URBEM

Urban Reference Buildings for Energy Modelling

Region:	Liguria		Archetype code:
Building category:	Residential buildings – Single family houses		RES_SINGLE_
Period of construction:	-1950		-1950_F_LIG
Climatic zone:	F	Number of records:	280

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	0.27	0.57	0.76	0.93
	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	0.02	0.09	0.10	0.11
ENVELOPE	Roof type				-			
	U-value of the roof	$U_{fl;up}$	W/(m²·K)	1.56	0.89	0.60	1.62	2.15
	External walls type				-			
	U-value of the wall	U_{wl}	W/(m²·K)	1.89	0.68	1.30	1.85	2.35
	Slab on ground floor type				-			
	U-value of the floor	$U_{fl;lw}$	W/(m²·K)	1.63	0.54	1.41	1.64	2.00
	Windows type				-			
	U-value of the windows	U_W	W/(m²·K)	4.10	1.15	3.25	4.39	4.95
	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: 99%; Mechanical: 1%			
	Air exchange rate *	n	h⁻¹	0.30	0.00	0.30	0.30	0.30
THERMAL SYSTEMS	Heating system type				Unknown: 97%; Autonomous: 3%			
	Heating generator				Unknown: 68%; Traditional boiler: 16%; Fireplace: 13%; Condensing boiler: 3%			
	Daily operating time of the heating system *				No limitations			
	Energy carrier				Unknown: 69%; Natural gas: 10%; Electricity and solid biomass: 7%; Solid biomass: 5%; LPG: 5%; Electricity and natural gas: 3%; Gas Oil: 1%			
	Heating emission sub-system				Unknown: 66%; Radiators: 25%; Air Ducts: 8%; Convectors: 1%			
	Cooling system type				-			
	Daily operating time of the cooling system *	t_C	h	-	-	-	-	-
	Cooling emission sub-system				-			
	DHW system type				-			
	DHW generator				Unknown: 63%; Electric boiler: 25%; Natural gas boiler: 5%; Electric heat pump: 4%; Condensing boiler: 3%			
	* These values were not available in the considered sources, and are thus derived from UNI EN Standards							

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Numerical variables – GEOMETRY
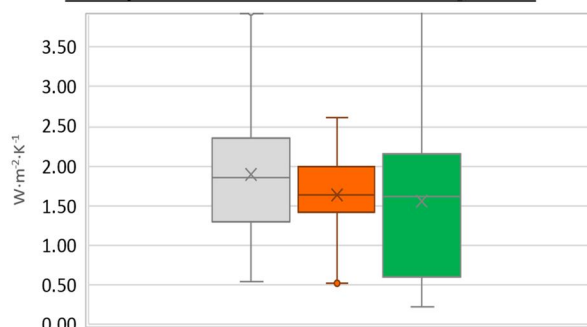
COMPACTNESS RATIO
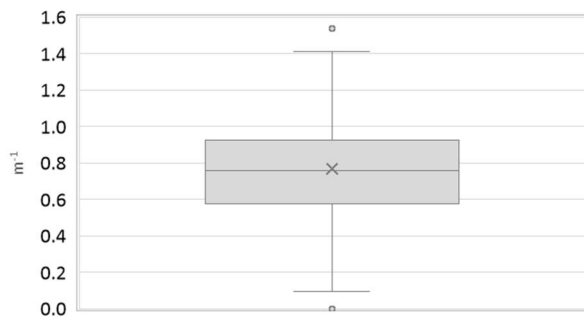
WINDOWS TO WALL RATIO
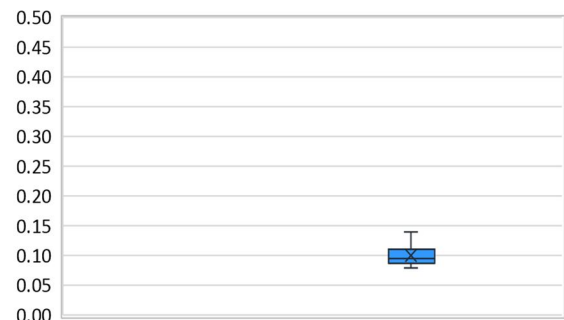
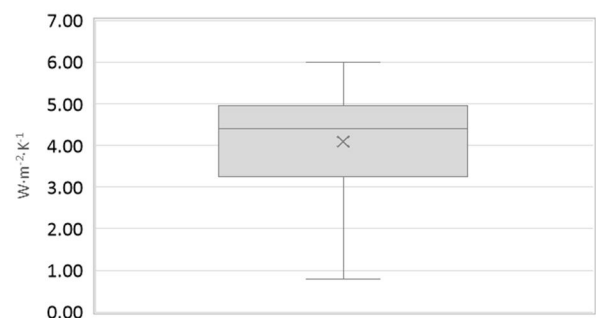☐ WWR_N ☐ WWR_S ☐ WWR_E ☐ WWR_W ☐ Awi/Ause

Numerical variables – ENVELOPE

OPAQUE BUILDING COMPONENTS U-VALUE

☐ External walls ☐ Slab on ground floor ☐ Roof
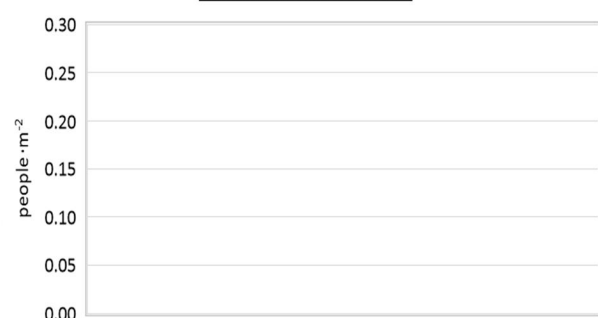
WINDOWS U-VALUE

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

AIR EXCHANGE RATE

OCCUPANCY DENSITY

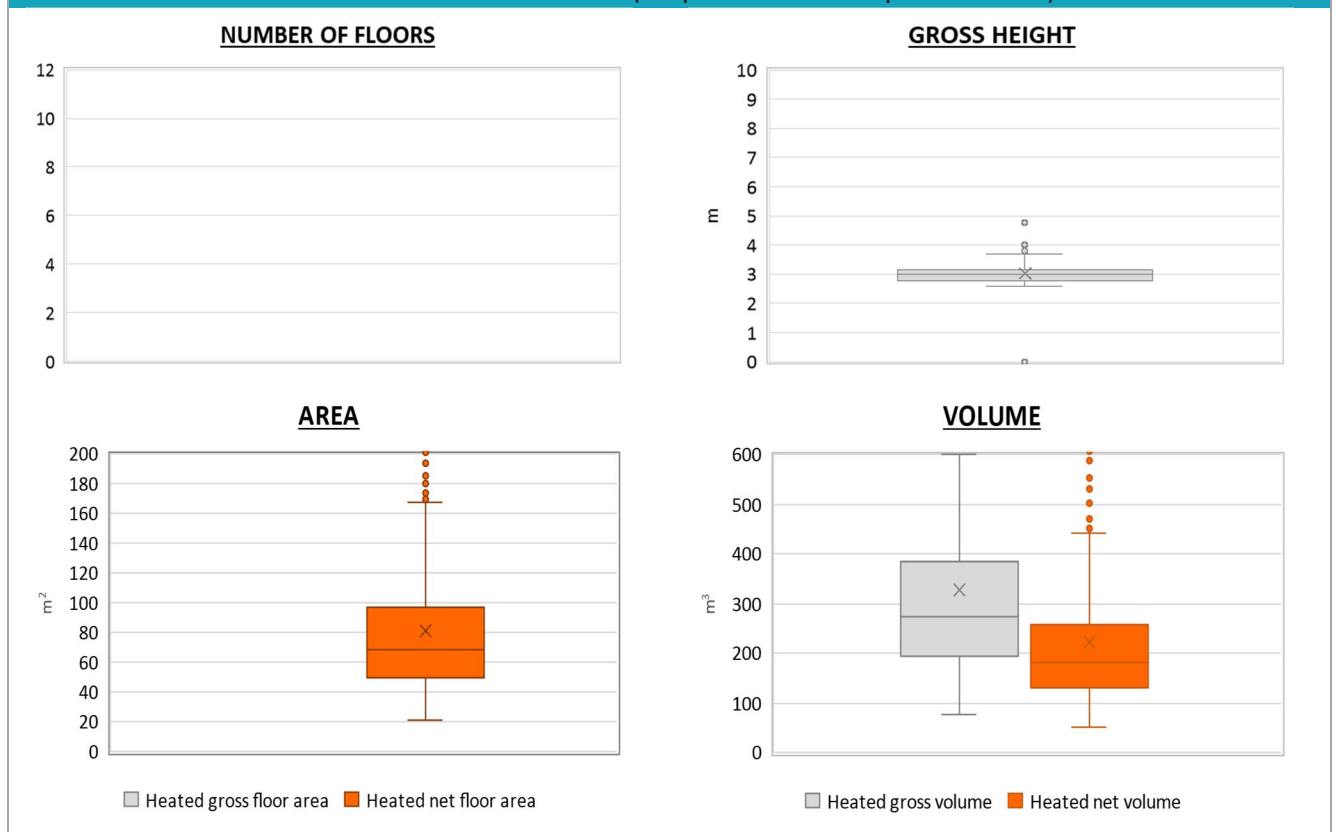### INTERNAL GAINS POWER DENSITY

DAILY OPERATING TIME

☐ Heating ☐ Cooling

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	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	3.0	0.4	2.8	3.0	3.2
	Heated gross floor area	$A_{H;g}$	m²	-	-	-	-	-
	Heated net floor area	$A_{H;n}$	m²	81.5	52.6	50.0	68.2	97.3
	Heated gross volume	$V_{H;g}$	m³	329.1	228.7	195.8	273.3	383.3
	Heated net volume	$V_{H;n}$	m³	224.1	154.0	131.2	182.0	259.0
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	19.9	9.4	12.0	23.7	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	17.3	69.0	1.2	1.5	24.0
	* 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
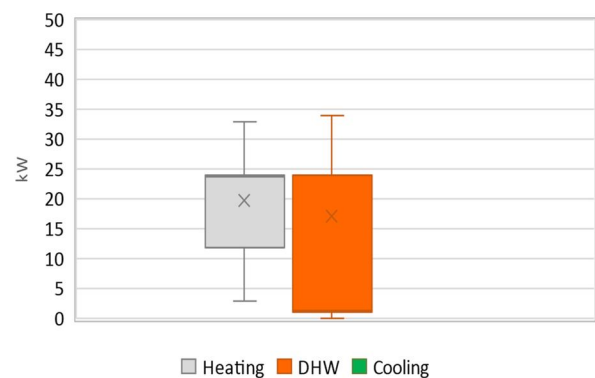
CO₂ EMISSION
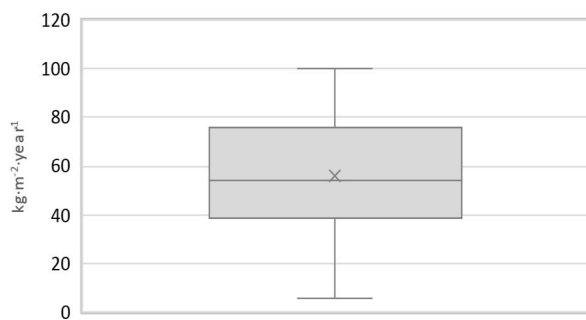
HEATING SYSTEM INSTALLATION YEAR

NON-RENEWABLE PRIMARY ENERGY USE

☐ EP_H_nren ■ EP_W_nren ■ EP_GL_nren

RENEWABLE PRIMARY ENERGY USE

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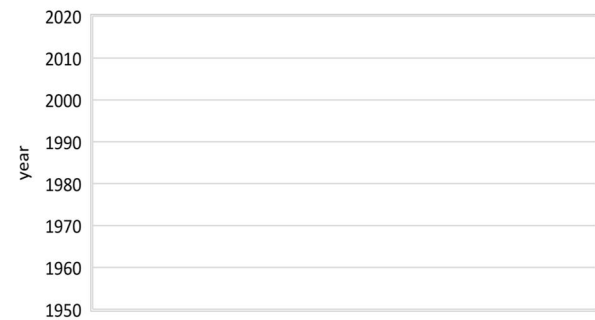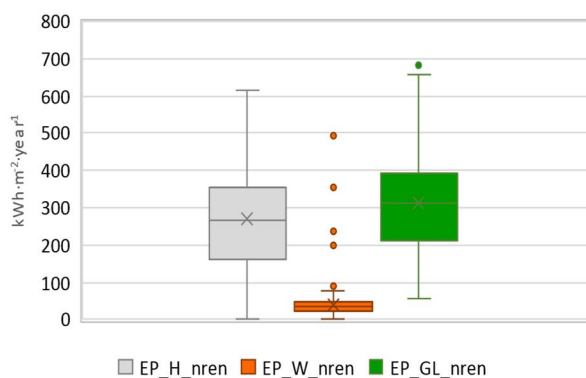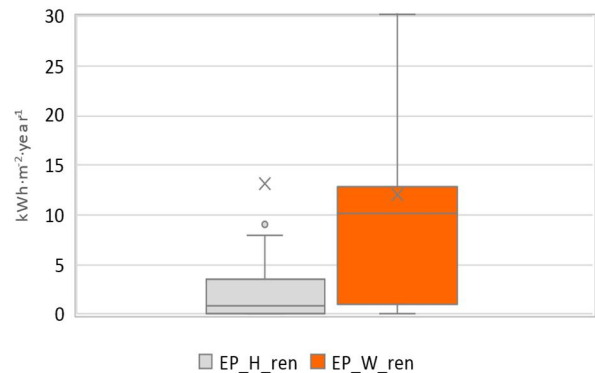
NOTE: Sample size of the analysed data.

Compactness ratio: 279; Window to useful floor area ratio: 27; U-value of the roof: 83; U-value of the wall: 260; U-value of the floor: 34; U-value of the windows: 280; Inter-storey height: 279; Heated net floor area: 279; Heated gross volume: 279; Heated net volume: 279; Total heating power: 63; DHW system power: 154; CO2 Emission: 238; EP_H_nren: 277; EP_W_nren: 272; EP_GL_nren: 275; EP_H_ren: 74; EP_W_ren: 171