72	0,70	0,73	0,70
	W	0,42	0,48	0,55	0,53	0,60	0,65	0,70	0,68	0,63	0,55	0,52	0,46
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C4c	E	0,48	0,47	0,58	0,59	0,60	0,68	0,72	0,73	0,66	0,52	0,51	0,46
	S	0,74	0,66	0,67	0,52	0,09	0,00	0,02	0,52	0,72	0,68	0,74	0,73
	W	0,42	0,48	0,55	0,53	0,60	0,67	0,71	0,71	0,64	0,55	0,43	0,40
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
D1c	E	0,43	0,49	0,58	0,58	0,59	0,63	0,61	0,63	0,59	0,55	0,46	0,45
	S	0,73	0,72	0,69	0,49	0,19	0,00	0,03	0,38	0,64	0,73	0,76	0,70
	W	0,47	0,54	0,60	0,59	0,59	0,57	0,59	0,62	0,57	0,60	0,53	0,42
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
D2c	E	0,43	0,49	0,58	0,58	0,59	0,66	0,69	0,69	0,60	0,57	0,55	0,48
	S	0,73	0,72	0,69	0,49	0,19	0,00	0,03	0,44	0,69	0,74	0,75	0,70

CZ	Orientation	1	2	3	4	5	6	7	8	9	10	11	12
	W	0,47	0,54	0,60	0,59	0,59	0,61	0,68	0,67	0,63	0,54	0,43	0,38
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
D3c	E	0,43	0,49	0,58	0,58	0,59	0,68	0,69	0,66	0,65	0,58	0,46	0,47
	S	0,73	0,72	0,69	0,49	0,19	0,00	0,02	0,50	0,69	0,74	0,78	0,70
	W	0,47	0,54	0,60	0,59	0,59	0,66	0,69	0,69	0,66	0,49	0,56	0,30
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
E1c	E	0,45	0,58	0,58	0,61	0,63	0,62	0,63	0,63	0,60	0,57	0,51	0,42
	S	0,74	0,73	0,62	0,49	0,15	0,00	0,02	0,39	0,67	0,74	0,77	0,74
	W	0,48	0,55	0,55	0,59	0,61	0,57	0,64	0,63	0,54	0,56	0,49	0,49
	N	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Table A.45 — Choices between options and methods for calculation of shading by external objects (see F.1)

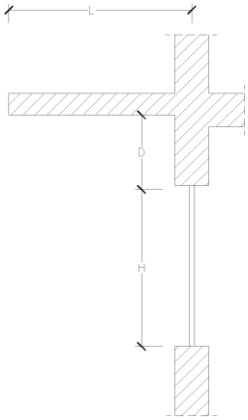
Application [b]	**All applications**			**Not applicable**		
Description	**Choice**			**Choice**		
Calculation of the effect of shading by distant objects included in this document?	Yes			n.a.		
When calculating solar shading on building elements: which types of distant shading objects (not on site) may or shall be taken into account or ignored NOTE For instance landscape (such as hills or dikes), vegetation (such as trees), other constructions (such as buildings)	Shall be taken into account:	May be taken into account:	Shall be ignored:	Shall be taken into account:	May be taken into account:	Shall be ignored:
	Other constructions (such as buildings)	Vegetation (such as trees) Landscape (such as hills or dikes), other	-	n.a.	n.a.	n.a.
When calculating solar shading on opaque building elements such as roofs or facades: which types of on site shading objects can or shall be ignored	Shall be taken into account:	May be taken into account:	Shall be ignored:	Shall be taken into account:	May be taken into account:	Shall be ignored:
	-	Other constructions (such as buildings)	-	n.a.	n.a.	n.a.

Application [b]	All applications			Not applicable		
Description	**Choice**			**Choice**		
NOTE For instance rebates, overhangs or other shading objects from the own building(s) on site		Rebates overhangs or other shading objects from the own building(s) on site				
When calculating solar shading on transparent elements:	Shall be taken into account:	May be taken into account:	Shall be ignored:	Shall be taken into account:	May be taken into account:	Shall be ignored:
NOTE For instance window rebates, overhangs and side fins	Window rebates, overhangs and side fins if depth larger than 20% of window height resp. width	Ot her window rebates, overhangs and side fins	-	n.a.	n.a.	n.a.
Specific subdivision rules for the calculation of solar shading on building elements	None			n.a.		
Choice between the two methods for the solar shading calculation:	Choice [a]			Choice [a]		
Method 1, Shading of direct radiation	Yes			n.a.		
Method 2, Shading of direct and diffuse radiation	No			n.a.		
In case of method 2: give reference to calculation procedure	n.a.			n.a.		

a Only one Yes per column is possible.

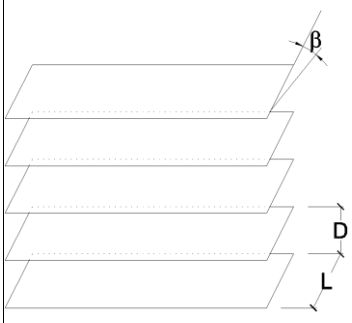
b Add more columns if needed to differentiate between applications (e.g. building categories, new or existing buildings, etc.).

Table A.46 — Parameters for monthly solar shading due to overhangs (See F.3.5.1.2)

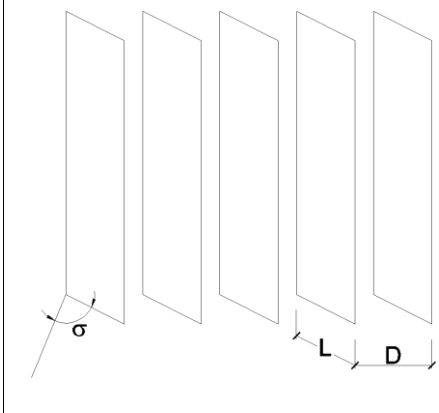


Orientation		0,2 < L / H <= 0,5	0,5 < L / H <= 1	1 < L / H <=2	L / H > 2
S	0 < D / H <= 0,2	0,82	0,50	0,28	0,16
	0,2 < D / H <= 0,5	0,87	0,64	0,39	0,22
	D / H > 0,5	0,93	0,82	0,60	0,39
SE/SW	0 < D / H <= 0,2	0,90	0,71	0,43	0,16
	0,2 < D / H <= 0,5	0,94	0,82	0,60	0,27
	D / H > 0,5	0,98	0,93	0,84	0,65
E/W	0 < D / H <= 0,2	0,92	0,77	0,55	0,22
	0,2 < D / H <= 0,5	0,96	0,86	0,70	0,43
	D / H > 0,5	0,99	0,96	0,89	0,75

Table A.47 — Parameters for monthly solar shading due to fins (See F.3.5.1.2)



Orientation	Horizontal fins Inclination angle (β)		
	0º	30º	60º
S	0,49	0,42	0,26
SE/SW	0,54	0,44	0,26
E/W	0,57	0,45	0,27



Orientation	Vertical fins Inclination angle (σ)						
	-60º	-45º	-30º	0º	30º	45º	60º
S	0,37	0,44	0,49	0,53	0,47	0,41	0,32
SE	0,46	0,53	0,56	0,56	0,47	0,40	0,30
E	0,39	0,47	0,54	0,63	0,55	0,45	0,32
W	0,44	0,52	0,58	0,63	0,50	0,41	0,29
SW	0,38	0,44	0,50	0,56	0,53	0,48	0,38

Table A.48a — Parameters for monthly solar shading by obstacles; more detailed method (See F.3.1.2 and F.3.5.2.2)

Location:	40º north latitude								
Period:	winter: October - May								
Orientation	**Weight, $w_{obst;m;i}$ per sector**				**Solar altitude, $\alpha_{sol;m;i}$ per sector**				**Fraction direct solar irradiation $f_{sol;dir;m}$**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	
N	0	0	0	0	-	-	-	-	0
NE	0	0	0	1,00	-	-	-	7,6	0,10
E	0	0	0,31	0,69	-	-	9,0	20,8	0,50
SE	0	0,14	0,58	0,28	-	9,2	22,2	24,0	0,70
S	0,06	0,40	0,47	0,07	9,4	22,8	22,6	9,7	0,75
SW	0,22	0,63	0,15	0	24,2	22,0	9,6	-	0,70
W	0,70	0,30	0	0	20,6	9,5	-	-	0,50
NW	1,00	0	0	0	8,7	-	-	-	0,10

Table A.48b — Parameters for monthly solar shading by obstacles; more detailed method (See F.3.1.2 and F.3.5.2.2)

Location:	40º north latitude								
Period:	Summer: June - September								
Orientation	**Weight, $w_{obst;m;i}$ per sector**				**Solar altitude, $\alpha_{sol;m;i}$ per sector**				**Fraction direct solar irradiation $f_{sol;dir;m}$**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	
N	0	0	0	1,00	-	-	-	17,4	0,10
NE	0	0	0,62	0,38	-	-	20,9	50,2	0,30
E	0	0,48	0,48	0,04	-	21,8	52,5	74,4	0,45
SE	0,33	0,53	0,10	0,03	23,2	54,0	74,4	74,4	0,55
S	0,30	0,20	0,21	0,29	60,5	74,4	74,4	60,7	0,50
SW	0,03	0,11	0,52	0,34	74,4	74,4	54,2	23,1	0,55
W	0,04	0,47	0,49	0	74,4	52,7	21,8	-	0,45
NW	0,37	0,63	0	0	50,3	20,9	-	-	0,30

5. ISO 52018-1: Indicators for partial EPB requirements related to thermal energy balance and fabric features

Annex A Input data sheet with default values and choices

A.1 General

The template in Annex A of this standard shall be used to specify the choices between methods, the required input data and references to other standards.

NOTE 1 Following this template is not enough to guarantee consistency of data.

A.2 References

The references, identified by the EPB module code number, are given in Table A.1.

Table A.1 —References

Reference	Reference document	
	Number	**Title**
M1-4	ISO 52003-1	Energy performance of buildings – Indicators, requirements, ratings and certificates – Part 1: General aspects and application to the overall energy performance
M1-6	ISO 17772-1	Energy performance of buildings - Indoor environmental Quality - part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings
	EN 16798-1	Energy performance of buildings – Ventilation for buildings – Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics (Module M1-6)
M1-13	ISO 52010-1	Energy performance of buildings - External climatic conditions - Part 1: Conversion of climatic data for energy calculations
M2-2	ISO 52016-1	Energy performance of buildings — Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads — Part 1: Calculation procedures
M2-5.1	ISO 13789	Thermal performance of buildings - Transmission and ventilation heat transfer coefficients - Calculation method
M2-5.2	ISO 10211	Thermal bridges in building construction – Heat flows and surface temperatures – Detail calculations

Reference	Reference document	
	Number	**Title**
M2-5.3	ISO 14683	Thermal bridges in building construction – Linear thermal transmittance – simplified methods and default values
M2-8.1	ISO 52011-1	Energy performance of buildings — Thermal, solar and daylight properties of building components and elements — Part 1: Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing
M2-8.2	ISO 52022-3	Energy performance of buildings — Thermal, solar and daylight properties of building components and elements — Part 3: detail calculation method of the solar and daylight characteristics for solar protection devices combined with glazing
M5-8	EN 16798-5-1	Energy performance of buildings — Modules M5-6, M5-8, M6-5, M7-5, M7-8 -– Ventilation for buildings – Calculation methods for energy requirements of ventilation and air conditioning systems – Part 5-1: Distribution and generation (revision of EN 15241) – Method 1
	EN 16798-5-2	Energy performance of buildings — Modules M5-6, M5-8.2, -– Ventilation for buildings – Calculation methods for energy requirements of ventilation systems – Part 5-2: Distribution and generation – Method 2
M9-1	EN 15193-1	Energy performance of buildings - Module M9 – Energy requirements for lighting – Part 1: Specifications

A.3 Mix of partial energy performance requirements

A.3.1 General

See Clause 6

The table based on the template of Table A.2 shall be filled out as follows.

- The first column lists the partial EPB features that can be considered for setting requirements. The motivation for the mix that is chosen shall be reported below the table. If needed, still other partial EPB features can be added at the bottom of the table. By means of a numbered reference, a pricese description of each additional EPB feature will be given below the table. If possible, the description of an extra feature shall be taken from an EPB standar. Also, for each extra partial EPB feature, the motivation shall be described in a clear manner.

- In the second column, an x-mark is placed at each of the features that is chosen to set a requirement.

- In the third column, for each exception, a numbered reference is made to a full, detailed and clear explanation below the table, including the motivation for the exception. For some types of (detailed) requirements (e.g. on element level, such as thermal insulation), it may be easier to explain the exceptions in conjuction with the detailed description of the actual requirements. In these instances it suffices to give here a general synthesis, the motivation and precise reference to the regulatory texts where the requirements and exceptions are described.

A.3.2 Application: new buildings

The requirements are established, for all types of buildings, according to the climatic zone and its use (residential and non-residential).
Climatic zones can be found in Annex B of CTE DB-HE and are arranged according to winter severity, from less severe to more severe:

- α: (lighter winter)
- A:
- B:
- C:
- D:
- E: (more severe winter)

Table A.2a —Choices with respect to the mix of partial EPB requirements related to thermal energy balance and fabric features (See Clause 6)

	Application: New constructions							
Partial EPB feature	**Requirement based on climate zones**						**Excepcions**	**Details in**
	α	**A**	**B**	**C**	**D**	**E**		
Summer thermal comfort	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	--	Table A.3/B.3
Winter thermal comfort	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	--	Table A.4/B.4
Energy "need" for heating: give further especifications*	--	--	--	--	--	--	--	Table A.5/B.5
Energy "need" for cooling: give further especifications*	--	--	--	--	--	--	--	Table A.6/B.6
Combined energy "need" for heating and cooling (and possibly still other quantities): define precisely*	--	--	--	--	--	--	--	Table A.7/B.7
Overall thermal insulation of the envelope	X	X	X	X	X	X	--	Table A.8/B.8
Thermal insulation of individual elements of the thermal envelope	X	X	X	X	X	X	--	Table A.9/B.9
Thermal bridges	--	--	--	--	--	--	--	Table A.10/B.10
Window energy performance	X	X	X	X	X	X	--	Table A.11/B.11
Airtightness of the thermal envelope: mandatory measurement: give further specifications*	--	--	--	--	--	--	--	Table A.12/B.12
Airtightness of the thermal envelope: quantitative requirement: give further specifications*	X(2)	X(2)	X(2)	X(2)	X(2)	X(2)	X(2)	Table A.12/B.12
Solar control	X	X	X	X	X	X	--	Table A.13/B.13
The columns or cells that are marked with an asterisk (i.e. any cell involving a specific national/regional element) shall be marked with a numbered reference. A clear explanation and motivation shall be given for each of these new elements below the table.								
Explanation: (a) If applicable, specify for energy "need" for heating:								

- with the real or with a predefined fictitious ventilation system;
- includin/excluding the amount of heat needed for active preheating of the incoming hygienic ventilation air (if present);
- includin/excluding the latent heat need (i.e. the sensible heat need only or not);
- still other aspects.

(B) If applicable, specify for energy "need" for cooling:

- with the real or with a predefined fictitious ventilation system;
- includin/excluding the amount of cold needed for active precooling of the incoming hygienic ventilation air (if present);
- includin/excluding the latent cold need (i.e. the sensible cold need only or not);
- still other aspects.

Specifications according to each of the numbered references:

Numbered references:

(1) Summer and winter comfort is established through a maximum annual number of hours beyond temperature setpoints, as established by the thermal regulations in CTE DB-HE. It sets an annual and global requirement, so it is affects both situations.

(2) Air tightness measurements shall be performed according to UNE-EN 13829:2002 (method B), with specifications aligned with the treatment of infiltration/exfiltration in the EPB assesment method (e.g. open combustion devices shall be sealed if the air flow through them is already separately taken into account in the EPB assesmente method).
This quantitative requirement applies only to residential buildings with more that 120m^2 built area.

Motivation for the chosen requirement mix:

(in bottom-up order):

- Solar gains (influenced by window area and orientation, choice of glazing and solar protection devices, etc.) are a crucial point of attention for summer comfort.
- The incorporation of air tightness requirement, although not too stringent, allows to raise awareness on this parameter and familiarize with the existing tools and techniques to handle it. It is expected that future regulation will increase this requirement for all types of buildings.
- The requirement on the thermal insulation of all individual elements of the thermal envelope ensures, first of all, that sufficiently high internal surface temperatures are achieved under winter conditions. The transmittance limit values ensure a minimum quality of the thermal envelope and avoid decompensations in the thermal quality of the building spaces. However, these values do not ensure an adequate level of demand, limited by the overall thermal insulation and overall energy efficiency performace, limited using primary energy consumption indicators (total and non -renewable).
- An overall thermal insulation of the envelope allows an assessment of the minimum quality of the enclosure in a simplified way that guarantees the building's resilience to its use in the absence or malfunctioning of technical systems.

A.3.3 Application: existing buildings

Requirements are established, for all types of buildings, according to the climatic zone and its use (residential and no residential).

Climatic zones can be found in Annex B of the spanish thermal regulation (CTE DB-HE) and are ordered by winter severity, from less severe to more severe.

- α: (lighter winter)
- A:
- B:
- C:
- D:
- E: (more severe winter)

Table A.2b — Choices with respect to the partial EPB requirements related to the thermal energy balance and fabric features (See Clause 6)

	Application: Works on existing buildings							
Partial energy performance feature	**Requirement based on climate zones**						**Excepcions**	**Details in**
	α	**A**	**B**	**C**	**D**	**E**		
Summer thermal comfort	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	Table A.3/B.3
Winter thermal comfort	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	Table A.4/B.4
Energy “need” for heating: give further especifications*	--	--	--	--	--	--	--	Table A.5/B.5
Energy “need” for cooling: give further especifications*	--	--	--	--	--	--	--	Table A.6/B.6
Combined energy “need” for heating and cooling (and possibly still other quantities): define precisely*	--	--	--	--	--	--	--	Table A.7/B.7
Overall thermal insulation of the envelope	X(2)	X(2)	X(2)	X(2)	X(2)	X(2)	X(2)	Table A.8/B.8
Thermal insulation of individual elements of the thermal envelope	X(3)	X(3)	X(3)	X(3)	X(3)	X(3)	X(3)	Table A.9/B.9
Thermal bridges	--	--	--	--	--	--	--	Table A.10/B.10
Window energy performance	X	X	X	X	X	X	--	Table A.11/B.11
Airtightness of the thermal envelope: mandatory measurement: give further specifications*	--	--	--	--	--	--	--	Table A.12/B.12
Airtightness of the thermal envelope: quantitative requirement: give further	--	--	--	--	--	--	--	Table A.12/B.12

specifications*								
Solar control	X(4)	X(4)	X(4)	X(4)	X(4)	X(4)	X(4)	Table A.13/B.13

The columns or cells that are marked with an asterisk (i.e. any cell involving a specific national/regional element) shall be marked with a numbered reference. A clear explanation and motivation shall be given for each of these new elements below the table.

Explanation:

(a) If applicable, specify for energy "need" for heating:

- with the real or with a predefined fictitious ventilation system;
- includin/excluding the amount of heat needed for active preheating of the incoming hygienic ventilation air (if present);
- includin/excluding the latent heat need (i.e. the sensible heat need only or not);
- still other aspects.

(B) If applicable, specify for energy "need" for cooling:

- with the real or with a predefined fictitious ventilation system;
- includin/excluding the amount of cold needed for active precooling of the incoming hygienic ventilation air (if present);
- includin/excluding the latent cold need (i.e. the sensible cold need only or not);
- still other aspects.

Specifications according to each of the numbered references:

Numbered references:

(1) This requirement in works on existing buildings only applies for:

- extensions exceeding 50m^2 of surface that implies more than 10% of surface or volume of existing building,
- change of use, exceeding 50m^2
- reforms or improvements where the intervention takes place at the same time in thermal generation systems and more than 25% of the thermal envelope

Summer and winter comfort is established through a maximum annual number of hours beyond temperature setpoints, as established by the thermal regulation (CTE DB-HE). It sets an annual and global requirement, so it affects both situations.

(2) The overall thermal insulation of the envelope only aplies for:

- extensions (regardless of its surface)
- usage changes (regardless of its surface)
- reforms or improvements where the interventions affect more than 25% of its thermal envelope
-

(3) Thermal insulation of individual elements of the thermal envelope applies for:

- extensions (regardless of its surface)
- usage changes (regardless of its surface)
- reforms or improvements where the interventions affect more than 25% of the thermal envelope

For reforms or improvements where the interventions affect less than 25% of the thermal envelope this requirement will apply only to those elements of the thermal envelope:

- that will be replaced, incorporated, or substantially modified;
- whose internal or external conditions are modified as a result of the intervention, when these

increase the energy needs of the building.

The thermal insulation of individual elements may be exceeded when the overall thermal insulation of the envelope obtained considering the final thermal transmittance of the affected elements does not exceed what obtained by applying the regulatory values

(4) Solar control of the thermal envelope only applies for:

- extensions (regardless of its surface)
- usage changes (regardless of its surface)
- reforms or improvements where the interventions affect more than 25% of the thermal envelope

Motivation for the chosen requirement mix:

- For reasons of practicality in the context of minor renovations, requirements are only set at the element level and not on combinations of elements (which may involve existing elements).
- For extensive renovations (e.g. extensions, changes of use, etc) further reaching requirements are appropiate.
- Solar gains (influenced by window area and orientation, choice of glazing and solar protection devices, etc.) are a crucial point of attention for summer comfort.
- In existing buildings there is no air tightness requirement, however this is a parameter which should be considered by both, designer and constructor, and it has a great impact in overall energy needs, which are limited using the total primary energy indicator.
- The requirement on the thermal insulation of all individual elements of the thermal envelope ensures, first of all, that sufficiently high internal surface temperatures are achieved under winter conditions. Furthermore, the transmittance limit values ensure a minimum quality of the thermal envelope in order to avoid decompensations in the thermal quality of the building spaces. However, these values do not ensure a compliant level of energy needs, limited by the overall thermal insulation.
- An overall thermal insulation of the envelope allows an assessment of the minimum quality of the enclosure in a simplified way that guarantees the building's resilience to the absence or malfunctioning of the technical systems.

A.4 Partial energy performance requirements

A.4.1 Application: new buildings

Table A.3a— Numeric indicator used for the requirement on the summer thermal comfort (See Clause 7)

Application: New constructions	
Numeric indicator	**Choice**
Time above a fixed reference temperature [h]	--
Temperature weighted time above a fixed reference temperature [K.h]	--
Percentage of occupation time above or below fixed reference temperature [%]*	X
--	
*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other indicator:**	
The indicator if fixed in terms of percentage: it is allowed to exceed in a maximum of 4% occupation time hours of the building for each of its uses throughout the year for the fixed temperatures. This implies that the indicator works for the sum of winter and summer hours and not exclusively for any of them.	

Table A.4a— Numeric indicator used for the requirement on the winter thermal comfort (See Clause 8)

Application: New constructions	
Numeric indicator	**Choice**
Time above a fixed reference temperature [h]	--
Temperature weighted time above a fixed reference temperature [k.h]	--
Percentage of occupation time below fixed reference temperature [%]*	X
--	
*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other indicator:**	
The indicator if fixed in terms of percentage: It is allowed to exceed in a maximum of 4% of the hours of the occupation time of the building for each of its uses throughout the year for the fixed referenced temperature. This implies that the indicator works for the sum of winter and summer hours and not exclusively for any of them.	

Table A.5a is not applicable

Table A.6a is not applicable
Table A.7a is not applicable

Table A.8a— Numeric indicator used for the requirement on the overall thermal insulation of the thermal envelope (See Clause 12)

Application: New constructions	
Numeric indicator	**Choice**
Overall transmition heat tranfer coefficient H_{tr} [W/K]	
Mean thermal transmittance U_{mn} [W/m².K]	X(1)
Ratio; define*	
<Free text>Other indicator; define*--	
--	

*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:
Description in case of other indicator:

(1) U_{mn} (although it is named *K* in CTE DB-HE for consistency with previous regulations): mean thermal transmittance of the thermal envelope. It is expressed in W/m^2·K

$U_{mn} = K = H_{tr} / A_{te}$

where:

- H_{tr} corresponds to the overall heat transfer coefficient of the thermal envelope (including its thermal bridges). For simplified computation, elements in contact with the ground and elements in contact with other inner spaces or buildings can be excluded; It is expressed in W/K
- A_{te} is the exchange area of the thermal envelope obtained as a sum of the different components considered in the heat transmission (those considered in H_{tr}). It can therefore exclude, as a valid simplification, the areas of elements of the thermal envelope in contact with the ground or with other buildings or adjacent spaces outside the thermal envelope. It is expressed in m^2

NOTE 1 In a simplified way, this parameter can be calculated from the thermal transmittances and surfaces of the elements of the thermal envelope and an adjustment factor:

$$K = \Sigma_x b_{tr,x} [\Sigma_i A_{x,i} U_{x,i} + \Sigma_k l_{x,k} \Psi_{x,k} + \Sigma_j x_{x,j}] / \Sigma_x \Sigma_i b_{tr,x} A_{x,i}$$

where:

- $b_{tr,x}$ is the adjustment factor for the envelope elements. Its value is 1 except for elements in contact with the ground or with buildings or adjacent spaces outside the thermal envelope, where it takes the value 0;
- $A_{x,i}$ is the exchange area of the element of the thermal envelope considered;
- $U_{x,i}$ is the value of the thermal transmittance of the element of the thermal envelope considered; The thermal transmittance applicable to the elements in contact with the ground includes not only the intrinsic transmittance of the element but also the effect of the terrain.
- $l_{x,k}$ is the length of the thermal bridge considered;

- $\Psi_{x,\,k}$ is the value of the linear thermal transmittance of the thermal bridge considered;
- $x_{x,\,j}$ is the point transmittance of the thermal bridge considered.

NOTE 2 In the simplified calculation, the transmittance and surface area of construction solutions designed to reduce energy needs (terraced greenhouses, parietodynamic walls, Trombe walls, etc.) are also excluded.

NOTE 3 The allowed limits for this indicator is weighted according to the compactness of the building and the climatic zone

Table A.9a— Numeric indicator used for the requirement on the thermal insulation of individual elements of the thermal envelope (See Clause 13)

Application: New constructions	
Numeric indicator	**Choice**
Minimum temperature factor f_{Rsi} *[-]*	
Thermal transmittance *U* [W/m².K]	X
Total thermal resistance R_{tot} [m².K/W]	
Intrinsic element thermal resistance $R_{c,op}$ [m².K/W]	
<Free text>Other indicator; define*--	
--	
*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other indicator:**	
Not applicable. Thermal insulation of individual elements of the thermal envelope applies for every new construction regardless of its use.	

Concerning Table A.10a, thermal bridges not explicit requirements, but integrated into the EPB assessments in the overall heat transfer coefficient through the thermal envelope of the building, a practical manner that stimulates “good solutions” as discussed in ISO/TR 52108-2[7]

Table A.11 a— Numeric indicator used for the requirement on the window energy performance (See Clause 15)

Application: New constructions	
Numeric indicator	**Choice**
Heating energy performance $P_{E;H;w}$ [kWh/m^2]	
Cooling energy performance $P_{E;C;w}$ [kWh/m^2]	
Combination of heating and cooling energy performance $P_{E;H*C;w}$ [kWh/m^2]	
For glazing only: energy balance value E [W/(m^2.K)]	
Minimal window area in certain types of rooms: specify*	
Thermal window transmittance U_H [W/m².K]	X
--	
If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other method:**	
For the calculation of the thermal transmittance of windows (window, skylights or transparent doors) U_H , the UNE EN ISO 10077 standard is used: Thermal insulation of individual window elements of the thermal envelope applies for every new construction regardless its use.	

Table A.12 a— Numeric indicator used for the requirement on the thermal envelope air tightness (See Clause 16)

Application: New constructions	
Numeric indicator	**Choice**
Specific leakage rate per thermal envelope area q_{Epr} [m³/h/m²]	
Air change rate n_{pr} [h^{-1}]	X
Specific leakage rate per useful floor area q_{Fpr} [m³/h/m²]	
<Free text>Other indicator; define*--	
--	
Specify for the chosen method of the air tightness measurement: • the precise definition of the reference area or volume for the indicator used; • the reference pressure, pr; • result of pressurization , depressurization or mean; • other, if needed.	
Specification (if method 1,2 or 3):	
The reference pressure difference is 50 Pascal. The elements used for the calculation of this indicator are: • the internal volume of the thermal envelope (removing the volume occupied by the building floor and roof slabs) • the surface of the opaque and transparent elements of the thermal envelope in contact with the air (the elements in contact with the ground or with adjacent spaces outside the thermal envelope are excluded) Note the specific details provided in Table A.2a for this requirement: The air tightness measurements shall be performed according to UNE-EN 13829:2002 (method B), with specifications aligned with the treatment of infiltration/exfiltration in the EPB assesment method (e.g. open combustion devices shall be sealed if the air flow through them is already separately taken into account in the EPB assesmente method). Also this quantitative requirement applies only to residential buildings with more than 120m^2 built area.	
If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other method:**	

Table A.13a — Numeric indicator used for the requirement on solar control (See Clause 17)

Application: New constructions	
Numeric indicator	**Choice**
Solar factor g or g_{tot} or F_{npss} [-]	
Solar control *[-]*	X
--	
*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other indicator:**	
Solar control ($q_{sol;jul}$) is the ratio between the cummulative window solar gains for the month of July ($Q_{sol;jul}$) considering only the windows in the thermal envelope and with their movable solar shading protections being activated, and the surface of the occupied spaces within the thermal envelope (A_u). It can be applied to the building or to part of it. $q_{sol;jul}$ is defined as: $q_{sol;jul} = Q_{sol;jul} / A_u = [\Sigma_k F_{sh,obst} \; g_{gl,sh;wi} \; (1- F_F) \; A_{w;p} \; H_{sol:jul}] / A_u$ where: • $F_{sh;\,obst}$ is the reducing factor due to external shadings (it includes all the elements outside of windows, such as overhangs, lateral fins, setbacks, remote obstacles, etc.), for the month of July, for window k, and represents the reduction in incident solar irradiation due to permanent shading of those obstacles. • $g_{gl;\,sh;\,wi}$ is the total solar energy transmittance of the glazing with the movable shading device being activated, for the month of July and window k; • F_F is the frame fraction of the window k (in a simplified way, the value of 0.25 can be adopted) • $A_{w;\,p}$ is the projected surface (m^2) of window k; • $H_{sol;\,jul}$ is the cumulative average solar irradiation of the month of July (kWh / m^2 · month) for the considered climate and for the inclination and orientation of window k. • A_u is the area of the occupied spaces inside the thermal envelope, as considered in accordance with the rest of the EPB balance. The objective of this parameter is to ensure the possibility of effective solar gains control, mainly in the summer season, by means of both movable shading devices and fixed elements, limiting the impact of solar radiation on the occupied (and normally conditioned) spaces.	

B.4.2 Application: existing buildings

Table A.3b— Numeric indicator used for the requirement on the summer thermal comfort (See Clause 7)

Application: Works on existing buildings	
Numeric indicator	**Choice**
Time above a fixed reference temperature [h]	--
Temperature weighted time above a fixed reference temperature [K.h]	--
Percentage of occupation time above or below fixed reference temperature [%]*	X
--	
*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other indicator:**	
The indicator if fixed in terms of percentage: it is allowed to exceed in a maximum of 4% occupation time hours of the building for each of its uses throughout the year for the fixed temperatures. This implies that the indicator works for the sum of winter and summer hours and not exclusively for any of them. In works on existing buildings this indicator only aplies to: • extensions (regardless of its surface) • changes of use (regardless of its surface) • reforms or improvements where the interventions affect more than 25% of the thermal envelope and, at the same time, where the thermal generation systems are also reformed.	

Table A.4b— Numeric indicator used for the requirement on the winter thermal comfort (See Clause 8)

Application: Works on existing buildings	
Numeric indicator	**Choice**
Time above a fixed reference temperature [h]	--
Temperature weighted time above a fixed reference temperature [k.h]	--
Percentage of occupation time below fixed reference temperature [%]*	X
--	
*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other indicator:**	
The indicator if fixed in terms of percentage: It is allowed to exceed in a maximum of 4% of the hours of the occupation time of the building for each of its uses throughout the year for the fixed referenced temperature. This implies that the indicator works for the sum of winter and summer hours and not exclusively for any	

of them.

In works on existing buildings this indicator only aplies to:

- extensions (regardless of its surface)
- changes of use (regardless of its surface)
- reforms or improvements where the interventions affect more than 25% of the thermal envelope and, at the same time, where the thermal generation systems are also reformed.

Tables A.5b to A.7b are not applicable because there are no requirements set in Table A.2b for these EPB features.

Table A.8b— Numeric indicator used for the requirement on the overall thermal insulation of the thermal envelope (See Clause 12)

Application: Works on existing buildings	
Numeric indicator	**Choice**
Overall transmition heat tranfer coefficient H_{tr} [W/K]	
Mean thermal transmittance U_{mn} [W/m².K]	X(1)
Ratio; define*	
<Free text>Other indicator; define*--	
--	

*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:
Description in case of other indicator:

(1) U_{mn} (although it is named *K* in CTE DB-HE for consistency with previous regulations): mean thermal transmittance of the thermal envelope. It is expressed in W/m²·K

$U_{mn} = K = H_{tr} / A_{te}$

where:

- H_{tr} corresponds to the overall heat transfer coefficient of the thermal envelope (including its thermal bridges). For simplified computation, elements in contact with the ground and elements in contact with other inner spaces or buildings can be excluded; It is expressed in W/K
- A_{te} is the exchange area of the thermal envelope obtained as a sum of the different components considered in the heat transmission (those considered in H_{tr}). It can therefore exclude, as a valid simplification, the areas of elements of the thermal envelope in contact with the ground or with other buildings or adjacent spaces outside the thermal envelope. It is expressed in m²

NOTE 1 In a simplified way, this parameter can be calculated from the thermal transmittances and surfaces of the elements of the thermal envelope and an adjustment factor:

$$K = \Sigma_x b_{tr,x} [\Sigma_i A_{x,i} U_{x,i} + \Sigma_k l_{x,k} \Psi_{x,k} + \Sigma_j x_{x,j}] / \Sigma_x \Sigma_i b_{tr,x} A_{x,i}$$

where:

- $b_{tr,\ x}$ is the adjustment factor for the envelope elements. Its value is 1 except for elements in contact with the ground or with buildings or adjacent spaces outside the thermal envelope, where it takes the value 0;
- $A_{x,\ i}$ is the exchange area of the element of the thermal envelope considered;
- $U_{x,\ i}$ is the value of the thermal transmittance of the element of the thermal envelope considered; The thermal transmittance applicable to the elements in contact with the ground includes not only the intrinsic transmittance of the element but also the effect of the terrain.
- $l_{x,\ k}$ is the length of the thermal bridge considered;
- $\Psi_{x,\ k}$ is the value of the linear thermal transmittance of the thermal bridge considered;
- $x_{x,\ j}$ is the point transmittance of the thermal bridge considered.

NOTE 2 In the simplified calculation, the transmittance and surface area of construction solutions designed to reduce energy needs (terraced greenhouses, parietodynamic walls, Trombe walls, etc.) are also excluded.

NOTE 3 The allowed limits for this indicator is weighted according to the compactness of the building and the climatic zone.

On existing buildings this indicator only aplies for:

- extensions (regardless of its surface)
- usage changes (regardless of its surface)
- reforms or improvements where the interventions affect more than 25% of the thermal envelope

Table A.9 b— Numeric indicator used for the requirement on the thermal insulation of individual elements of the thermal envelope (See Clause 13)

Application: Works on existing buildings	
Numeric indicator	**Choice**
Minimum temperature factor f_{Rsi} *[-]*	
Thermal transmittance *U* [W/m².K]	X
Total thermal resistance R_{tot} [m².K/W]	
Intrinsic element thermal resistance $R_{c,op}$ [m².K/W]	
<Free text>Other indicator; define*--	
--	
*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other indicator:**	
Not applicable. But note that specific detail provided in Table B.2b for exceptions for this requirement: Thermal insulation of individual elements of the thermal envelope applies in works on existing buildings applies for:	

- extensions (regardless of its surface)
- usage changes (regardless of its surface)
- reforms or improvements where the interventions affect more than 25% of the thermal envelope

For reforms or improvements where the interventions affect less than 25% of the thermal envelope this requirement will apply only to those elements of the thermal envelope:

- that will be replaced, incorporated, or substantially modified (when elements of the thermal envelope, e.g. window, roof, wall, etc, are completly replaced or when new elements are added to the thermal envelope, maximum *U*-values apply)
- whose internal or external conditions are modified as a result of the intervention, when these increase the energy needs of the building.

For works on existing buildings the thermal insulation of individual elements may be exceeded when the overall thermal insulation of the envelope obtained considering the final thermal transmittance of the affected elements does not exceed what obtained by applying the regulatory values

Concerning Table A.10b, thermal bridges don't have explicit requirements, but they are evaluated both into the global EPB assessments and into the overall heat transfer coefficient through the thermal envelope of the building. This practical option stimulates “good solutions” as discussed in ISO/TR 52108-2[7]

Table A.11b— Numeric indicator used for the requirement on the window energy performance (See Clause 15)

Application: Works on existing buildings	
Numeric indicator	**Choice**
Heating energy performance $P_{E;H;w}$ [kWh/m^2]	
Cooling energy performance $P_{E;C;w}$ [kWh/m^2]	
Combination of heating and cooling energy performance $P_{E;H*C;w}$ [kWh/m^2]	
For glazing only: energy balance value E [W/(m^2.K)]	
Minimal window area in certain types of rooms: specify*	
Thermal window transmittance U_H [W/m^2.K]	X
--	
If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: **Description in case of other method:**	
For the calculation of the thermal transmittance of windows (windows, skylights or transparent doors) U_H , the UNE EN ISO 10077 standard is used:	

Note that specific detail provided in Table A.2b for exceptions to this requirement:
Thermal insulation of individual window elements of the thermal envelope apply in works on existing buildings for:

- extensions (regardless of its surface)
- usage changes (regardless of its surface)
- reforms or improvements where the interventions affect more than 25% of the thermal envelope

For reforms or improvements where less than 25% of the thermal envelope is affected this requirement will apply only to those elements belonging to the thermal envelope:

- that will be replaced, incorporated, or substantially modified;
- whose internal or external conditions are modified as a result of the intervention, whenever the energy needs of the building are increased.

For works on existing buildings the thermal insulation of individual elements may be exceeded when the overall thermal insulation of the envelope obtained considering the final thermal transmittance of the affected elements does not exceed what obtained by applying the regulatory values

Table A.12b is not applicable

Table A.13b — Numeric indicator used for the requirement on solar control (See Clause 17)

Application: Works on existing buildings	
Numeric indicator	**Choice**
Solar factor g or g_{tot} or F_{npss} [-]	
Solar control *[-]*	X
--	

*If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:
Description in case of other indicator:

Solar control ($q_{sol;jul}$) is the ratio between the cummulative window solar gains for the month of July ($Q_{sol;jul}$) considering only the windows in the thermal envelope and with their movable solar shading protections being activated, and the surface of the occupied spaces within the thermal envelope (A_u). It can be applied to the building or to part of it.

$q_{sol;jul}$ is defined as: $q_{sol;jul} = Q_{sol;jul} / A_u = [\ \Sigma_k\ F_{sh,obst}\ g_{gl,sh;wi}\ (1- F_F)\ A_{w;p}\ H_{sol:jul}] /\ A_u$

where:

- $F_{sh;\ obst}$ is the reducing factor due to external shadings (it includes all the elements outside of windows, such as overhangs, lateral fins, setbacks, remote obstacles, etc.), for the month of July, for window k, and represents the reduction in incident solar irradiation due to permanent shading of those obstacles.
- $g_{gl;\ sh;\ wi}$ is the total solar energy transmittance of the glazing with the movable shading device being activated, for the month of July and window k;
- F_F is the frame fraction of the window k (in a simplified way, the value of 0.25 can be adopted)

- $A_{w;\,p}$ is the projected surface (m^2) of window k;
- $H_{sol;\,jul}$ is the cumulative average solar irradiation of the month of July (kWh / m^2 · month) for the considered climate and for the inclination and orientation of window k.
- A_u is the area of the occupied spaces inside the thermal envelope, as considered in accordance with the rest of the EPB balance.

The objective of this parameter is to ensure the possibility of effective solar gains control, mainly in the summer season, by means of both movable shading devices and fixed elements, limiting the impact of solar radiation on the occupied (and normally conditioned) spaces.