AIRSYS

OPTIMA-INV DXW

Precision Cooling Technology for Critical Applications

Cooling Capacity: 26.7kW-116.2kW

www.air-sys.uk

The OPTIMA product family from Airsys is designed specifically for use within small, medium and large data centres, as well as for process and cleanroom applications.OPTIMA units combine precise temperature and humidity control with outstanding reliability.

OPTIMA INV-DXW is a DX water-cooled system that is optimised to deliver energy efficient solutions utilising EC fan and inverter compressor technology as standard. With options to combine DX-based cooling with Airsys leading-edge indirect free-cooling technology, allowing you to exploit low ambient conditions and maximise your energy savings.

Unit Identification

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
OPTIMA-INV	.	Default	.	O	.	DXW	16	E1	A1	R410	.	380/3/50	FEA	.	XXX

01	OPTIMA	Product series name: OPTIMA: Precision air conditioner
02	.	Separator Character "."
03	Default	Without free cooling or dual cooling sources FC - Indirect free cooling DC - Dual cooling sources DFC - Direct free cooling
04	.	Separator Character "."
05	O/U	O: Upflow U: Downflow
06	.	Separator Character "."
07	DXW	Direct expansion with dry air cooler
08	20	Nominal cooling capacity: kW
09	V1	V1- OPTIMA-INV 1 compressor V2 - OPTIMA-INV 2 compressors
10	A1	Cabinet size code: "A" cabinet with 5 sizes A1-A5.
11	R410	Refrigerant: R410A
12	.	Separator Character "."
13	380/3/50	Power source: Voltage/Phase/Frequency Default= 380/3/50
14	FEA	Fan type: FEA-EC supply fan, CMEH series outdoor unit
15	.	Separator Character "."
16	XXX	Code for custom design

Engineered features

1 Precise control

The control accuracy for temperature is ±1° C and for relative humidity is ±5%.

2 Various supply air arrangements

Supply air arrangements include top discharge (upflow) and bottom discharge (downflow). Return air arrangements include top return, bottom return, front return and rear return, to meet all varied requirements of ICT sites.

3 Corrosion-proof

The unit framework is provided with a corrosion protection treatment. The treatment is sufficient to provide protection for a 15 year life cycle for inland installation. If necessary, the treatment for sea air environment can be supplied as an option.

4 Easy maintenance

The technical compartment housing the compressor, humidifier, control and safety devices is spearate from the air flow, enabling ordinary service and preventative maintenance to occur during operation.

5 EC Fan

Highly efficient EC fans are supplied with OPTIMA products.

6 Air Filter

A washable, easily maintainable and durable G4 class air filter is a standard configuration for the OPTIMA range. With optional air pressure switch, a clogged filter alarm can be triggered when the filter is dirty.

7 Scroll compressor

OPTIMA (DXA & DXW) units are equipped with scroll compressors which produce less vibration, lower noise and greater efficiencies.

8 Isolated control panel

All the electrical and control components are installed in an isolated control panel with orderly wiring and clear labelling, meeting the IEC standards.

9 Forced dehumidification system

The dehumidification process occurs through decreasing the evaporator coil surface temperature or reducing the air flow across the coil. dariable-capacity systems come with power monitoring tools that are displayed locally, in addition to being available via remote access. Power monitoring can be used to measure efficiencies across systems, regions and networks. This feature can be used for predictive maintenance.

10 Electrode Humidifier (optional)

An electrode humidifier, controlled by a microprocessor, monitors and adjusts the humidifying capacity precisely, while the water quality monitoring and wash extends the maintenance interval, prolonging the working life of the unit.

11 Electric Heater (optional)

The construction of the electric heater element (stainless steel pipe with wrapped fins) allows for a reduced operating temperature, therefore eliminating ionisation, and avoiding unpleasant odors.

12 Self-diagnosis

All the microprocessor-connected components are continuously monitored and controlled and, in case of malfunction, the unit is shut down and the fault is shown on the display.

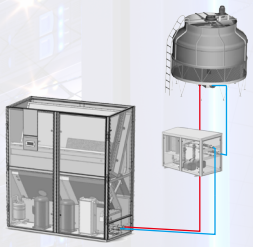
Working Flow Schematic Diagram

Water cooled direct expansion system (DXW)

The water cooled direct expansion system (DXW) operates similarly to the air cooled system, however the refrigerant transfers the rejected heat to water via a plate heat exchanger, which is then discharged to the outside air via a dry cooler or cooling tower.

No additional refrigerant pipework is required on site, only for the water circuit, making the installation significantly easier. The internal refrigerant circuit is sealed and pressure tested prior to delivery, with the unit coming with a holding charge of nitrogen.

Indoor unit: OPTIMA(-INV).DXW
Outdoor unit: CMEH series dry cooler/cooling tower(user supplied), PUG pump unit

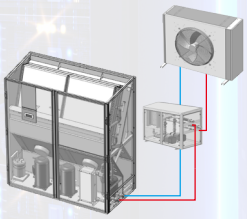


Water cooled direct expansion with indirect free cooling (FC.DXW)

The FC.DXW system combines DXW mechanical cooling with indirect free cooling (FC); the two cooling modes sharing the same water system.

When there is a call for cooling, and the difference between indoor and ambient temperatures is acceptable, the FC unit will run to provide indirect free cooling through rejecting heat via a dry cooler or cooling tower. Only when free cooling capacity is insufficient to meet the cooling demand will the DXW unit start up mechanical cooling. The FC circuit enables a significant reduction in compressor run hours for the DXW system saving significant energy.

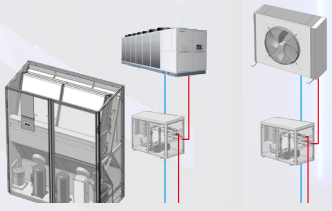
Indoor unit: OPTIMA(-INV)-FC.DXW
Outdoor unit: CMEH dry cooler/cooling tower (user supplied), PUG pump kit



Water cooled direct expansion with double cooling source (DC.DXW)

The DC.DXW unit is a dual-circuit system offering DXW (water-cooled) mechanical cooling and chilled water cooling (CW). It contains two independent cooling circuits with different heat-rejection methods for redundancy.

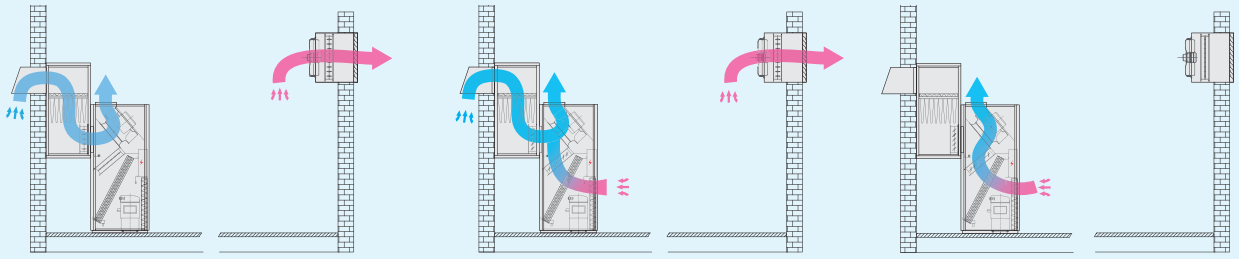
Indoor unit: OPTIMA(-INV)-DC.DXW
Outdoor unit: PUG pump kit, CMEH dry cooler.cooling tower (user supplied), user supplied chilled water source



Direct Free Cooling (DFC)

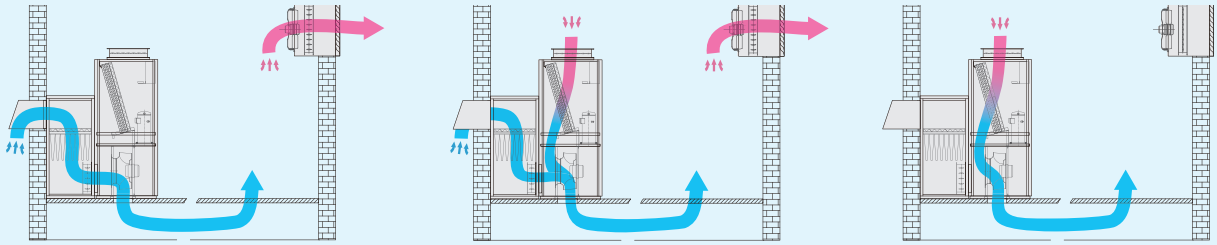
For installations where outdoor temperatures are commonly lower than indoor temperature, fresh air can be introduced directly into the room to cool the equipment; this is known as direct free cooling (DFC). A well designed and integrated DFC system can greatly reduce the dependency on other cooling systems and save energy through minimizing their run hours. DFC systems can be integrated with OPTIMA-INV units, with both up flow and down flow configurations. The corresponding series name becomes OPTIMA-INV-DFC.DXW. The diagram showing the arrangement and principle for direct free cooling options is as follows:

Up Flow Unit



Free Cooling Mode | Free Cooling + Mechanical Cooling | Mechanical Cooling Mode

Down Flow Unit



Free Cooling Mode | Free Cooling + Mechanical Cooling | Mechanical Cooling Mode

OPTIMA-INV-DFC systems include mechanical (DX) cooling and free cooling modes, together with the intelligence to switch between the modes to ensure the most efficient operation. When utilizing direct free cooling, the DX system compressor stops, which has a significant impact on the energy consumption.

In recent years, energy-efficient data centers have attracted greater attention and many data centers are now able to achieve significant energy savings through both increasing the IT equipment tolerance temperatures and expanding the considered geographical scope to exploit direct free cooling (which is not only limited to regions of extreme cold).

Indirect Free Cooling

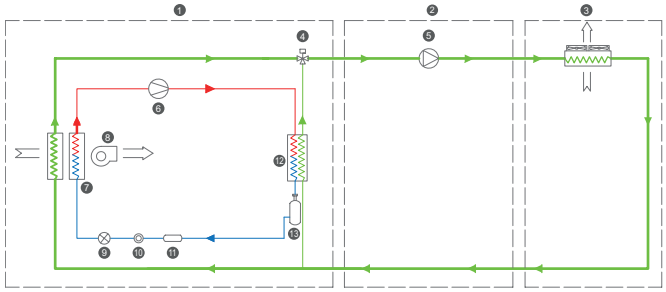
Indirect free cooling refers to heat-rejection through circulating water between an indoor cooling coil and an outdoor dry cooler or cooling tower; the water absorbs the heat at the indoor coil and then discharges it to the atmosphere via the dry cooler or cooling tower.

Water cooled direct expansion unit with indirect free cooling(FC)

A FC water coil can be added to the direct-expansion evaporator coil to introduce FC ability. The unit then automatically determines whether the water should flow through the plate heat exchanger (for DX cooling) or the water coil (for FC operation) via a three-way valve. A single outdoor dry cooler provides heat-rejection water for both the direct-expansion plate heat exchanger and the FC coil, reducing required plant space and allowing energy savings through reduced compressor power consumption.

OPTIMA-INV units can accommodate the indirect free cooling option. The corresponding series becomes OPTIMA-INV-FC.DXW.

The schematic diagram showing the principle of operation for a water cooled direct expansion unit with indirect free cooling (FC) is as follows:



1 Indoor unit
2 Pump group(optional)
3 Dry cooler(optional)
4 3-way valve
5 Pump
6 Compressor
7 Evaporator
8 Supply fan
9 Expansion valve
10 Sight glass
11 Filter dryer
12 Plate Heat Exchanger
13 Receiver

Technical Parameters

OPTIMA-INV.DXW

Unit model		25V1A2	30V1A2	35V1A2	40V1A3	45V2A3
Supply air scheme(1)				O/U		
Cooling capacity						
Total (2)	kW	26.7	31.1	36.1	44.1	46.0
Sensible (2)	kW	24.6	28.6	33.2	40.6	42.2
Compressor						
Type				Hermetic inverter scroll circuit 1, fixed speed scroll circuit 2		
Power input (2)	kW	6.5	7.1	7.8	9.6	10.1
Current (2)	A	13.7	16.4	18.2	20.7	22.5
Supply fan						
Type				Caseless backward EC centrifugal fan		
Qty. of fan	n.	1	1	1	2	2
Air volume	m^3/h	7500	8900	9600	12600	13600
Extra pressure (5)	Pa			Standard ESP is 50Pa, adjustment range is 50~300Pa		
Power input	kW	1.5	1.9	2.1	3	3.3
Current	A	2.2	2.8	3.2	4.4	4.8
Water cooled condenser						
Water flow	m^3/h	6.2	7.3	8.3	11.0	11.8
Pressure drop w/o valve	kPa	28.6	26.0	32.3	46.4	46.9
Pressure drop w/ valve	kPa	44.6	47.5	55.6	63.4	65.1
Water volume	n.	1.8	2.2	3.2	6.6	10.1
Dry cooler						
Model		CMEH30	CMEH40	CMEH50	CMEH60	CMEH70
Qty	n.	1	1	1	1	1
Power input	kW	0.75	1.5	1.5	1.5	2.3
Current	A	3.3	6.6	6.6	6.6	10.1
Electric heater (4)						
Type	kW	9	9	9	13.5	13.5
Heating capacity	A	13.5	13.5	13.5	20.4	20.4
Working steps	n.	2	2	2	2	2
Humidifier						
Type				Electrode		
Capacity	kg/h	5	5	5	8	8
Power input	kW	3.8	3.8	3.8	5.9	5.9
Current	A	5.7	5.7	5.7	9	9
Power supply						
Power supply				380V/3Ph/50Hz		
Unit maximum operation power	kW	21.1	23.2	25.9	26.9	33.6
Unit maximum operation current	A	28.6	36.1	40.5	44.1	56.5
Air filter				G4/plate		
Unit connection pipe						
Humidifier water supply	in			1/2		
Condensing water drainage	in			3/4		
Chilled water inlet/outlet	in	1-1/4	1-1/4	1-1/4	1-1/2	1-1/2
Unit dimension and weight						
Width	mm	1480	1480	1480	1750	1750
Depth	mm	890	890	890	890	890
Height	mm	1960	1960	1960	1960	1960
Weight	kg	410	430	510	570	630

(1) O:Up flow; U:Down flow;

(2) Return air dry bulb temperature 24 , RH50%, water cooled condenser inlet/outlet temperature 30 /35 ;

(3) For ESP over 300 Pa, Contact manufacturer;

(4)The default capacity, please refer to "electric heater/ humidifier selection sheet" for other capacity.

Technical Parameters

OPTIMA-INV.DXW

Unit model		50V2A3	60V2A4	70V2A4	80V2A4	90V2A5	100V2A5
Supply air scheme(1)				O/U			
Cooling capacity							
Total (2)	kW	53.1	62.1	72.2	83.2	93.6	105.6
Sensible (2)	kW	48.9	57.1	66.4	76.5	86.1	97.2
Compressor							
Type				Hermetic inverter scroll circuit 1, fixed speed scroll circuit 2			
Power input (2)	kW	10.9	13.4	14.7	17.6	20.1	22.8
Current (2)	A	23.6	29.4	31.6	36.2	39.8	49.5
Supply fan							
Type				Caseless backward EC centrifugal fan			
Qty. of fan	n.	2	3	3	3	3	3
Air volume	m^3/h	13600	17800	19200	21000	24600	27900
Extra pressure (5)	Pa			Standard ESP is 50Pa, adjustment range is 50~300Pa			
Power input	kW	3.3	4.3	4.65	5.1	6.3	6.6
Current	A	4.8	6.2	6.9	8.4	9.6	10.2
Water cooled condenser							
Water flow	m^3/h	12.4	14.1	16.0	18.1	20.3	23.5
Pressure drop w/o valve	kPa	44.3	44.8	46.3	48.4	34.3	36.7
Pressure drop w/ valve	kPa	62.8	58.3	61.3	69.9	51.8	55.2
Water volume	n.	4.5	5.2	5.8	6.4	7.3	8.1
Dry cooler							
Model		CMEH70	CMEH80	CMEH50	CMEH50	CMEH60	CMEH70
Qty	n.	1	1	2	2	2	2
Power input	kW	2.3	2.3	3.0	3.0	3.0	4.6
Current	A	10.1	10.1	13.2	13.2	13.2	20.2
Electric heater (4)							
Type	kW	13.5	18	18	18	18	18
Heating capacity	A	20.4	27.3	27.3	27.3	27.3	27.3
Working steps	n.	2	2	2	2	2	2
Humidifier							
Type				Electrode			
Capacity	kg/h	8	8	8	8	8	8
Power input	kW	5.9	5.9	5.9	5.9	5.9	5.9
Current	A	9	9	9	9	9	9
Power supply							
Power supply				380V/3Ph/50Hz			
Unit maximum operation power	kW	28.5	34.2	38.5	42.0	43.4	47.1
Unit maximum operation current	A	48.9	59.8	67.1	72.1	74.6	87.5
Air filter				G4/plate			
Unit connection pipe							
Humidifier water supply	in			1/2			
Condensing water drainage	in			3/4			
Chilled water inlet/outlet	in	1-1/2	1-1/2	2	2	2	2
Unit dimension and weight							
Width	mm	1750	2490	2490	2490	3095	3095
Depth	mm	890	890	890	890	890	890
Height	mm	1960	1960	1960	1960	2050	2050
Weight	kg	720	810	960	1050	1120	1210

Technical Parameters

OPTIMA-INV(-DFC/FC/DC).DXW

Unit model		26V1A2	30V1A2	35V1A2	40V1A3	45V2A3	50V2A3
Supply air scheme(1)				O/U			
Cooling capacity							
Total (2)	kW	26.7	31.1	36.1	44.1	46.0	53.1
Sensible (2)	kW	24.6	28.6	33.2	40.6	42.3	48.9
FC unit free cooling/DC unit cooling coil capacity							
Total (3)	kW	29.6	37.3	40.5	43.6	55.2	55.2
Sensible (3)	kW	26.3	33.2	36.0	39.7	50.2	50.2
DFC unit free cooling capacity							
Free cooling (4)	kW	15.0	16.2	16.2	21.3	23.0	23.0
Free cooling (5)	kW	30.1	32.4	32.4	42.5	45.9	45.9
Compressor (6)							
Type				Hermetic inverter scroll circuit 1, fixed speed scroll circuit 2			
Power input (2)	kW	5.9	6.4	7.0	8.6	9.1	9.8
Supply fan							
Type				Caseless backward EC centrifugal fan			
Qty. of fan	n.	1	1	1	2	2	2
Air volume	m^3/h	8900	9600	9600	12600	12600	13600
External static (7)	Pa.			Standard ESP is 75Pa, adjustment range is 50~300Pa			
Power input	kW	1.5	1.8	1.8	2.6	2.6	2.9
Noise level (8)							
	dB	63	66	66	66	66	66
Water condenser							
Water flow	m^3/h	6.2	7.3	8.3	11.0	11.8	12.4
Pressure drop	kPa	28.6	26.0	32.3	46.4	46.9	44.3
Pressure drop (with valve)	kPa	44.6	47.5	55.6	63.4	65.1	62.8
Water volume	L	1.8	2.2	3.2	4.0	4.2	4.5
Air filter				G4/plate			
Dry cooler (9)							
Model		CMEH30	CMEH40	CMEH50	CMEH60	CMEH70	CMEH70
Qty		1	1	1	1	1	1
Electric heater (12)							
Type				Stainless steel			
Heating capacity	kW	9	9	9	13.5	13.5	13.5
Working steps	n.	2	2	2	2	2	2
Humidifier (12)							
Type				Electrode			
Capacity	kg/h	5	5	5	8	8	8
Power input	kW	3.8	3.8	3.8	5.9	5.9	5.9
FC unit free cooling coil/DC unit chilled water coil							
Water flow	m^3/h	5.2	6.7	7.1	7.5	9.5	9.5
Pressure drop	kPa	56.4	63.1	69.2	56.7	51.4	51.4
DFC unit fresh air inlet box (10)							
Model*Qty		S2*1	S2*1	S2*1	S1*2	S1*2	S1*2
DFC unit air outlet box (11)							
Model*Qty		B*1	B*1	B*1	B*2	B*2	B*2
Power supply							
Model*Qty				380V/3Ph/50Hz			
Unit max. operating power input	kW	21.1	23.2	25.9	35.4	35.6	28.5
Unit max. operating current	A	35.5	40.2	44.6	58.8	59.8	48.9
Unit piping connection							
Humidifier water supply	in			1/2"			
Condensing water drainage	in			3/4"			
Chilled water inlet/outlet	in	1 - 1/4"	1 - 1/4"	1 - 1/4"	1 - 1/2"	1 - 1/2"	1 - 1/2"
FC/DC unit free cooling coil water inlet/outlet		1 - 1/4"	1 - 1/4"	1 - 1/4"	1 - 1/2"	1 - 1/2"	1 - 1/2"
Unit external dimensions							
Width	mm	1480	1480	1480	1750	1750	1750
Depth	mm	890	890	890	890	890	890
Height	mm	1960	1960	1960	1960	1960	1960
Net weight							
OPTIMA-INV(-DFC)	kg	390	430	435	540	560	580
OPTIMA-INV-FC/DC	kg	430	481	486	605	625	645
Wooden packaging dimension							
OPTIMA-INV(-DFC)	mm				1690x1025x2160		
OPTIMA-INV-FC/DC	mm				1690 x 1025x2160		
Net weight							
OPTIMA-INV(-DFC)	kg	500	540	545	665	685	705
OPTIMA-INV-FC/DC	kg	540	591	596	730	750	770

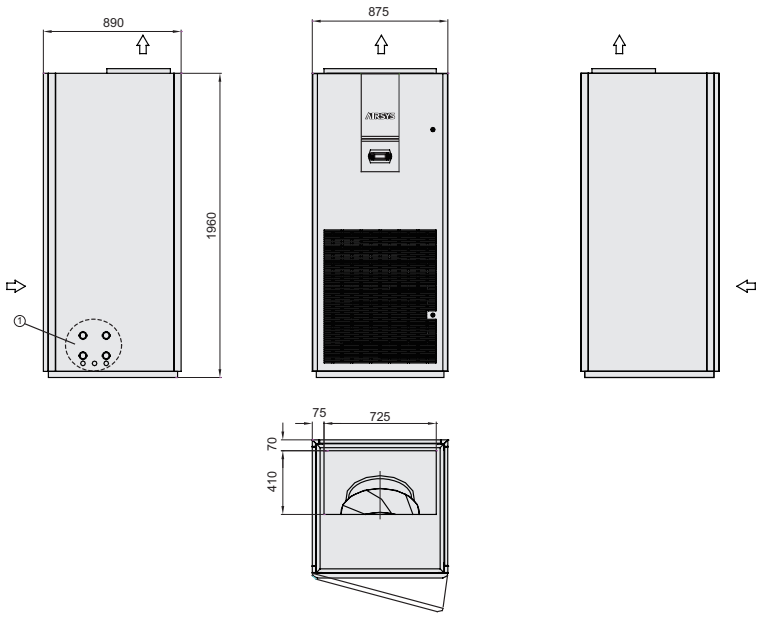
Technical Parameters

OPTIMA-INV(-DFC/FC/DC).DXW

Unit model		60V2A4	70V2A4	80V2A4	90V2A5	100V2A5
Supply air scheme(1)				O/U		
Cooling capacity						
Total (2)	kW	62.1	72.2	83.2	93.6	105.6
Sensible (2)	kW	57.1	66.4	76.5	86.1	97.2
FC unit free cooling/DC unit cooling coil capacity						
Total (3)	kW	63.1	77.5	84.1	102.5	116.2
Sensible (3)	kW	57.4	70.5	75.7	92.3	104.6
DFC unit free cooling capacity						
Free cooling (4)	kW	30.1	32.4	35.5	41.5	47.1
Free cooling (5)	kW	60.1	64.8	70.9	83.1	94.2
Compressor (6)						
Type		Hermetic inverter scroll circuit 1, fixed speed scroll circuit 2				
Power input (2)	kW	12.1	13.2	15.8	18.1	20.5
Supply fan						
Type		Caseless backward EC centrifugal fan				
Qty. of fan	n.	3	3	3	3	3
Air volume	m^3/h	17800	19200	21000	24600	27900
External static (7)	Pa.	Standard ESP is 75Pa, adjustment range is 50~300Pa				
Power input	kW	3.6	3,9	4.1	4.4	6.3
Noise level (8)						
	dB	69	69	69	69	69
Water condenser						
Water flow	m^3/h	14.1	16.0	18.1	20.3	23.5
Pressure drop	kPa	44.8	46.3	48.4	34.3	36.7
Pressure drop (with valve)	kPa	58.3	61.3	69.9	51.8	55.2
Water volume	L	5.2	5.8	6.4	7.3	8.1
Air filter				G4/plate		
Dry cooler (9)						
Model		CMEH80	CMEH50	CMEH50	CMEH60	CMEH70
Qty		1	2	2	2	2
Electric heater (12)						
Type				Stainless steel		
Heating capacity	kW	18	18	18	18	18
Working steps	n.	2	2	2	2	2
Humidifier (12)						
Type				Electrode		
Capacity	kg/h	8	8	8	8	8
Power input	kW	5.9	5.9	5.9	5.9	5.9
FC unit free cooling coil/DC unit chilled water coil						
Water flow	m^3/h	10.7	13.2	14.2	17.2	19.2
Pressure drop	kPa	62.2	54.6	61.3	100.3	118.1
DFC unit fresh air inlet box (10)						
Model*Qty		S1+S2	S1+S2	S1+S2	S2*2	S2*2
DFC unit air outlet box (11)						
Model*Qty		B*2	B*2	B*2	B*3	B*3
Power supply						
Model*Qty				380V/3Ph/50Hz		
Unit max. operating power input	kW	34.2	38.5	42.0	43.4	47.1
Unit max. operating current	A	59.8	67.1	72.1	74.6	87.5
Unit piping connection						
Humidifier water supply	in			1/2"		
Condensing water drainage	in			3/4"		
Chilled water inlet/outlet	in	1 - 1/2"	2"	2"	2"	2"
FC/DC unit free cooling coil water inlet/outlet		2"	2"	2"	2"	2"
Unit external dimensions						
Width	mm	2490	2490	2490	3095	3095
Depth	mm	890	890	890	890	890
Height	mm	1960	1960	1960	2050	2050
Net weight						
OPTIMA-INV(-DFC)	kg	740	770	800	960	980
OPTIMA-INV-FC/DC	kg	812	857	887	1070	1090
Wooden packaging dimension						
OPTIMA-INV(-DFC)	mm		2700x1025x2160		3305x1025x2250	
OPTIMA-INV-FC/DC	mm		2700x1025x2160		3305x1025x2250	
Net weight						
OPTIMA-INV(-DFC)	kg	895	925	955	1145	1165
OPTIMA-INV-FC/DC	kg	967	1012	1042	1255	1275

Unit Dimension Drawing

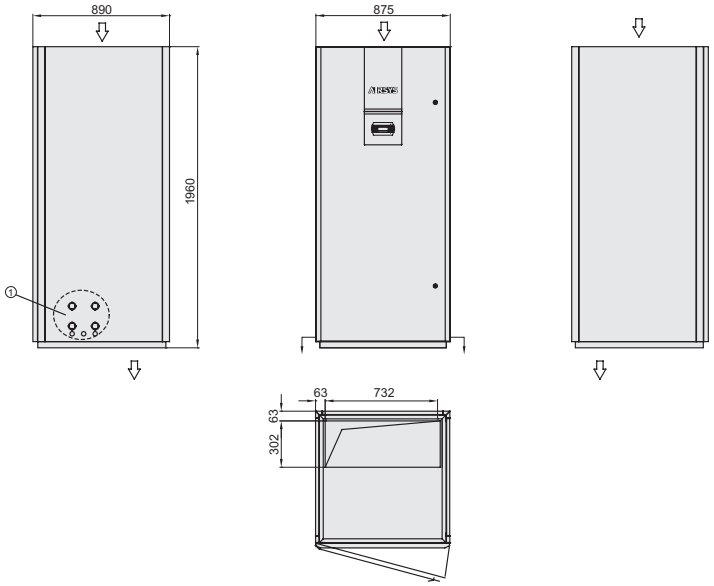
A1 Unit cabinet dimension drawing for upflow unit



① Pipe connect area: Specific position and kinds differ slightly in different unit series. Refer to the onsite unit.

	A1	A2	A3	A4	A5
WIDTH/mm	875	1480	1750	2490	3095
DEPTH/mm	890	890	890	890	890
HEIGHT/mm	1960	1960	1960	1960	2050

A1 Unit cabinet dimension drawing for underflow unit

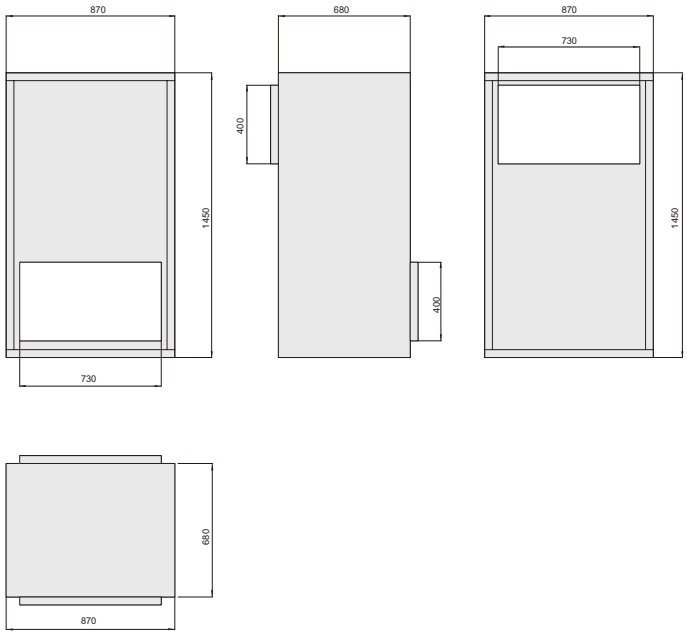


① Pipe connect area: Specific position and kinds differ slightly in different unit series. Refer to the onsite unit.

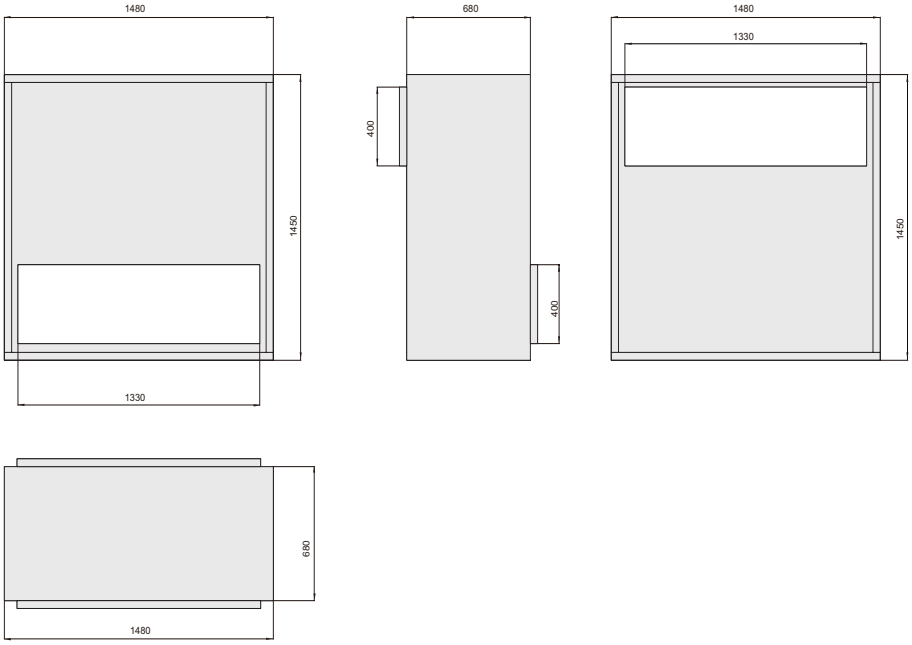
	A1	A2	A3	A4	A5
WIDTH/mm	875	1480	1750	2490	3095
DEPTH/mm	890	890	890	890	890
HEIGHT/mm	1960	1960	1960	1960	2050

OPTIMA-DFC Fresh air inlet box

S1 Fresh air inlet box

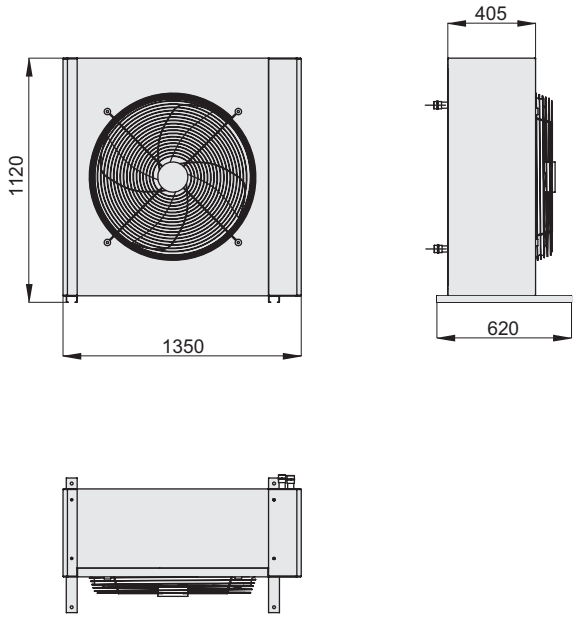


S2 Fresh air inlet box

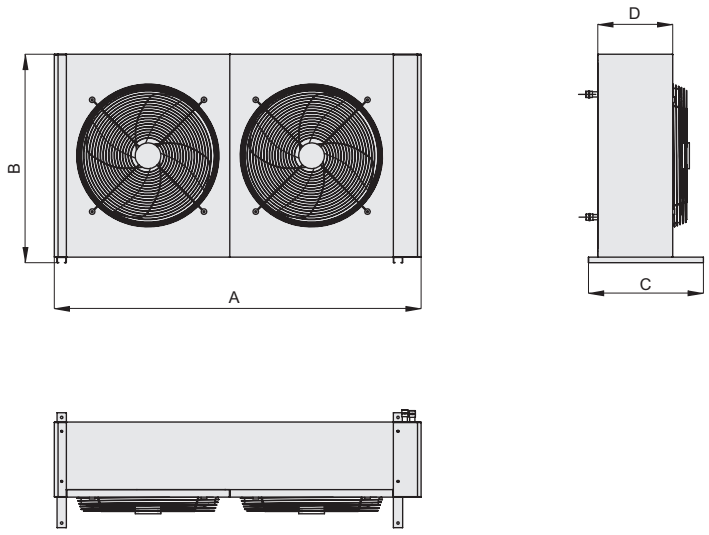


CMEH dry cooler

CMEH20/CMEH30

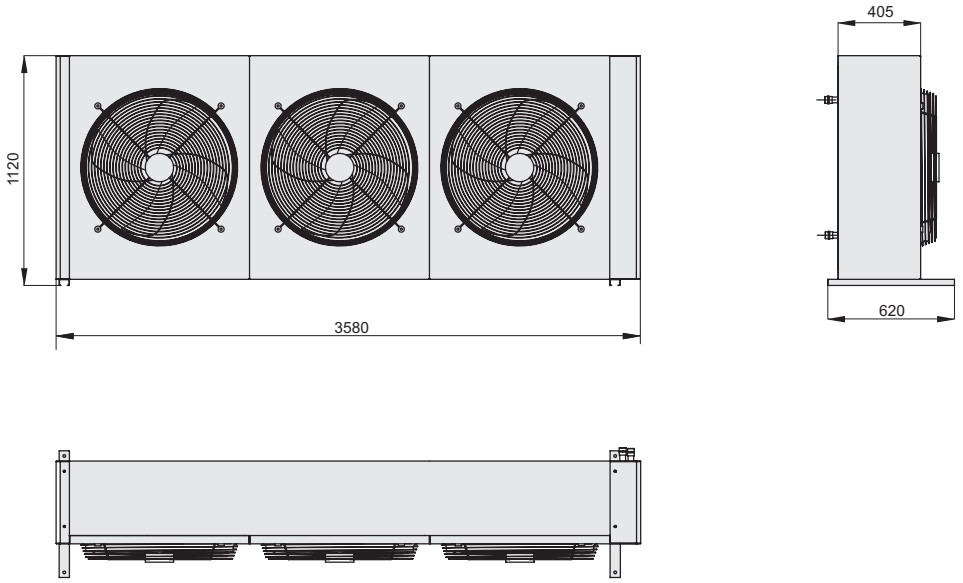


CMEH40/CMEH50/CMEH60

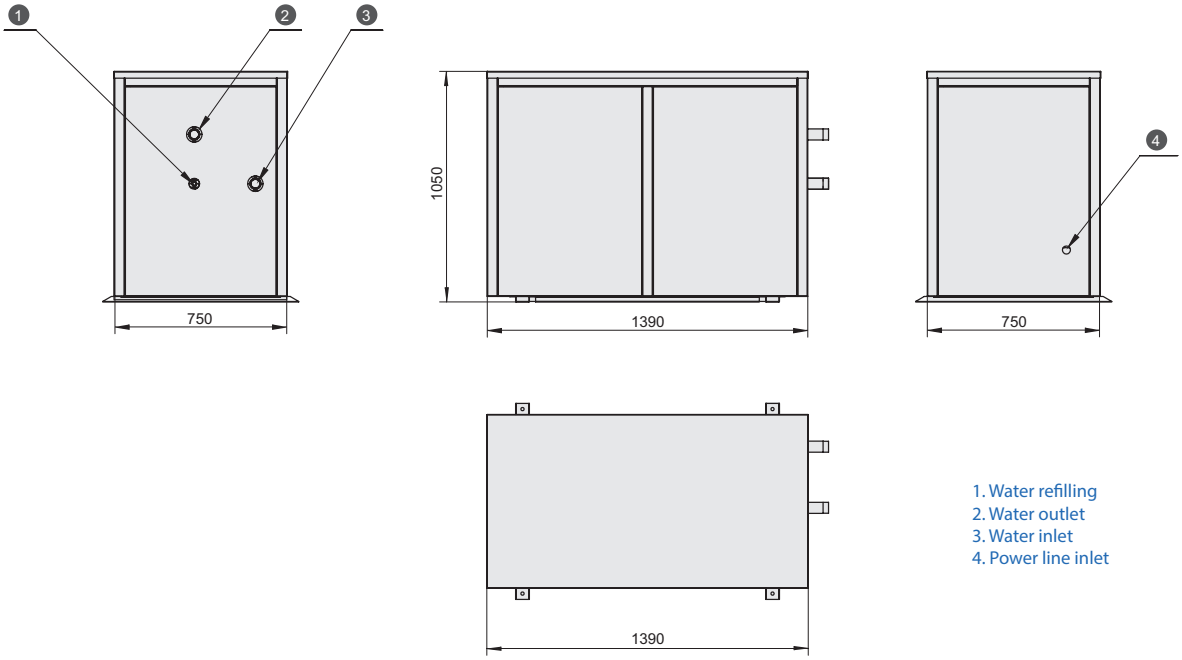


	CMEH40	CMEH50	CMEH60
A	1540	2400	2400
B	1070	1135	1135
C	620	630	630
D	1437	2160	2160

CMEH70/CMEH80



PUG Pump group



1. Water refilling
2. Water outlet
3. Water inlet
4. Power line inlet

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