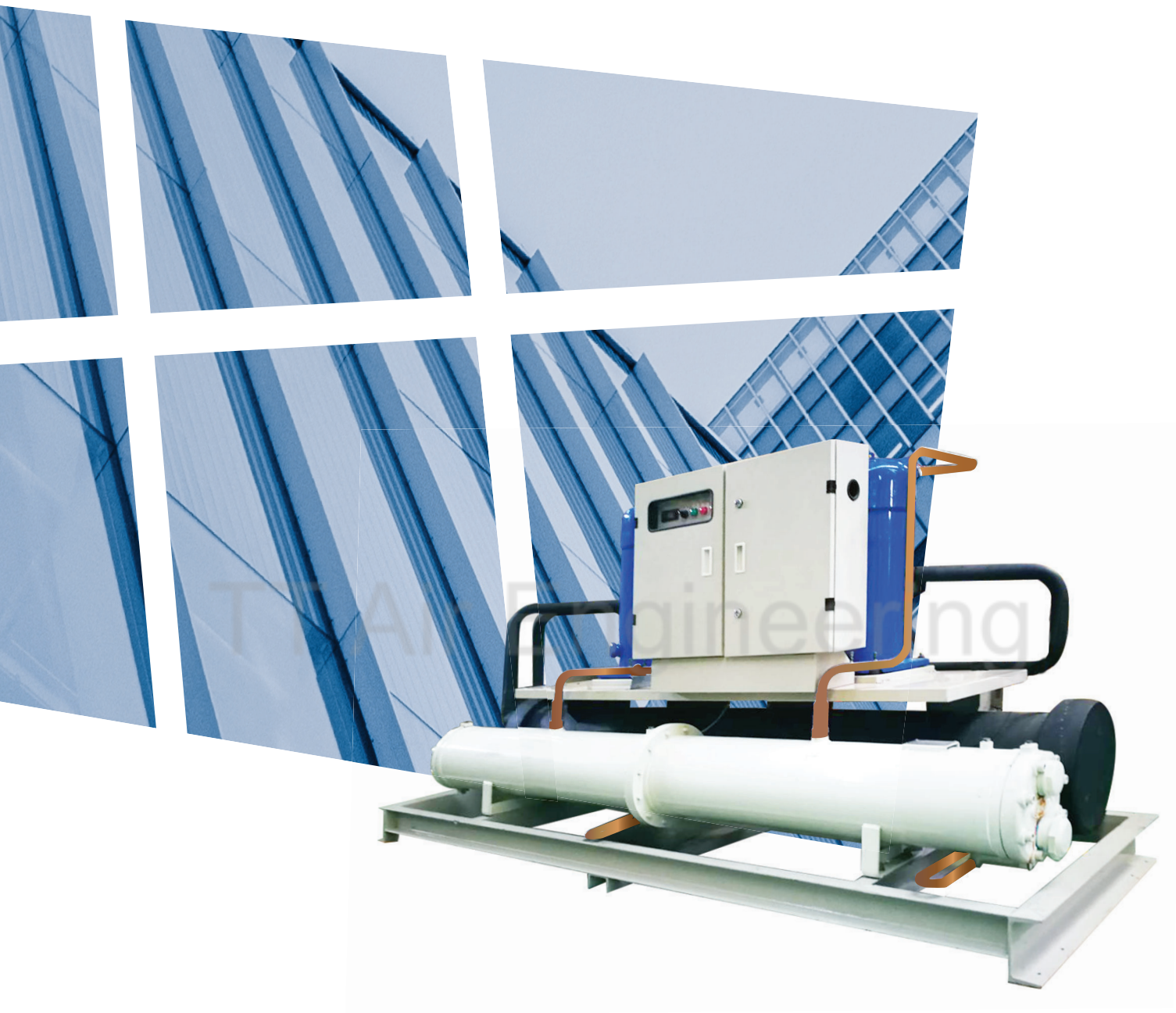


30BAW Series

Water-cooled Scroll chiller

18-50 Ton

Carrier (Thailand) Limited
www.carrier.co.th

Model number Nomenclature

1	2	3	4	5	6	7	8	9	10	11	12	13	14	Digit Number
3	0	B	A	W	0	1	8	S	3	0	5	F	A	**Standard Unit**

30BAW " Carrier "
Water Cooled Chiller
R-410A type

Size / Nominal Tons
018 = 18Ton (216,000BTU/Hr)
020 = 20Ton (240,000BTU/Hr)
025 = 25Ton (300,000BTU/Hr)
030 = 30Ton (360,000BTU/Hr)
040 = 40Ton (480,000BTU/Hr)
050 = 50Ton (600,000BTU/Hr)

Compressor Type
R = Rotary Compressor
S = Scroll Compressor

Power Supply
1 = 220V / 1Ph / 50Hz.
3 = 380V / 3Ph / 50Hz.

Revision / Series
0,1,2,3 Version

Compressor brand (Copeland, Danfoss)

Controller / Communication Option
F = Factory Controller Display
M = MODBUS Controller option

Special Option (A,B,C,D)
M = Modular Type

General Features

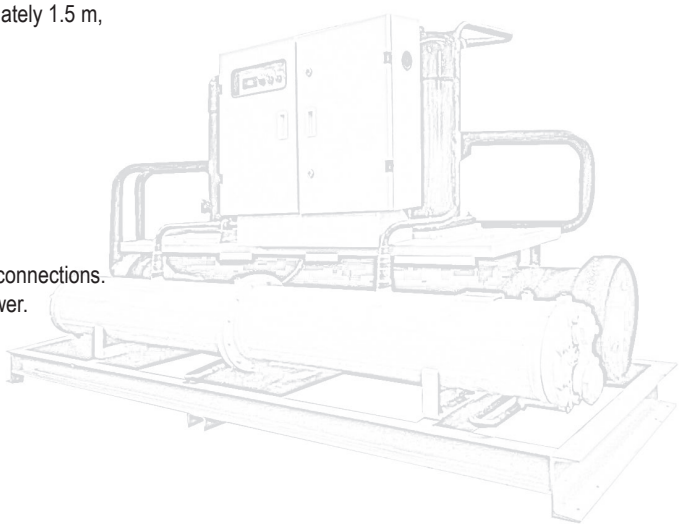
The 30BAW scroll chillers are a premium solution for industrial and commercial applications where installers, consultants, and building owners require maximum quality and optimal performances, especially at part load. These units are designed to meet current and future requirements in terms of energy efficiency, versatility, and compactness.

The 30BAW use the most reliable technologies available today:

· Scroll compressors, an evolution of the proven the compressor stronger and more reliable.
· Simplified controllers.
· Extremely efficient Shell & Tube evaporator and condenser.
· Refrigerant HFC-410a (compounds 50% of R32 and 50% of R125)
· No chlorine content, no ozone depletion potential. ODP = 0
· Global warming potential GWP = 2,088

Compact design

· The 30BAW scroll chillers are designed to offer compact dimensions for easy installation.
· With a width of approximately 1.1 m, a height of approximately 1.5 m, only requires minimum floor space in the plant room.



Simplified electrical connections

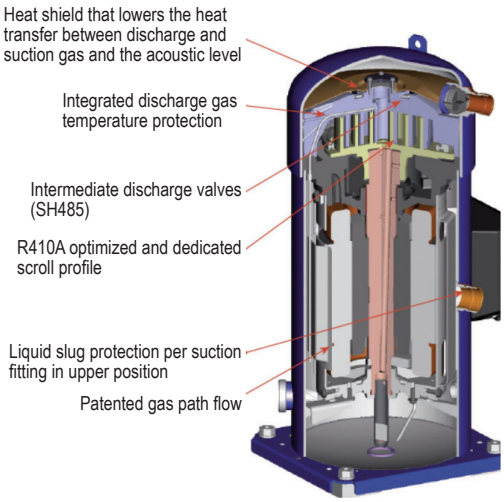
· Power supply 380 volt 3 phase 50 Hertz

Simplified water connections

· Male Pipe Thread connections on the evaporator.
· Female Pipe Thread connections on the condenser.
· Practical reference marks for entering and leaving water connections.
· Low-pressure drop to conserve the required pumping power.
· Fast commissioning.
· Systematic factory operation test before shipment.

Hermetic scroll compressor

Compressors benefit from a further improved design to achieve the highest efficiency.
High efficiency motor and long service life
Durable Structure
Cooling capacity @ ARI condition
Energy Saving
Internal Overload Protection
Specific lower counterweight – vibration improvement

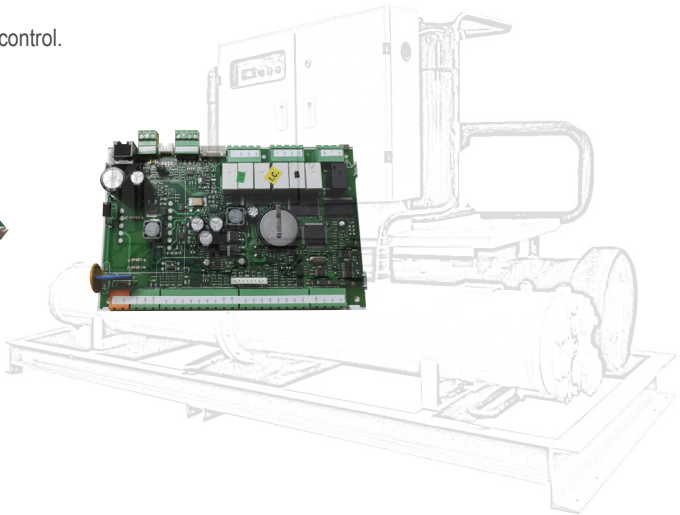


Graphic Display

Is an electronic device it allows complete management of graphics by the display of icons (defined at application software development level), the management of international fonts, and acoustic signal through piezoelectric buzzer as well.
The application software resides on the µPC controller therefore the terminal does not require any additional software for operation.
Furthermore, the terminals feature a wide operating temperature range (-20 To 60 °C), the index of protection of the front panel of IP65.

Control System

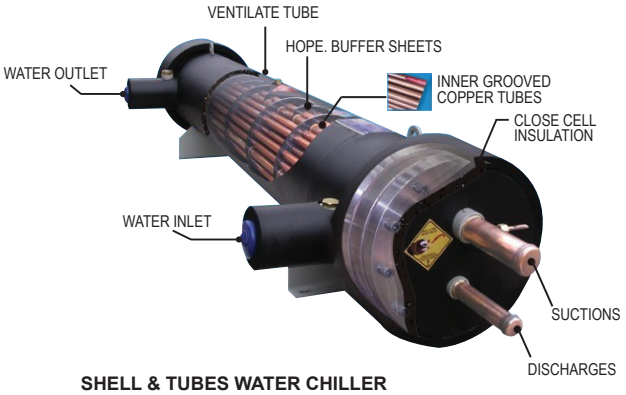
· µPC is a microprocessor-based electronic controller developed by CAREL in compliance with the European RoHS directives.
· It provides a solution for many applications in the air-conditioning and refrigeration sectors and ensures absolute versatility.
· µPC runs the control program and is fitted with the set of terminals required for the connection to the devices(compressors, fans…).
· Which combines more functions including the RS-485 communication interface for option, delivering stronger performance, utility, standardization, convenience, and universality.
· The best performance of the cooling circuit thanks to PID superheat control.



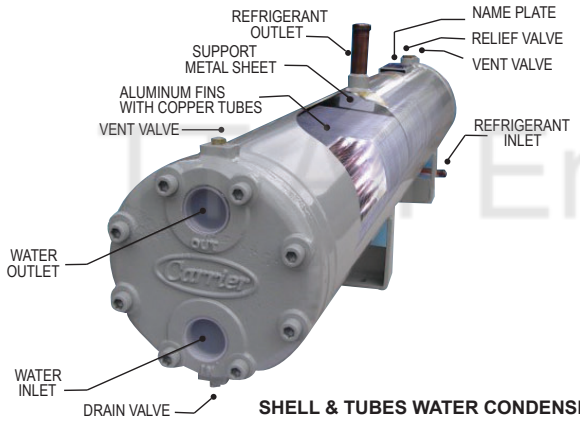
Heat Exchanger

Shell &Tubes heat exchanger features a simple design that allows one fluid to run through the inner tubes while another fluid flows through the shell to transfer heat efficiently.
Shell &Tubes are designed specifically for refrigerant evaporate(DX Cooler) and condensing(Condenser) to heat exchange with water. Enhancements on the outside and the inside produce exceptional performance and efficiency.
Shell &Tubes are designed to provide excellent heat transfer rates, Quality insulation to prevent heat loss.
Shell circuits are designed to provide high performance with a low-pressure drop to conserve the required pumping power.
Simplified water connection, male pipe thread connections on the evaporator and female pipe thread connections on the condenser.

- Compact size for easy maintenance.
- Female Pipe Thread connections on the evaporator and condenser.
- Practical reference marks for entering and leaving water connections.
- Low-pressure drop to conserve the required pumping power.
- Fast commissioning.



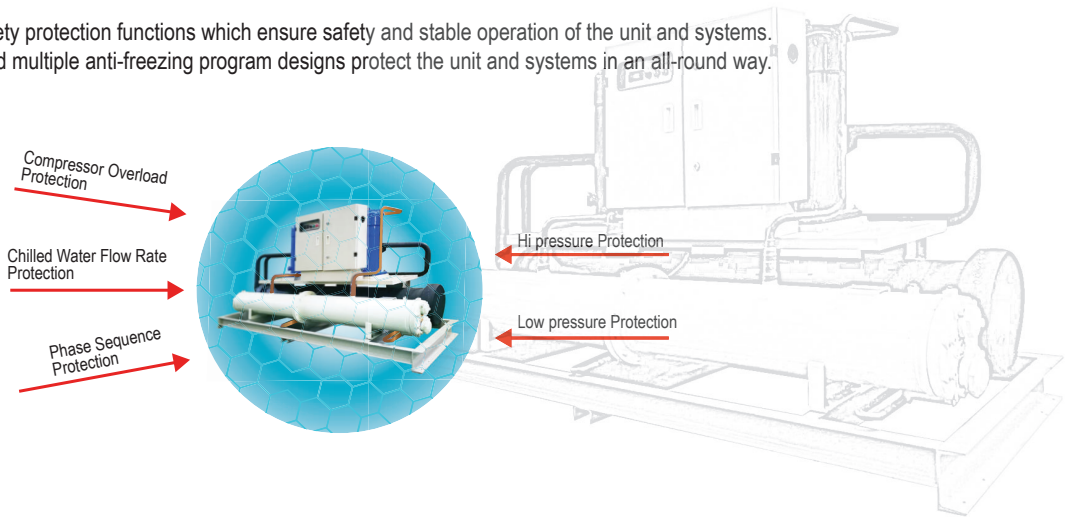
SHELL & TUBES WATER CHILLER



SHELL & TUBES WATER CONDENSER

Multiple Protection Functions, Providing Safety And Reliable

The unit has multiple safety protection functions which ensure safety and stable operation of the unit and systems.
The water flow switch and multiple anti-freezing program designs protect the unit and systems in an all-round way.



SPECIFICATION

Model			30BAW018S305	30BAW025S305	30BAW030S305	30BAW040S305	30BAW050S305
General data	Type		Water Cooled Chiller				
	Cooling Capacity (nominal)	BTU/H	216,000	300,000	360,000	480,000	600,000
		Ton	18	25	30	40	50
	Power supply	V/Ph/Hz	380V-3Ph-50Hz	380V-3Ph-50Hz	380V-3Ph-50Hz	380V-3Ph-50Hz	380V-3Ph-50Hz
	Power input	W	14,244	22,040	29,140	35,600	44,900
	Current	A	26.7	42.3	51.6	64.0	81.6
	Refrigerant charge from factory	KG	15.0	20.0	24.0	30.0	36.0
	Unit Weight	KG	590	950	950	1,260	1,275
Cooler	Type		Shell and Tube DX Cooler				
	Size	inch	8"	10"	10"	10"	10"
	Water Flow Rate	GPM	43.2	60.0	72.0	96.0	120.0
	Inlet/Outlet (MPT)	INCH	2"	2-1/2"	2-1/2"	3"	3"
	Pressure Drop	FT.WG	14.3	15.7	20.0	34.0	36.2
Condenser	Type		Shell and Tube				
	Size	inch	8"	10"	10"	10"	10"
	Water Flow Rate	GPM	54.0	75.0	90.0	120.0	150.0
	Inlet/Outlet (FPT)	INCH	2"	2-1/2"	2-1/2"	3"	3"
	Pressure Drop	FT.WG	19.7	19.7	19.7	19.7	24.8
Compressor	Type		Hermetic Scroll Compressor				
	Q'ty		2	2	2	2	2
	Power Input	W	7,200	10,700	13,350	16,800	22,500
	RLA	A	15.7	24.5	31.0	38.3	48.3
	MCA	A	25.0	38.6	51.0	62.0	79.0
	LRA	A	125.0	197.0	215.0	260.0	320.0
	Initial oil charge	OZ.	83	122	227	227	227
	Net weight	KG	49 (108 lbs)	72 (159 lbs)	108 (238 lbs)	111 (245 lbs)	160 (351 lbs)
Controller		Type	PLC Controller board				
Protection	High Pressure Switch	PSIG	600 +25 / 420 +15 (Cut out / Cut in) - Auto Restart type				
	High Pressure Transducer	PSIG	0 - 5 VDC, 450/400 (Cut out / Cut in)				
	Low Pressure Transducer	PSIG	0 - 5 VDC, 30/80 (Cut out / Cut in)				
	Pressure Relife Valve	PSIG	550 (Set pressure)				
Structure	Body thickness		U STEEL 2"	U STEEL 2"	U STEEL 2"	U STEEL 2"	U STEEL 2"
	Insulation type		EPDM				
	Insulation thickness		Pipe insulation 3/8"thk / Cooler insulation 1"thk				
	Weight		590	950	950	1260	1275
	Dimension WxDxH mm.		1000x2000x1130	1100x2000x1310	1100x2000x1310	1100x2500x1350	1100x3000x1430

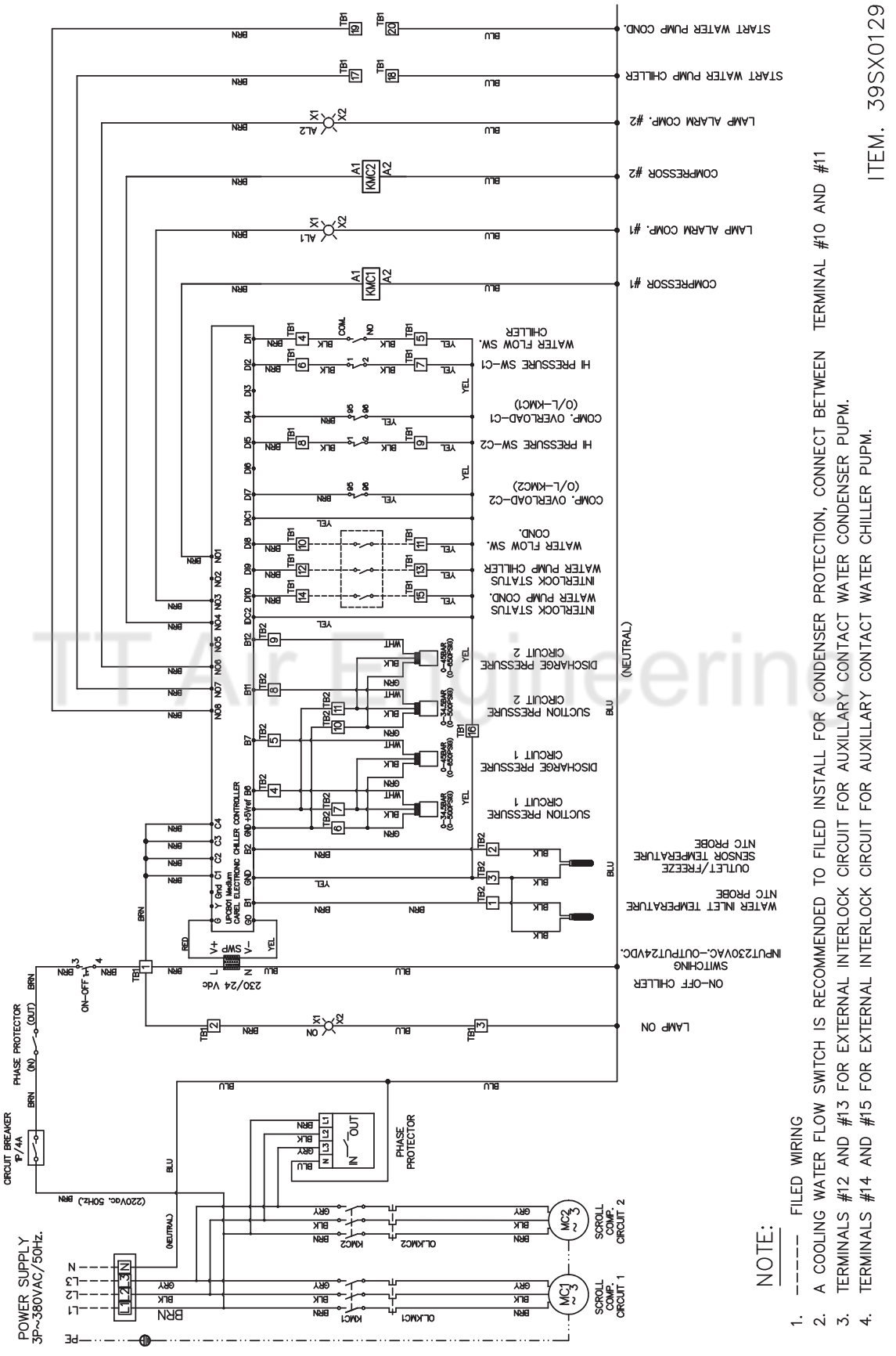
COMBINED CAPACITY PARAMETER TABLE

Model and Modular Quantity		UNIT	1	2	3	4	5
30BAW018S305	Cooling capacity	BTUH	216,000	432,000	648,000	864,000	1,080,000
	Cooler water flow rate	GPM	43.20	86.40	129.60	172.80	216.00
	Condensor water flow rate	GPM	54.00	108.00	162.00	216.00	270.00
30BAW025S305	Cooling capacity	BTUH	300,000	600,000	900,000	1,200,000	1,500,000
	Cooler water flow rate	GPM	60.00	120.00	180.00	240.00	300.00
	Condensor water flow rate	GPM	75.00	150.00	225.00	300.00	375.00
30BAW030S305	Cooling capacity	BTUH	360,000	720,000	1,080,000	1,440,000	1,800,000
	Cooler water flow rate	GPM	72.00	144.00	216.00	288.00	360.00
	Condensor water flow rate	GPM	90.00	180.00	270.00	360.00	450.00
30BAW040S305	Cooling capacity	BTUH	480,000	960,000	1,440,000	1,920,000	2,400,000
	Cooler water flow rate	GPM	96.00	192.00	288.00	384.00	480.00
	Condensor water flow rate	GPM	120.00	240.00	360.00	480.00	600.00
30BAW050S305	Cooling capacity	BTUH	600,000	1,200,000	1,800,000	2,400,000	3,000,000
	Cooler water flow rate	GPM	120.00	240.00	360.00	480.00	600.00
	Condensor water flow rate	GPM	150.00	300.00	450.00	600.00	750.00

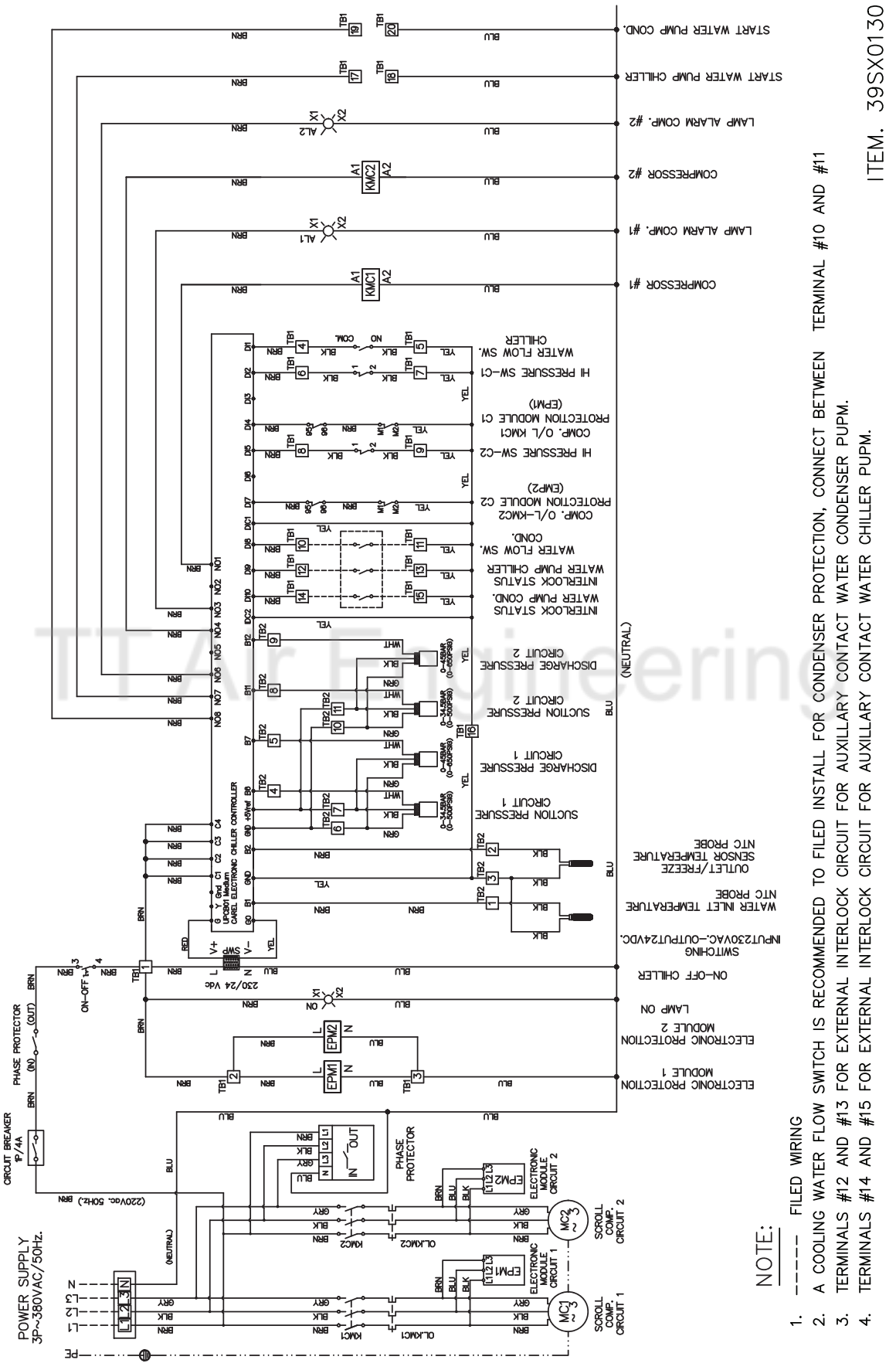
Note:
1. Nominal cooling operating conditions: Chilled leaving water temperature 45°F, Condensing leaving water temperature 100°F
2. In actual use, the cooling loss should be considered after the installation of the system piping, pumps, valve, dirt, etc. about 6%.
3. There will be no further notice if the parameters change due to product optimization.
4. The units of the same model or different models can be combined freely. Each system can combine up to 5 modules.

Manufacturer reserves the right to make changes to above specifications without prior notice, please refer to the factory configuration when purchasing.

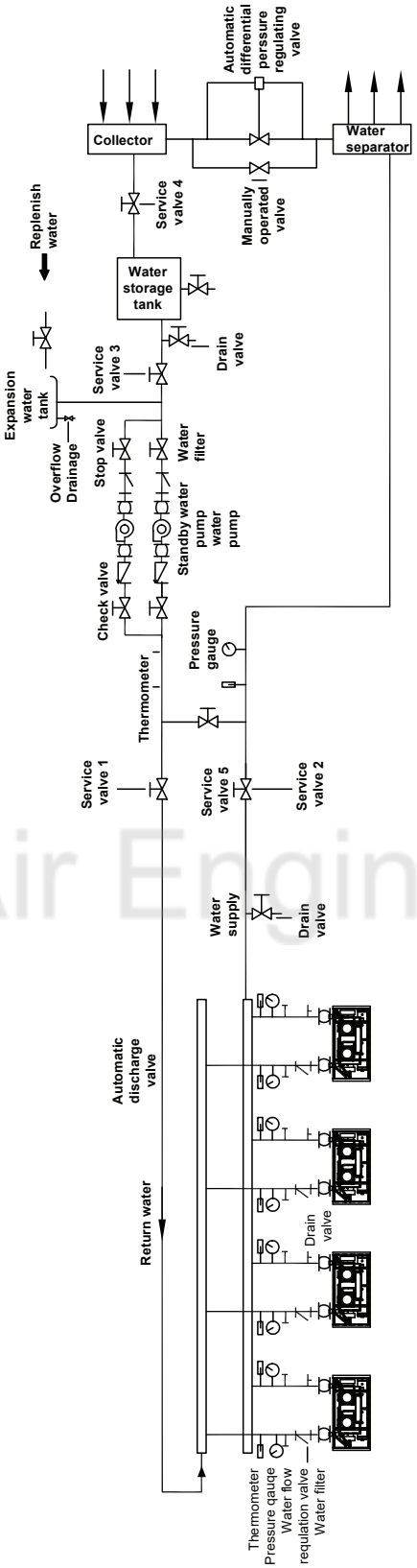
WIRING DIAGRAM (30BAW018-025)



WIRING DIAGRAM (30BAW030-050)



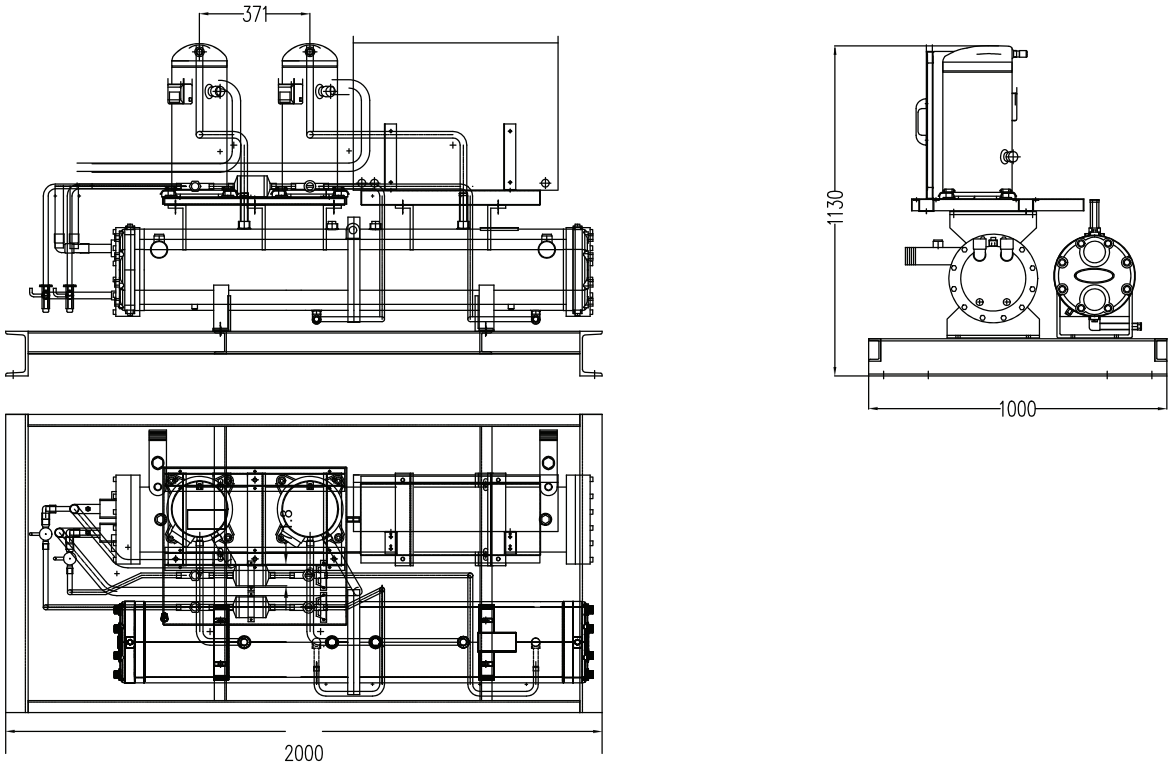
PIPING DIAGRAM



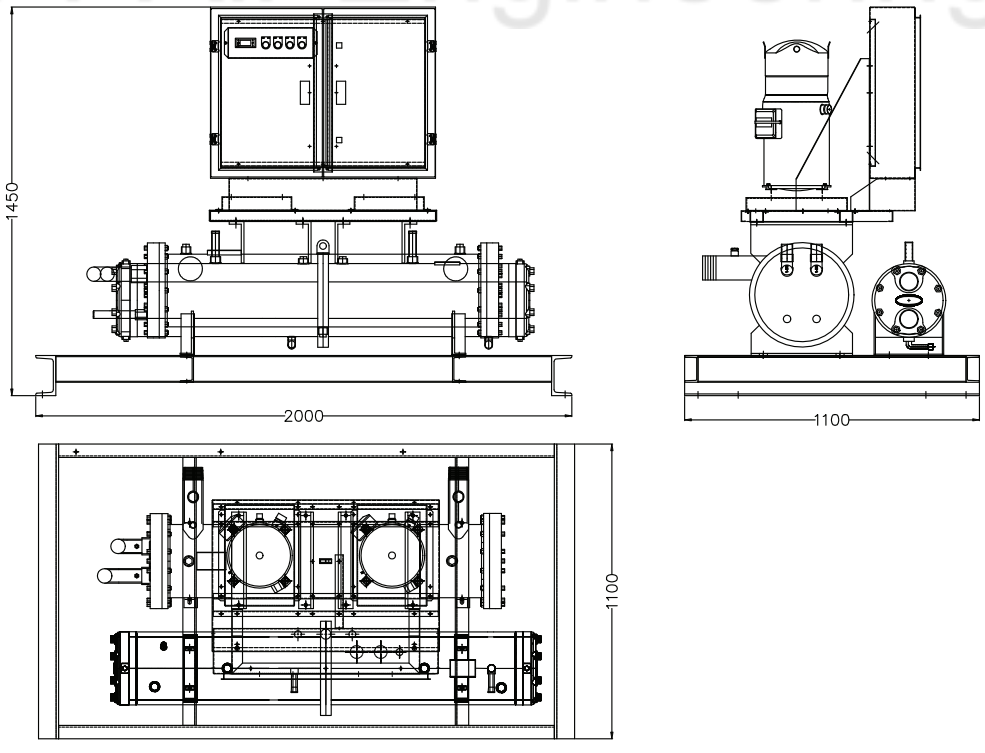
Note :

- Multi-system water lines are applied to large projects and generally designed to realize area-based water supply. If some areas are being overhauled or closed, the loads may change significantly, so any unit can be turned off for the purpose of energy conservation.
- After the water system of the unit is installed, close the service valves 1 and 2 and open service valve 5; start the water pump; then wash the water filter; after the water line system is clean, connect the water pipe to the main machine to be ready for normal operation.
- Water pumps shall be selected according to the water flow and required pump head and can be installed on the inlet and outlet header pipes. When the inlet pressure exceeds 1.0 MPa, they are recommended to be installed on the outlet pipe. The pump control shall be interlocked with the unit.
-The automatic differential pressure regulator can facilitate a more stable operation of the whole system.
- The automatic differential pressure regulator can facilitate a more stable operation of the whole system.
- Each inlet branch pipe of units shall be equipped with water regulating valve to allow water to flow into units at a consistent rate.
- To ensure balanced water resistance, units shall be subject to equal-length installation.
- The valves 1, 2, 3, and 4 shall be used as service valves while valve 5 shall be used when the pipes shall be cleaned for initial system commissioning or when the terminals and pipes are subject to water treatment. In such cases, valves 1 and 2 shall be closed while valves 3, 4 and 5 shall be opened and the water pump shall be started

DIMENSION

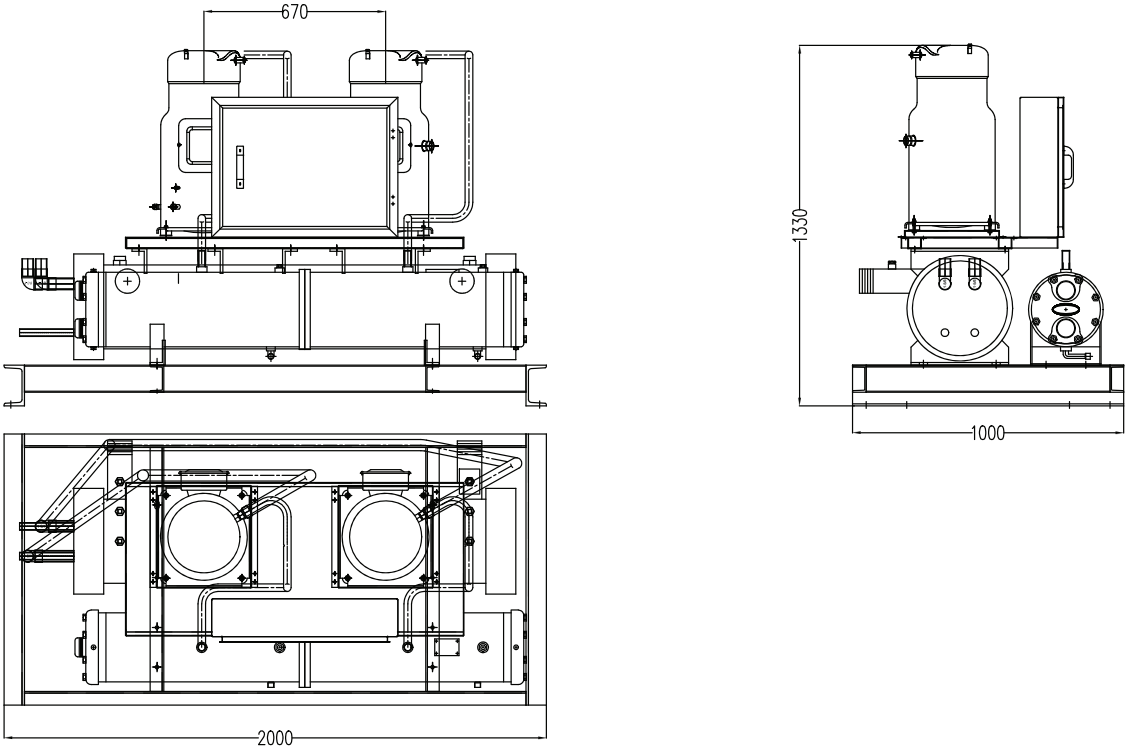


30BAW018

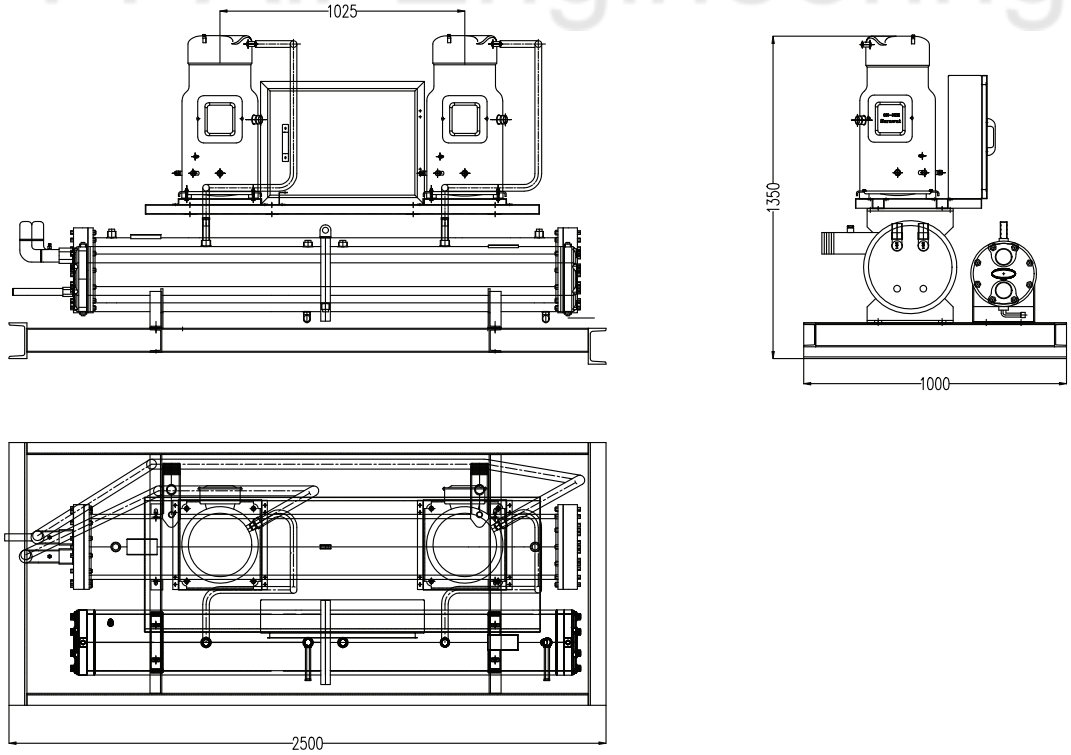


30BAW025

DIMENSION

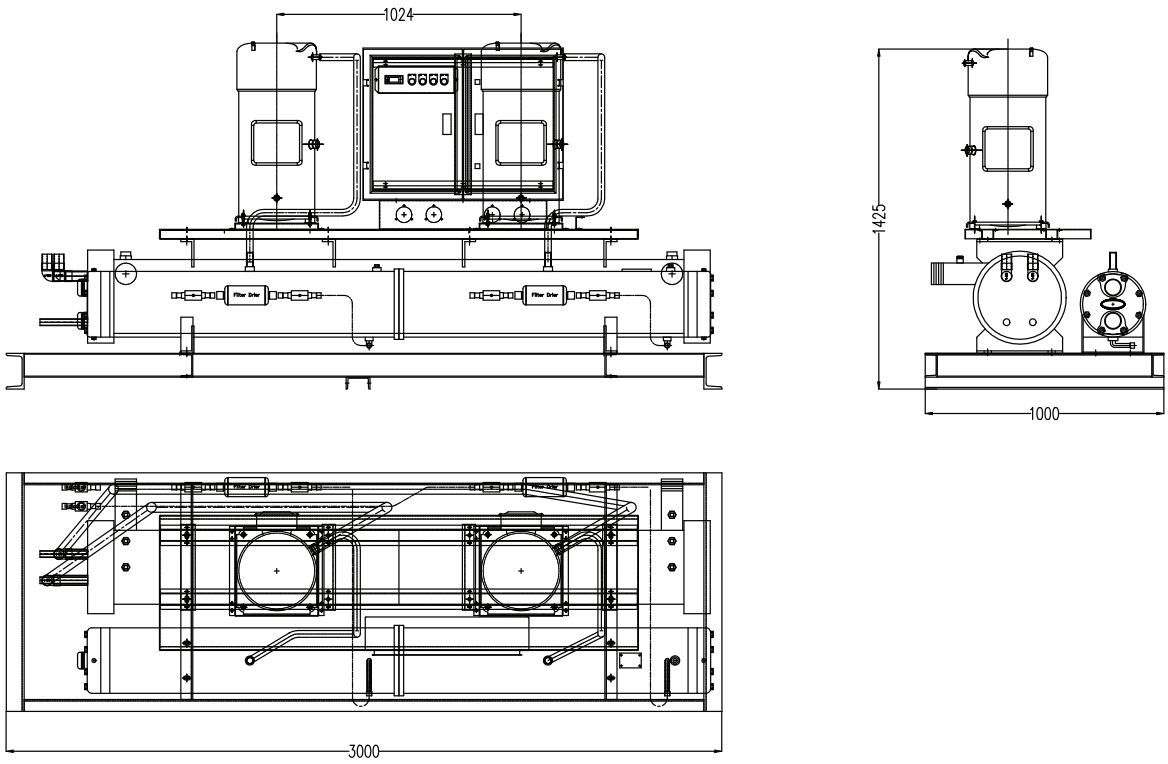


30BAW030



30BAW040

DIMENSION



30BAW050

Unit Conversion

Metric Tech	x	=	English Unit	x	=	SI Unit
Lenght						
mm	0.03937		in.	25.4		mm
mm	0.003281		ft	304.8		mm
m	3.281		ft	0.3048		m
m	1.094		yd	0.9144		m
Power						
kcal/h				1.163		W
kcal/h	3.968		Btu/h	0.2931		W
Mcal/h	0.3307		Ton refr.	3.517		kW
Pressure						
mm w.g. 4°C	0.03937		in H_2O 39,2°F	249.1		Pa
mm Hg 0°C	0.03937		in Hg 32°F	3.386		kPa
mm H_2O	3.281		ft H_2O	2.989		kPa
Velocity						
m/s	3.281		ft/s	0.3048		m/s
m/s	196.9		ft/min	0.00508		m/s
Volume/Time						
m^3/h	0.5886		ft^3/min	0.4719		L/s
L/h	4.403×10^{-3}		U.S. gal/min	0.06309		L/s
(m^3/h)/ (1000 kcal/h)	1.780		cfm/ton	0.1342		L/s kw

Metric Tech	Conversion Function	=	English Unit	Conversion Function	=	SI Unit
Temperature						
°C	(°C x 1.8) + 32		°F	(°F - 32) / 1.8		°C

Prefixes

M	MEGA -	10^6
k	KILO -	10^3
d	DECI -	10^{-1}
c	CENTI -	10^{-2}
m	MILLI -	10^{-3}
µ	MICRO -	10^{-6}

Legend

m	METER
cal	CALORIE
L	LITER
°C	DEGREE CELSIUS
°F	DEGREE FAHRENHEIT
K	KELVIN
w	WATT
N	NEWTON
h	HOUR
s	SECOND

Units

mm w.g.		MILLIMETERS WATER GAUGE
mm Hg		MILLIMETERS MERCURY
tonne	=	1000 kg
bar	=	100 kPa
Ton refr.	=	ton of refrigerant
	=	12,000 btu/h

Efficiency Conversion

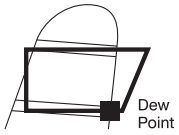
kW/ton	=	12 / EER
EER	=	COP X 3.412
COP	=	(12 / kW/Ton) / 3.412

Pressure-Temperature Guide - psig

°F	R-22	R-407c (Dew Point)	R-407c (Bubble Point)	R-410a	R-32	R-134a	°C
30	55.0	49.6	64.7	97.4	**99.5**	26.1	-1
32	57.5	52.1	67.7	101.4	**103.2**	27.8	0
34	60.2	54.8	70.8	105.6	**107.1**	29.5	1
36	62.9	57.5	73.8	109.9	**111.0**	31.3	2
38	65.7	60.3	77.0	114.3	**115.0**	33.1	3
40	68.6	63.2	80.2	118.8	**119.1**	35.0	4
42	71.5	66.1	83.7	123.4	**127.6**	37.0	6
44	74.5	69.2	87.0	128.2	**132.1**	39.0	7
46	77.6	72.3	90.7	133.0	**136.6**	41.1	8
48	80.8	75.5	94.3	138.0	**141.1**	43.2	9
50	84.1	78.8	97.9	143.2	**145.9**	45.4	10
52	87.4	82.2	101.7	148.4	**150.6**	47.7	11
54	90.8	85.7	105.6	153.8	**155.6**	50.0	12
56	94.4	89.3	109.6	159.3	**160.7**	52.4	13
58	98.0	93.0	113.7	164.9	**165.7**	54.9	14
60	101.6	96.9	117.9	170.7	**176.5**	57.4	16
62	105.4	100.7	122.3	176.6	**182.0**	60.0	17
64	109.3	104.7	126.7	182.7	**187.6**	62.7	18
66	113.2	108.8	131.2	188.9	**193.3**	65.4	19
68	117.3	113.0	135.8	195.3	**199.2**	68.2	20
70	121.4	117.3	140.5	201.8	**205.2**	71.1	21
72	125.7	121.7	145.4	208.4	**211.3**	74.1	22
74	130.0	126.2	150.3	215.2	**217.5**	77.1	23
76	134.5	131.0	155.4	222.2	**223.9**	80.2	24
78	139.0	135.6	160.5	229.3	**236.9**	83.4	26
80	143.6	140.5	165.8	236.5	**243.8**	86.7	27
82	148.4	145.5	171.2	244.0	**250.7**	90.0	28
84	153.2	150.7	176.8	251.6	**257.7**	93.5	29
86	158.2	155.9	182.4	259.3	**264.9**	97.0	30
88	163.2	161.3	188.2	267.3	**272.2**	100.6	31
90	168.4	166.8	194.1	275.4	**279.6**	104.3	32
92	173.7	172.3	200.1	283.6	**287.3**	108.1	33
94	179.1	178.1	206.3	292.1	**295.0**	112.0	34
96	184.6	184.1	212.5	300.7	**310.9**	115.9	36
98	190.2	190.0	219.0	309.5	**319.2**	120.0	37
100	195.9	196.1	225.5	318.5	**327.6**	124.2	38
102	201.8	202.5	232.2	327.7	**336.0**	128.4	39
104	207.7	209.0	239.0	337.1	**344.7**	132.7	40
106	213.8	215.5	246.0	346.7	**353.6**	137.2	41
108	220.0	222.2	253.0	356.5	**362.5**	141.7	42
110	226.4	229.0	260.3	366.4	**371.8**	146.4	43
112	232.8	236.1	267.7	376.6	**381.1**	151.1	44
114	239.4	243.4	275.1	387.0	**400.4**	156.0	46
116	246.1	250.6	282.8	397.6	**410.3**	160.9	47
118	253.0	258.2	290.7	408.4	**420.3**	166.0	48
120	260.0	265.9	298.6	419.4	**430.4**	171.2	49
122	267.1	273.7	306.8	430.7	**440.9**	176.5	50
124	274.3	281.7	315.0	442.1	**451.5**	181.8	51
126	281.7	289.9	323.4	453.8	**462.3**	187.4	52
128	289.2	298.2	332.0	465.8	**473.2**	193.0	53
130	296.9	306.6	340.8	477.9	**484.4**	198.7	54
132	304.7	315.5	349.8	490.3	**507.4**	204.6	56
134	312.6	324.3	358.8	503.0	**539.2**	210.6	57
136	320.7	333.4	368.0	515.9	**531.2**	216.7	58
138	329.0	342.7	377.5	529.1	**543.4**	222.9	59
140	337.4	352.2	387.0	542.5	**555.7**	229.2	60
142	345.9	361.7	396.8	556.2	**568.4**	235.7	61
144	354.6	371.7	406.7	570.2	**581.3**	242.3	62
146	363.5	381.7	416.8	584.5	**594.3**	249.0	63
148	372.5	392.0	427.0	599.0	**607.7**	255.9	64
150	381.7	402.6	437.5	613.9	**634.9**	262.9	66

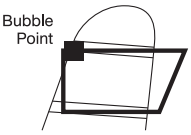
Superheat - Saturate Vapor Pressures

Typical PH Diagram
Superheat - Reference Point



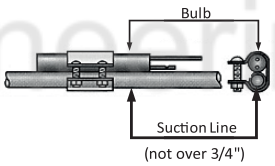
Subcooling - Saturate Liquid Pressures

Typical PH Diagram
Subcooling - Reference Point

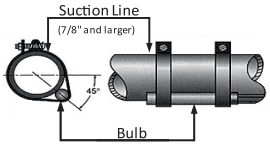


ตำแหน่งการติดตั้งกระเปาะวัดอุณหภูมิของ TXV ที่ท่อ Suction

Suction line < 7/8”



Suction line 7/8” and larger



บริษัท แคเรียร์ (ประเทศไทย) จำกัด
1858/63-74 ชั้น 14, 15
ถ.เทพรัตน กม. 4.5 แขวงบางนาใต้
เขตบางนา กรุงเทพฯ 10260
โทร. 0-2090-9999 แฟกซ์: 0-2751-4778

Carrier (Thailand) Ltd.
1858/63-7 4 , 14th , 15th Floor,
Debaratna Road, Km.4.5, Bangna Tai,
Bangna Bangkok 10260 Thailand
Tel. 0-2090-9999 Fax: 0-2751-4778

YOUR CARRIER MAN :

38BAW/05/22