

## Ecodesign in SystemairCAD

A quick guide to Ecodesign



# Ecodesign

To reduce products' energy consumption, the European Union has introduced new legal requirements – the Ecodesign standards – in order to remove the least energy efficient products from the market. This is an important part of the plan that will make it possible to fulfil the EU's 2020 Energy and Climate goals.

The new Ecodesign standards apply to a long list of energy related products, including the product category: Air Handling Units.

The Ecodesign Directive 1253/2014 concerning Air Handling Units prescribes minimum requirements regarding heat recovery efficiency, fan efficiency, SFP internal values, and operation of the air handling unit, which all must be followed. In addition, there are further requirements to the technical documentation that Systemair as a manufacturer of air handling units must enclose.

All minimum requirements are prescribed in Ecodesign Directive 1253/2014. Ecodesign Directive 1253/2014 is valid from 1 January 2016. The Ecodesign minimum requirements are increased gradually. The first level of requirements is valid from 1 January 2016. The second level is valid from 1 January 2018, and third level is valid from 1 January 2020.



# Ecodesign in SystemairCAD

## Bidirectional ventilation unit (Heat recovery units)

The selection software SystemairCAD is updated with an automatic Ecodesign calculation that will tell you whether the requirements for both 2016 and 2018 are fulfilled. All calculation details are summarised in the technical documentation.

Ecodesign						
	2016	Value	Limit	2018	Value	Limit
① Unit type (Non Residential - Bidirectional)	Approved			Approved		
② Fan with multispeed or Var.Speed Drive	Approved			Approved		
③ Heat recovery	Approved			Approved		
④ Thermal efficiency of Heat Recov. System	Approved	80.8	67.0	Approved	80.8	73.0
⑤ Pressure gauge (exclusively for 2018)	Approved			Approved		
⑥ SFPint in W/(m <sup>3</sup> /s)	Approved	904	1414	Approved	904	1134
⑦ Total check	Approved			Approved		

Printout from SystemairCAD with extra mandatory technical documentation in accordance with Ecodesign.

### ① Bidirectional ventilation unit (Heat recovery units)

Unit type (*non-residential – Bidirectional*)

A distinction is made between 'A residential ventilation unit' that covers air handling units with air volumes between 250 and 1000 m<sup>3</sup>/h. and 'A non-residential ventilation unit', which covers air handling units with air volumes higher than 1000 m<sup>3</sup>/h. In SystemairCAD, all air handling units are categorised as 'Non-residential ventilation units'.

*A bidirectional air handling unit means a unit which produces an air-flow between indoors and outdoors and is equipped with both exhaust and supply fans.*

### ② Fan with multispeed or var. speed drive

All fans must be equipped with speed control. All EC motors are approved automatically, because they have a frequency regulation. PM/AC motors can be delivered with

a frequency converter. The air handling unit can also be ordered without any frequency converter and still be legal to use, but a 'Warning' will appear in the printout. In this case, it will be the contractor's responsibility to ensure that the unit fulfils all Ecodesign requirements.

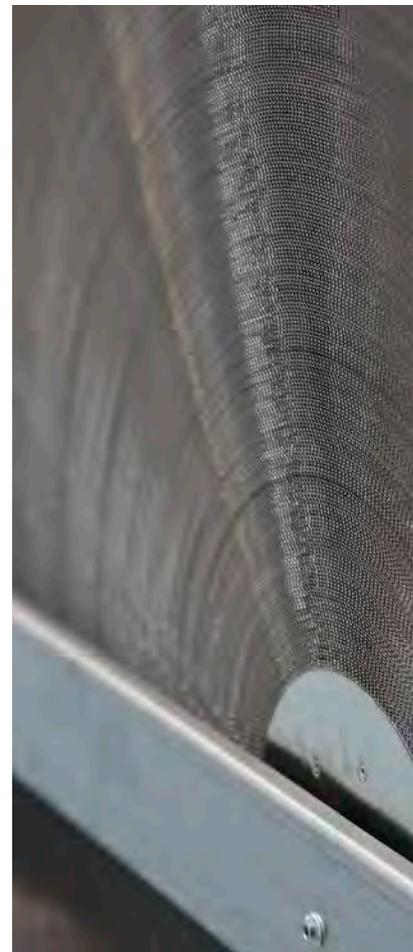
### ③ Heat recovery

All units must have heat recovery e.g. rotary heat exchanger, counterflow exchanger, cross-flow exchanger, or run-around coil exchangers.

### ④ Thermal efficiency of heat recovery system (HRS)

The actual value and the limit value is visible from the printout. The limit value is as follows (dry condition):

Rotary heat exchanger, counterflow exchanger, and cross-flow exchanger:  
 2016: 67%  
 2018: 73%  
 Run-around coil exchangers:  
 2016: 63%  
 2018: 68%.



8	Manufacturer	Systemair			
	Model	Geniox Comfort 12DR			
	Typology	NRVU;BVU			
	Drive Type		VSD	VSD	Installed
	Type of Heat Recovery System (HRS)	Rotary heat exchanger			
	Thermal efficiency of HRS (dry condition)	80.8			%
	Non Residential unit - flow rate		1.33	1.33	m <sup>3</sup> /s
	Effective electric power input incl. clean filters and variable drive		1.36	1.30	kW
	SFPint in W/(m <sup>3</sup> /s) 2016	904	469	436	W/(m <sup>3</sup> /s)
	SFPint in W/(m <sup>3</sup> /s) 2018	904	469	436	W/(m <sup>3</sup> /s)
	Face velocity		2.03	2.03	m/s
	Nominal external pressure		300.00	300.00	Pa
	Internal pressure drop of ventilation components		268.84	245.93	Pa
	Overall static pressure drop with clean filter		585.26	549.21	Pa
	Overall static efficiency of fans with clean filter		57.30	56.45	%
	Maximum external leakage rate	Leakage class L2 according to EN 1886. Leakage rate is less than 1%.			
	Maximum internal leakage rate	Leakage rate is less than 3%.			
	Energy class for filters		B	D	
	Visual filter warning description	Control display			
	Internet address with information about disassembly	techdoc.systemair.dk			

Printout from SystemairCAD with extra mandatory technical documentation in accordance with Ecodesign.

### 5 Pressure gauge

(Exclusively for 2018).

If the air handling unit has filters installed, they must be equipped with a visual alarm signal or an alarm in the control system, if the pressure drop across the filter exceeds the maximum allowed pressure drop.

### 6 SFPint in W (m<sup>3</sup>/s)

The SFP Internal calculation is based on the pressure drop in the following components:

- Filter pressure drop
- Pressure drop across the heat recovery system
- Pressure drop across the fans.

For calculation of the SFP Internal, the air handling unit is compared to a standard configuration, which is an F7 filter in the supply air and an M5 filter in the extract air.

By missing or lower filter classes, a 'penalty' is added to the filter's pressure drop. Thus, the actual value is increased as well as the limit value is lowered.

Example: If the air handling unit has an M6 filter in the supply air and an M5 filter in the extract air, the air

handling unit receives a calculative 'penalty', which causes that the pressure drop for the supply air filter is calculated with 200 Pa.

Thus, the SFP Internal value is increased, and the limit value is lowered with 200 points. Therefore, it will be difficult to comply with the limit value.

This also applies to the extract air filter. The 'penalty' is 160 Pa, if the filter is missing or the filter class is lower than M5.

If more efficient filters than F7 and M5 are selected, the calculation of SFP Internal is still based on the pressure drop for respectively F7 and M5. In this way, more efficient filters can be selected without affecting the SFP internal.

### 'Approved', 'Failed' or 'Warning'

- If all requirements are fulfilled, the function is marked as 'Approved'.
- If one or more requirements are not fulfilled, the function is marked with a 'Warning' or 'Failed'
- 'Warning' is displayed, if you need to pay special attention to something. Usually, to point out that the fans must be equipped with

variable speed drive (frequency converter).

- 'Failed' usually means that the efficiency in the chosen configuration is not ok. The air handling unit then needs to be further optimised.

### 7 Total check

'Approved' – All Ecodesign requirements are fulfilled.

'Failed' – One or more requirements are not fulfilled. The air handling unit is illegal to install and operate according to Ecodesign.

### 8 Technical specification

Additional technical specification that must be documented from the manufacturer according to Ecodesign Directive 1253/2014.



# Ecodesign

## **What does this mean for you as a customer at Systemair?**

As a general rule, Systemair's air handling units are prepared for the Ecodesign requirements in both 2016 and 2018. If the air handling unit is designed in an energy efficient way, all legal requirements are automatically fulfilled.

Ecodesign implies that extra mandatory Ecodesign data will be added to Systemair's technical documentation. From this documentation you can check whether the requirements are fulfilled or not – Ecodesign requirements for both 2016 and 2018.

If you have any unclarified questions regarding this matter, you are more than welcome to contact us.

Systemair wishes to contribute positively to global energy savings, and therefore we welcome the new Ecodesign requirements.

# Ecodesign in SystemairCAD

## Unidirectional ventilation unit (Supply-/Extract units)

<b>Ecodesign</b> Air handling unit with filters							
	2016	Value	Limit	2018	Value	Limit	
① Non Residential - Unidirectional	Approved			Approved			
② Fan with multispeed or Var.Speed Drive	Approved			Approved			
③ Pressure gauge (exclusively for 2018)	Approved			Approved			
④ SFPint in W/(m <sup>3</sup> /s)	Approved	219	250	Approved	219	230	
Total check	Approved			Approved			

<b>Ecodesign</b> Air handling unit without filters							
	2016	Value	Limit	2018	Value	Limit	
Non Residential - Unidirectional	Approved			Approved			
Fan with multispeed or Var.Speed Drive	Approved			Approved			
⑤ Fan efficiency	Approved	45	34	Approved	45	41	
Pressure gauge (exclusively for 2018)	Approved			Approved			
⑥ Total check	Approved			Approved			

Printout from SystemairCAD with extra mandatory technical documentation in accordance with Ecodesign. On top: Air handling unit with filters. In the bottom: Air handling unit without filters.

### ① Unidirectional ventilation unit (Supply-/Extract units)

Unit Type (Non-residential – Unidirectional)

*A unidirectional air handling unit means a ventilation unit which produces an airflow in one direction only. Either from indoors to outdoors (exhaust) or from outdoors to*

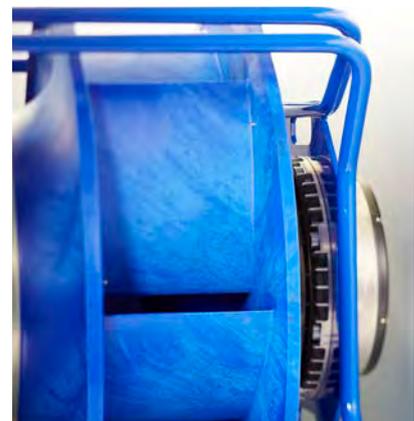
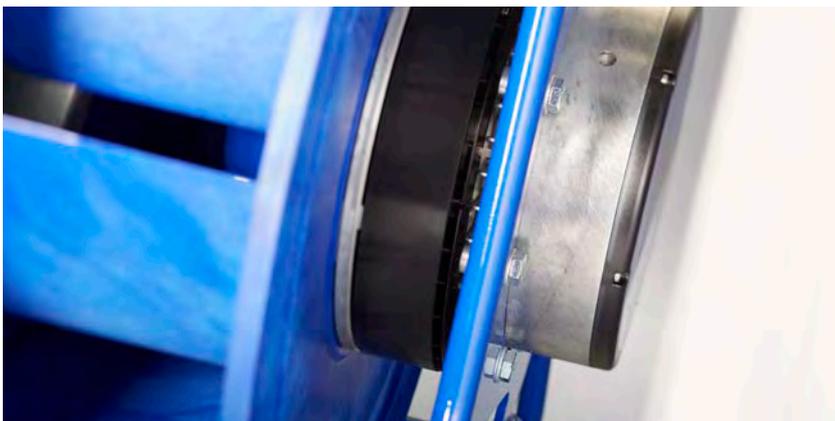
*indoors (supply), where the mechanically produced airflow is balanced by natural air supply or exhaust.*

### ② Fan with multispeed or var. speed drive

The fan must be equipped with speed control. All EC motors are approved automatically, as they have a frequency regulation. PM/AC motors can

be delivered with a frequency converter. The air handling unit can be ordered without any frequency converter and still be legal, but a 'Warning' will appear in the printout. In this case, it will be the contractor's responsibility to ensure that the unit fulfils all Ecodesign requirements.

*Italic = Wording from Ecodesign Directive 1253/2014.*



**③ Pressure gauge**

(Exclusively for 2018).

If the air handling unit has a filter installed, it must be equipped with a visual alarm signal or an alarm in the control system, if the pressure above the filter exceeds the maximum allowed pressure drop.

**④ SFPint in W (m³/s)**

For an extract/supply unit with a filter, there are some demands for SFP Internal. SFP Internal has a specific limit value for respectively 2016 and 2018.

The air handling unit's actual value must be lower than the limit value.

2016: 250 W/m³/s

2018: 230 W/m³/s.

**⑤ Specific Fan Power**

For an extract/supply unit without any filter, there are some specific fan power demands (SFP). SystemairCAD calculates the limit value as well as the actual specific fan power value of the air handling unit. The specific fan power must be higher than the limit value in order to be approved.

**'Approved', 'Failed' or 'Warning'**

- If all requirements are fulfilled, the function is marked as 'Approved'.
- If one or more requirements are not fulfilled, the function is marked with a 'Warning' or 'Failed'.
- 'Warning' is displayed, if you need to pay special attention to something. Usually, to point out that the

fan must be equipped with variable speed drive (frequency converter).

- 'Failed' usually means that the efficiency in the chosen configuration is not ok. The air handling unit needs to be further optimized.

**⑥ Total check**

'Approved' – All Ecodesign requirements are fulfilled.

'Failed' – One or more requirements are not fulfilled. The air handling unit is illegal to install and operate according to Ecodesign.

**⑦ Technical specification**

Additional technical specification that must be documented from the manufacturer according to Ecodesign Directive 1253/2014.

**⑦**

		Supply		
Manufacturer	Systemair			
Model	Geniox Comfort 11.055IR			
Typology	NRVU;UVU			
Drive Type		VSD		Installed
Type of Heat Recovery System (HRS)	None			
Non Residential unit - flow rate		1.25		m³/s
Effective electric power input incl. clean filters and variable drive		1.66		kW
SFPint in W/(m³/s) 2016	219	220		W/(m³/s)
SFPint in W/(m³/s) 2018	219	220		W/(m³/s)
Face velocity		2.52		m/s
Nominal external pressure		300.00		Pa
Internal pressure drop of ventilation components		70.82		Pa
Overall static pressure drop with clean filter		426.41		Pa
Overall static efficiency of fans with clean filter		32.19		%
Maximum external leakage rate	Leakage class L2 according to EN 1886. Leakage rate is less than 1%.			
Maximum internal leakage rate	Leakage rate is less than 3%.			
Energy class for filters		B	No filter	
Visual filter warning description	Control display			
Internet address with information about disassembly	techdoc.systemair.dk			
<b>Sound power level</b>	<b>Supply air</b>	<b>Outdoor air</b>	<b>Sound break out</b>	
Total	91 dB(A)	80 dB(A)	85 dB(A)	



Systemair A/S  
Ved Milepælen 7  
DK-8361 Hasselager

Avedøreholmen 88  
DK-2650 Hvidovre

Tel. +45 87 38 75 00

[mail@systemair.dk](mailto:mail@systemair.dk)  
[www.systemair.dk](http://www.systemair.dk)