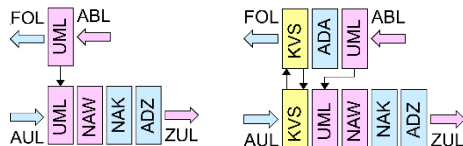


Point of reference		Outside air	Recirc. air	Supply air	Return air
Winter	°C	-18.00	20.00	24.00	20.00
	%	100.00	30.00	40.00	30.00
	g/kg	0.77	4.38	7.49	4.38
Summer	°C	38.00	26.00	16.00	26.00
	%	36.00	54.18	80.00	54.18
	g/kg	15.13	11.50	9.16	11.50
Volume flow humid	m3/h	variable		25000.00	25000.00
Mass flow dry	kg/h			29442.70	29442.70

Service/Air flow		Air (%)	Service (h)	Supply air (Pa)	Return air (Pa)
Day (07.00 - 19.00)	1	100.00	2920.00	1200.00	900.00
"	2	66.67	1460.00	534.00	400.00
"	3	0.00	0.00	0.00	0.00
Night (19.00 - 07.00)	1	66.67	4380.00	534.00	400.00
"	2	0.00	0.00	0.00	0.00
"	3	0.00	0.00	0.00	0.00

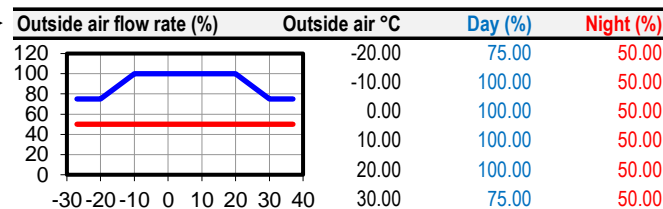
Comparison of different calculations	Without heat recovery	CC-System
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AUL = Outside air
 ZUL = Supply air
 ABL = Return air
 FOL = Exhaust air
 UML = Recirc. air



Temp. efficiency	%	---	70.00
Efficiency humid	%	---	0.00
SFP (Specific Fan Power)	W/(m3/s)	1129.05	1208.87
Investment costs	EUR	75000.00	127000.00
Energy costs	EUR/a	63201.52	42148.64
Support costs	EUR/a	3750.00	6350.00
Overheads	EUR/a	66951.52	48498.64
Life cycle	Years	15.00	15.00
Capital costs	EUR/a	92833.55	74817.16
BEP (Break even point) after	Years	---	2.90
Net useful ratio	EUR/a	---	18452.88
Net useful ratio	%/a	---	27.56
Need of energy	MWh/a	890.20	553.95
Net useful ratio	MWh/a	---	336.25
Net useful ratio	%/a	---	37.77
Adiabatic return air cooling	Hours/a	---	1944.00
CO2 reduction	MWh/a	---	336.25
Energy brown coal (400 kgCO2/MWh)	t CO2/a	---	134.50
Energy hard coal (330 kgCO2/MWh)	t CO2/a	---	110.96
Energy heating oil (270 kgCO2/MWh)	t CO2/a	---	90.79
Energy natural gas (200 kgCO2/MWh)	t CO2/a	---	67.25

Frankfurt (Germany)	Software by www.zcs.ch
Height over sea level	m 106.00
Pressure	hPa 1000.56
Temp.	°C 20.00
Rel. humidity	% 40.00
Supply air-Fan-Pressure drop	Pa 1200.00
Supply air-Fan-Efficiency	--- 0.70
Return air-Fan-Pressure drop	Pa 900.00
Return air-Fan-Efficiency	--- 0.70



Company
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 Country

Phone:

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Homepage

City, 23.12.2021

With the compliments of

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Plant

Object

Position

Capital interest	2.00 %
Energy increase	1.00 %
Inflation	1.00 %
Support costs	5.00 %

Day	7.00 - 19.00
Night	19.00 - 7.00
High rate	6.00 - 22.00
Low rate	22.00 - 6.00

Day	EUR/MWh
Heating	65.00
Cooling	74.43
Electric energy	100.00
Humidification	3.00
Dehumidifying	1.00

Night	EUR/MWh
Heating	61.67
Cooling	74.14
Electric energy	86.67
Humidification	3.00
Dehumidifying	1.00