To offer eco-friendly HVAC&R products for a greener tomorrow.

STANDARD REFRIGERATION & ENGINEERING CO., LTD.
立德工程有限公司
香港液體氣(集團)有限公司 附屬機構

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ECOLITE ECVW 2018.08 V1

ECVW Series

Water Cooled VSD Screw Chiller

ECOLITO

Company profile

Ecolite Cooling Technologies Co., Ltd. was originally incorporated in Hong Kong as a consulting company providing energy savings solutions for efficient energy management. Now Ecolite has made a business breakthrough from green solutions to green products supplier. With world leading technology and guaranteed energy-saving policy, Ecolite Cooling provides incomparable energy-efficient and zero-emission HVAC&R products to the world market since its creation in 2016.

Design Features

ECOLITE ECVW series Water Cooled VSD screw chillers use high efficiency variable frequency screw compressors, falling film or flooded (optional) evaporators and cutting-edge MS One control system to achieve best energy efficiency ratio at both full load and part loads and reduce operating costs significantly. ECOLITE ECVW series chillers play an important role in environmental protection and energy conservation.

Cooling capacity of each unit ranges from 70RT to 350RT, which is ideal for applications in hotels, restaurants, movie theaters, shopping malls, office buildings, residential buildings, hospitals, etc. as well as industrial process refrigeration, such as plastic chemical and precision instrument industries.

Electronic expansion valve (EXV) is used for metering the supply of liquid refrigerant for the falling film or flooded evaporator. The packaged unit has already been factory-charged with refrigerant and factory-tested, requiring only pipelines and power-lines connections while eliminating complicated pump-down and refrigerant charge during field installation to ensure reliable operation of the equipment.

Ecolite's new generation of MS One programmable control system not only provides the most powerful protection and control over the chiller, but also enables remote monitoring with its powerful communication function.The chillers are designed to be compact, space saving and installation cost saving.

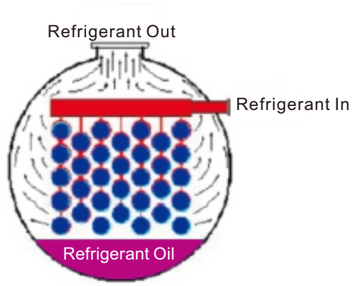
Structure Features

ECOLITE ECVW series Water Cooled VSD screw chillers are of packaged design. Main parts include screw refrigeration compressor, variable speed drive (VSD) on compressor, shell and tube condenser, falling film evaporator (optional flooded evaporator), filter drier, EXV and control system. To make sure consistent ex-factory performance, chillers have been pumped down, charged with refrigerant and lubrication oil and run-tested in the factory. Field works only remain water pipes installation and power lines connection.

VI Series VSD Compressor

Semi-hermetic screw refrigeration compressor has a motor and screw rotor installed in the same housing. The screw rotor is directly driven by the motor without any mechanical driving device, thus avoiding efficiency loss and reducing vibration and noise. This structure and directly driven design eliminate the use of shaft seal and avoid associated refrigerant and oil leakage as well as shaft seal change due to wear and tear.

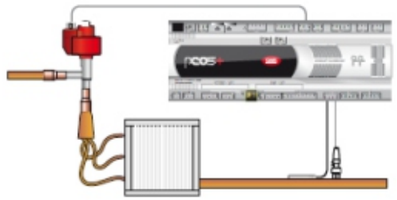
With excellent volumetric efficiency and minimum clearance, the 5~6 tooth profile wound-rotor design has been patented in the U.S.A., Japan and China. Pressure ratio is adjustable based on actual operating conditions and operation loss can be reduced to achieve better capacity control range and more accurate temperature control. Motor and discharge temperature safeties, oil level control, oil heater, oil cooling and anti-slugging functions ensure reliable and stable operation of the compressor.



Evaporator

Falling film evaporator is utilized in the chiller. Theoretical heat transfer coefficient of falling film evaporation outside evaporator tubes is 30% higher than that of pool boiling of a flooded type evaporator. Liquid refrigerant can be distributed more evenly and forms a film outside the tubes to ensure better heat transfer. Falling film evaporator has relatively lower internal liquid level and is less influenced by hydrostatic column. Lubrication oil is concentrated together which enables easier compressor oil return.

Optional flooded evaporator features high heat exchange efficiency and reliable operation after continuous product improvement.



Advanced Refrigerant Control

EVDEVO driver and super capacitor module are integrated in pCO5+ without the need of solenoid valve. EXV is used to fast and precisely meter refrigerant flow to keep a stable evaporator leaving water temperature.

Ms one control system

ECOLITE ECVW series Water Cooled VSD screw chillers use MS One control system. The control core is a programmable pCO^5+ logic controller dedicated for HVAC products. The patent chip of pCO^5+ makes advantage of ASIC technology to ensure flexibility of the control system. LCD touch screen provides operators, factory technicians and service personnel with current operation data of the chiller, faults, load history, start/stop history, etc.

Temperature Control

MS One Control System compares the entering and leaving water temperature with its setpoint value to compute the capacity required and determine the compressor load. The inverter will adjust cooling capacity of the chiller based on the previous calculated value and keep the water temperature within set point.

Compressor Balance and Start/Stop Restriction

MS One accumulates running hours of each compressor and hence establishes a working sequence to well balance the running hours of the two compressors of the chiller.
Minimum non-running hours, minimum running hours, restart times limit and other settings allow the control of start and stop frequency of the compressor, which can improve its life span.

Failsafe

Control system can monitor the following faults. In the event of a compressor fault, the controller will close the faulty compressor. In the case of a system fault, the controller will close all compressors of the chiller bank.
Compressor Faults: High discharge pressure, low suction pressure, discharge temperature fault, compressor overload, inverter fault, motor faults, etc.
System Faults: Low chilled water flow, low condenser water flow, low leaving chilled water temperature, high leaving condenser water temperature, system pressure Fault, external interlock fault/protection, pump fault, cooling tower fault, etc.

Remote Communication

MS One Control System is fitted with Ethernet, RS485, RS232 and USB ports to realize remote communication and integrated controls via connection between the Building Automation System (BAS) or Distributed Control System (DCS) and various protocols. These protocols can also work with DDC and other different types of controllers to build a control network.

Password Security

MS One has three levels of security access – User, Service and Factory. The three-level security accesses ensure that only authorized personnel can modify chiller control and protection settings to avoid any unwanted change that may result in chiller failure by an unauthorized person.

Equipment Advantages / Nomenclature

ECVW — 075 — F

1 — 2 — 3

1 —— Product Series

ECVW: ECVW series Water Cooled VSD screw chillers

2 ——Cooling Capacity Code

3 —— Falling film evaporator

Technical Data

Model			ECVW075F	ECVW090F	ECVW110F	ECVW125F
Cooling Capacity		kW	264.1	312.0	360.9	436.6
		TR	75.1	88.7	102.6	124.1
Power Supply			380V-50Hz-3Ph			
Power Input		kW	52.6	60.2	69.2	83.6
COP			5.02	5.18	5.22	5.22
IPLV			8.96	9.23	9.28	9.32
Full Load Amps		A	132	151	174	210
Compressor Type			VSD Screw Compressor			
Evaporator	Type		Falling Film Evaporator			
	Water Flow Rate	m^3/h	45.4	53.7	62.4	75.1
	Connection Size	DN	100	100	100	125
	Fouling Factor	m^2K/kW	0.018			
	Water Side Max Working Pressure	MPa	1.0			
	Pressure Drop	kPa	59.1	61.3	60.3	61.2
Condenser	Type		Shell and Tube Heat Exchanger			
	Water Flow Rate	m^3/h	54.5	64.0	74.0	89.5
	Connection Size	DN	100	100	125	125
	Fouling Factor	m^2K/kW	0.044			
	Water Side Max Working Pressure	Mpa	1.0			
	Pressure Drop	kPa	49.1	49.8	52.6	54.2
Refrigerant	Type		R134a			
	Charge	kg	66	78	90	109
Physical Dimensions	Length	mm	3300	3300	3300	3300
	Width	mm	1250	1300	1350	1350
	Height	mm	1750	1800	1850	1850
Shipping Weight		kg	2600	2700	2800	2850
Operating Weight		kg	2750	2850	3000	3050

Notes:

1. Working Conditions: entering/leaving condenser water temp. 30℃/35℃;
   entering / leaving chilled water temp. 12℃/7℃;
2. Power Supply:AC380~415V/50Hz/3Ph, AC380~460V/60Hz/3Ph are available;
3. Non-standard products are available upon request;
4. Technical data are for standard products only and subject to change without prior notice due to product improvement.

Technical Data

Model			ECVW140F	ECVW170F	ECVW190F	ECVW210F	ECVW230F
Cooling Capacity		kW	497.6	586.7	658.5	734.2	814.7
		TR	141.5	166.8	187.2	208.8	231.6
Power Supply			380V-50Hz-3Ph				
Power Input		kW	94.3	110	122.6	136.6	145.5
COP			5.28	5.33	5.37	5.37	5.60
IPLV			9.42	9.53	9.66	9.94	9.42
Full Load Amps		A	237	277	309	349	420
Compressor Type			VSD Screw Compressor				
Evaporator	Type		Falling Film Evaporator				
	Water Flow Rate	m^3/h	85.6	100.9	113.2	126.3	140.1
	Connection Size	DN	125	150	150	150	150
	Fouling Factor	m^2KkW	0.018				
	Water Side Max Working Pressure	MPa	1.0				
	Pressure Drop	kPa	60.9	60.1	61.8	61.8	61.8
Condenser	Type		Shell and Tube Heat Exchanger				
	Water Flow Rate	m^3/h	101.8	119.5	134.3	149.8	165.1
	Connection Size	DN	125	150	150	150	200
	Fouling Factor	m^2K/kW	0.044				
	Water Side Max Working Pressure	Mpa	1.0				
	Pressure Drop	kPa	53.8	56.8	54.3	56.6	57.5
Refrigerant	Type		R134a				
	Charge	kg	124	146	164	184	204
Physica Dimensions	Length	mm	3300	3300	3300	4200	3300
	Width	mm	1350	1400	1400	1450	1405
	Height	mm	1850	1900	1900	1900	1950
Shipping Weight		kg	3100	3500	3700	4200	4100
Operating Weight		kg	3300	3750	3950	4400	4300

Notes:
1. Working Conditions: entering/leaving condenser water temp. 30℃/35℃;
   entering / leaving chilled water temp. 12℃/7℃;
2. Power Supply:AC380~415V/50Hz/3Ph, AC380~460V/60Hz/3Ph are available;
3. Non-standard products are available upon request;
4. Technical data are for standard products only and subject to change without prior notice due to product improvement.

Technical Data

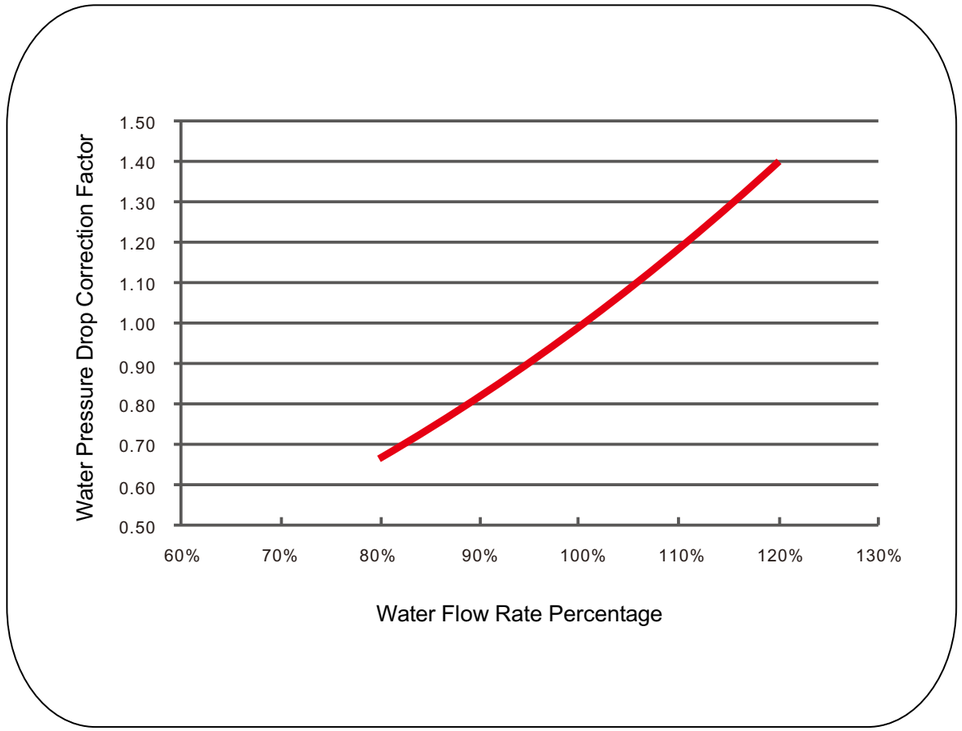
Model			ECVW250F	ECVW290F	ECVW350F	ECVW390F	ECVW480F
Cooling Capacity		kW	888.0	1012.2	1213.2	1361.8	1684.8
		TR	252.5	287.8	345.0	387.2	479.0
Power Supply			380V-50Hz-3Ph				
Power Input		kW	164.8	186	214	238.6	283.4
COP			5.39	5.44	5.67	5.71	5.94
IPLV			9.99	10.10	10.19	10.28	10.32
Full Load Amps		A	421	475	554	618	840
Compressor Type			VSD Screw Compressor				
Evaporator	Type		Falling Film Evaporator				
	Water Flow Rate	m^3/h	152.7	174.1	208.6	234.2	289.7
	Connection Size	DN	150	200	200	200	250
	Fouling Factor	m^2K/kW	0.018				
	Water Side Max Working Pressure	MPa	1.0				
	Pressure Drop	kPa	63.2	61.0	65.7	64.6	64.7
Condenser	Type		Shell and Tube Heat Exchanger				
	Water Flow Rate	m^3/h	181.0	206.1	245.4	275.2	338.5
	Connection Size	DN	200	200	200	200	250
	Fouling Factor	m^2KkW	0.044				
	Water Side Max Working Pressure	MPa	1.0				
	Pressure Drop	kPa	63.2	61.0	65.7	64.6	64.7
Refrigerant	Type		R134a				
	Charge	kg	222	253	303	340	421
Physica Dimensions	Length	mm	4200	4200	4200	4200	4200
	Width	mm	1500	1550	1550	1550	1600
	Height	mm	1950	2050	2050	2050	2100
Shipping Weight		kg	4800	5300	6200	6800	7500
Operating Weight		kg	5100	5700	6700	7300	8000

Notes:
1. Working Conditions: entering/leaving condenser water temp. 30℃/35℃;
   entering / leaving chilled water temp. 12℃/7℃;
2. Power Supply:AC380~415V/50Hz/3Ph, AC380~460V/60Hz/3Ph are available;
3. Non-standard products are available upon request;
4. Technical data are for standard products only and subject to change without prior notice due to product improvement.

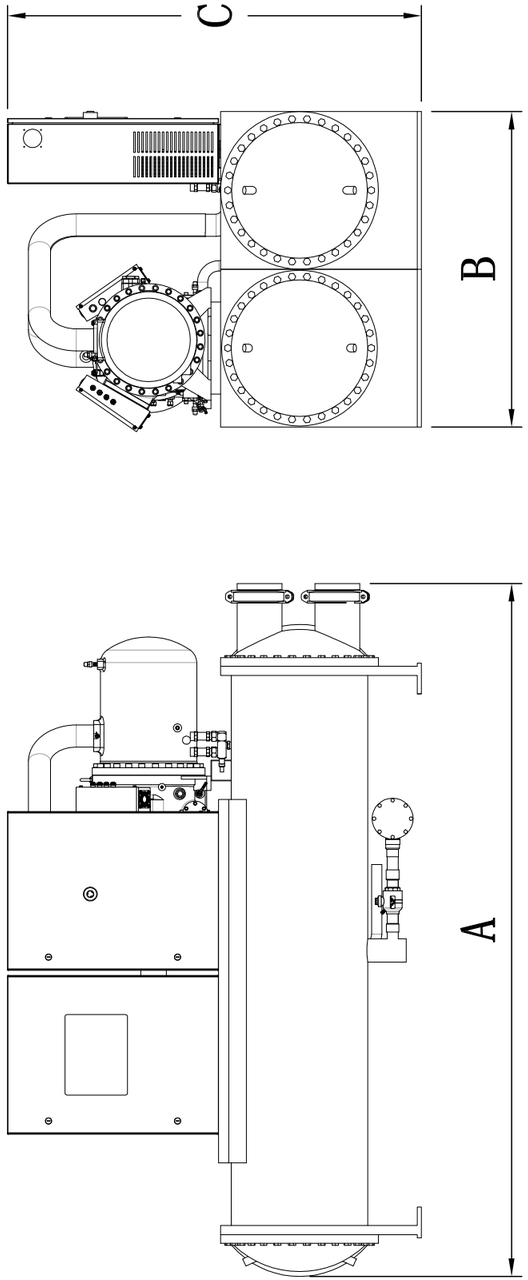
Correction Factor Table

LCHWT ℃	ECWT ℃									
	15		20		25		30		35	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
5	1.04	0.58	1.01	0.74	0.97	0.87	0.92	1.00	0.87	1.13
7	1.12	0.56	1.09	0.72	1.05	0.87	1.00	1.00	0.95	1.13
9	1.21	0.53	1.17	0.70	1.13	0.86	1.08	1.00	1.02	1.13
11	1.30	0.50	1.26	0.68	1.22	0.85	1.17	0.99	1.11	1.14
13	1.40	0.47	1.36	0.66	1.31	0.83	1.26	0.99	1.19	1.14

WATER PRESSURE DROP CORRECTION CURVE

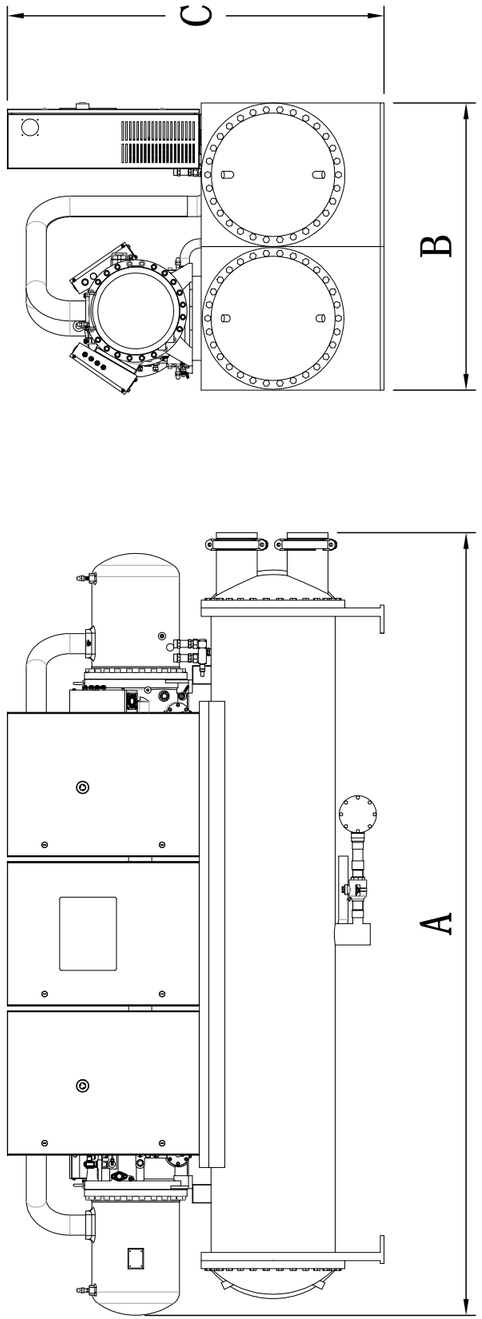


Physical Dimensions



Model	ECVW075F	ECVW090F	ECVW110F	ECVW125F	ECVW140F	ECVW170F	ECVW190F	ECVW230F
Lengty(A)	3300	3300	3300	3300	3300	3300	3300	3300
Width(B)	1250	1300	1350	1350	1350	1400	1400	1450
Height(C)	1750	1800	1850	1850	1850	1900	1900	1950

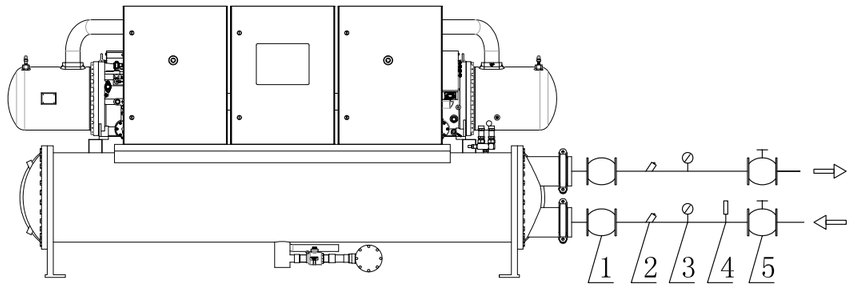
Physical Dimensions



Model	ECVW210F	ECVW250F	ECVW290F	ECVW350F	ECVW390F	ECVW480F
Lengty(A)	4200	4200	4200	4200	4200	4200
Width(B)	1450	1500	1550	1550	1550	1600
Height(C)	1900	1950	2050	2050	2050	2100

Piping & Instrumentation Diagram

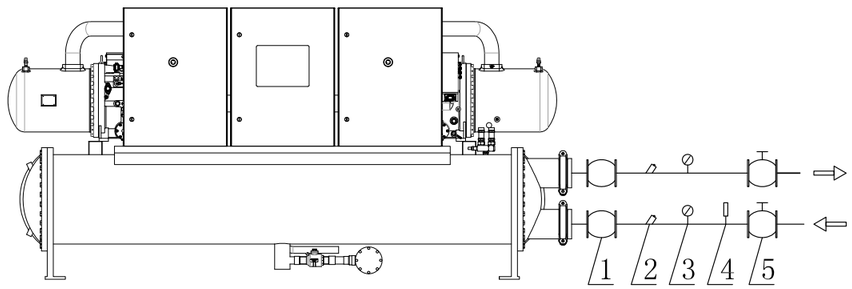
1. Condenser Water Piping



1. Flexible Joint 2. Temp. Sensor 3. Pressure Gauge

4. Water Flow Switch 5. Stop Valve

2. Chilled Water Piping



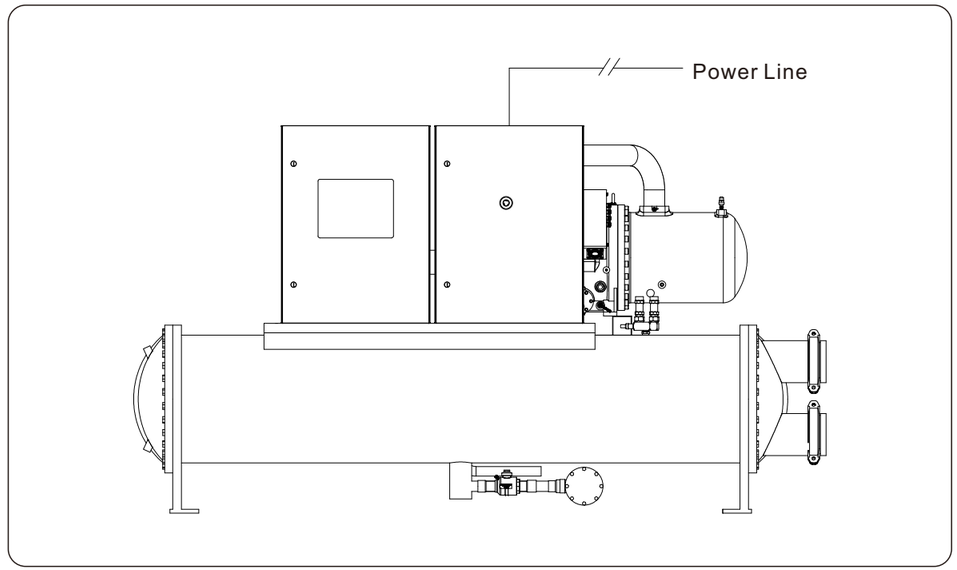
1. Flexible Joint 2. Temp. Sensor 3. Pressure Gauge

4. Water Flow Switch 5. Stop Valve

Power Line Connection

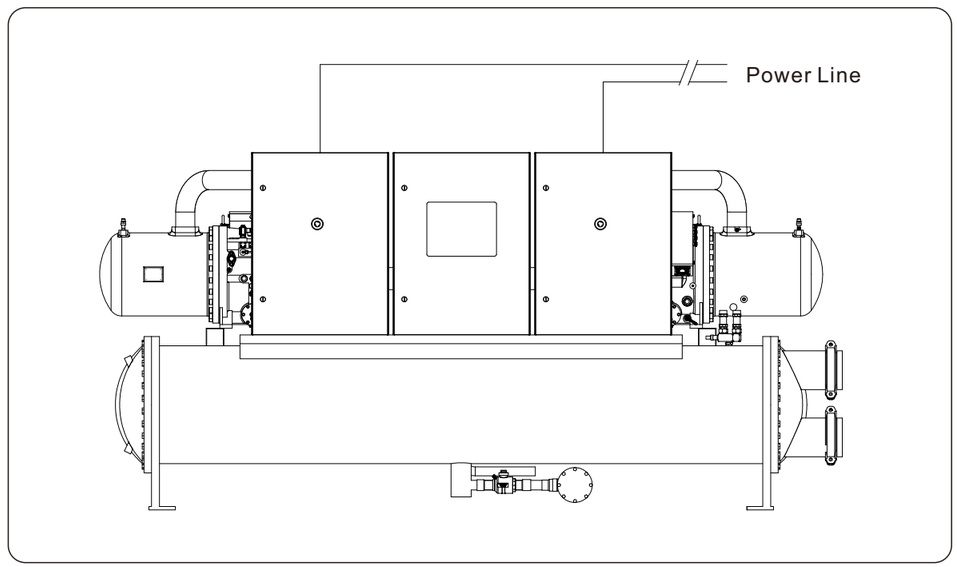
1. Single-compressor Unit

Remove the power mains inlet cover on the top of the electrical box. Power line should be run through the cable entry into the electrical box and connected to the main air circuit breaker.

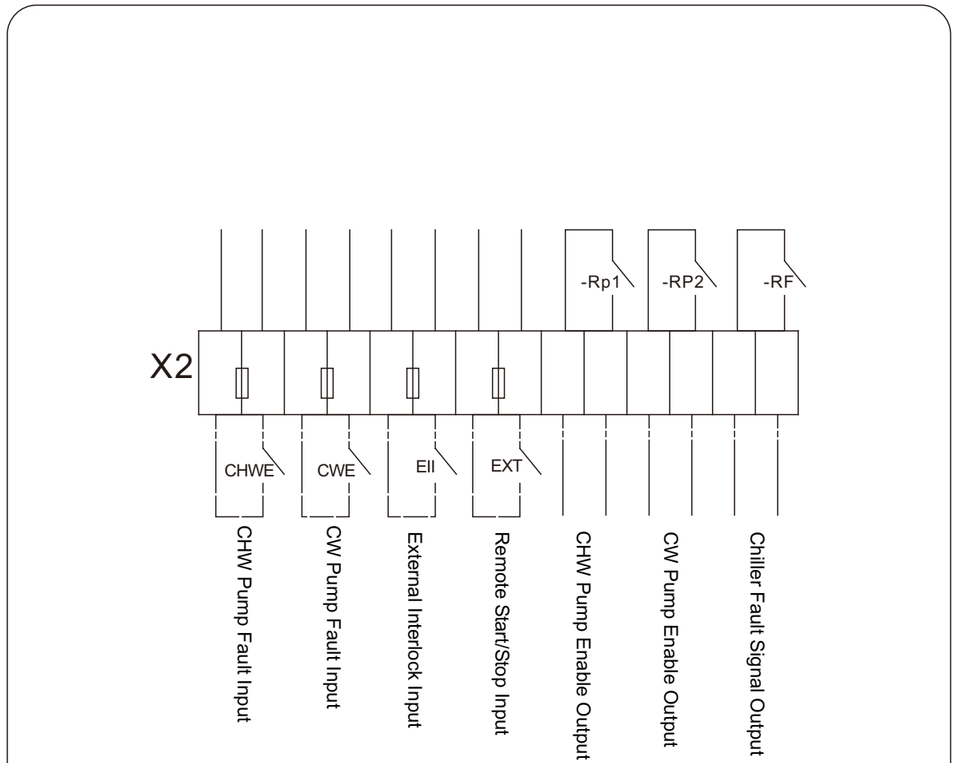


2. Double-compressor Unit

Remove the two power inlet covers on the top of the electrical box. Power lines should be separately run through the cable entries into the electrical box and respectively connected to the main air circuit breaker of each compressor.



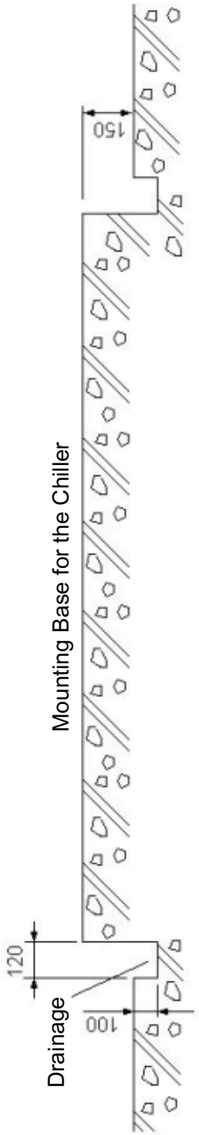
Field Wiring Diagram



Technical Notes:

1. Minimum cross section of control wires should be 1mm^2;
2. All input terminals have been factory-bridged, which require removal of jumper blocks before use;
3. All input terminals are volt-free contacts;
4. Maximum current allowable for volt-free output contact is 5A (Resistive);
5. "—" for factory wiring and "--" for field wiring.

Mounting Base



Wide Range of Applications

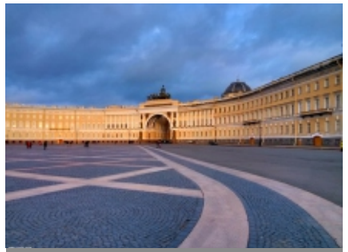
ECOLITE products are used in a wide range of applications in large high-rise commercial buildings, multi-story building complex, and various industrial refrigeration fields shown as below:


Office Buildings


Villas


Commercial Pedestrian Streets

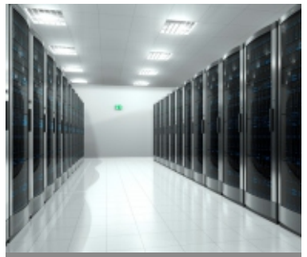

Metros


Plazas


Factories


Schools/Libraries


Hotels


Data Centers


Movie Theaters


Banks


Hospitals