URBEM

Urban Reference Buildings for Energy Modelling

Region:	Liguria	**Archetype code:**
Building category:	Residential buildings – Apartments in multi-family block	RES_APPBLOCK_
Period of construction:	1961-1970	1961-1970_F_LIG
Climatic zone:	F	**Number of records:** 120	

Description:

External walls: no data available

Roof slabs: no data available

Data sources:
EPC databases (100%)

|	Data	Symbol	Unit of measure	Mean value	Standard deviation	Q1 (first quartile)	Q2 (Median value)	Q3 (third quartile)
BUILDING GEOMETRY	Number of floors	n_f	-	-	-	-	-	-
	Gross height	H_g	m	-	-	-	-	-
	Footprint area	$A_{footprint}$	m²	-	-	-	-	-
	Heated gross floor area	$A_{H;g}$	m²	-	-	-	-	-
	Heated net floor area	$A_{H;n}$	m²	-	-	-	-	-
	Heated gross volume	$V_{H;g}$	m³	-	-	-	-	-
	Heated net volume	$V_{H;n}$	m³	-	-	-	-	-
	Compactness ratio	$A_{env}/V_{H;g}$	m⁻¹	0.77	0.28	0.62	0.74	0.87
	WWR – North orientation	WWR_N	-	-	-	-	-	-
	WWR – South orientation	WWR_S	-	-	-	-	-	-
	WWR – East orientation	WWR_E	-	-	-	-	-	-
	WWR – West orientation	WWR_W	-	-	-	-	-	-
	Window to useful floor area ratio	A_{wi}/A_{use}	-	0.10	0.04	0.08	0.09	0.11
ENVELOPE	Roof type		-					
	U-value of the roof	$U_{fl;up}$	W/(m²·K)	1.42	0.59	0.99	1.45	1.92
	External walls type		-					
	U-value of the wall	U_{wl}	W/(m²·K)	1.20	0.49	0.98	1.19	1.34
	Slab on ground floor type		-					
	U-value of the floor	$U_{fl;lw}$	W/(m²·K)	1.46	0.43	1.15	1.65	1.76
	Windows type		-					
	U-value of the windows	U_W	W/(m²·K)	4.24	1.12	3.51	4.43	5.05
	Shading system type		-					
GAINS and VENTILATION	Occupancy density *	O_C	person/m²	UNI EN 16798-1 - Table A.19				
	Lighting power density *	W_L	W/m²	UNI EN 16798-1 - A.8.3				
	Equipment power density *	W_A	W/m²	UNI EN 16798-1 - A.8.3				
	Type of ventilation		Natural: 100%					
	Air exchange rate *	n	h⁻¹	0.30	0.00	0.30	0.30	0.30
THERMAL SYSTEMS	Heating system type		Unknown: 95%; Autonomous: 5%					
	Heating generator		Unknown: 57%; Traditional boiler: 23%; Fireplace: 13%; Condensing boiler: 3%; Electric heating: 3%; Air-source heat pump: 1%					
	Daily operating time of the heating system *		No limitations					
	Energy carrier		Unknown: 55%; Natural gas: 13%; Electricity and solid biomass: 11%; Gas Oil: 6%; Electricity: 4%; Solid biomass: 3%; LPG: 3%; Electricity and gas oil: 3%; Electricity and natural gas: 2%					
	Heating emission sub-system		Unknown: 55%; Radiators: 37%; Convectors: 4%; Air Ducts: 3%; Radiant panels: 1%					
	Cooling system type		-					
	Daily operating time of the cooling system *	t_C	h	-	-	-	-	-
	Cooling emission sub-system		-					
	DHW system type		-					
	DHW generator		Unknown: 53%; Electric boiler: 33%; Electric heat pump: 8%; Natural gas boiler: 5%; Condensing boiler: 1%					
	* These values were not available in the considered sources, and are thus derived from UNI EN Standards							

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Numerical variables – GEOMETRY

COMPACTNESS RATIO
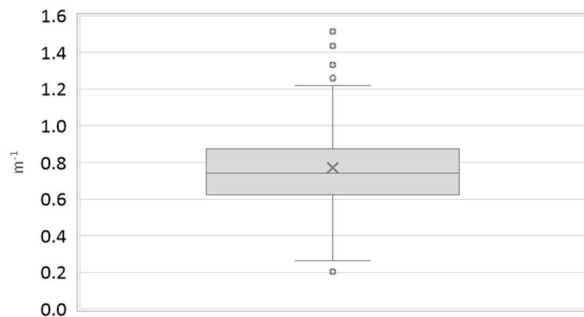
WINDOWS TO WALL RATIO
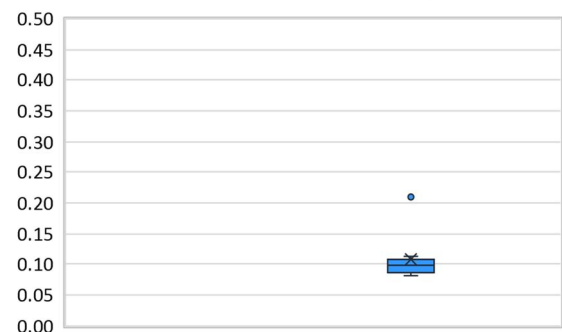
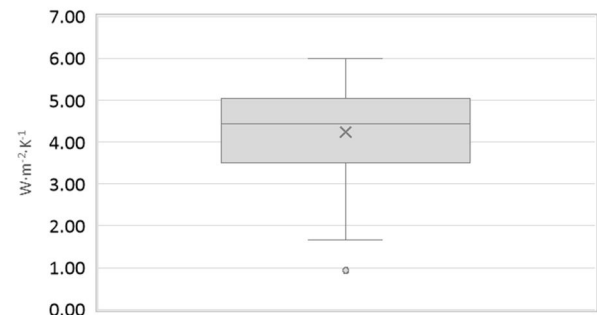
☐ WWR_N ☐ WWR_S ☐ WWR_E ☐ WWR_W ☐ Awi/Ause

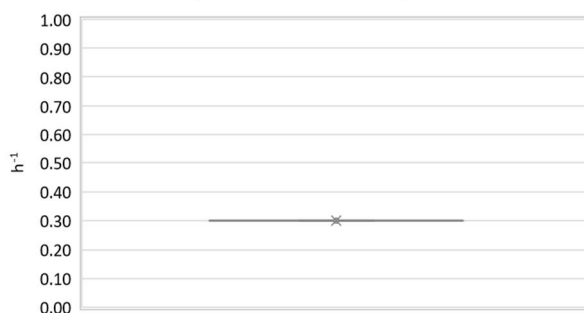## Numerical variables – ENVELOPE

OPAQUE BUILDING COMPONENTS U-VALUE
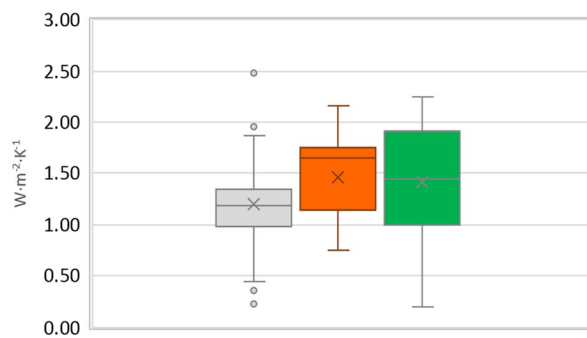
☐ External walls ☐ Slab on ground floor ☐ Roof

WINDOWS U-VALUE

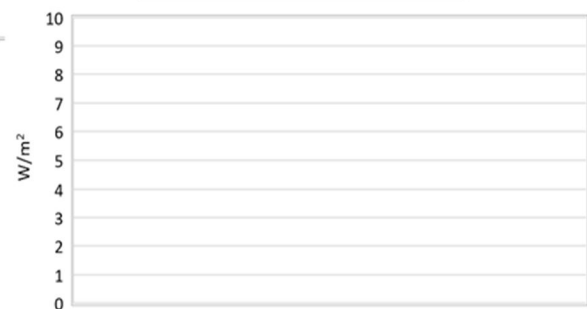## Numerical variables – GAINS, VENTILATION and SYSTEMS USAGE (Standard Values)

AIR EXCHANGE RATE

OCCUPANCY DENSITY

INTERNAL GAINS POWER DENSITY
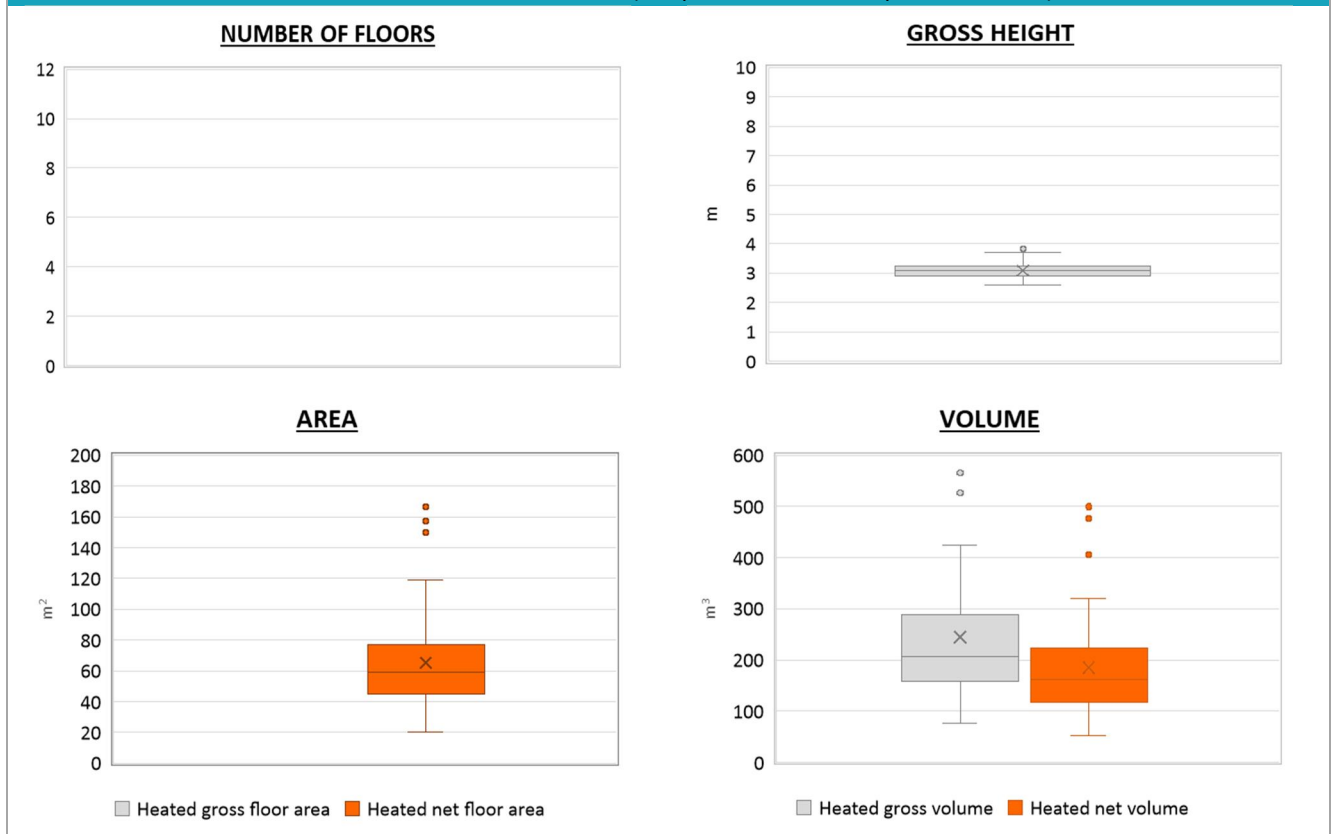

DAILY OPERATING TIME

☐ Heating ☐ Cooling

Residential buildings – Apartment blocks – 1961-1970 – Zone F – Italy

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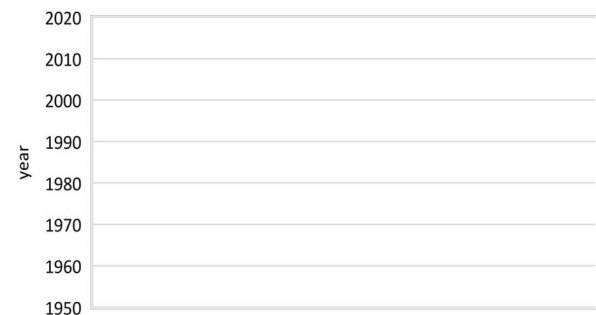| ADDITIONAL DATA								
	Data	Symbol	Unit of measure	Mean value	Standard deviation	Q1 (first quartile)	Median value	Q3 (third quartile)
GEOMETRY: apartments	Inter-storey height	H_n	m	3.1	0.3	2.9	3.1	3.2
	Heated gross floor area	$A_{H;g}$	m²	-	-	-	-	-
	Heated net floor area	$A_{H;n}$	m²	65.2	37.2	44.8	59.3	77.3
	Heated gross volume	$V_{H;g}$	m³	244.7	165.3	158.4	206.8	288.5
	Heated net volume	$V_{H;n}$	m³	185.4	130.7	116.6	163.0	222.8
THERMAL SYSTEMS	Heating efficiency or *COP*	$\eta_{H;gen}$ or $COP_{H;gen}$	-	This value has to be retrieved from suitable datasheets				
	Total heating power *	$P_{H;gen}$	kW	16.9	8.5	9.3	19.3	24.0
	Cooling efficiency or *EER*	$\eta_{C;gen}$ or $EER_{C;gen}$	-	This value has to be retrieved from suitable datasheets				
	Total cooling power *	$P_{C;gen}$	kW	-	-	-	-	-
	Temperature of DHW	θ_W	°C	-	-	-	-	-
	DHW system power *	$P_{W;gen}$	kW	9.1	10.6	1.2	1.5	21.7
	* These values refer to the apartment scale							

Additional data: GEOMETRY (the plots refer to the apartment scale)

NUMBER OF FLOORS

GROSS HEIGHT

AREA

VOLUME

□ Heated gross floor area ■ Heated net floor area

□ Heated gross volume ■ Heated net volume

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Additional data: other numerical variables that are not included in the archetype

DHW SUPPLY TEMPERATURE

SYSTEM POWER

☐ Heating ☐ DHW ☐ Cooling
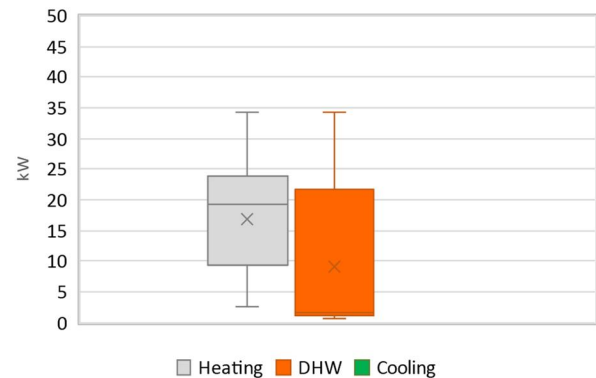
CO₂ EMISSION
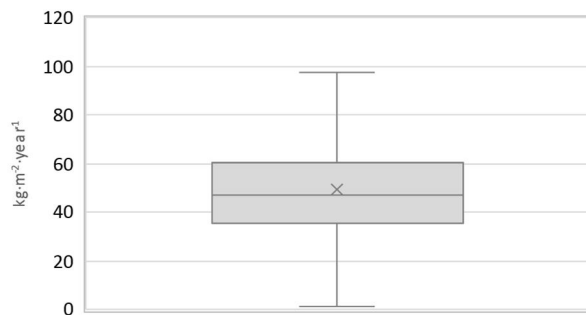
HEATING SYSTEM INSTALLATION YEAR

NON-RENEWABLE PRIMARY ENERGY USE

☐ EP_H_nren ☐ EP_W_nren ☐ EP_GL_nren

RENEWABLE PRIMARY ENERGY USE

☐ EP_H_ren ☐ EP_W_ren
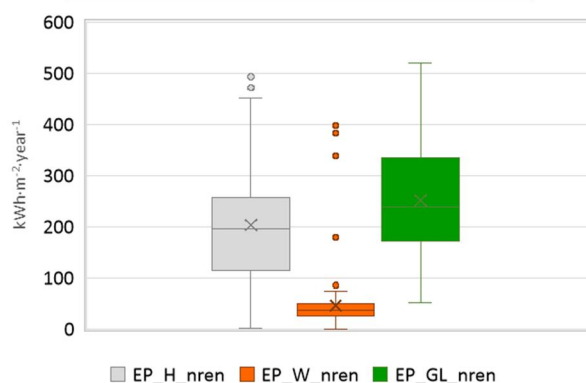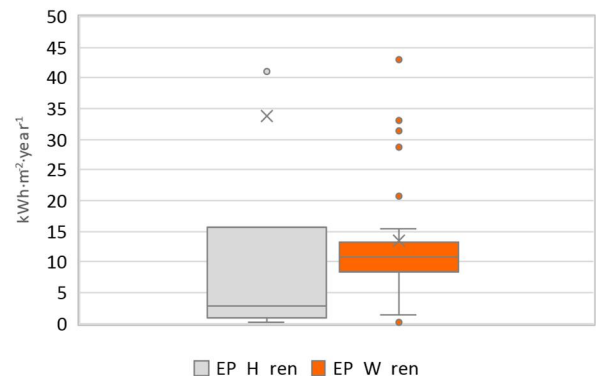
NOTE: Sample size of the analysed data.

Compactness ratio: 120; Window to useful floor area ratio: 11; U-value of the roof: 15; U-value of the wall: 109; U-value of the floor: 11; U-value of the windows: 120; Inter-storey height: 120; Heated net floor area: 120; Heated gross volume: 120; Heated net volume: 120; Total heating power: 38; DHW system power: 73; CO2 Emission: 109; EP_H_nren: 120; EP_W_nren: 115; EP_GL_nren: 120; EP_H_ren: 42; EP_W_ren: 81