



## Crystal8 – 86 kW Industrial Glycol Chiller

### Owner's Manual

**Please read this owner's  
Manual carefully before  
operating the unit.**

**KegLand Distribution PTY LTD**

## Table of Contents

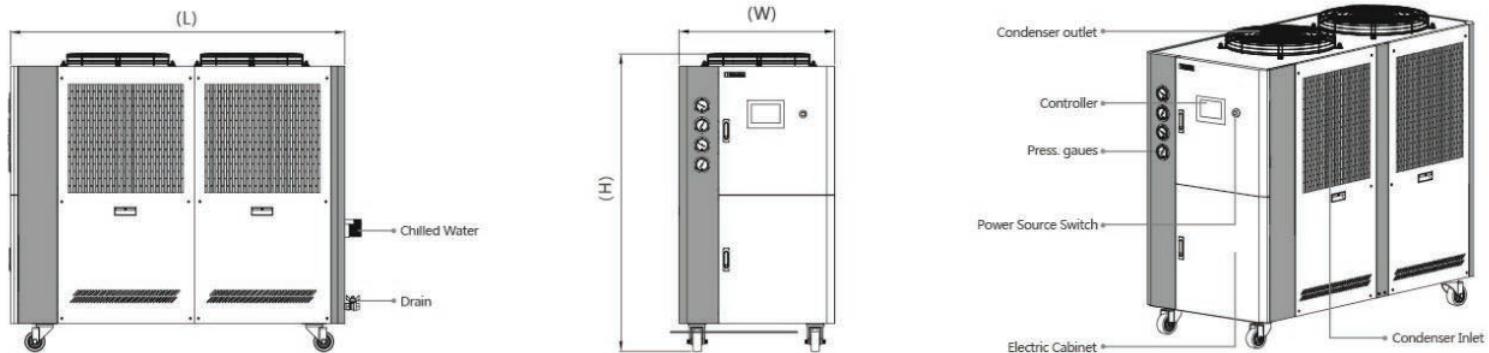
Specifications .....	3
Refrigeration Principle .....	4
Installation .....	5
Positioning .....	5
Wiring .....	5
Hosing/Tubing .....	6
Operation and Parameter Adjustment .....	7
Control Panel .....	7
Main Interface .....	7
Changing Set Temperature .....	7
Alarm Interface .....	8
Function Menu .....	8
Parameter Adjustment .....	9
Parameters .....	9
Fault Code Table .....	10
Control Logic .....	11
Electrical Wiring .....	11
Electrical Diagram .....	12
Troubleshooting .....	13
Maintenance .....	14
Service and Warranty .....	15

## Specifications [2]

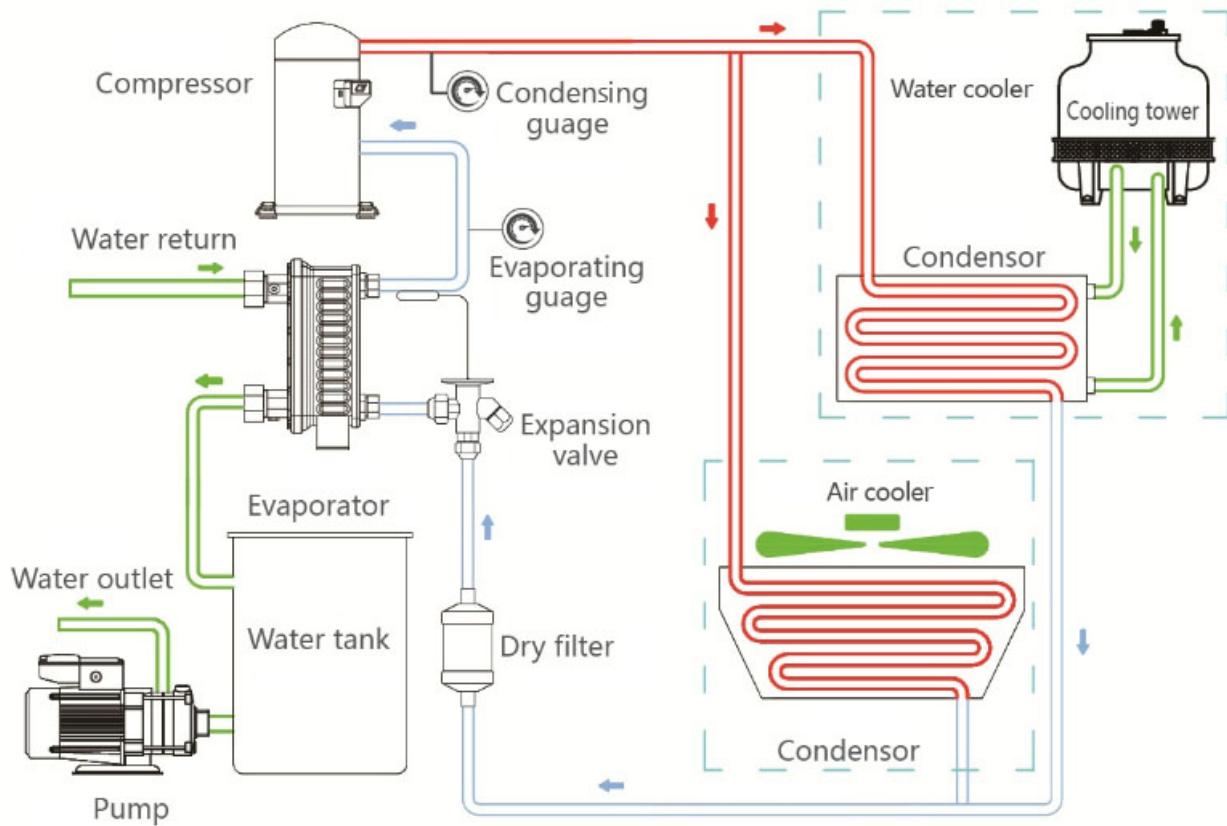
Model			86 kW Industrial Glycol Chiller
Cooling Capacity		kW	86
		kcal/h	74.1 x 10 <sup>3</sup>
Power Source		V/ph/Hz	380/3/50
Gross Power		kW	30
Rated Current		A	57
Compressor	Type		Scroll Type
	Power	kW	25
Condenser	Type		Efficient internal thread fin type
	Fan		Axial Flow
Evaporator	Type		Stainless shell and tube (stainless heat exchange tube)
	Pipe Size	DN	65
	Water Flow	m <sup>3</sup> /h	28.9
		L/min	480
Pump	Type		Stainless steel centrifugal
	Power	kW	2.2
	Head	m	25
Refrigerant	Type		R22/R407C
	Throttling Type		Expansion valve
Protector			Pressure, Overload, Delay, Over-temperature, Flow
Noise Level		dB(A)	68
Unit Weight		kg	780
Dimensions	L	mm	2080
	W	mm	1050
	H	mm	1920

[1] The above cooling capacity is based on the ambient temperature 35°C and outlet temperature 7°C

[2] Design and specification are subject to change without prior notice



## Refrigeration Principle



The Crystal8 industrial chiller uses a freon forced cooling method in which the glycol solution is constantly circulated through the plate heat exchanger and evaporator using the in-built pump. The plate heat exchanger takes advantage of shunt and counter current methods to maximise heat exchange efficiency.

When the glycol temperature which is returned from the into the chiller measures higher than the set value on the chillers temperature controller the refrigeration system will begin circulating liquid fluorine into the plate heat exchanger to allow for heat exchange. This will drop the temperature of the circulating glycol solution which will mix with the solution in

the water tank to ensure the temperature in the water tank is controlled within the specific set range.

When the return water temperature is lower than or equal to the set value, the refrigeration system will stop recirculating into the heat exchanger until the return water temperature is again above the set value on the temperature controller.

This system will keep your circulating coolant water at the specified set value and hence it may require the use of external filters, pressure relays and water flow switches according to the actual desired use of the chiller.

## Installation

### Positioning

1. Installation environment: the chiller should be installed in a well-ventilated and clean air environment, clear of any corrosive gases, flammable and explosive goods and away from high temperatures. Direct sunlight on the chiller should be avoided. If installed outdoors appropriate rain protection measures must be taken (especially for electrical boxes and operating panels).
2. Installation foundation: the foundation which the chiller is installed on should be able to fully withstand the total weight of the unit and the forces transmitted by its work. The inclination of the foundation should not be greater than 5 degrees.
3. Installation principles: ensure that there is a clearance of at least 50cm around the air inlet, at least 80cm around the air outlet and no less than 80cm around the chiller for maintenance.
4. Lifting requirements: when lifting the chiller to install it in its final position, it should be protected from external force impact or excessive bumps and damage. It is strictly prohibited to skew or invert the chiller. During lifting the chiller should be supported at its centre of gravity and sharp increases or decreases in height are to be avoided.

### Wiring

**Important, all wiring works are to be completed by a trained electrician or an individual deemed competent.**

1. Operating voltage: Please note the operate voltage specified on the nameplate. The voltage is required to fluctuate in the range of AC 380V±10%. If the voltage is outside of this range (especially if the voltage is much higher than this range) then it is recommended to add a regulated power supply (the power of the regulated power supply should be slightly greater than the total power of the chiller), otherwise the chiller should be used within its normal voltage range or not used.

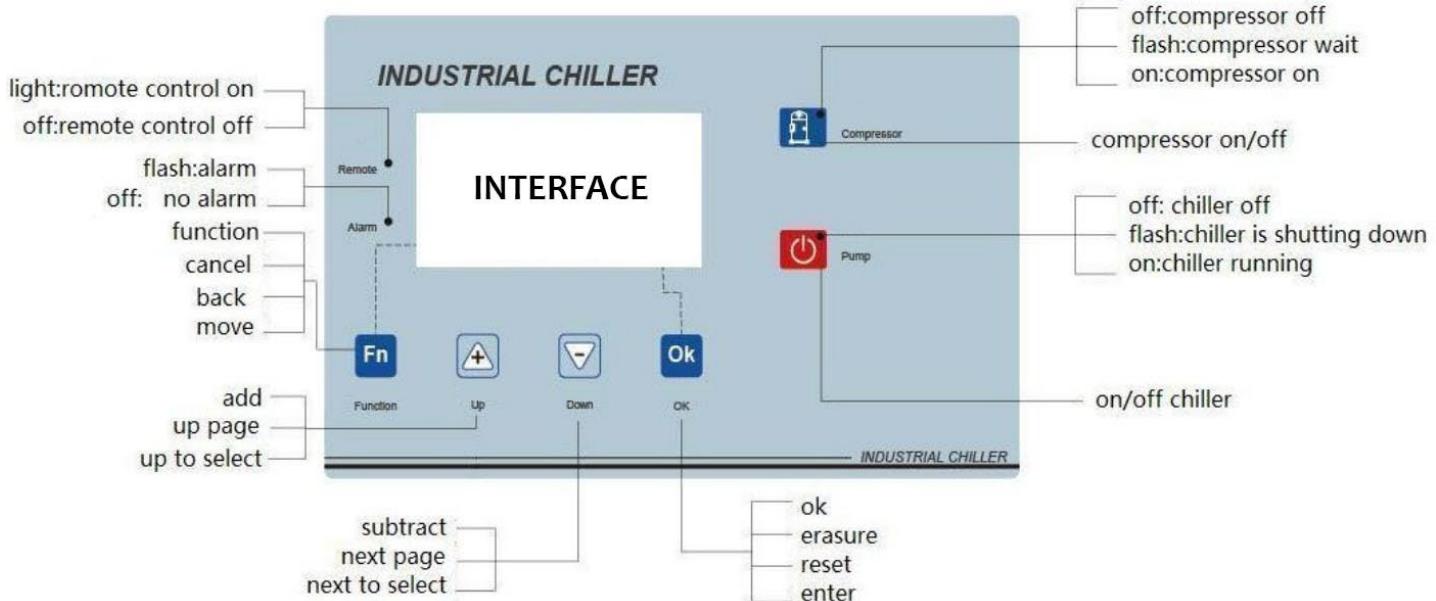
2. Power cables: the total power cables of the chiller is usually made up of three-phase five-wire, i.e. three phase lines, one zero line and one ground wire. Where only three-phase four-wire (i.e. zero-free) is used, the built-in control transformers in the chiller or zero-line as ground line are to be used.
3. How to wire: refer to the chiller wiring diagram at the end of this manual
4. Line diameter requirements: the total power supply wire diameter size should be based on the nameplate current value and in accordance with electrical wiring standards. An air switch of the appropriate capacity should be installed on the total power supply circuit.
5. Grounding requirements: the chiller must be reliably grounded.

## Hosing/Tubing

1. Pipe diameter requirements: The inside diameter of all hosing and tubing must be strictly in accordance with the internal diameter of the chiller water in/out pipe. Do not reduce the pipe diameter below the size of the inlet/outlet on the chiller.
2. Distance from the vessel: the inlet of the chiller should be as close to the vessel as possible, and the length of any elbows and pipes should be as low as possible to reduce pressure drop.
3. Hosing requirements: It is recommended to use steel wire reinforced hose for the inlet and outlet pipe or install shock-absorbing hose for outlet and inlet of the chiller.

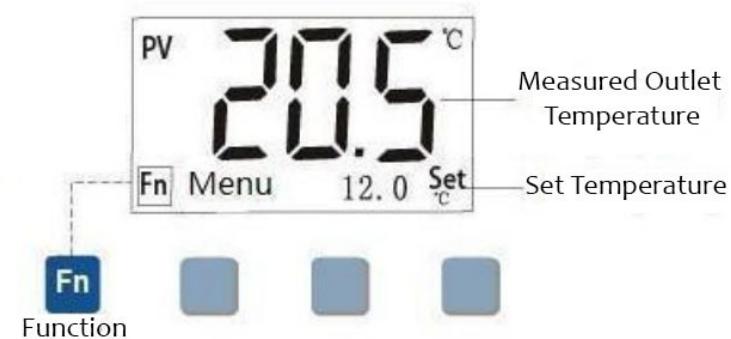
## Operation and Parameter Adjustment

### Control Panel



### Main Interface

During normal operation the following will be displayed on the interface.



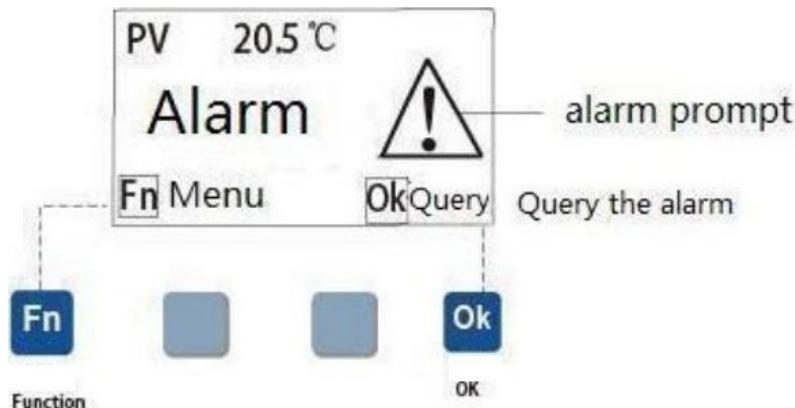
### Changing Set Temperature



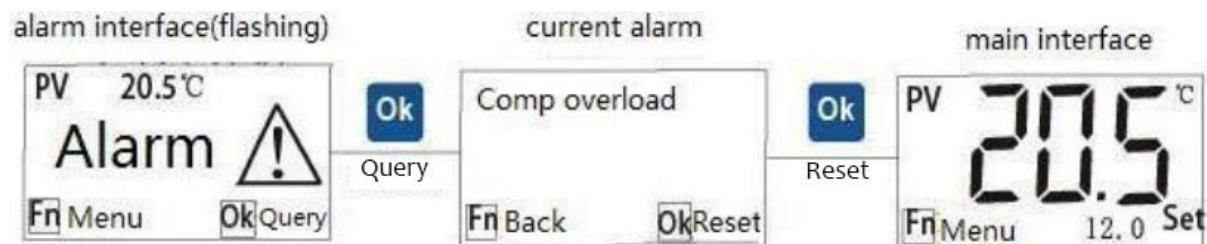
To change the set temperature of the chiller, while on the main interface press the "Up" or "Down" arrow to change the displayed set temperature.

## Alarm Interface

When an alarm occurs, the following interface will be displayed automatically:

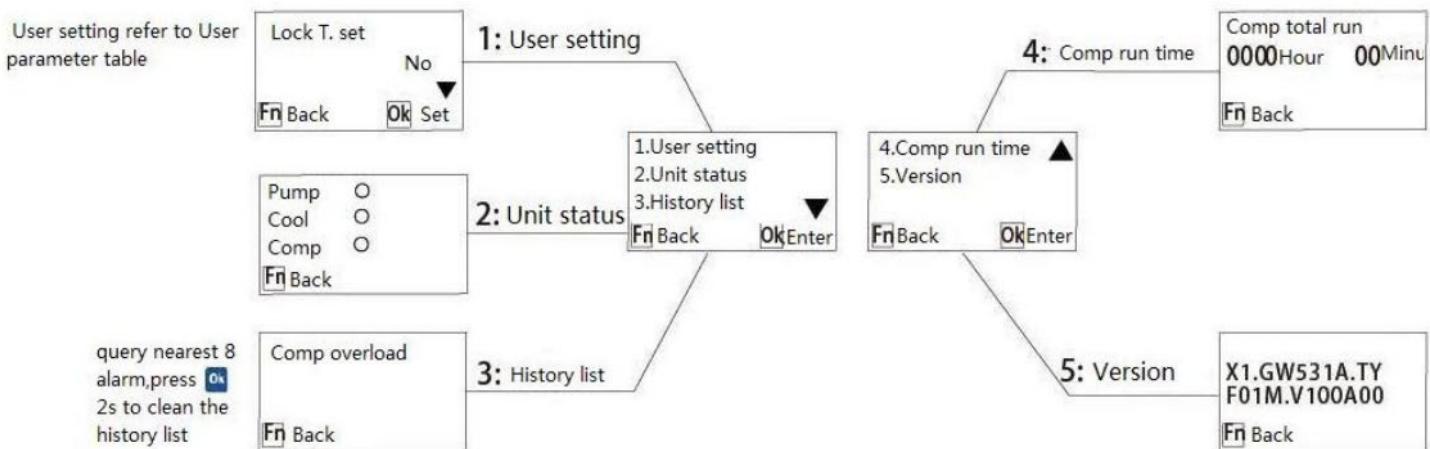


To determine the reason for the alarm press “Ok” to query the alarm. Then press “Ok” to reset the control panel.



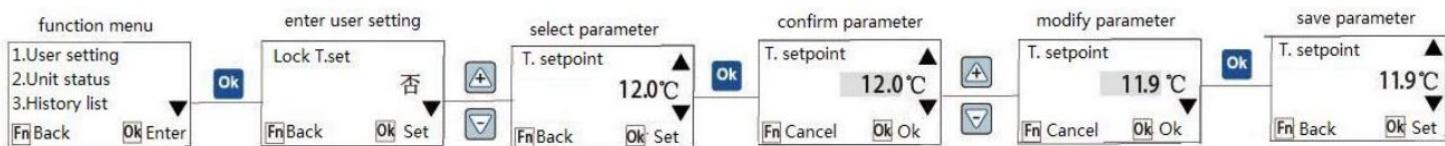
## Function Menu

Press Fn to enter the Function Menu. This menu will display the following five items:



## Parameter Adjustment

To adjust any of the parameters, enter the Function Menu and then enter **1. user setting**. Then select the parameter which is required to be adjusted using the up/down arrows. Press “Ok” to select the parameter. Modify the parameter using the up/down arrows and then save the parameter by pressing “Ok”.



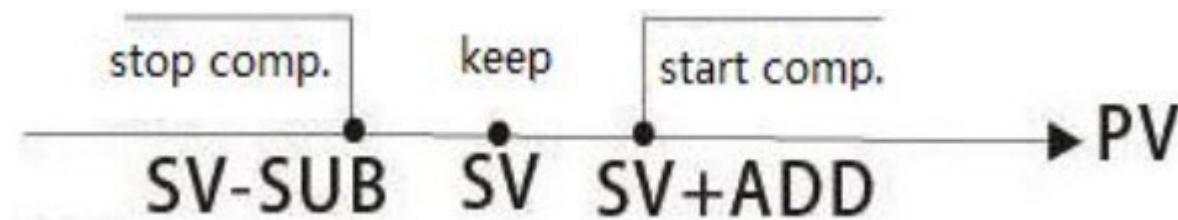
## Parameters

Parameter Name	Default Value	Value Range	Note
Lock T.set	No	Yes/No	Lock Set Temperature
T.setpoint	12.0C	-38.0c – 99.9C	Temperature Limits
Contrast	32	20 - 44	LCD contrast
Run type	Local	Local / Remote	Remote On / Off
Backlight on	0	0 – 255 minutes	Backlight run time (0 = backlight always on)
Language	English	Chinese / English	Select Language

## Fault Code Table

Name of failure	Test conditions	Fault handling	The solution
Comp.P high AL	Test when comp running	Stop the compressor,the fan,the pump	If detect input and switch Setting are consistent
Comp.P low AL			
Comp overload			
Temp. low AL	Test when Running	Stop the compressor,the fan,the pump	Raising the temp.
T. high warn		Only report to the police	Cool the Temp.
T. high alarm		Stop the compressor,the fan,the pump	Cool the Temp.
Anti-freeze. AL	Test when power on	Stop the compressor,the fan,the pump	Detect input and switch settings
Probe break			detect the sensor contact
Probe short			
Cool overload	Test after Cooling pump start	Stop the compressor,the fan,the pump	Check cooling overload input and switch settings
Water flow AL	More than set delay time	Stop the compressor,the fan,the pump	Check the water flow and switch settings
Pump overload	Cooling pump start after test	Stop the unit	Check whether frozen overload input and switch settings
A power failure	Test when power on	Stop the unit	check power supply or test switch Setting
Water lv. AL	Test when power on	Stop the compressor,the fan,the pump	
Need maintain	Start testing	Unit can't start once stop, comp. run time is more than setting	

## Control Logic



PV = Outlet Temp

SV = Set Temp

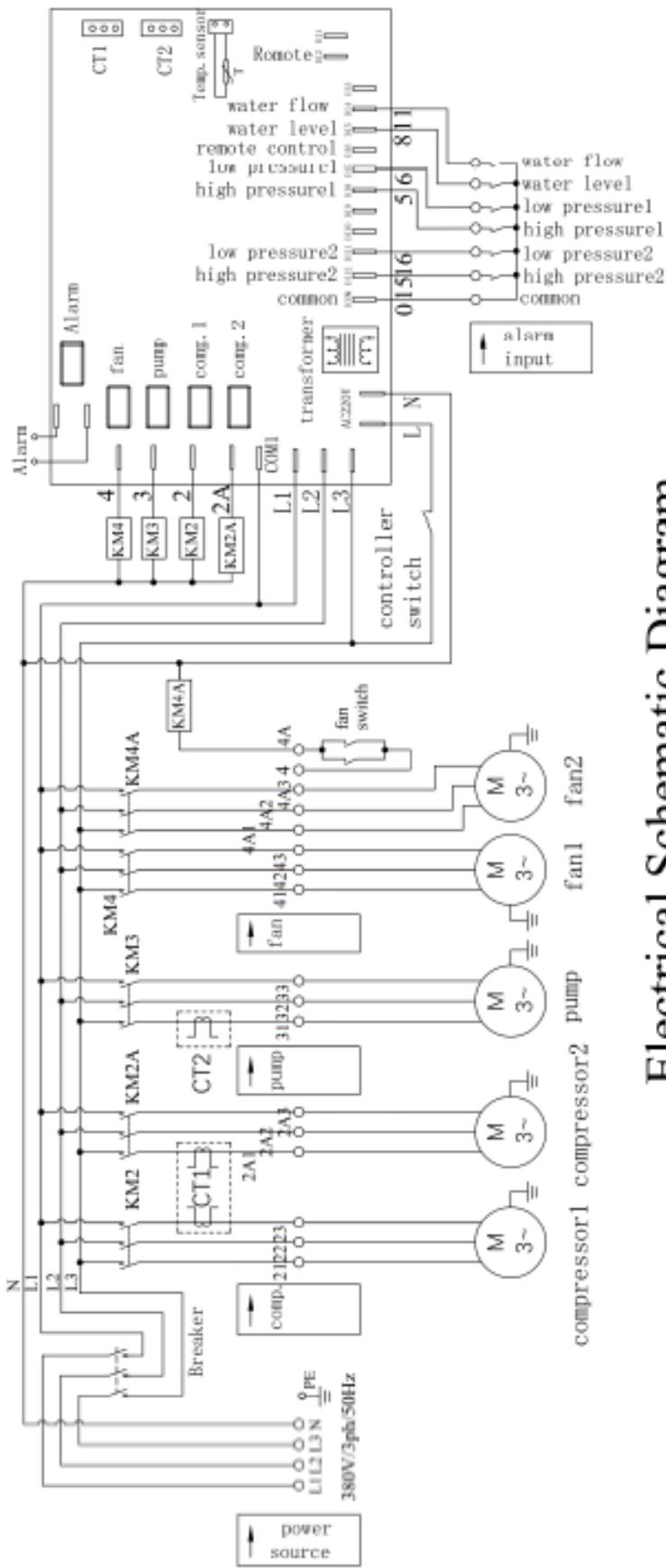
Add = Upper range of hysteresis      Sub = Lower range of hysteresis

When temperature rising:  $PV \geq SV + ADD$ , start the compressorWhen temp cooling:  $PV \leq SV - SUB$ , stop the compressor.

## Electrical Wiring

1. The operating voltage of the unit should be kept within  $\pm 5\%$ . Too high or too low operating voltage will adversely affect the chiller.
2. The voltage difference between phases should be within 5%. The maximum and minimum phase current difference should not be less than 3% of the rated value. The power frequency should be maintained within  $\pm 2\%$  of the rated value. Avoid overheating the compressor.
3. Power to the wiring between units is to be strictly in accordance with the electrical construction standards with good insulation. Electrical parts, terminals and the body should be tested with a 500V high impedance meter to determine the insulation, the insulation resistance should be above  $3M\Omega$ .
4. The chiller should have a good and reliable ground protection device to prevent electric shock.

# Electrical Diagram



## Electrical Schematic Diagram

## Troubleshooting

Phenomena	Reasons	Troubleshooting
The suction pressure is too high.	The exhaust pressure is too high.	Refer to “over-high exhaust pressure”.
	The refrigerant is infused excessively.	Discharge excessive refrigerant.
	The thermal insulation of the chilled water pipe is not good.	Check the thermal insulation of pipeline.
	The liquid tube or suction tube is blocked.	Check the refrigerant filter.
	The expansion valve is not well adjusted or of failure.	Adjust the degree of superheat correctly and check whether the temperature response bag is leaked.
	The system refrigerant is short.	Check the leakage of refrigerant.
	Excessive lubricant in the system is in circulation.	Check the volume of lubricant.
	The inlet temperature of chilled water is less than the standard temperature.	Readjust the set value of temperature.
	The chilled water through evaporation is inadequate.	Check the pressure loss of cold water pipe or whether the water pump works normally.
The compressor stops due to high-pressure cut off.	The exhaust pressure is too low.	Adjust the water pipe valve.
	The cooling water is short.	Check the water pipe valve.
	The condenser is blocked and the water enter valve closed.	Check the condenser copper tube and waterway valve.
	The set value of high-pressure protection is not correct.	Check the set value.
The compressor stops due to overload of motor.	The infused refrigerant is excessive.	Check the refrigerant infusion.
	Voltage is too high or low.	Check whether the voltage is consistent with the rated value of the unit. Correct the unbalance of phase if necessary.
	The overload component is of failure.	Check compressor current and compare total current in the data.
	Motor failure or wiring short cut.	Check the impedance between motor wiring seat and earth wire.

## Maintenance

- To keep the chiller in the best condition, regular maintenance should be conducted on the following items. If necessary, adjust and keep up to date inspection records.

Inspection Time	Items	Methods	Central Control Targets	Aftermath
Daily	Exhaust pressure	Check high-pressure gage	2.2~2.8MPa	MPa
	The exhaust pressure difference among the operating compressors	Check high-pressure gage	<0.1Mpa	MPa
	Suction pressure	Check low-pressure gage	0.02~0.15Mpa	MPa
	The suction pressure difference among the operating compressors	Check low-pressure gage	<0.05Mpa	MPa
	Power supply	Check with voltmeter	Not exceed $\pm 10\%$ of rated voltage	V
	The outlet temperature of chilled water	Check the thermometer.	-5~40°C	°C
	Vibration and noise	Feel and listening	No abnormal vibration and noises	
	Ambient Temperature	Check the thermometer	<42°C	°C

- The condenser should be cleaned once every three months or in case of abnormally high pressure.
- If alarm stops operation of the chiller, trained personnel should inspect the unit for any abnormalities
- After the shutdown of the unit, cut off mains power supply.

## Service and Warranty

### 1. Maintenance and inspection

After several seasons of use, due to the accumulation of dust on the condenser, the performance of the unit will be reduced. In addition to carrying out daily maintenance and repair yourself, it is recommended that the unit is regularly professionally inspected to keep the chiller in its best condition.

### 2. Installation and repairs

Installation and repairs should be conducted by a trained professional. Improper installation or repairs may cause oil leakage, electric shock or fire.

The Crystal8 chillers come with a 12 month Warranty when sold in Australia.

To lodge a warranty claim in Australia please forward as many visual pieces of supporting information and a detailed description of your issue to [beer@kegland.com.au](mailto:beer@kegland.com.au)

If you purchased your unit from an international distributor, you will be required to go through their warranty claims process.

*For a full terms and conditions, please visit our website here -> [Terms & Conditions](#)*