

KR-112 Mini Ice Plant Training System



The Mini Ice Plant Training System (KR-112) provides a learning platform for students to understand various freezing methods in terms of Industrial 4.0 practice through wireless transmission and remote control, the structures of the components, and the operating principles of ice plant systems.

The system allows students to learn how to operate the brine cycle refrigeration and practice adjusting the concentration in brine, which can be made by various raw materials, such as salt, alcohol, and ethylene glycol. Furthermore, students can examine the influence of brine concentration on different frozen objects.

KR-112 adopts an industrial way of ice plant. Forced air cooling and water cooling are two cooling methods in the system. Different from forced air cooling by a fan under similar room temperature at a time, our transparent cooling tower enables users to simulate different heat dissipation capacity by water cooling and with variable air volume. Students can observe different effects on ice plant from changes in surrounding temperature. The Forced air cooling and water cooling can be used at the same time or separately to test different effects.

System should include the Human Machine Interface with build in programs which are the standard control method for the system operation, and the control interface is modifiable (the system provides the original program).

● Specifications

1. Power : 1 Ø 220V AC, 50Hz/60Hz
2. Compressor : reciprocating compressor (3/4HP or above)
3. Evaporator :
 - (1) The brine freeze mode is used
 - (2) Two ice cubes can be produced simultaneously
(size: (40 x 20 x 20)cm)
 - (3) Brine concentration can be adjusted
4. Expansion Valve : thermal type
5. Filter drier : flare type filter drier SAE
6. Receiver : refrigerant capacity R404a/R507-2.5LBS
7. Accumulator :
refrigerant holding cap R404a/R507-3.4LBS 0°F SAT
8. Oil separator : 1/2" ODS / DIA. 4"
9. Water pump : capacity : 10 L/min
Max. head: 2m
10. Condensers :
 - (1) Air-cooled coil cooling fan with more than 1HP
 - (2) Double-tube water-cooled condenser with a desktop cooling tower
 - (3) These two condensers can be used at the same time

11. Cooling tower : dimension (600(W) x 300(D) x 600(H))mm
 Fan parameter :
 motor speed 2700rpm/3100rpm, 50Hz/60Hz
 Volume rate of flow : 84CFM/105CFM, 50Hz/60Hz
 Waterproof rating : IPX7
12. Protection switch : low pressure, high pressure, over load
 flow switch (Min. start flow 1 LPM)
13. Pressure transmitter : low pressure :-1bar ~16 bar
 high pressure:-1bar ~40 bar
14. HMI Control Interface :
 - (1) 10 "TFT LCD touch-human machine interface with MMC (Multi-channels Modular Controller) control
 - (2) The screen displays temperatures, pressures and control of the machine
 - (3) You can use the computer to read the data of the system
7. Testing of the capacity of the cooling tower
 - (1) Adjusting the cooling capacity by changing the air volume of the cooling tower
 - (2) Observing the temperature changes of water in the high pressure area of the system
8. Testing of the capacity of the evaporator
 Adjusting the temperature of the evaporator by changing refrigerant pressure and observing the effects
9. Testing of the capacity of the compressor
 - (1) Adjusting the temperature of the evaporator by changing refrigerant pressure
 - (2) Observing the changes in output power on the compressor
10. Troubleshooting practices
 Adjusting the refrigerant pressure or protection switch to simulate fault

Please refer to the appendix table for the accessories set and optional equipment of KR-112.

● Experiments

1. Calculation of cooling water
 Using the refrigeration capacity to calculate the required amount of the cooling water Learning how to select suitable water pumps in the future
2. Calculation of chilled water
 Learning how much brine volume is required for different ice and various frozen products that would like to be produced
3. Calculation of refrigeration capacity
 Using the discharge capacity of compressor to calculate the refrigeration capacity
4. Adjustment of brine concentration
 Adjusting the brine concentration to change the temperature of the sink
5. Calculation of condenser capacity
 Using the Mollier Chart to calculate the capacity of the condenser and compare it with the capacity of the cooling tower
6. Study the rate of change in ice plant
 Adjusting the brine flow to adjust the speed of making ice

Appendix Table

Accessories Sets										
Items	KR-101	KR-102	KR-105	KR-112	KR-115	KR-201	KR-212	KR-221	KR-270	KR-351
Manifold Gauge	●	●	●	●	●	●	●	●	●	
Digital Thermal Meter	●			●	●			●	●	
Digital Anemometer			●	●	●	●	●	●	●	
AC Current Clamp Meter	●	●	●					●		●
Wrench Set		●		●			●			
Flaring & Swaging Kit		●					●			
Others		Leak Detector		Concentration meter			Leak Detector			
Tool Box	●	●	●	●	●	●	●	●	●	●

Optional										
Items		Soldering Set *					Washing tools Set			
Specific Tools Set										
Vacuum Pump	●	●	●		●	●	●	●	●	
Air Compressor				●						●
Wire Rack										●

Self-Provide										
Refrigerant	R-134a	R-134a	R-134a	R-404A	R-134a	R-410A	R-410A	R-410A	R-134a	

*Note. Soldering Set = If the soldering tools set is obtained, locally please prepare a fuel cylinder.



22 736 3650 / 22 736 5827
 22 736 4461 / 22 728 6162
 ✉ systelec@systecl.cl
 🌐 ww.systecl.cl
 ☎ +56 9 34415419
 📍 Av. Pedro Fontova 3954
 Santiago de Chile