Indirect Free Cooling IFC DV

IFC DV 20-150

- ✓ **Efficient free-cooling solution**
- ✓ **High efficiency EC Fans**
- ✓ **Ready to operate in extreme outdoor air conditions**
- ✓ **Integrated control system**
- ✓ **No mixing with outdoor air**
- ✓ **High Air & Water Economizer**
- ✓ **Long-lasting equipment**
- ✓ **TIER 3 ready**

IFC DV units are specially developed for cooling of process air in data centers or another premises with high heating load. Plate heat exchanger, Adiabatic humidifier and Cooling coil create complete system for energy efficient and safe cooling even in extreme outdoor environment. Depending on outdoor air parameters, control system switches between unit working modes to ensure most efficient performance and lowest energy consumption of whole system.

Unit characteristics:

- *Temperature and humidity control of indoor air*
- *100% sensible cooling*
- *High efficient WUE adiabatic cooling with water recovery*
- *Low pPUE figures*
- *Heat exchangers with efficiency up to 80%*
- *Temperature or Pressure control of cooling need*

Options:

- *UPS and Double power feed intake*
- *By-pass mixing damper for extreme low temperature environment*
- *Steam humidifier*
- *Reheating coil for dehumidification*
- *Roof installation*
- *ERE coil*
- *F7 filters*

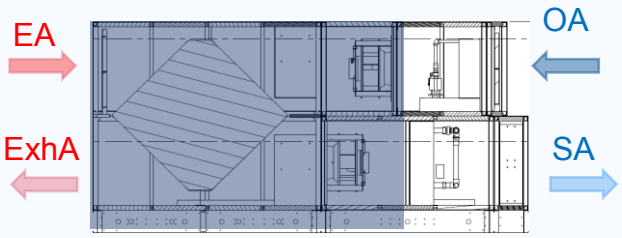
Green Ventilation

systemair

Working Modes

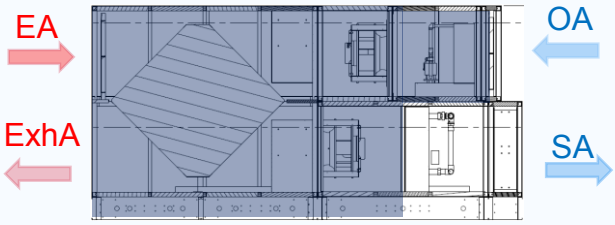
Mode1. Heat Exchanger

Warm air from data center room is supplied to plate heat exchanger. Cold outdoor air passes through heat exchanger in parallel air path, without any mixing with indoor air. Indoor air is cooled down by cooling power of outdoor air. In order to maintain needed capacity, outdoor airflow varies depending on outdoor air parameters: if temperature goes down airflow is reduced.



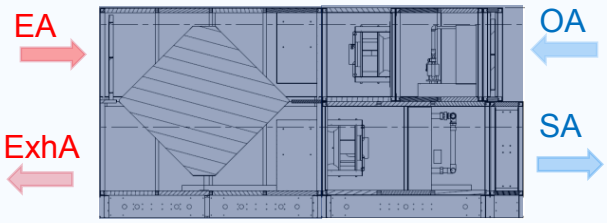
Mode2. HE+Adiabatic

When outdoor air temperature goes up and its cooling power is not enough to maintain needed capacity, adiabatic evaporative cooling mode starts: outdoor air passes through adiabatic humidifier, where water is evaporated and outdoor air temperature is reduced. Precooled outdoor air is supplied to plate heat exchanger and cools down process indoor air. In order to maintain minimal power consumption outdoor airflow is also reduced according to cooling need in this mode.



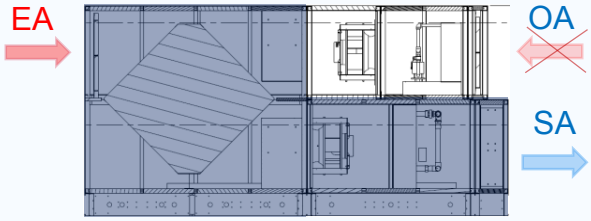
Mode3. Partial Support

During very high outdoor air temperature periods partial support mode starts. In this mode there are 2 cooling stages of process indoor air: first it is precooled with help of evaporative cooling and heat exchanger, then it is cooled in built-in cooling coil stage.



Mode 4. Support

During periods of extreme high both outdoor air temperature and humidity, outdoor air fan will be turned off. Process indoor air will be cooled down by built in cooling coil that is able to maintain 100% of needed cooling capacity. Cooling coil is supported by external chiller or Condensing unit.



Technical Specification

IFC DV with Standard Heat Exchanger						
Unit Size	**20**	**40**	**50**	**60**	**120**	**150**
Nominal Cooling Capacity, kW[1]	25	56	75	100	160	230
Nominal Airflow, m³/h	5000	10450	14025	18700	30000	42930
Nominal Supply/Extract Air temperature, °C	23/39	23/39	23/39	23/39	23/39	23/39
Nominal pressure drop, Supply Air, Pa	270	270	270	270	270	270
Nominal pressure drop, Outdoor Air, Pa	100	100	100	100	100	100
Mechanical pPUE[2]	1.27	1.17	1.16	1.15	1.15	1.16
Power Supply	3/400V/50Hz					
Supply Fan Power input, kW	1.36	3.16	4.25	5.39	11.40	15.03
Outdoor Fan Power input, kW	1.30	2.54	3.65	4.29	9.41	12.49
Cooling coil	Water/DX	Water/DX	Water/DX	Water/DX	Water	Water
Maximum outdoor Air T for Mode 1, °C	12.3	13.4	13.3	14.4	16.1	13.9
Adiabatic Humidifier, Cooling Δt, °C[3]	5.4	5.8	5.8	6	6.4	5.9
Adiabatic Humidifier, water flow, l/min	0.52	0.79	0.96	1.20	1.95	2,58
Extract Air Filter	G4					
Outdoor Air Filter	G4					
Sound Power Level, with/without sound attenuator, dB(A)						
Supply Air	82/52	87/64	81/55	83/61	79/59	84/62
Outdoor Air	77/54	81/58	76/53	78/56	73/54	77/57
Exhaust Air	80/56	86/64	81/58	83/62	77/58	81/62
Extract Air	73/52	77/57	70/48	73/54	71/53	75/55
Sound Break Out	56	61	55	58	55	59
Dimensions and Weight[4]						
Width, mm	1270	1720	2020	2170	2590	2890
Height, mm	1590	2040	2340	2490	3390	3690
Length, mm	3590	4340	4340	4490	6050	5460
Weight, kg	1035	1796	2090	2268	3980	4683

1. Capacity is calculated for nominal airflow and temperature parameters.
   To recalculate capacity for another parameters use formula:
   Capacity, W=0.336*Δt°*Airflow(m³/h)

Technical Specification

IFC DV with High Efficient Heat Exchanger						
Unit Size	**20**	**40**	**50**	**60**	**120**	**150**
Nominal Cooling Capacity, kW[1]	25	56	75	100	160	230
Nominal Airflow, m^3/h	5000	10450	14025	18700	30000	42930
Nominal Supply/Extract Air temperature, °C	23/39	23/39	23/39	23/39	23/39	23/39
Nominal pressure drop, Supply Air, Pa	270	270	270	270	270	270
Nominal pressure drop, Outdoor Air, Pa	100	100	100	100	100	100
Mechanical pPUE[2]	1.18	1.17	1.14	1.14	1.14	1.15
Power Supply	3/400V/50Hz					
Supply Fan Power input, kW	1.57	3.65	4.84	6.67	12.28	19.25
Outdoor Fan Power input, kW	1.69	3.00	4.26	5.49	10.36	15.93
Cooling coil	Water/DX	Water/DX	Water/DX	Water/DX	Water	Water
Maximum outdoor Air T for Mode 1, °C	18.9	19	18.9	18.9	19.7	18.5
Adiabatic Humidifier, Cooling Δt, °C[3]	6.7	6.9	6.9	6.8	7	6.8
Adiabatic Humidifier, water flow, l/min	0.57	0.88	1.09	1.34	2.17	3.0
Extract Air Filter	G4					
Outdoor Air Filter	G4					
Sound Power Level, with/without sound attenuator, dB(A)						
Supply Air	82/56	88/66	84/62	85/61	82/62	84/62
Outdoor Air	77/53	81/60	77/55	80/58	76/55	79/59
Exhaust Air	80/55	86/65	82/61	85/64	77/57	83/63
Extract Air	73/51	78/58	74/53	75/54	71/53	73/52
Sound Break Out	57	62	58	59	58	59
Dimensions and Weight[4]						
Width, mm	1270	1720	2020	2170	2590	2890
Height, mm	1590	2040	2340	2490	3390	3690
Length, mm	3590	4340	4340	4490	8450	8600
Weight, kg	1186	2040	2478	2395	6319	6887

2. pPUE figures are calculated for 100% load for Madrid city.
3. Humidifier performance is calculated for outdoor air humidity 50%
4. Dimensions and weight are calculated for Basic indoor unit with adiabatic humidifier.