WFC- SC
Chiller

1

Specifications

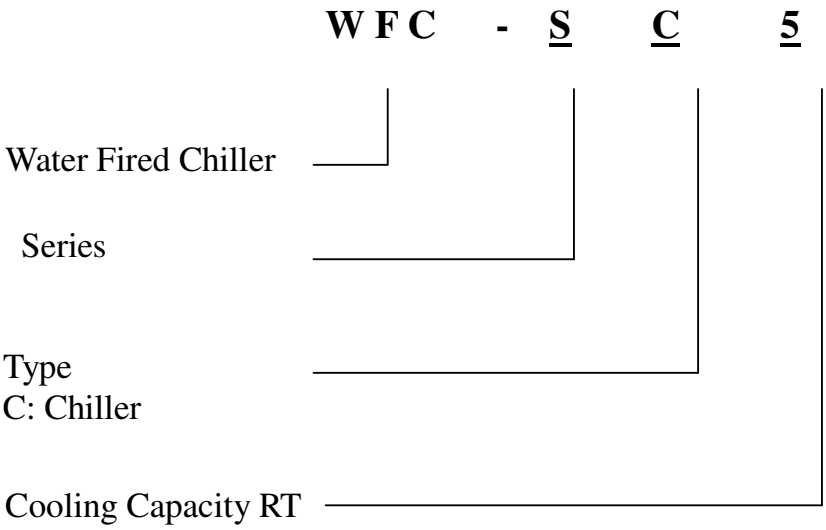
WFC-SC5
Version 8-1

YAZAKI

Contents

1. Specification

1.1 Model Designation



1.2 Multiple Module Combination

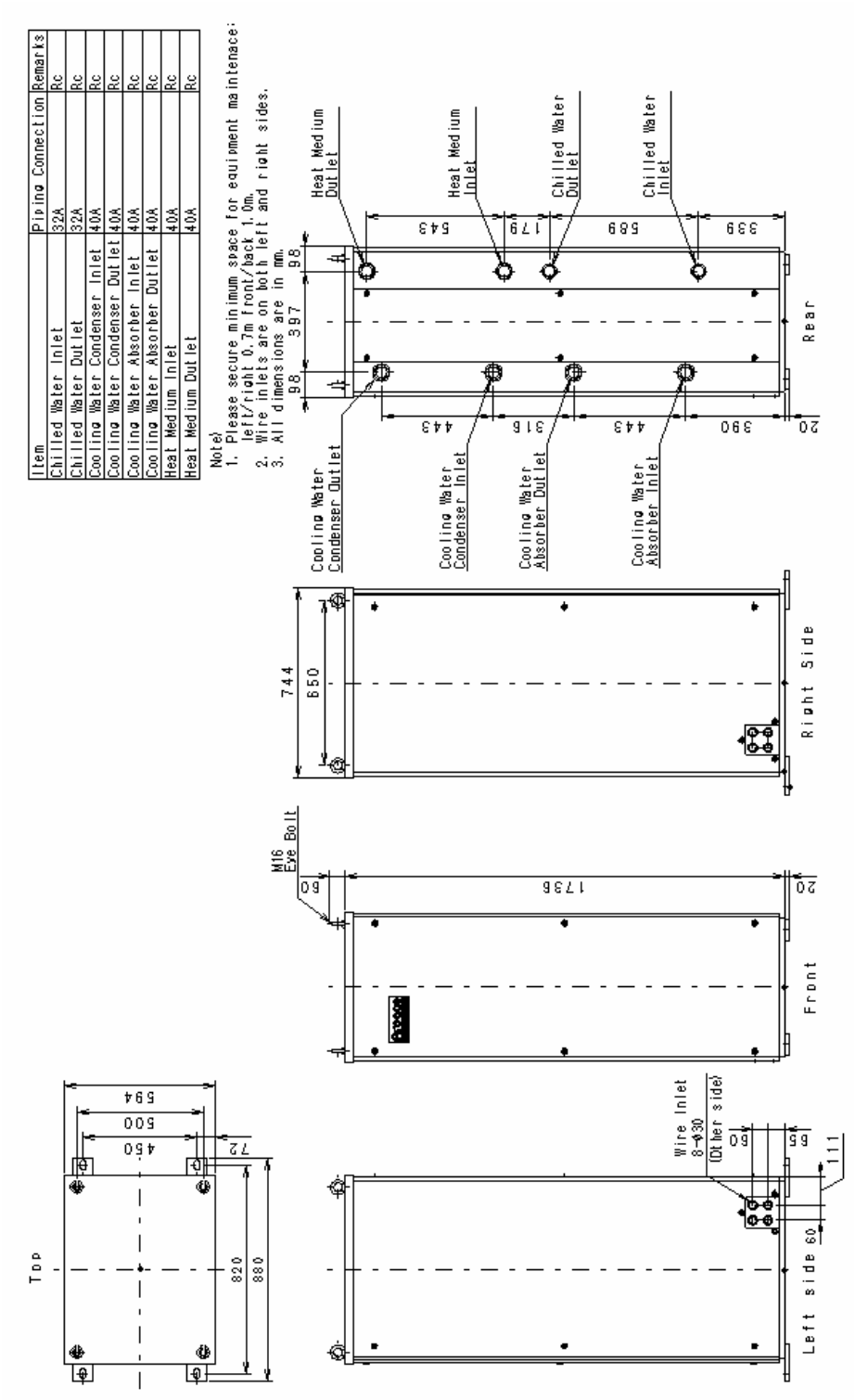
Model	Rt	Note
WFC-SC5	5	Cooling only

1.3 Specification Table

Item				WFC-SC5
Cooling capacity			kW	17.6
Chilled water	Temperature (cooling)	Inlet	°C	12.5
		Outlet	°C	7.0
	Evaporator pressure loss		kPa	52.6
	Maximum operating pressure		kPa	588
	Flow rate		l/s	0.77
			㎥/h	2.77
	Water retention volume		l	8
Cooling water *1	Heat rejection		kW	42.7
	Temperature	Inlet	°C	31.0
		Outlet	°C	35.0
	Absorber/condenser pressure loss		kPa	38.3
	Maximum operating pressure		kPa	588
	Flow rate		l/s	2.55
			㎥/h	9.18
	Water retention volume		l.	37
Heat medium	Heat input		kW	25.1
	Temperature	Inlet	°C	88
		Outlet	°C	83
		Inlet Range	°C	70 - 95
	Generator pressure loss		kPa	77.0
	Maximum operating pressure		kPa	588
	Flow rate		l/s	1.20
			㎥/h	4.32
	Water retention volume		l.	10
Electrical	Power supply	Voltage	V	AC100-240
		Frequency	Hz	50/60
		Phase	ph	1
	Consumption *1		W	48
Control				On - Off
Dimensions	Width		mm	594
	Depth		mm	744
	Height *2		mm	1,736(1,816)
Weight	Dry		kg	365
	Operating		kg	420
Piping Diameter (A)	Chilled water			32A
	Cooling water			40A
	Heat medium			40A
Cabinet and finish				Weatherproof cabinet suitable for indoor or outdoor application comprising silver metallic pre-painted hot dip zinc coated sheet steel exterior panels.

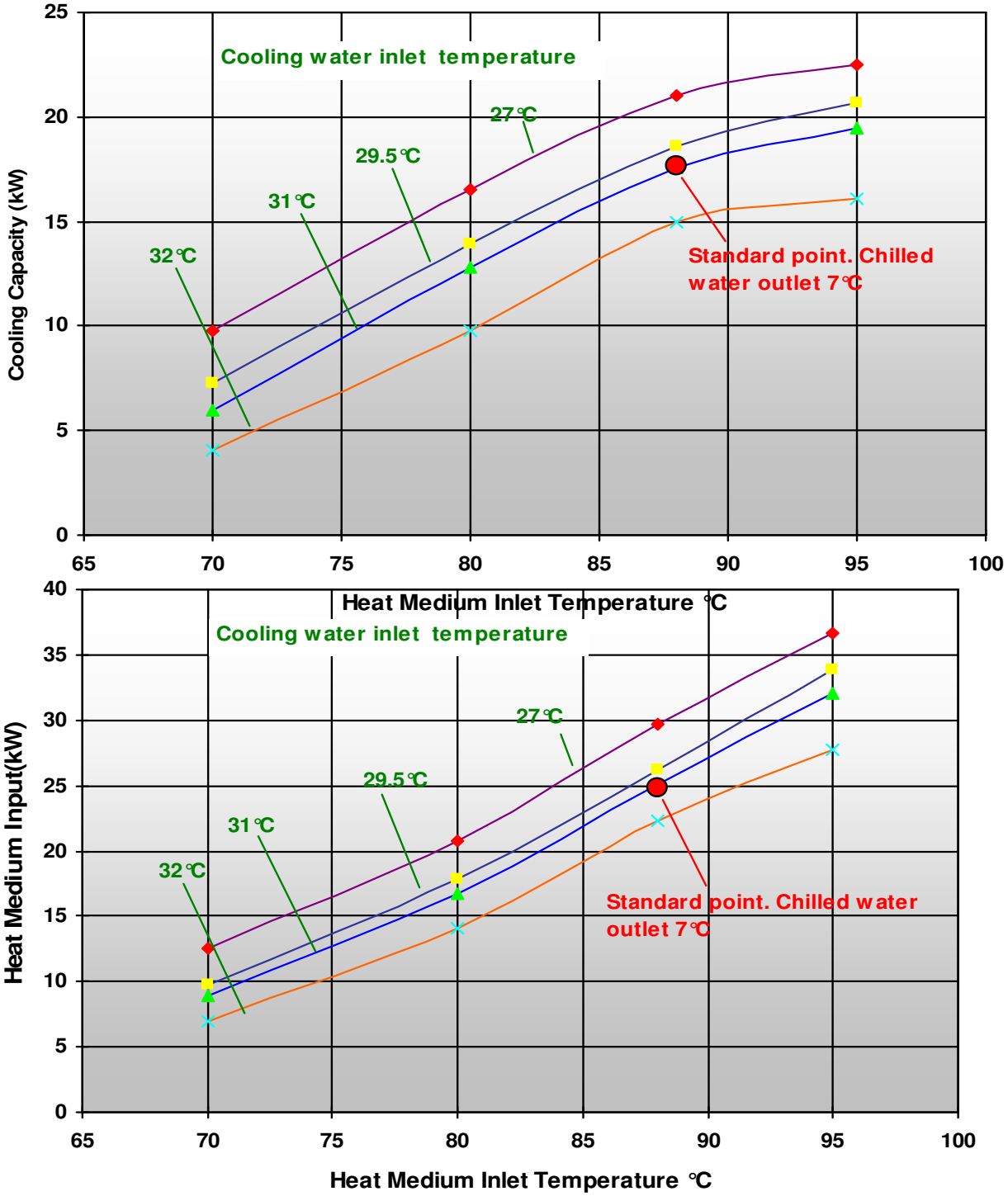
*1.Power consumption of Chiller only. (Excluding circulating pumps and cooling tower fan)
*2.Dimension in ( ) includes fixed plate and eye bolt.
*3.Specification are subject to change without prior notice.
*4.The flow rate of Chilled-hot water and Cooling water must be stable.
The allowable flow rate range are Chilled- water: 80 to 120% of nominal, Cooling water: 100 to 120% of nominal.

1.4 External Dimensions



2. Performance Characteristics.

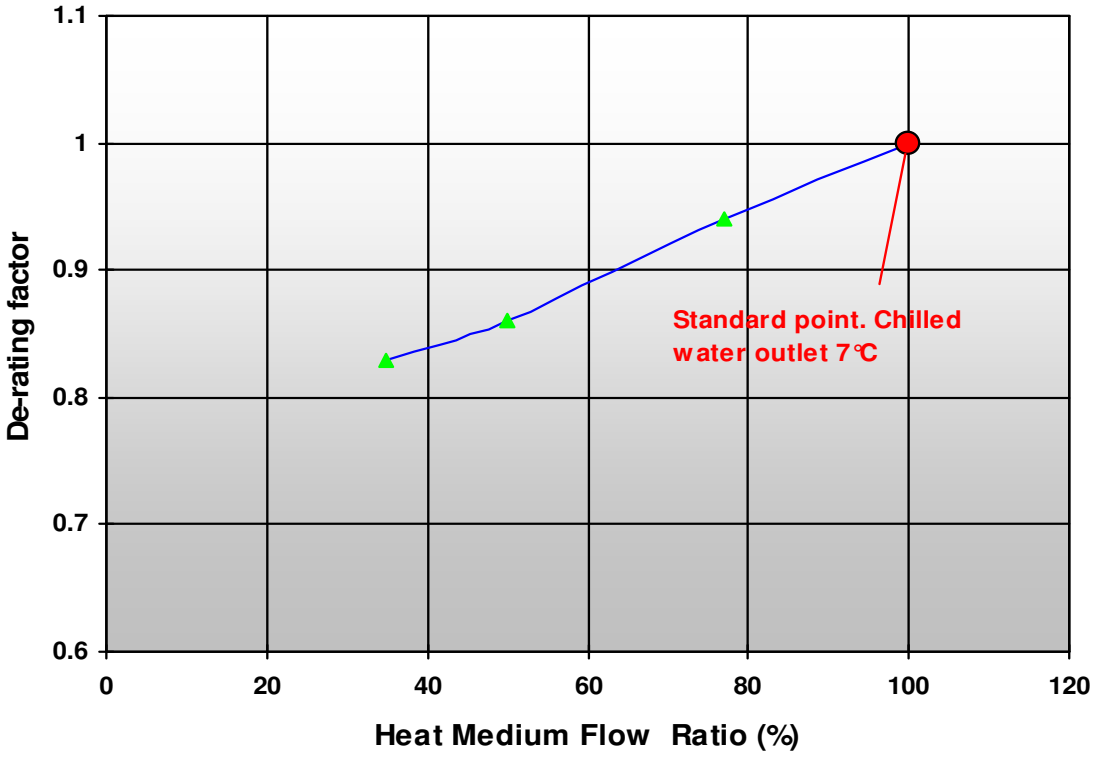
2.1 Cooling Performance (typical)



Curves typify performance characteristics and must only be used for broad reference purpose

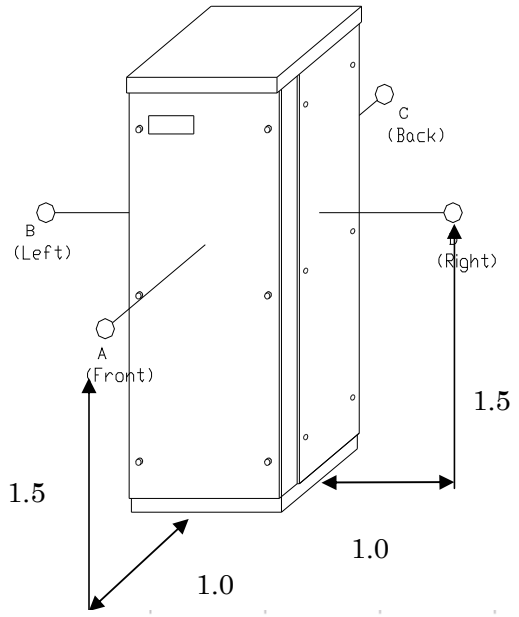
2.2 De-rating factor (typical)

Note: All other parameters of flow and temperature are considered standard.



Curves typify performance characteristics and must only be used for broad reference purpose

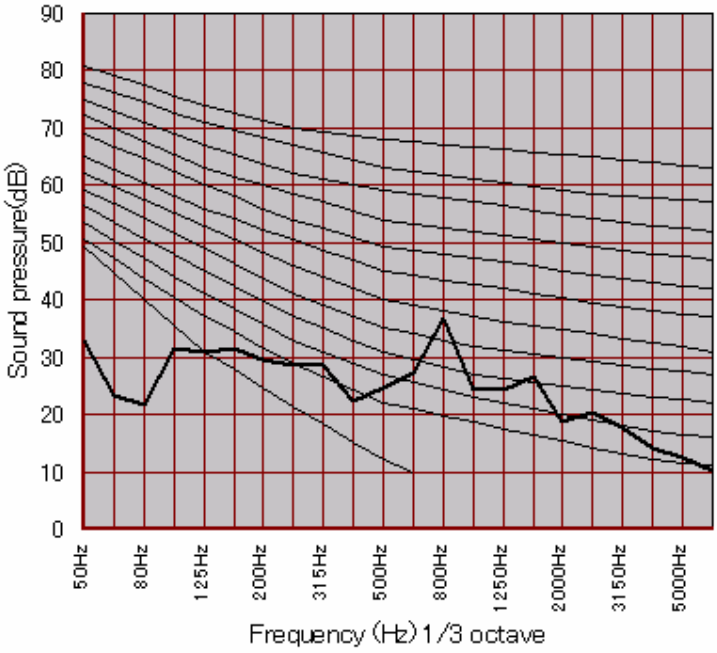
2.3 WFC-SC5 Noise Criteria



Sound level

Point	db(A)
A	35
B	38
C	38
D	-

NC curves



3. Principle & Structure

3.1 General

The WFC-SC5 absorption chiller is limited to chilling mode.

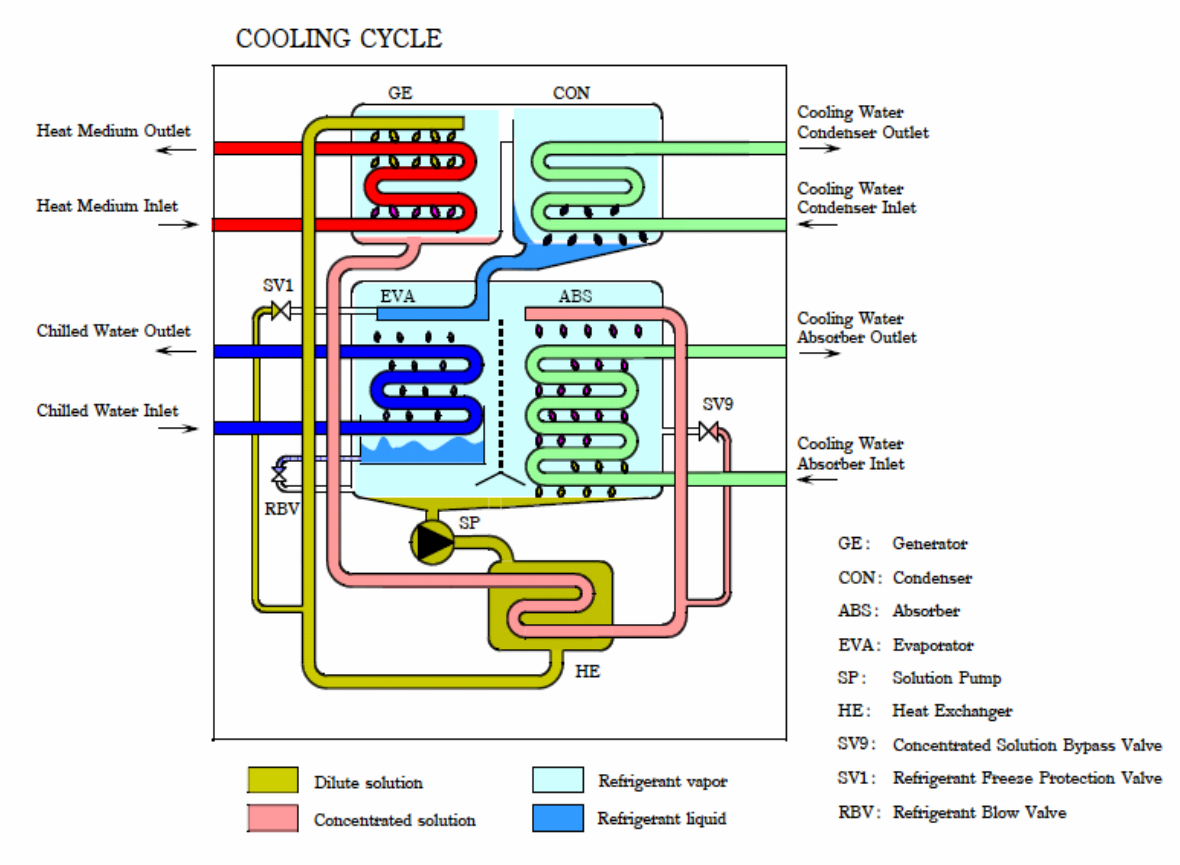
3.2 Cooling Cycle.

Referring to the schematic of the cooling cycle as shown in figure1, lithium bromide solution (Dilute Solution) is pumped to the generator (GE) by the solution pump (SP) where it is heated to boiling point by the circulating heat medium. Refrigerant vapor (water vapor) is liberated from solution and flows to the condenser (CON) where it is condensed to a liquid state by rejection of heat to the cooling water from the cooling tower circulating through the condenser coil.

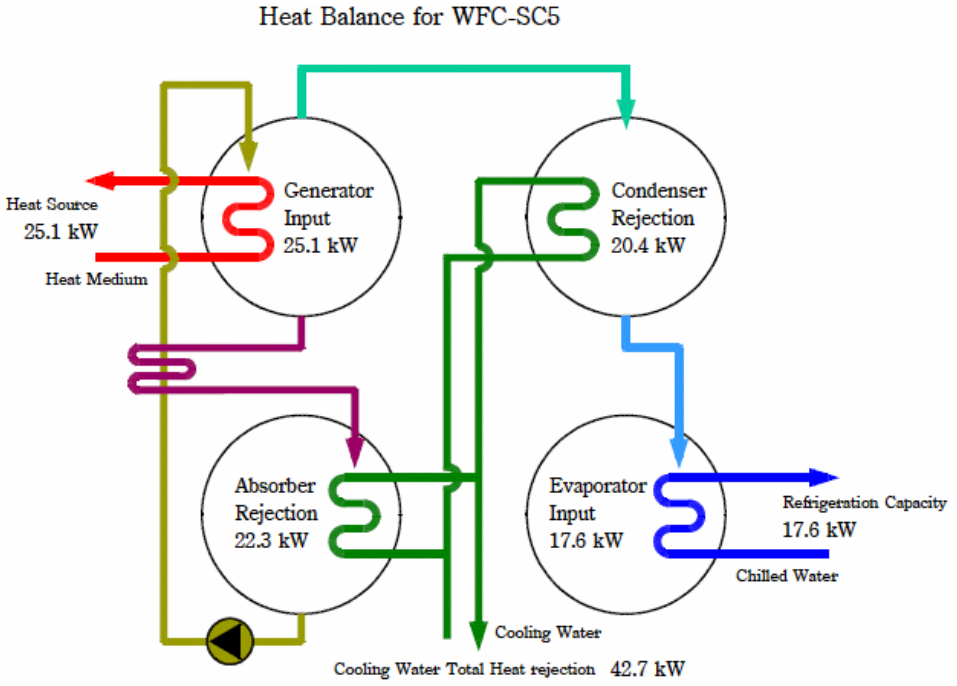
Because partial separation of the lithium bromide and the water in solution has occurred in the process of boiling in the (GE), an increase in concentration takes place and the resultant solution is termed (Concentrate Solution). Accordingly, the concentrate solution flows from (GE) to the heat exchanger (HE), imparting heat to the dilute solution, before arriving at the absorber (ABS) to flow over the surface of the absorber coil.

Since cooling water from the cooling tower is circulating through the absorber coil, a comparatively low vapor pressure is created due to the concentration of the lithium solution, and this is the environment which refrigerant liquid from the condenser encounters as it flows over the coil in the evaporator (EVA). The concentrate solution absorbs refrigerant vapor from the evaporator as the liquid refrigerant changes phase deriving heat of vaporization from the chilled water circulating through the evaporator coil. This results in the production of chilled water.

The concentrate solution returns to a diluted state as refrigerant vapor is absorbed. In its relatively cool condition, it is collected in the (ABS)/(EVA) sump and thereafter forced by (SP) through the (HE) collecting heat from the concentrate solution before returning to the (GE) for boiling again to repeat the cycle.



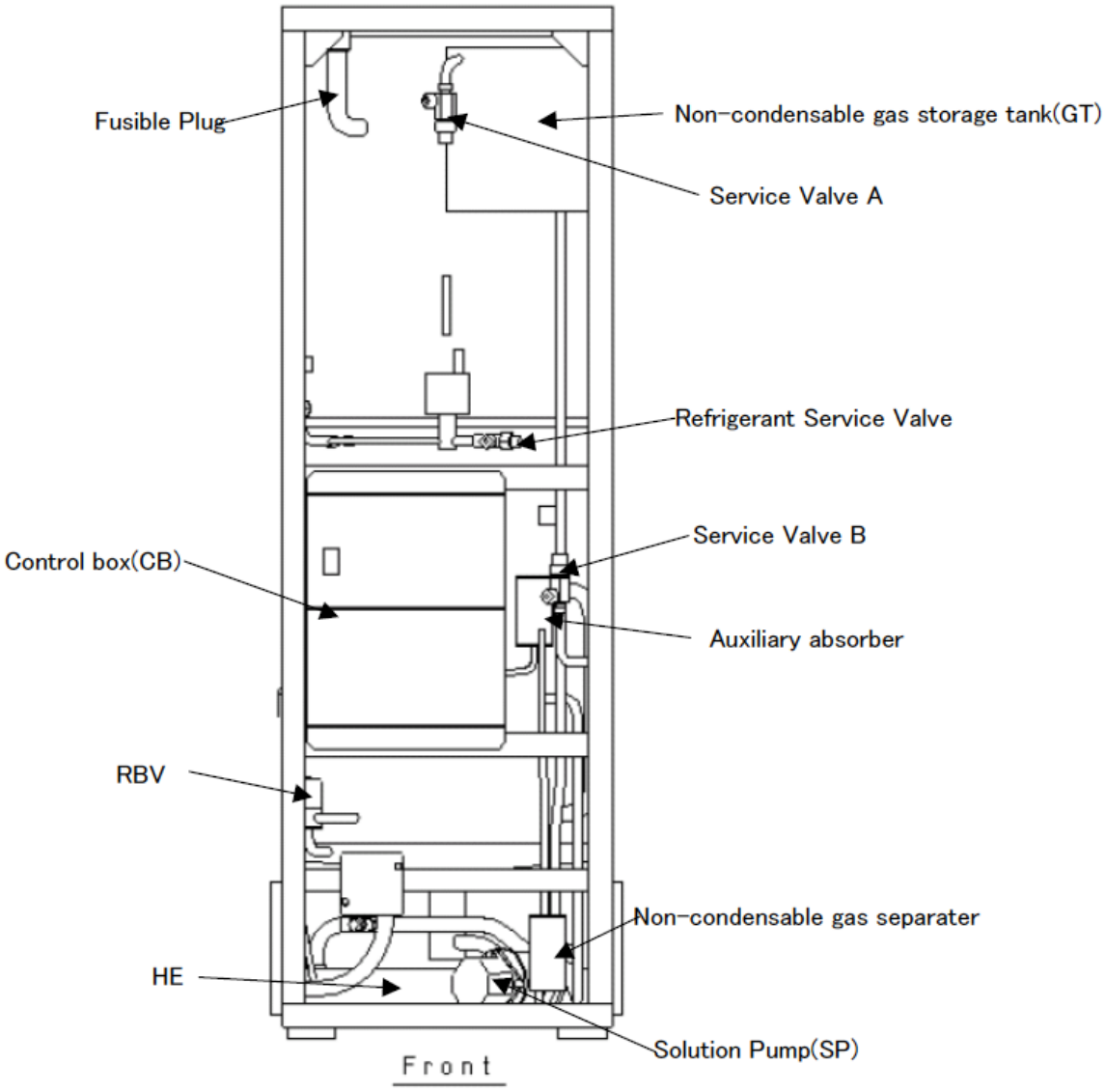
3.3 Heat Balance (Cooling Cycle)

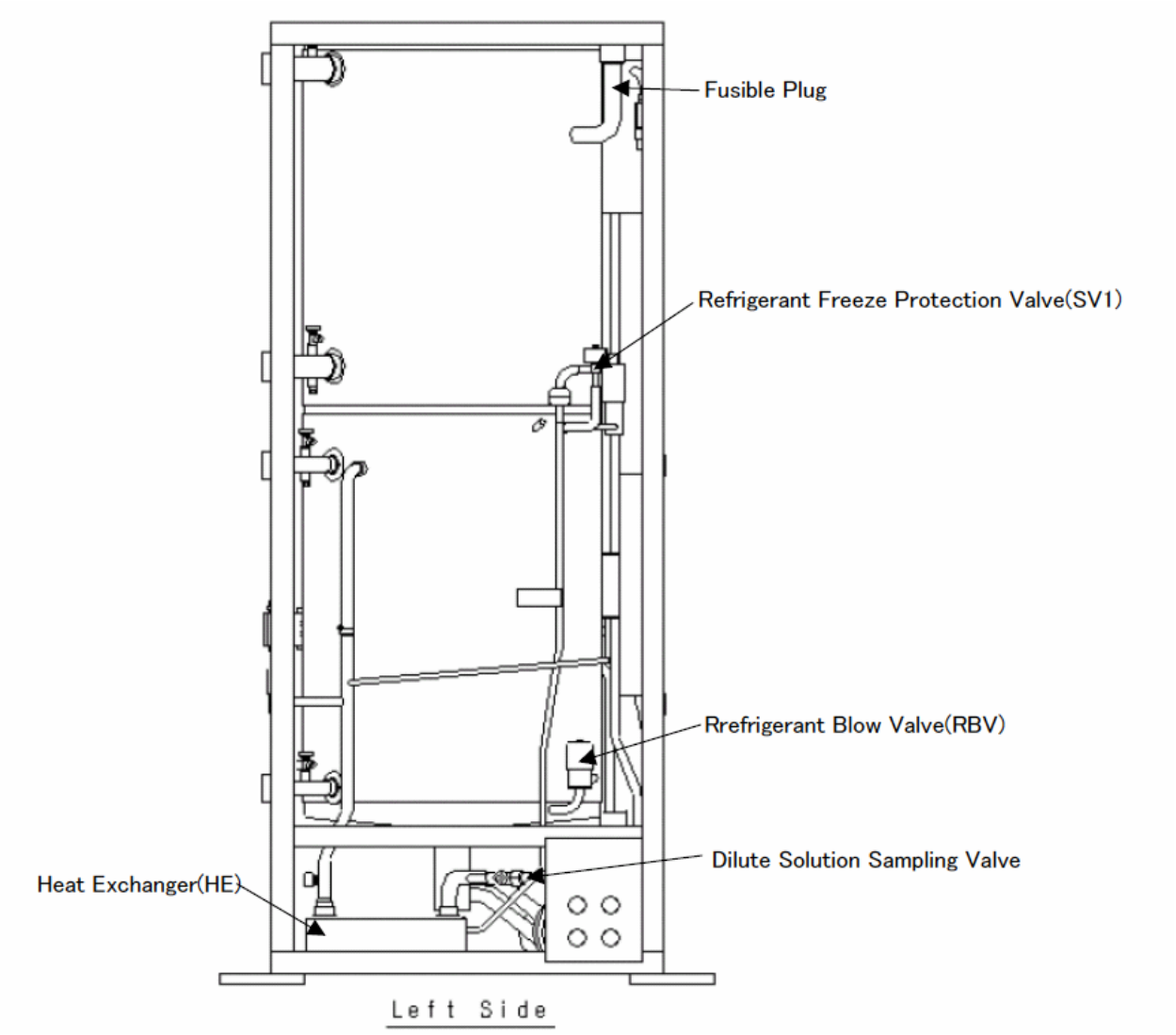


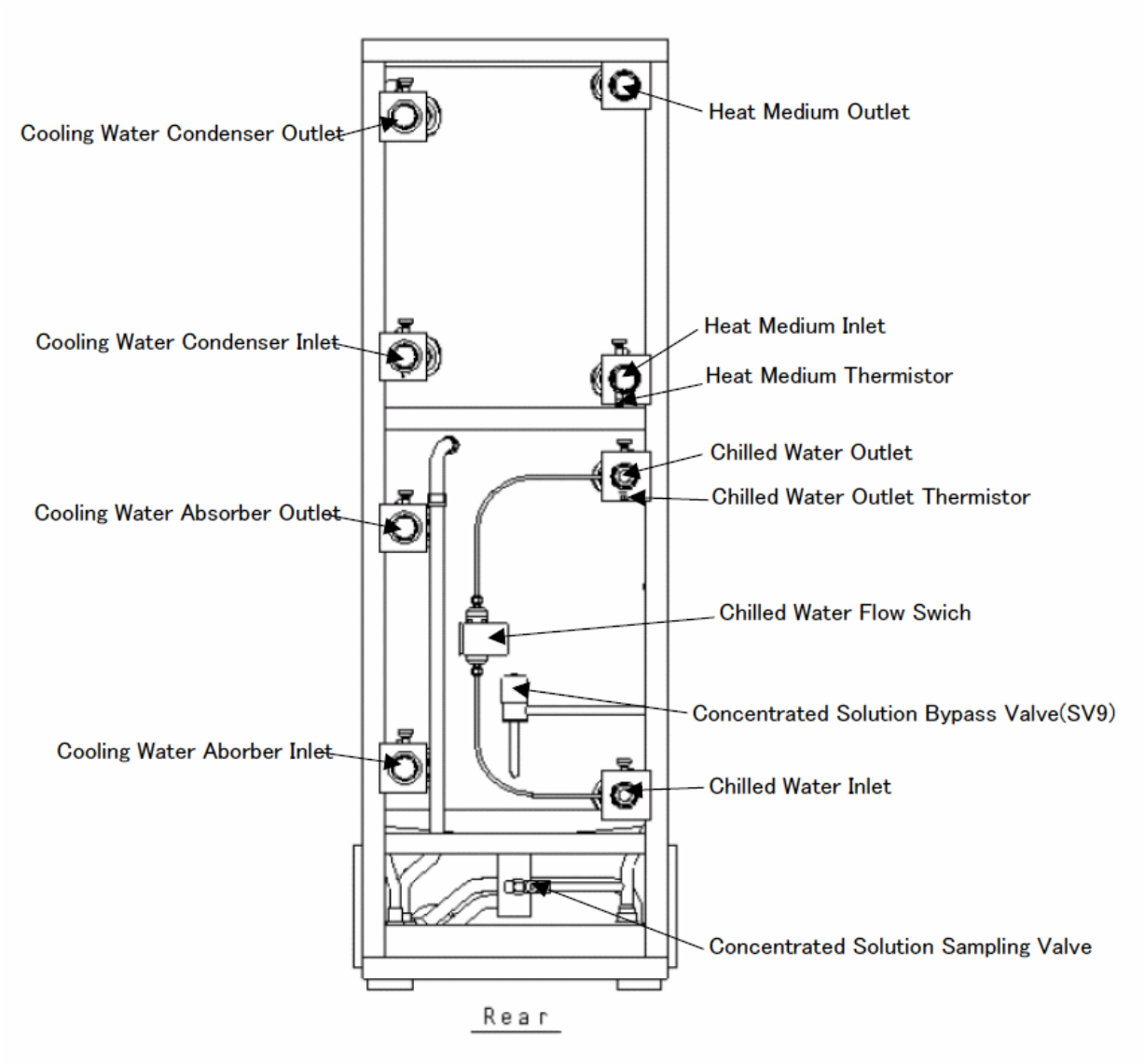
4. Component Identification and Function

4.1 Chiller Assembly (WFC-SC5)

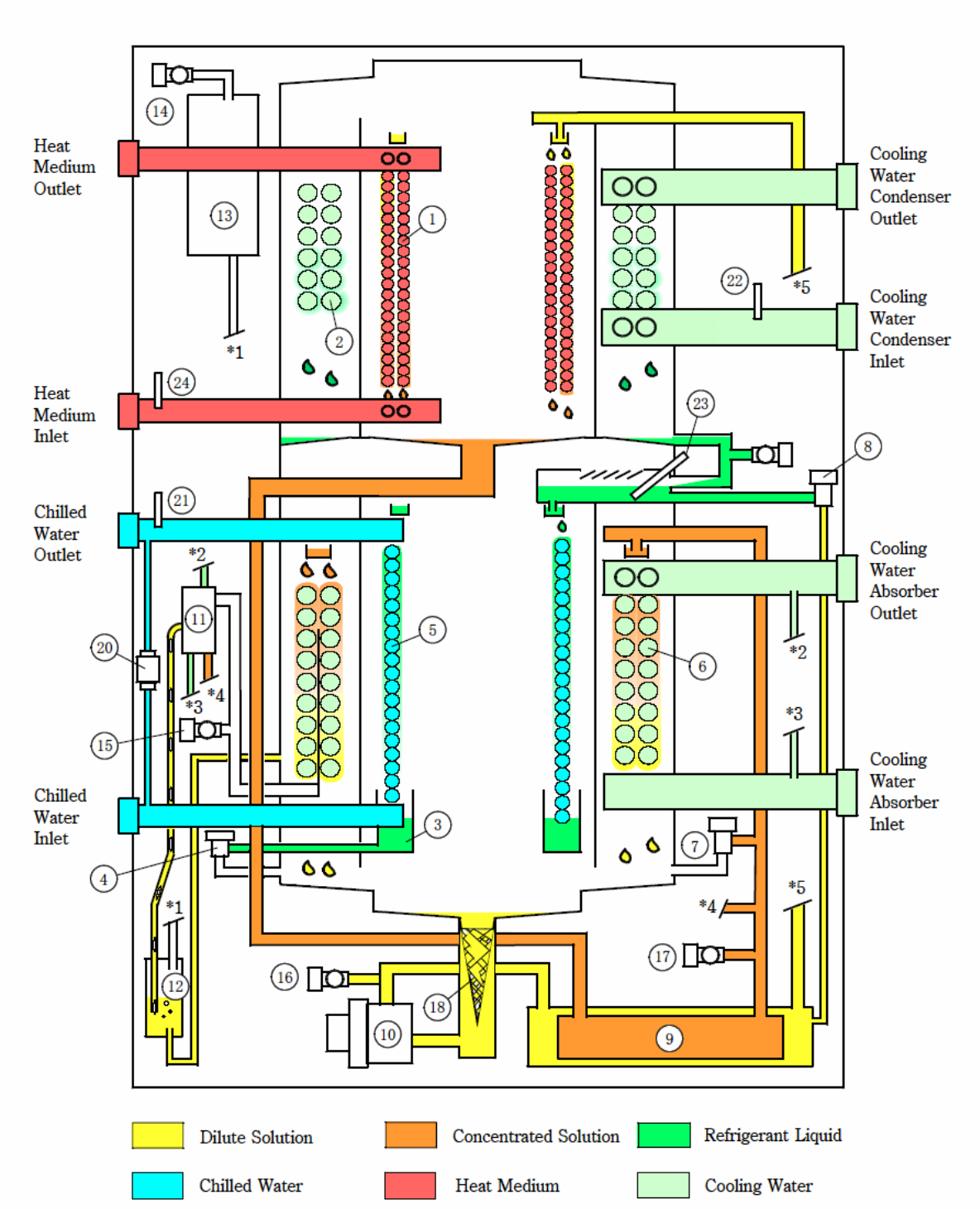
Parts and components are identified in the following.




Fusible Plug
Refrigerant Freeze Protection Valve(SV1)
Rrefrigerant Blow Valve(RBV)
Dilute Solution Sampling Valve
Heat Exchanger(HE)
Left Side


Cooling Water Condenser Outlet
Heat Medium Outlet
Cooling Water Condenser Inlet
Heat Medium Inlet
Heat Medium Thermistor
Chilled Water Outlet
Cooling Water Absorber Outlet
Chilled Water Outlet Thermistor
Chilled Water Flow Swich
Concentrated Solution Bypass Valve(SV9)
Cooling Water Aborber Inlet
Chilled Water Inlet
Concentrated Solution Sampling Valve
Rear

4.2 Component Description



No.	Component	Description
1	Generator (GE)	Boils dilute LiBr solution to separate refrigerant from the absorbent
2	Condenser (CON)	Condenses refrigerant vapour to provide liquid refrigerant.
3	Refrigerant storage tray (RST)	For accumulating liquid refrigerant for best suited solution density.
4	Refrigerant blow valve (RBV)	To blow refrigerant liquid stored in Refrigerant storage when shutdown. Also RBV will open when LT is 3℃ or less and cooling water temp 20℃ or less to prevent from solution condensing.
5	Evaporator (EVA)	Heat of evaporation or condensation from the refrigerant is extracted from, or transferred to, the water flowing through the EVA coil
6	Absorber (ABS)	As refrigerant vapor is absorbed by the LiBr solution, heat of absorption is transferred to the cooling water flowing through the ABS coil.
7	Solution bypass valve (SV9)	In the event the EVA, or cooling water temperatures fall to a predetermined level, SV9 will open to reduce the flow of LiBr solution to the ABS
8	Refrigerant freeze protection valve (SV1)	If the operation of SV9 does not arrest the fall in temperature of the EVA, SV1 valve will open at 1°C to allow dilute solution to enter the evaporator.
9	Heat exchanger (HE)	Heat exchange between the cool dilute and hot concentrate LiBr solution is facilitated by HE.
10	Solution pump (SP)	Dilute LiBr solution is transferred from the ABS to the GE by the SP.
11	Auxiliary absorber	Non-condensable gases are gathered from the ABS by the auxiliary absorber.
12	Non-condensable gas separator	Gases gathered by the auxiliary absorber are separated from dilute solution and transported to the storage tank GT.
13	Non-condensable gas storage tank (GT)	GT retains non-condensable gases accumulating in the absorption circuit.
14	Non-condensable storage service valve (A)	Removal of non-condensable gases from the GT is facilitated by valve (A).
15	ABS service valve (B)	Vacuum service of the ABS/EVA areas of the chiller is afforded by valve (B)
16	Dilute solution sampling valve	Dilute LiBr solution circuit is accessed by the dilute solution service valve.
17	Concentrate solution sampling valve	Concentrate LiBr solution circuit is accessed by the concentrate solution service valve.
18	Strainer	Solution drawn from the absorber is strained before entering the solution pump.
19	Control box (CB)	All operation of the chiller and interface with external controls is provided by the CB
20	Flow switch (FS)	If the chilled water flow rate falls to less than 80% of standard, the operation of the chiller will cease.
21	Thermistor (WTO)	The chilled water outlet temperature is controlled by WTO =- see section 4 Electrical & Maintenance
22	Thermistor (CTI)	The chiller operation is responsive to cooling water temperature monitored by CTI – see section 4 Electrical & Maintenance
23	Thermistor (LT)	Operation of the chiller is responsive to the EVA temperature monitored by LT – see section 4 Electrical & Maintenance.
24	Thermistor (HWT)	Operation of the chiller is responsive to the inlet heat medium temperature monitored by HWT – see section 4 Electrical & Maintenance.