

## FACTORS DETAILS

### Factors details form

Unilab Coils 8.0 ev - build 160927[E]

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Project: ... | Standard Conditions | Units: ...

... \CITIZEN 18T 8NR 650.24A...

**Cooling**

**Calculation Mode**

☒ Verify  
☐ Design

**Geometry**

CITIZEN

**Geometry Details**

Search Geometry

Modified factors

**Tube**

**Fin**

**Manifolds**

**Air Side Details**

Output

Calculate | Print

AIR SIDE		Total	Sensible
Capacity	ton(ref.)	18,419	
Airflow	cft/min	2000	
Face Velocity	ft/min	500	
Inlet Temperature DB	°F	86	
Inlet Temperature WB	°F	84	
Outlet Temperature DB	°F	53,3	
Outlet Temperature WE	°F	53,3	
Fouling factor	(m <sup>2</sup> K)/W	0	
Pressure Drop	Pa	361	

TUBE SIDE	
Fluid	WATER (PL)
Pressure	bar A 1
Inlet Temperature	°C 7
Outlet Temperature	°C 12,5
Pressure Drop	ftH2O 8,539
Fouling factor	(m <sup>2</sup> K)/W 0
Fluid Velocity	m/s 1,4

N° tubes for row	18	Finned Length	in 25,6
Rows	8	Circuits	18
Fin Pitch	mm (2) 2,11	Baffles n°	0
Nr of Skipped Tubes	0		

Coils 8.0 by Unilab SRL

Ready 09:46 28/10/2016

**Geometry Details**

**Geometries**

- New
- Save
- Save as
- Copy to...

**Current View**

- Geometry Details
- Factors Details**
- DeltaF Factors
- Press. Drop Factors

**GEOMETRY DETAIL**

Description: CITIZEN

Fin (Integral/Spiroidal): Integral

Spacing (Staggered/Aligned): Staggered

Tubes Spacing: mm 31,75

Rows Spacing: mm 27,5

Tube Shape: Circular

Tube Thickness: mm 0,406

Tube External Diam.: mm 12,7

Tube Width: mm 0

Tube Height: mm 0

Fin Thickness: mm 0,13

Fin Height: mm 0

Diagram: PR = 27,5 mm, PT = 31,8 mm, DE = 12,7 mm

Fin corrug.: Corrugated

Tube corrug.: Smooth

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**Geometry Details**

**Geometries**

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**Current View**

- Geometry Details
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**ADVANCED GEOMETRY FACTORS**

Fin Corr. Factor	1,1500	Slope Fin Corr. Factor	1,0000
Coef. Factor Tube Side	1,0000	Slope Fact. Tube Side Coeff.	1,0000
Corr. Factor Friction factor	1,0000	Slope Corr. Factor Friction factor	1,0000
Friction Factor Air Side	1,2500	Slope Fact. Air Friction	1,0000
Pid./Aum. Factor Surface	1,0000	Tube Inner Surfaces Ratio	1,0000
Red. Area Pass. Tube	1,0000	Security Factor	1
Latent air friction factor	1,0000	Factor for the sensible capacity	0,6
DeltaF factors table	<input type="checkbox"/>		

**Calculation settings**

Calculation method: Standard

Press. drp. calculation: Standard

K0 coeff. for DPW curve: 0,0000

K1 coeff. for DPW curve: 0,0000

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Descriptions of factors details



All the under factors can have a positive effect on the calculation only if obtained by laboratory test. They should not be used to trim performances of the coils without knowing the possible consequences

<b><i>Fin corrugation factor/slope:</i></b>	this parameter, defined as fin corrugation factor, represents the ratio (with the same air frontal velocity) between the exchange coefficient of a corrugated finned coil, and the corresponding exchange coefficient of a plain fin coil. This value is equal to 1 for plain fin. For further corrugation cases, the factors must be experimentally determined.
<b><i>Tube side coef. factor/slope:</i></b>	this parameter, defined as "coefficient factor inside tubes/slope", represents the ratio between the real exchange coefficient of internal tubes and the ideal one. This value is equal to 1 for cylindrical tubes with internal plain surface. For further cases, the factor must be experimentally determined
<b><i>Correction factor of friction factor/slope:</i></b>	this parameter, defined as "correction factor of friction factor/slope", represents the ratio between the real tubes internal side friction factor and the ideal one. This value is equal to 1 for cylindrical tubes with internal plain surface. For further cases, the factor must be experimentally determined.
<b><i>Friction factor air side/slope:</i></b>	this parameter, defined as "friction factor air side/slope", represents the ratio between the real tubes external side friction factor and the ideal one. This value is equal to 1 for plain fins. For further cases, the factor must be experimentally determined.
<b><i>"Slope" factors</i></b>	the coefficient of proportionality in logarithmic coordinates between the item at issue (fin etc...) and the related fluid speed. This parameter enables the user to find the correction factor in function of speed.
<b><i>Red/Inc Surface factor:</i></b>	this parameter, defined as the surface reduction/increase factor, is a nondimensional parameter which considers the possible calculation differences of the exchange surface. This factor permits to analyze those cases in which the geometry parameters are not constant, such as differentiated spacing coils (typical for direct expansion coils at very low temperature) or differentiated fin height coils.
<b><i>Reduction Area Pass. Tube:</i></b>	this parameter, defined as "tube passage reduction area", permits to consider possible elements which may reduce the fluid passage area. The value goes from 0 to 1.
<b><i>Latent air friction factor</i></b>	this factor applies specifically to calculations with dehumidification. In this type of application the fin is covered by water, which makes an increment on the air side pressure drops, calculated by a specific equation. This factor lets you trim the behavior of this equation.
<b><i>Tube internal surface ratio</i></b>	this parameter applies to grooved tubes and it lets you specify the ratio of the internal surface calculated like (Internal Grooved Surface / Internal Smooth Surface). This parameter is very important when the controlling resistance is tubes side. For a detailed explanation, please see the FAQ called "Considerations about grooved tubes" at the end of the manual.
<b><i>Security factor</i></b>	this parameter affects the entire calculation, and lets you increase or decrease the performance of the coil. It's intended to be a factor to gain some security margin.
<b><i>Sensible factor</i></b>	this parameter affects the sensible capacity of the coil. The standard value is 0.6 and it is not proportional.

## What happens when the factors details are changed

	Please don't change the slope factors.
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***Fin corrugation factor***

The default value is 1.

If the value increases / decreases, the coefficient of partial exchange air side increases / decreases.

***Tube side coef. factor***

The default value is 1.

If the value increases / decreases, the coefficient of partial exchange inside the tube increases / decreases.

***Correction factor of friction factor***

The default value is 1.

If the value increases / decreases, the inner tube side pressure drop increases / decreases.

***Friction factor air side***

The default value is 1.

If the value increases / decreases, the air side pressure loss increases / decreases.

***Red/Inc Surface factor***

The default value is 1.

If the value increases / decreases, the heat exchange surface in the calculation increases / decreases and so the power increases / decreases.

***Reduction Area Pass. Tube:***

The default value is 1.

If the value increases / decreases, the passage area of the pipe decreases / increases.

***Latent air friction factor***

The default value is 1.

If the value increases / decreases, the load losses relating to condensed increases / decreases (you have to apply only to cooling coils of air)

***Tube internal surface ratio***

The default value is 1.

If the value increases / decreases, the tube internal exchange surface increases / decreases.

***Security factor***

The default value is 1.

If the value increases / decreases, the capacity increases / decreases.

***Sensible factor***

The default value is 0,6.

If the value increases / decreases, the sensitive capacity decreases / increases (you have to apply only to cooling coils of air).