B COOL MANUFACTURERS OF AIR-CONDITIONING EQUIPMENT LTD

Small Series
BAWC/H - S

PACKAGED AIR TO WATER CHILLERS / HEAT PUMPS
COOLING / HEATING APPLICATIONS
OUTDOOR INSTALLATION

Ver. 3.02 01_18

ISO 9001
BUREAU VERITAS
Certification

COOLING CAPACITY
5,8 kW - 38,1 kW (R407C)
6,2 kW - 39,2 kW (R410a)

HEATING CAPACITY
6,9 kW - 43,0 kW (R407C)
7,3 kW - 43,6 kW (R410a)

Engineering Data

The **BCOOL BAWC/H** small capacity series includes packaged air cooled water chillers and heat pumps for cooling and heating applications and outdoor installation. They are available in several types and models, with nominal capacities ranging from 5,8 to 39,2 kW in cooling and 6,9 to 43,6 kW in heating.

The **BCOOL BAWC/H - S series** is ideal, in combination with water terminal units or air-handling units, for air-conditioning of residences, office-buildings, shops, hotels, hospitals, banks, restaurants, etc., or for supplying cold or hot water in industrial applications.

Optimized design for R407C and R410a refrigerant

Casing: Galvanized Steel plate with polyesteric coating
Assembly: Fully bolted/welding free
Compressor: Hermetically sealed scroll type
Air heat exchanger: Cross finned coil, internally grooved copper tubes and louvered aluminium fins
Direct drive propeller fan: Low rpm, quiet operation
Water heat exchanger: Brazed, plate type
Hydromodule
Safety and functional devices:
High/low pressure switch
Phase sequence - phase failure - reverse phase and voltage monitoring device
Evaporator low temperature protection
Electronic microprocessor control with digital display
Differential water pressure switch
High and low pressure manometers
Linear fan speed regulation, according to coil temperature
Various optional capabilities

Nomenclature

B - A W - X - X X X - X - X - X

1 2 3 4 5 6 7

1 **BCOOL**

2 **A**ir Cooled **W**ater Chiller or Heat Pump

3 **C**-Cooling only, **H**-Heat Pump

4 **Capacity (RT)**

5 **Series**

S-small

6 **Optional**

1-single phase, **omitted**-three phase

HD-Hydronic

PK-Pump kit

7 **Refrigerant Liquid**

R407C, R410a

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Generally

The BCOOL BAWC/H small series, including air cooled water chillers and heat pumps, consists of 10 basic models covering capacities from 5,8 up to 39,20 kW in cooling and 6,9 up to 43,6,0 kW in heating. It is the end result of a thorough study and accurate design by experienced BCOOL research and development teams, to develop a small size chiller/heat pump series with compact shape, high performance and reliability of the highest quality standards. This series meets the highest levels of aesthetic and technical requirements, using the latest technological innovations, including environmentally friendly R407C or R410a refrigerant, that is chlorine-free and has zero ozone depletion potential. BAWC/H - S units are therefore ideal for installation in residential, commercial and industrial applications, due to their robust construction, high-efficiency performance, reliability, selected materials and low operating sound levels.

Casing

All units use metal parts that are fabricated from heavy gauge galvanized steel sheets, formed to ensure maximum rigidity that guarantees and preserves the unit's operation during the years. After fabrication these are degreased, phosphatised and electrostatically powder coated with an epoxy-polyester RAL 9002 coating of a thickness of 60-70 μm.
This fully automatic process ensures superior corrosion resistance against the most aggressive ambient conditions. This treatment can successfully withstand a salt spray test of 500 hours, according to ASTM B-117.
All components are assembled together using bolts, thus avoiding the need for welding which may harm the galvanization of the steel and ensuring that the whole assembly can fully withstand adverse weather conditions.
The compact footprint of the unit arises from detailed study and design by our engineering teams and results in a machine which fits easily in restricted areas, is simple and easy to install and maintain and has been designed with special fittings for easy transportation and lifting.
Removable side panels with special locks are used to permit access only to authorized personnel to internal components of the unit, for inspection and maintenance. Electrical and electronic equipment and components for proper unit's operation are located inside a weather proof (IP 55) electrical panel, with access via special key.

Compressor

All units use low-noise, maintenance free, Hermetic Scroll compressors with low vibration levels, especially optimized for use with R407C or R410a refrigerant, provided from world class suppliers. They are equipped with a crankcase electrical heater for the oil and are internally protected against potential overloading or electrical spikes.
The compressors are mounted on special anti-vibration rubber mounts, to absorb and eliminate any vibrations from the unit's operation.

Air heat exchanger

All units' air heat exchangers are manufactured from high quality seamless inner grooved copper tubes according to ASTM B-280, having an outside diameter of 9,52 mm (3/8''). The fins are manufactured from aluminium and form the secondary extended heat transfer surface. The fins are continuous across the heat exchanger and are fabricated in high precision dedicated press lines. The fin surface is waffle formed, so as to increase the fin rigidity and has special louvers that help to increase heat transfer. The combination of internally grooved copper-tubing and louvered fins has resulted in a heat transfer performance 30% superior to that of a conventional coil for this particular application. The assembly of the finned pack is achieved by mechanical expansion of the tubes in such a way, as to form a perfect mechanical bond with the fins. For this purpose, the fin holes have a peripheral extrusion (collar) of adjustable height. This extrusion serves to define the distance between the fins (and consequently the total heat transfer surface) and to ensure perfect contact of the fins to the tubes.
Alternative fin materials are available upon request, such as epoxy - coated aluminium or copper for applications in especially aggressive environments.

Water heat exchanger

All units are equipped with a water Plate Heat Exchanger, selected from world class manufacturers.
It is made of stainless steel plates (AISI 3161.4401), especially formed to achieve a large heat transfer surface and assembled by means of an automatic brazing process, under vacuum.
There is an air vent for HD models, differential water pressure switch, probes for water temperature sensors and the whole heat exchanger is wrapped in a heavy insulation material.

Air heat exchanger fans

All units' fans are of the axial type, single phase, 6 poles, internally protected against potential overheating, silent and suitable for outdoor installation. Due to the sophisticated aerodynamic design of the blades and inlet cones, as well as the perfect static and dynamic balancing, their operation is completely vibration-free. The fan-motor assembly has a protective grid against accidental contact with moving parts, which is designed according to ISO regulations. Fan motors are of the external rotor type, aerodynamically shaped so as not to interfere with the airflow and have permanently lubricated bearings that to do not require service.
Continuous linear fan speed regulation control is achieved according to coil temperature, resulting in fan silent mode operation. This standard feature for BCOOL BAWC/H units saves energy and reduces sound levels dramatically, optimizing capacity.

Microprocessor controller

All units are equipped with a sophisticated controller that combines intelligence with operating simplicity. The controller constantly monitors all machine parameters and precisely manages among others:
Automatic compressor control function through return water temperature.
Continuous fan speed control, based on coil heat exchanger temperature.
Defrost control.
Hydraulic circuit pump control.
Compressor start-up time delay function.
Compressor running time records.
Over 150 programmable parameters.
Fan motor overload protection.
Auto diagnostic stop function due to low water circulation, high/low operating pressure and compressor/pump thermal overload.
Auto diagnostic stop function and digital display of approximately 30 possible error codes, including thermistor faults.
Digital displays of inlet/outlet water, as well as coil temperature.
Remote cool/heat selector switch.
Remote on/off switch.
Phase sequence - phase failure - reverse phase and voltage monitoring .
Many optional control capabilities (listed in optional accessories).

Refrigerant circuit

All units have one refrigerant circuit. The refrigerant circuit has restrictors, thermal expansion valve or electronic expansion valve. Other components fitted are: suction accumulator, liquid receiver, 4-way reversing valve, check valve, solenoid valve, sight glass, large capacity filter dryer and high/low pressure manometers. Unit protection is provided by a high/low pressure switch with auto reset.

Other unit accessories / options

Reciprocating or scroll compressor availability, based on specifications.
R134a or other refrigerant liquid.
Modes for high water temperature.
Condenser fins made of copper or prepainted aluminium and Blygold treatment for anti-corrosion protection.
Glycol application for chilled water low temperature down to -5°C.
Pressure relief valve on compressor discharge.
A-meter, V-meter.
Hydraulic module without buffer tank (PK series).
Water heat exchanger anti-freezing electrical heater.
Compressor noise reduction jacket.
Hydronic module with buffer tank (HD series).
Two pumps (one stand by).
Axial fans with EC motors, for energy saving.
Heat recovery exchanger.

Optional accessories

Microprocessor controller options:
Remote keyboard.
Dynamic set point program.
BMS module interface kit for Modbus connection.
Parallel chiller operation with optional controller.
Microprocessor parameter reprogramming card.

MODEL		50 Hz	BAWC/H 001-1	BAWC/H 002-1	BAWC/H 002	BAWC/H 003	BAWC/H 004	BAWC/H 005	BAWC/H 006	BAWC/H 008	BAWC/H 010	BAWC/H 012
Nominal Cooling capacity[1]		**kW**	**5,8**	**6,9**	**6,9**	**8,1**	**12,20**	**14,60**	**19,35**	**26,20**	**31,80**	**38,10**
		RT	1,7	2,0	2,0	2,3	3,5	4,2	5,5	7,5	9,0	10,8
		Btu/h	19.807	23.564	23.564	27.662	41.663	49.859	66.080	89.473	108.597	130.112
Nominal Heating capacity[2]		**kW**	**6,9**	**8,2**	**8,2**	**9,6**	**14,3**	**17,0**	**22,4**	**29,3**	**37,3**	**43,0**
		Mcal/h	5,9	7,1	7,1	8,3	12,3	14,6	19,3	25,2	32,1	37,0
Construction		Material/Color	Galvanized steel / Light grey-beige (RAL 9002)									
Compressor			SCROLL									
Quantity			1									
Capacity steps			0 - 100%									
Absorbed power	**cooling**	kW	2,00	2,40	2,30	2,70	4,00	4,60	6,59	8,43	10,30	12,85
	heating		**2,30**	**2,70**	**2,70**	**3,10**	**4,50**	**5,20**	**6,78**	**8,62**	**11,50**	**13,15**
Nominal operating current	**cooling**	A	9,40	11,10	4,40	5,00	7,80	8,30	12,38	15,30	17,80	25,54
	heating		**10,60**	**12,60**	**4,80**	**5,50**	**8,30**	**9,20**	**12,62**	**15,55**	**19,40**	**25,85**
Starting current		A	61,0	76,0	40,0	46,0	59,0	74,0	111,0	118,0	140,0	174,0
Air heat exchanger			High capacity cross finned coil with internally grooved tubes and louvered fins									
Water heat exchanger			Brazed Plate type									
Quantity			1									
Water content		Lit.	0,6	0,7	0,7	0,8	1,1	1,4	1,4	1,7	2,5	2,5
Max. operating pressure		Water side Bar	30									
		Refrigerant side Bar	30									
Connections			3/4"	3/4"	3/4"	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
Nominal water flow		Lit/h	999	1.189	1.189	1.395	2.102	2.515	3.333	4.513	5.478	6.563
Water pressure drop		kPa	26,5	27,6	27,6	29,2	29,9	34,1	34,6	45,4	24,4	28
Minimum content of water system		Lit.	43	55	55	62	95	109	139	183	233	274
Maximum operating pressure of water system		Bar	**3,0**	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0
Fan			Axial (6 poles)									
Quantity			1	1	1	1	1	1	1	1	2	2
Speed		RPM	900									
Total air flow		m^3/h	2.900	2.900	2.900	2.900	10.353	9.900	9.800	9.700	19.400	19.300
Absorbed power		kW	0,167	0,167	0,167	0,167	0,700	0,706	0,706	0,714	1,428	1,428
Nominal operating current		A	0,74	0,74	0,74	0,74	2,59	2,65	2,85	2,93	5,86	5,86
Maximum current		A	0,76	0,76	0,76	0,76	3,08	3,08	3,08	3,08	6,16	6,16
Water pump absorbed power		kW	0,13	0,13	0,13	0,13	0,25	0,30	0,45	0,45	0,55	0,55
Max. operating current		A	0,58	0,58	0,58	0,58	1,1	2,00	2,70	2,70	3,50	3,5
Available external st. pressure		kPa	35,0	35,0	35,0	35,0	45,0	130,0	150,0	120,0	165,0	165,0
Electrical characteristics			230 V / 1 Ph / 50 Hz		400 V / 3 Ph / 50 Hz							
Total absorbed power	**cooling**	kW	2,17	2,57	2,47	2,87	4,70	5,31	7,30	9,14	11,73	14,28
	heating		**2,47**	**2,87**	**2,87**	**3,27**	**5,20**	**5,91**	**7,49**	**9,33**	**12,93**	**14,58**
Total operating current	**cooling**	A	10,14	11,84	5,14	5,74	10,39	10,95	15,23	18,23	23,66	31,40
	heating		**11,34**	**13,34**	**5,54**	**6,24**	**10,89**	**11,85**	**15,47**	**18,48**	**25,26**	**31,71**
Compressor carter resistance power		W	70								90	
Voltage operating limits		V	220-240		360-440							
Refrigerant circuit												
Number of circuits			1									
Expansion device			Thermal expansion valve / restrictors									
Refrigerant type			R407C									
Noise level @ 5m		db(A)	45	45	46	48	48	51	52	53	55	55
Dimensions BAWC/H - S		Width mm	510	510	510	510	670	670	670	810	810	810
		Length mm	1.265	1.265	1.265	1.265	1.646	1.646	1.646	2.056	2.056	2.056
		Height mm	1.235	1.235	1.235	1.235	1.235	1.235	1.235	1.235	1.235	1.235
Shipping weight		kg	115	120	120	160	195	250	270	350	370	380

NOTES

Nominal conditions are as following:

1 Entering / leaving chilled water temperature 12 / 7°C, ambient 35°C (cooling).

2 Entering / leaving heated water temperature 40 / 45°C, ambient 7°C DB / 6°C WB (heating).

Electrical installation specifications are purely indicative and non-binding.
All connections to the system and the electrical installation must be in full accordance with the applicable national and local codes.

2.2 Technical specifications BAWC/H - S R410a

MODEL		50 Hz	BAWC/H 001-1	BAWC/H 002-1	BAWC/H 002	BAWC/H 003	BAWC/H 004	BAWC/H 005	BAWC/H 006	BAWC/H 008	BAWC/H 010	BAWC/H 012
Nominal Cooling capacity[1]		**kW**	**6,2**	**7,85**	**7,92**	**8,89**	**13,50**	**15,60**	**19,80**	**26,20**	**33,30**	**39,20**
		RT	1,8	2,2	2,3	2,5	3,8	4,4	5,6	7,5	9,5	11,2
		Btu/h	21.173	26.808	27.047	30.359	46.103	53.274	67.617	89.473	113.720	133.868
Nominal Heating capacity[2]		**kW**	**7,3**	**9,1**	**9,2**	**10,3**	**15,6**	**18,1**	**22,1**	**29,0**	**37,6**	**43,6**
		Mcal/h	6,3	7,8	7,9	8,9	13,4	15,6	19,0	25,0	32,4	37,5
Construction		Material/Color	Galvanized steel / Light grey-beige (RAL 9002)									
Compressor			SCROLL									
Quantity			1									
Capacity steps			0 - 100%									
Absorbed power	**cooling**	kW	2,17	2,66	2,65	2,99	4,20	5,02	6,24	8,24	10,40	12,20
	heating		**2,18**	**2,70**	**2,69**	**3,10**	**4,33**	**5,11**	**6,40**	**8,49**	**10,60**	**12,35**
Nominal operating current	**cooling**	A	10,00	12,81	4,96	5,12	7,77	8,90	10,75	14,54	18,07	23,20
	heating		**10,46**	**13,28**	**5,10**	**5,30**	**8,02**	**9,07**	**10,95**	**14,88**	**18,30**	**23,46**
Starting current		A	67,0	98,0	46,0	43,0	64,0	75,0	95,0	118,0	140,0	174,0
Air heat exchanger			High capacity cross finned coil with internally grooved tubes and louvered fins									
Water heat exchanger			Brazed Plate type									
Quantity			1									
Water content		Lit.	0,6	0,7	0,7	0,8	1,1	1,4	1,4	1,7	2,5	2,5
Max. operating pressure		Water side Bar	30									
		Refrigerant side Bar	45									
Connections			3/4"	3/4"	3/4"	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
Nominal water flow		Lit/h	1.068	1.352	1.364	1.531	2.326	2.687	3.411	4.513	5.736	6.753
Water pressure drop		kPa	26,5	27,6	27,6	29,2	29,9	34,1	34,6	45,4	24,4	28
Minimum content of water system		Lit.	43	55	55	62	95	109	139	183	233	274
Maximum operating pressure of water system		Bar	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0
Fan			Axial (6 poles)									
Quantity			1	1	1	1	1	1	1	1	2	2
Speed		RPM	900									
Total air flow		m^3/h	2.900	2.900	2.900	2.900	10.353	9.900	9.800	9.700	19.400	19.300
Absorbed power		kW	0,167	0,167	0,167	0,167	0,700	0,706	0,706	0,714	1,428	1,428
Nominal operating current		A	0,74	0,74	0,74	0,74	2,59	2,65	2,85	2,93	5,86	5,86
Maximum current		A	0,76	0,76	0,76	0,76	3,08	3,08	3,08	3,08	6,16	6,16
Water pump absorbed power		kW	0,13	0,13	0,13	0,13	0,25	0,30	0,45	0,45	0,55	0,55
Max. operating current		A	0,58	0,58	0,58	0,58	1,1	2,00	2,70	2,70	3,50	3,50
Available external st. pressure		kPa	35,0	35,0	35,0	35,0	45,0	130,0	150,0	120,0	165,0	165,0
Electrical characteristics			230 V / 1 Ph / 50 Hz		400 V / 3 Ph / 50 Hz							
Total absorbed power	**cooling**	kW	2,34	2,83	2,82	3,16	4,90	5,73	6,95	8,95	11,83	13,63
	heating		**2,35**	**2,87**	**2,86**	**3,27**	**5,03**	**5,82**	**7,11**	**9,20**	**12,03**	**13,78**
Total operating current	**cooling**	A	10,74	13,55	5,70	5,86	10,36	11,55	13,60	17,47	23,93	29,06
	heating		**11,20**	**14,02**	**5,84**	**6,04**	**10,61**	**11,72**	**13,80**	**17,81**	**24,16**	**29,32**
Compressor carter resistance power		W	70								90	
Voltage operating limits		V	220-240		360-440							
Refrigerant circuit												
Number of circuits			1									
Expansion device			Electronic expansion valve / restrictors									
Refrigerant type			R410a									
Noise level @ 5m		db(A)	45	45	46	48	48	51	52	53	55	55
Dimensions BAWC/H - S		Width mm	510	510	510	510	670	670	670	810	810	810
		Length mm	1.265	1.265	1.265	1.265	1.646	1.646	1.646	2.056	2.056	2.056
		Height mm	1.235	1.235	1.235	1.235	1.235	1.235	1.235	1.235	1.235	1.235
Shipping weight		kg	115	120	120	160	195	250	270	350	370	380

NOTES

Nominal conditions are as following:

1 Entering / leaving chilled water temperature 12 / 7°C, ambient 35°C (cooling).

2 Entering / leaving heated water temperature 40 / 45°C, ambient 7°C DB / 6°C WB (heating).

Electrical installation specifications are purely indicative and non-binding.
All connections to the system and the electrical installation must be in full accordance with the applicable national and local codes.

Cooling capacity table for BAWC/H - S R407C

Ambient °C		25			30			35			40			45		
MODEL	Water outlet °C	Cooling capacity kW	Absorbed power kW	Current A	Cooling capacity kW	Absorbed power kW	Current A	Cooling capacity kW	Absorbed power kW	Current A	Cooling capacity kW	Absorbed power kW	Current A	Cooling capacity kW	Absorbed power kW	Current A
BAWC/H 001-1	**5,0**	6,29	1,62	7,54	5,84	1,78	8,30	**5,35**	**1,96**	**9,12**	5,05	2,12	9,87	4,76	2,28	10,62
	7,0	6,79	1,65	7,66	6,32	1,80	8,38	**5,80**	**2,00**	**9,40**	5,45	2,16	10,05	5,10	2,34	10,89
	10,0	7,59	1,69	7,88	7,08	1,86	8,66	**6,44**	**2,08**	**9,68**	5,92	2,20	10,24	5,51	2,38	11,08
BAWC/H 002-1	**5,0**	7,48	1,94	9,05	6,95	2,14	9,97	**6,36**	**2,35**	**10,95**	6,00	2,54	11,84	5,66	2,74	12,75
	7,0	8,07	1,98	9,19	7,51	2,16	10,05	**6,90**	**2,40**	**11,10**	6,49	2,59	12,07	6,07	2,81	13,07
	10,0	9,03	2,03	9,45	8,42	2,23	10,39	**7,66**	**2,50**	**11,62**	7,04	2,64	12,29	6,56	2,86	13,29
BAWC/H 002	**5,0**	7,48	1,86	3,03	6,95	2,05	3,33	**6,36**	**2,25**	**3,66**	6,00	2,44	3,96	5,66	2,62	4,26
	7,0	8,07	1,89	3,07	7,51	2,07	3,45	**6,90**	**2,30**	**4,40**	6,49	2,48	4,52	6,07	2,69	4,72
	10,0	9,03	1,95	3,16	8,42	2,14	3,47	**7,66**	**2,39**	**4,51**	7,04	2,53	4,69	6,56	2,74	4,89
BAWC/H 003	**5,0**	8,78	2,19	3,55	8,16	2,41	3,91	**7,47**	**2,65**	**4,30**	7,05	2,86	4,65	6,64	3,08	5,00
	7,0	9,48	2,22	3,61	8,82	2,43	4,05	**8,10**	**2,70**	**5,00**	7,61	2,92	5,30	7,13	3,16	5,54
	10,0	10,59	2,28	3,71	9,88	2,51	4,08	**8,99**	**2,81**	**5,30**	8,26	2,97	5,50	7,70	3,21	5,74
BAWC/H 004	**5,0**	13,22	3,24	5,26	12,29	3,57	5,80	**11,25**	**3,92**	**6,37**	10,61	4,24	6,89	10,00	4,56	7,41
	7,0	14,27	3,29	5,35	13,29	3,60	6,00	**12,20**	**4,00**	**7,80**	11,47	4,32	7,85	10,74	4,68	8,21
	10,0	15,96	3,38	5,50	14,88	3,72	6,04	**13,54**	**4,16**	**7,85**	12,44	4,40	8,15	11,59	4,76	8,50
BAWC/H 005	**5,0**	15,83	3,73	6,05	14,70	4,10	6,67	**13,46**	**4,51**	**7,32**	12,70	4,88	7,92	11,97	5,25	8,53
	7,0	17,08	3,79	6,15	15,90	4,14	6,90	**14,60**	**4,60**	**8,30**	13,72	4,97	9,03	12,85	5,38	9,44
	10,0	19,10	3,89	6,32	17,81	4,28	6,95	**16,21**	**4,78**	**9,03**	14,89	5,06	9,37	13,87	5,47	9,78
BAWC/H 006	**5,0**	20,98	5,34	8,67	19,49	5,88	9,55	**17,84**	**6,46**	**10,49**	16,83	6,99	11,35	15,87	7,52	12,21
	7,0	22,64	5,42	8,81	21,07	5,93	9,89	**19,35**	**6,59**	**12,38**	18,19	7,12	12,94	17,03	7,71	13,53
	10,0	25,31	5,58	9,06	23,61	6,13	9,96	**21,48**	**6,85**	**12,93**	19,74	7,25	13,42	18,38	7,84	14,00
BAWC/H 008	**5,0**	28,40	6,83	11,09	26,38	7,52	12,22	**24,16**	**8,26**	**13,42**	22,79	8,94	14,52	21,48	9,62	15,62
	7,0	30,65	6,94	11,27	28,53	7,59	12,65	**26,20**	**8,43**	**15,30**	24,63	9,10	16,55	23,06	9,86	17,30
	10,0	34,27	7,13	11,59	31,96	7,84	12,74	**29,08**	**8,77**	**16,54**	26,72	9,27	17,17	24,89	10,03	17,91
BAWC/H 010	**5,0**	34,47	8,34	13,55	32,02	9,19	14,92	**29,32**	**10,09**	**16,40**	27,67	10,92	17,74	26,08	11,75	19,09
	7,0	37,21	8,48	13,77	34,63	9,27	15,45	**31,80**	**10,30**	**17,80**	29,89	11,12	20,23	27,98	12,05	21,14
	10,0	41,59	8,71	14,15	38,80	9,58	15,56	**35,30**	**10,71**	**20,21**	32,44	11,33	20,98	30,21	12,26	21,89
BAWC/H 012	**5,0**	41,30	10,41	16,91	38,37	11,46	18,62	**35,13**	**12,59**	**20,46**	33,15	13,62	22,13	31,24	14,66	23,82
	7,0	44,58	10,58	17,18	41,49	11,57	19,28	**38,10**	**12,85**	**25,54**	35,81	13,88	25,23	33,53	15,03	26,38
	10,0	49,83	10,87	17,66	46,48	11,95	19,41	**42,29**	**13,36**	**24,75**	38,86	14,14	26,18	36,20	15,29	27,31

Heating capacity table for BAWH - S R407C

Ambient °C		-5			0			2			7			10		
MODEL	Water outlet °C	Heating capacity kW	Absorbed power kW	Current A	Heating capacity kW	Absorbed power kW	Current A	Heating capacity kW	Absorbed power kW	Current A	Heating capacity kW	Absorbed power kW	Current A	Heating capacity kW	Absorbed power kW	Current A
BAWH 001-1	**35,0**	4,98	1,81	9,30	5,75	1,81	9,54	6,14	1,81	10,07	**7,20**	**1,79**	**10,28**	7,94	1,78	11,13
	40,0	5,33	2,04	9,90	5,66	2,04	10,07	6,04	2,03	10,34	**7,04**	**2,03**	**10,39**	7,71	2,01	11,45
	45,0	5,26	2,28	10,07	5,59	2,30	10,28	5,94	2,03	10,49	**6,90**	**2,30**	**10,60**	8,23	2,28	11,66
BAWH 002-1	**35,0**	5,92	2,12	11,05	6,84	2,12	11,34	7,30	2,12	11,97	**8,56**	**2,11**	**12,22**	9,43	2,08	13,23
	40,0	6,33	2,40	11,77	6,73	2,40	11,97	7,18	2,38	12,29	**8,36**	**2,38**	**12,35**	9,17	2,36	13,61
	45,0	6,26	2,68	11,97	6,64	2,70	12,22	7,06	2,38	12,47	**8,20**	**2,70**	**12,60**	9,78	2,68	13,86
BAWH 002	**35,0**	5,92	2,12	4,21	6,84	2,12	4,32	7,30	2,12	4,56	**8,56**	**2,11**	**4,66**	9,43	2,08	5,04
	40,0	6,33	2,40	4,48	6,73	2,40	4,56	7,18	2,38	4,68	**8,36**	**2,38**	**4,70**	9,17	2,36	5,18
	45,0	6,26	2,68	4,56	6,64	2,70	4,66	7,06	2,38	4,75	**8,20**	**2,70**	**4,80**	9,78	2,68	5,28
BAWH 003	**35,0**	6,93	2,44	4,82	8,01	2,44	4,95	8,54	2,44	5,23	**10,02**	**2,42**	**5,34**	11,04	2,39	5,78
	40,0	7,41	2,76	5,14	7,88	2,76	5,23	8,40	2,73	5,36	**9,79**	**2,73**	**5,39**	10,73	2,71	5,94
	45,0	7,32	3,08	5,23	7,78	3,10	5,34	8,27	2,73	5,45	**9,60**	**3,10**	**5,50**	11,45	3,08	6,05
BAWH 004	**35,0**	10,32	3,54	7,28	11,93	3,54	7,47	12,73	3,54	7,89	**14,93**	**3,51**	**8,05**	16,45	3,47	8,72
	40,0	11,04	4,00	7,75	11,74	4,00	7,89	12,51	3,97	8,09	**14,59**	**3,97**	**8,13**	15,99	3,94	8,96
	45,0	10,91	4,46	7,89	11,58	4,50	8,05	12,31	3,97	8,22	**14,30**	**4,50**	**8,30**	17,06	4,46	9,13
BAWH 005	**35,0**	12,27	4,09	8,07	14,18	4,09	8,28	15,13	4,09	8,74	**17,75**	**4,06**	**8,92**	19,55	4,01	9,66
	40,0	13,12	4,62	8,59	13,96	4,62	8,74	14,88	4,59	8,97	**17,34**	**4,59**	**9,02**	19,01	4,55	9,94
	45,0	12,97	5,16	8,74	13,77	5,20	8,92	14,64	4,59	9,11	**17,00**	**5,20**	**9,20**	20,28	5,16	10,12
BAWH 006	**35,0**	16,17	5,33	11,07	18,68	5,33	11,36	19,94	5,33	11,99	**23,39**	**5,29**	**12,24**	25,76	5,23	13,25
	40,0	17,29	6,03	11,79	18,39	6,03	11,99	19,60	5,98	12,30	**22,85**	**5,98**	**12,37**	25,04	5,93	13,63
	45,0	17,09	6,73	11,99	18,14	6,78	12,24	19,29	5,98	12,49	**22,40**	**6,78**	**12,62**	26,72	6,73	13,88
BAWH 008	**35,0**	21,15	6,78	13,64	24,44	6,78	14,00	26,08	6,78	14,77	**30,59**	**6,72**	**15,08**	33,70	6,65	16,33
	40,0	22,62	7,66	14,52	24,06	7,66	14,77	25,64	7,60	15,16	**29,89**	**7,60**	**15,24**	32,76	7,54	16,79
	45,0	22,36	8,55	14,77	23,73	8,62	15,08	25,23	7,60	15,39	**29,30**	**8,62**	**15,55**	34,95	8,55	17,11
BAWH 010	**35,0**	26,93	9,04	17,01	31,11	9,04	17,46	33,20	9,04	18,43	**38,94**	**8,97**	**18,82**	42,90	8,88	20,37
	40,0	28,80	10,22	18,12	30,62	10,22	18,43	32,64	10,14	18,92	**38,05**	**10,14**	**19,01**	41,70	10,06	20,95
	45,0	28,46	11,41	18,43	30,21	11,50	18,82	32,12	10,14	19,21	**37,30**	**11,50**	**19,40**	44,50	11,41	21,34
BAWH 012	**35,0**	31,05	10,34	22,67	35,86	10,34	23,27	38,27	10,34	24,56	**44,89**	**10,26**	**25,07**	49,45	10,15	27,14
	40,0	33,20	11,69	24,14	35,30	11,69	24,56	37,63	11,60	25,20	**43,86**	**11,60**	**25,33**	48,07	11,51	27,92
	45,0	32,81	13,04	24,56	34,83	13,15	25,07	37,02	11,60	25,59	**43,00**	**13,15**	**25,85**	51,30	13,04	28,44

NOTES
- Bold values show nominal cooling/heating capacities.
- Absorbed power and current refer to the compressor.
- Above figures are valid for water dt=5°C.

2.4 Cooling / Heating capacity tables BAWC/H - S R410a

Cooling capacity table for BAWC/H - S R410a

Ambient °C		25			30			35			40			45		
MODEL	Water outlet °C	Cooling capacity kW	Absorbed power kW	Current A	Cooling capacity kW	Absorbed power kW	Current A	Cooling capacity kW	Absorbed power kW	Current A	Cooling capacity kW	Absorbed power kW	Current A	Cooling capacity kW	Absorbed power kW	Current A
BAWC/H 001-1	**5,0**	6,72	1,76	8,18	6,24	1,94	9,01	**5,72**	**2,13**	**9,90**	5,39	2,30	10,71	5,08	2,48	11,53
	7,0	7,25	1,79	8,31	6,75	1,95	9,09	**6,20**	**2,17**	**10,00**	5,83	2,34	10,91	5,46	2,54	11,82
	10,0	8,11	1,84	8,55	7,56	2,02	9,39	**6,88**	**2,26**	**10,51**	6,32	2,39	11,11	5,89	2,58	12,02
BAWC/H 002-1	**5,0**	8,51	2,15	10,03	7,90	2,37	11,05	**7,24**	**2,61**	**12,13**	6,83	2,82	13,13	6,44	3,04	14,13
	7,0	9,18	2,19	10,19	8,55	2,39	11,14	**7,85**	**2,66**	**12,81**	7,38	2,87	13,37	6,91	3,11	14,49
	10,0	10,27	2,25	10,48	9,58	2,47	11,52	**8,71**	**2,77**	**12,88**	8,01	2,93	13,62	7,46	3,17	14,73
BAWC/H 002	**5,0**	8,59	2,15	3,49	7,98	2,36	3,84	**7,30**	**2,60**	**4,22**	6,89	2,81	4,56	6,49	3,02	4,91
	7,0	9,27	2,18	3,54	8,62	2,39	3,98	**7,92**	**2,65**	**4,96**	7,44	2,86	5,20	6,97	3,10	5,44
	10,0	10,36	2,24	3,64	9,66	2,46	4,00	**8,79**	**2,76**	**5,20**	8,08	2,92	5,40	7,52	3,15	5,63
BAWC/H 003	**5,0**	9,64	2,42	3,93	8,95	2,67	4,33	**8,20**	**2,93**	**4,76**	7,73	3,17	5,15	7,29	3,41	5,54
	7,0	10,40	2,46	4,00	9,68	2,69	4,49	**8,89**	**2,99**	**5,12**	8,36	3,23	5,87	7,82	3,50	6,14
	10,0	11,63	2,53	4,11	10,85	2,78	4,52	**9,87**	**3,11**	**5,87**	9,07	3,29	6,09	8,45	3,56	6,35
BAWC/H 004	**5,0**	14,63	3,40	5,53	13,59	3,75	6,09	**12,45**	**4,12**	**6,69**	11,75	4,45	7,23	11,07	4,79	7,78
	7,0	15,80	3,46	5,62	14,70	3,78	6,30	**13,50**	**4,20**	**7,77**	12,69	4,54	8,25	11,88	4,91	8,62
	10,0	17,66	3,55	5,77	16,47	3,91	6,35	**14,99**	**4,37**	**8,24**	13,77	4,62	8,56	12,83	5,00	8,93
BAWC/H 005	**5,0**	16,91	4,07	6,61	15,71	4,48	7,27	**14,38**	**4,92**	**7,99**	13,57	5,32	8,64	12,79	5,73	9,30
	7,0	18,25	4,13	6,71	16,99	4,52	7,53	**15,60**	**5,02**	**8,90**	14,66	5,42	9,86	13,73	5,87	10,30
	10,0	20,40	4,25	6,90	19,03	4,67	7,58	**17,32**	**5,22**	**9,85**	15,91	5,52	10,23	14,82	5,97	10,67
BAWC/H 006	**5,0**	21,46	5,05	8,21	19,94	5,57	9,04	**18,26**	**6,12**	**9,93**	17,23	6,61	10,74	16,24	7,12	11,57
	7,0	23,17	5,14	8,34	21,56	5,62	9,36	**19,80**	**6,24**	**10,75**	18,61	6,74	12,25	17,42	7,30	12,81
	10,0	25,90	5,28	8,58	24,16	5,80	9,43	**21,98**	**6,49**	**12,24**	20,20	6,86	12,71	18,81	7,43	13,26
BAWC/H 008	**5,0**	28,40	6,67	10,84	26,38	7,35	11,94	**24,16**	**8,08**	**13,12**	22,79	8,73	14,19	21,48	9,40	15,27
	7,0	30,65	6,78	11,02	28,53	7,42	12,36	**26,20**	**8,24**	**14,54**	24,63	8,90	16,18	23,06	9,64	16,91
	10,0	34,27	6,97	11,32	31,96	7,66	12,45	**29,08**	**8,57**	**16,17**	26,72	9,06	16,79	24,89	9,81	17,51
BAWC/H 010	**5,0**	36,10	8,42	13,68	33,53	9,28	15,07	**30,70**	**10,19**	**16,56**	28,97	11,02	17,91	27,31	11,87	19,28
	7,0	38,96	8,56	13,90	36,26	9,36	15,60	**33,30**	**10,40**	**18,07**	31,30	11,23	20,42	29,30	12,17	21,35
	10,0	43,56	8,80	14,29	40,63	9,67	15,71	**36,96**	**10,82**	**20,41**	33,97	11,44	21,19	31,64	12,38	22,10
BAWC/H 012	**5,0**	42,49	9,88	16,05	39,47	10,88	17,68	**36,14**	**11,96**	**19,42**	34,10	12,93	21,01	32,14	13,92	22,61
	7,0	45,86	10,04	16,31	42,69	10,98	18,30	**39,20**	**12,20**	**23,20**	36,85	13,18	23,96	34,50	14,27	25,04
	10,0	51,27	10,32	16,77	47,82	11,35	18,43	**43,51**	**12,69**	**23,94**	39,98	13,42	24,85	37,24	14,52	25,93

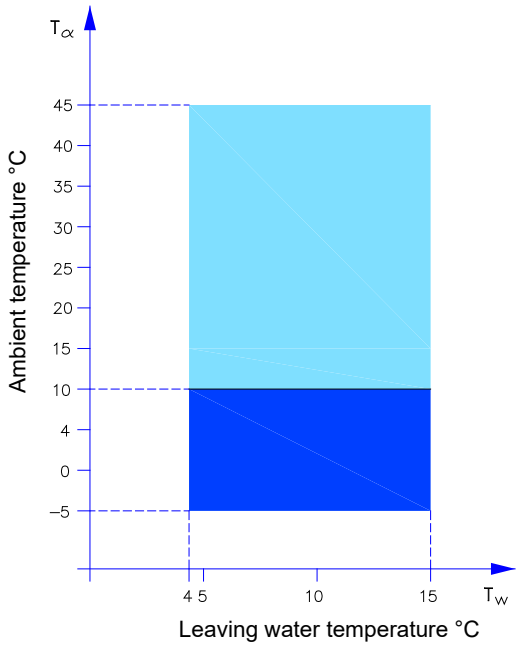
Heating capacity table for BAWH - S R410a

Ambient °C		-5			0			2			7			10		
MODEL	Water outlet °C	Heating capacity kW	Absorbed power kW	Current A	Heating capacity kW	Absorbed power kW	Current A	Heating capacity kW	Absorbed power kW	Current A	Heating capacity kW	Absorbed power kW	Current A	Heating capacity kW	Absorbed power kW	Current A
BAWH 001-1	**35,0**	5,27	1,71	9,17	6,09	1,71	9,41	6,50	1,71	9,94	**7,62**	**1,70**	**10,15**	8,40	1,68	10,98
	40,0	5,64	1,94	9,77	5,99	1,94	9,94	6,39	1,92	10,20	**7,45**	**1,92**	**10,25**	8,16	1,91	11,30
	45,0	5,57	2,16	9,94	5,91	2,18	10,15	6,29	1,92	10,36	**7,30**	**2,18**	**10,46**	8,71	2,16	11,51
BAWH 002-1	**35,0**	6,57	2,12	11,65	7,59	2,12	11,95	8,10	2,12	12,62	**9,50**	**2,11**	**12,88**	10,47	2,08	13,94
	40,0	7,03	2,40	12,40	7,47	2,40	12,62	7,96	2,38	12,95	**9,28**	**2,38**	**13,01**	10,17	2,36	14,34
	45,0	6,94	2,68	12,62	7,37	2,70	12,88	7,84	2,38	13,15	**9,10**	**2,70**	**13,28**	10,86	2,68	14,61
BAWH 002	**35,0**	6,64	2,11	4,47	7,67	2,11	4,59	8,19	2,11	4,85	**9,60**	**2,10**	**4,95**	10,58	2,08	5,36
	40,0	7,10	2,39	4,76	7,55	2,39	4,85	8,05	2,37	4,97	**9,38**	**2,37**	**5,00**	10,29	2,35	5,51
	45,0	7,02	2,67	4,85	7,45	2,69	4,95	7,92	2,37	5,05	**9,20**	**2,69**	**5,10**	10,98	2,67	5,61
BAWH 003	**35,0**	7,44	2,44	4,65	8,59	2,44	4,77	9,17	2,44	5,04	**10,75**	**2,42**	**5,14**	11,85	2,39	5,57
	40,0	7,95	2,76	4,95	8,46	2,76	5,04	9,01	2,73	5,17	**10,51**	**2,73**	**5,19**	11,52	2,71	5,72
	45,0	7,86	3,08	5,04	8,34	3,10	5,14	8,87	2,73	5,25	**10,30**	**3,10**	**5,30**	12,29	3,08	5,83
BAWH 004	**35,0**	11,26	3,40	7,03	13,01	3,40	7,22	13,88	3,40	7,62	**16,29**	**3,38**	**7,78**	17,94	3,34	8,42
	40,0	12,04	3,85	7,49	12,81	3,85	7,62	13,65	3,82	7,82	**15,91**	**3,82**	**7,86**	17,44	3,79	8,66
	45,0	11,90	4,30	7,62	12,64	4,33	7,78	13,43	3,82	7,94	**15,60**	**4,33**	**8,02**	18,61	4,30	8,82
BAWH 005	**35,0**	13,07	4,02	7,95	15,10	4,02	8,16	16,11	4,02	8,62	**18,90**	**3,99**	**8,80**	20,82	3,94	9,52
	40,0	13,97	4,54	8,47	14,86	4,54	8,62	15,84	4,51	8,84	**18,46**	**4,51**	**8,89**	20,24	4,47	9,80
	45,0	13,81	5,07	8,62	14,66	5,11	8,80	15,58	4,51	8,98	**18,10**	**5,11**	**9,07**	21,59	5,07	9,98
BAWH 006	**35,0**	15,96	5,03	9,60	18,43	5,03	9,86	19,67	5,03	10,40	**23,07**	**4,99**	**10,62**	25,42	4,94	11,50
	40,0	17,06	5,69	10,23	18,14	5,69	10,40	19,34	5,64	10,68	**22,54**	**5,64**	**10,73**	24,71	5,60	11,83
	45,0	16,86	6,35	10,40	17,90	6,40	10,62	19,03	5,64	10,84	**22,10**	**6,40**	**10,95**	26,37	6,35	12,05
BAWH 008	**35,0**	20,94	6,67	13,05	24,19	6,67	13,39	25,81	6,67	14,14	**30,28**	**6,62**	**14,43**	33,35	6,55	15,62
	40,0	22,39	7,55	13,90	23,81	7,55	14,14	25,38	7,49	14,51	**29,58**	**7,49**	**14,58**	32,42	7,43	16,07
	45,0	22,13	8,42	14,14	23,49	8,49	14,43	24,97	7,49	14,73	**29,00**	**8,49**	**14,88**	34,60	8,42	16,37
BAWH 010	**35,0**	27,15	8,33	16,05	31,36	8,33	16,47	33,46	8,33	17,39	**39,25**	**8,27**	**17,75**	43,24	8,18	19,22
	40,0	29,03	9,42	17,09	30,87	9,42	17,39	32,90	9,35	17,84	**38,35**	**9,35**	**17,93**	42,04	9,28	19,76
	45,0	28,69	10,52	17,39	30,46	10,60	17,75	32,37	9,35	18,12	**37,60**	**10,60**	**18,30**	44,86	10,52	20,13
BAWH 012	**35,0**	31,48	9,71	20,57	36,36	9,71	21,11	38,80	9,71	22,29	**45,52**	**9,63**	**22,76**	50,14	9,53	24,63
	40,0	33,66	10,98	21,91	35,80	10,98	22,29	38,15	10,89	22,87	**44,47**	**10,89**	**22,99**	48,74	10,81	25,34
	45,0	33,27	12,25	22,29	35,32	12,35	22,76	37,54	10,89	23,23	**43,60**	**12,35**	**23,46**	52,01	12,25	25,81

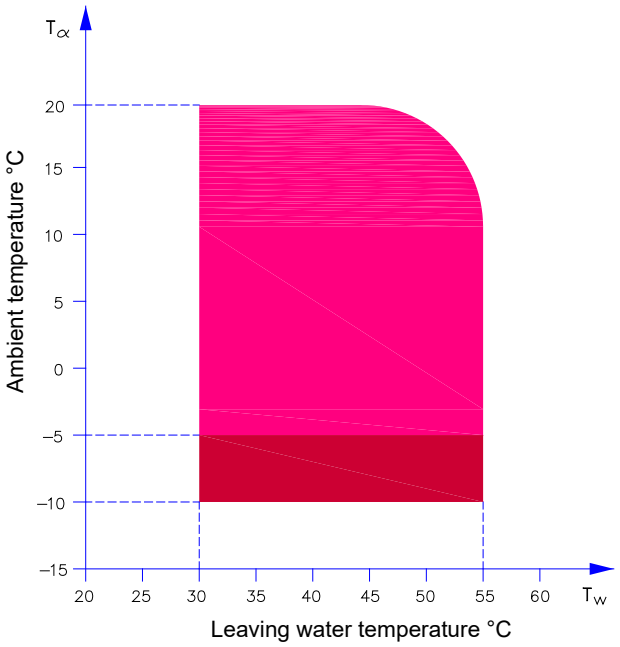
NOTES

- Bold values show nominal cooling/heating capacities.
- Absorbed power and current refer to the compressor.
- Above figures are valid for water dt=5°C.

COOLING



HEATING



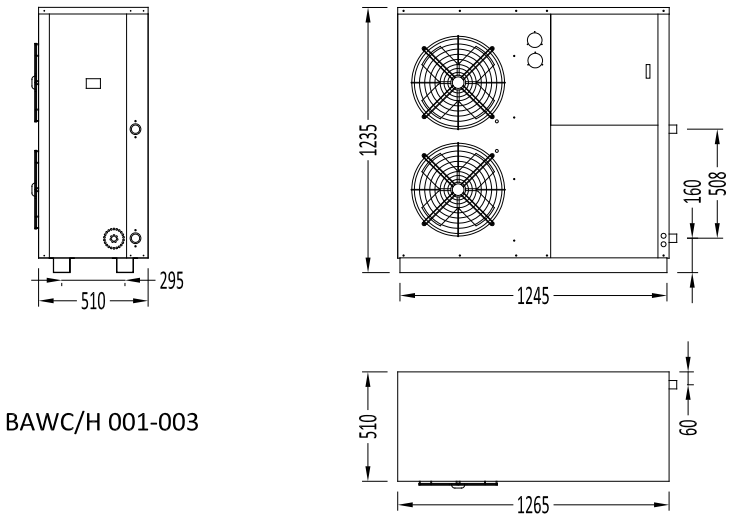
NOTES

The above operating limits are for general guidance only.
It may be possible for certain units to operate outside the confines of the graph. Please contact BCOOL if further clarification is required.
Protect the water circuit against freezing when it is necessary.

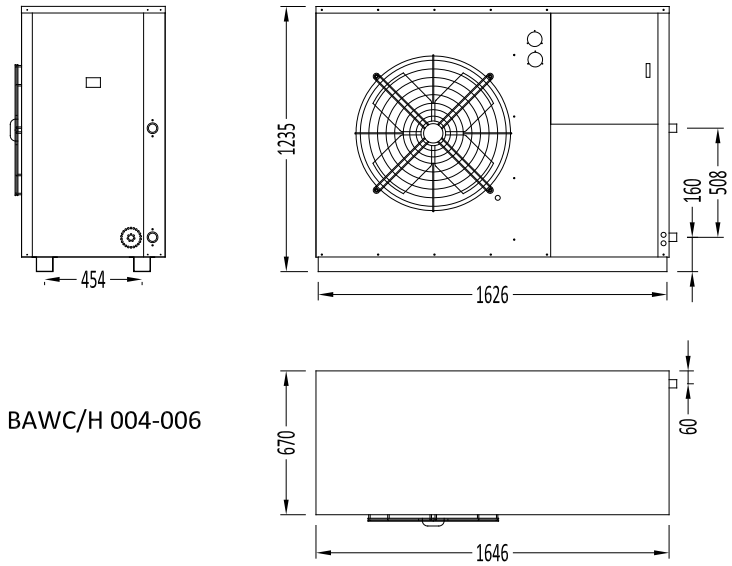
For operation with leaving water temperature below 6°C, it is obligatory to state this to BCOOL as soon as you order the chiller and also you need to add glycol in the water circuit.

2.6 Sound data BAWC/H - S

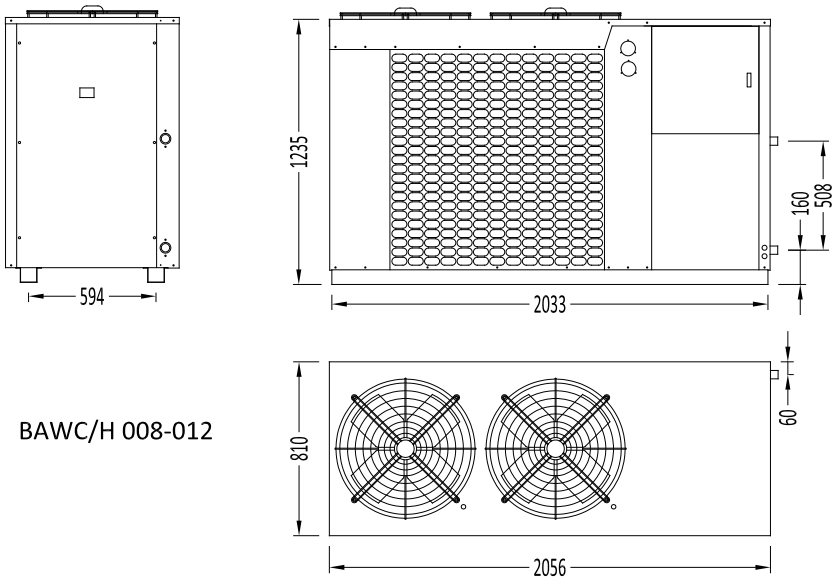
MODEL		db(A)	63	125	250	500	1000	2000	4000	8000
BAWC/H 001	Power	66	49	55	56	58	62	59	54	49
	Pressure @1 m	58	41	47	48	50	54	51	46	41
	Pressure @10 m	39	21	27	28	30	34	31	26	21
BAWC/H 002	Power	67	49	55	56	58	62	61	58	48
	Pressure @1 m	59	41	47	48	50	56	55	53	42
	Pressure @10 m	39	21	27	28	30	36	35	33	22
BAWC/H 003	Power	68	51	56	57	59	64	62	58	49
	Pressure @1 m	60	43	48	49	51	56	54	50	41
	Pressure @10 m	40	23	28	29	31	36	34	30	21
BAWC/H 004	Power	70	52	58	59	61	65	63	58	50
	Pressure @1 m	62	44	50	51	53	57	55	50	42
	Pressure @10 m	42	24	30	31	33	37	35	30	22
BAWC/H 005	Power	71	54	59	60	61	67	64	65	53
	Pressure @1 m	64	46	51	52	53	59	56	57	45
	Pressure @10 m	44	26	31	32	33	39	36	37	25
BAWC/H 006	Power	74	54	59	61	69	68	67	63	50
	Pressure @1 m	66	46	51	53	61	60	59	55	42
	Pressure @10 m	46	26	31	33	41	40	39	35	22
BAWC/H 008	Power	75	54	60	60	69	68	70	65	50
	Pressure @1 m	67	46	52	52	61	60	62	57	42
	Pressure @10 m	47	26	32	32	41	40	42	37	22
BAWC/H 010	Power	77	54	60	61	70	69	73	70	57
	Pressure @1 m	69	46	52	53	62	61	65	62	49
	Pressure @10 m	49	26	32	33	42	41	45	42	29
BAWC/H 012	Power	77	54	60	61	70	69	73	70	57
	Pressure @1 m	69	46	52	53	62	61	65	62	49
	Pressure @10 m	49	26	32	33	42	41	45	42	29



BAWC/H 001-003

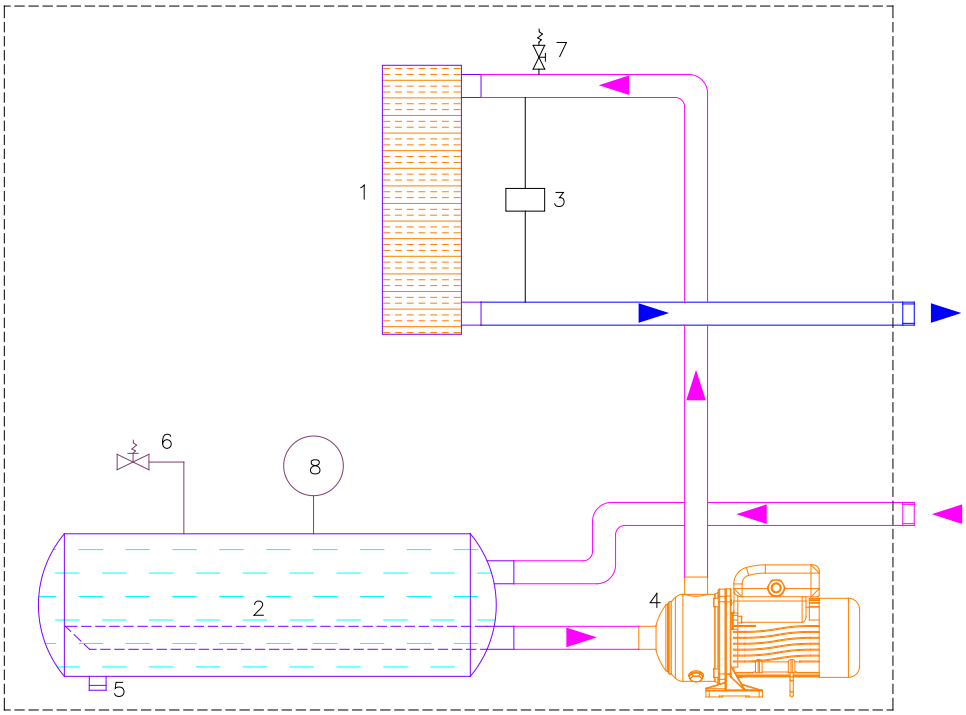


BAWC/H 004-006



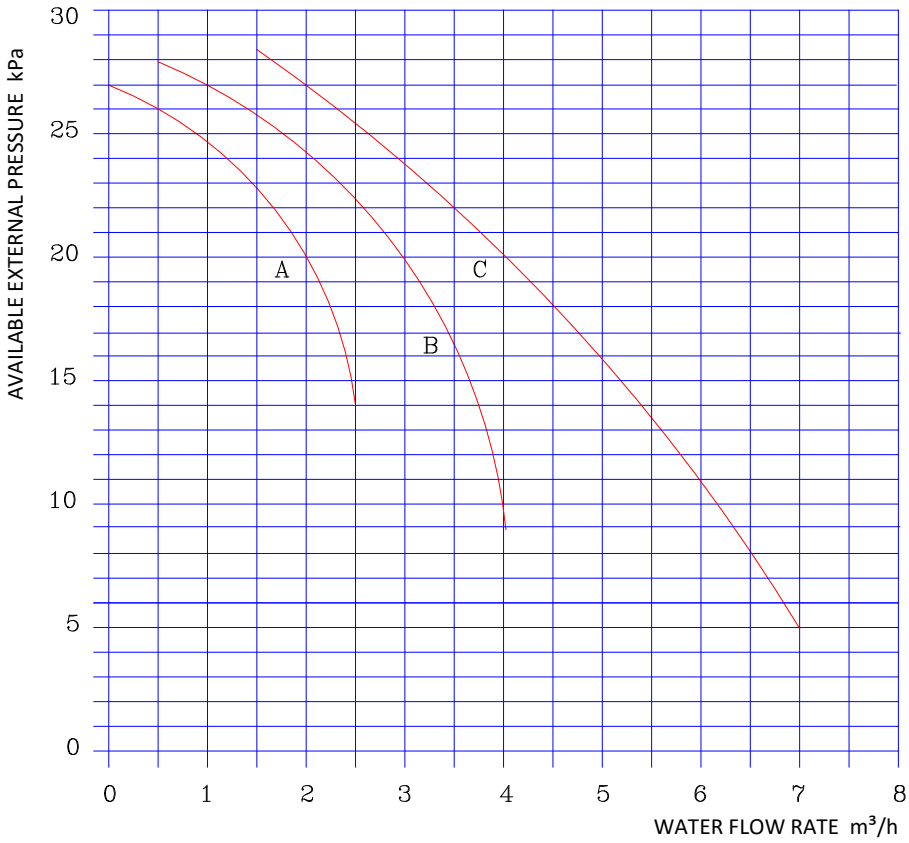
BAWC/H 008-012

4.1 Hydronic circuit diagram



1. PLATE HEAT EXCHANGER
2. WATER TANK
3. DIFFERENTIAL PRESSURE SWITCH
4. WATER PUMP
5. DRAIN VALVE
6. SAFETY VALVE
7. AIR VENT
8. EXPANSION TANK

4.1.1 Available external water pressure curves



A. BAWC/H 001-003 B. BAWC/H 004-006 C. BAWC/H 008-012

4.2.1 Recommendations concerning the hydraulic circuit

All field connections must be carried out by a licensed technician and must comply with the applicable local and national codes.
Water heat exchanger connections should be made in accordance with the unit outlook, respecting the water inlet/outlet.
Install a flow switch or water differential pressostat (standard component) in the water outlet piping, to prevent the unit from operating at a water flow which is too low. A terminal is provided in the switch box, for the electrical connection of the flow switch in the control circuit.
To protect the water heat exchanger and avoid contamination and fragment, it is compulsory to install a filter in the water inlet pipe.
It is essential to install a thermometer in the water inlet/outlet pipe, to check temperatures.
Provide heat insulation with suitable vapor barrier around the chilled water piping, to prevent condensation and capacity loss. Provide drain connections at all low points of the system, to allow complete drainage for maintenance and / or shutdown.
Air vents should be provided at all high points of the system, located where they are easily accessible for service. The water pipes are specially designed to obtain a complete air purge of the water heat exchanger.
Provide flexible connection pipes at the inlet and outlet of the water heat exchanger, to prevent tubes vibration.
Install an expansion tank on the suction side of the water pump, so that the water pressure on the pump suction shall be positive.

The frequent evacuation of the water system should be avoided. To avoid frequent on/off operation of the compressor, a minimum water volume is required in the system (table 4.2.2). To assure proper operation of the unit, the water flow through the water heat exchanger must be within the specified limits (in table 4.2.2). The water quality should be in accordance with the specifications in table 4.2.2, to ensure the longest life span and optimum operation.

4.2.2 Water charge, flow and quality

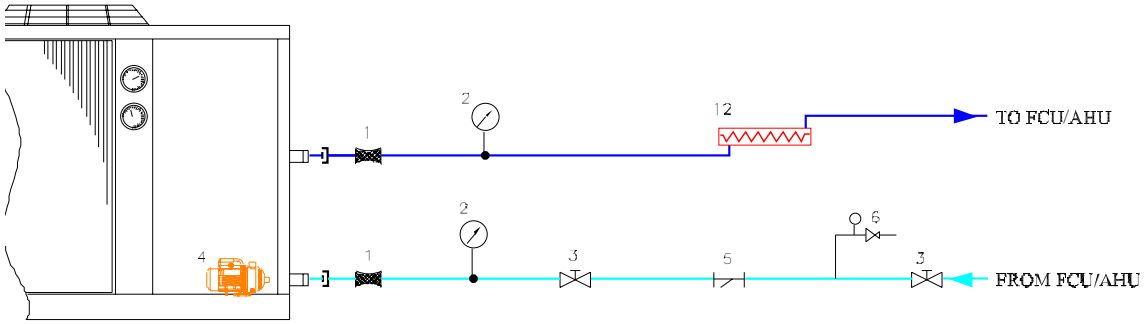
To ensure proper operation of the unit, a minimum water volume is required in the system and the water flow must be within the operational range, as specified in the tables.

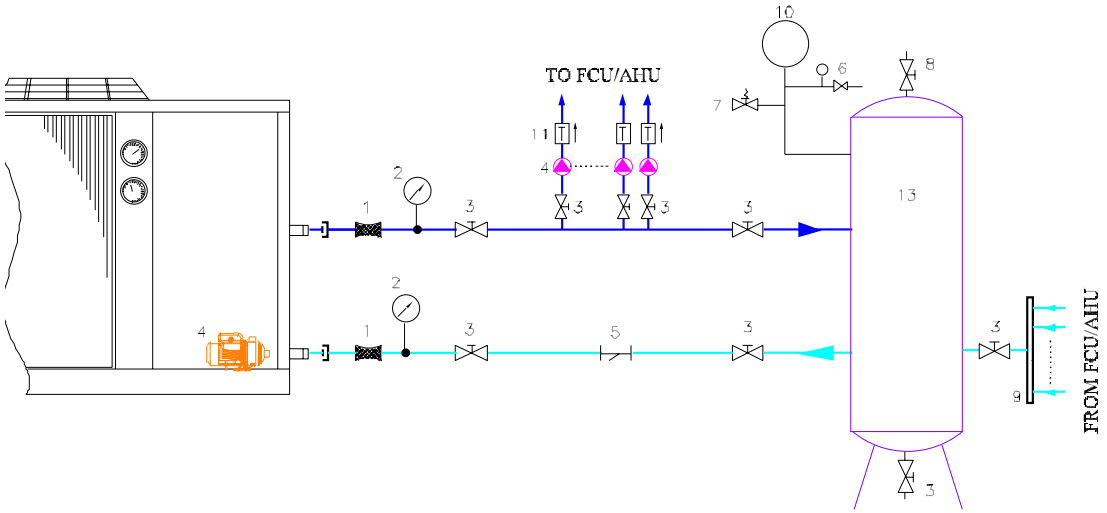
Be sure the water quality is in accordance with the specifications below.

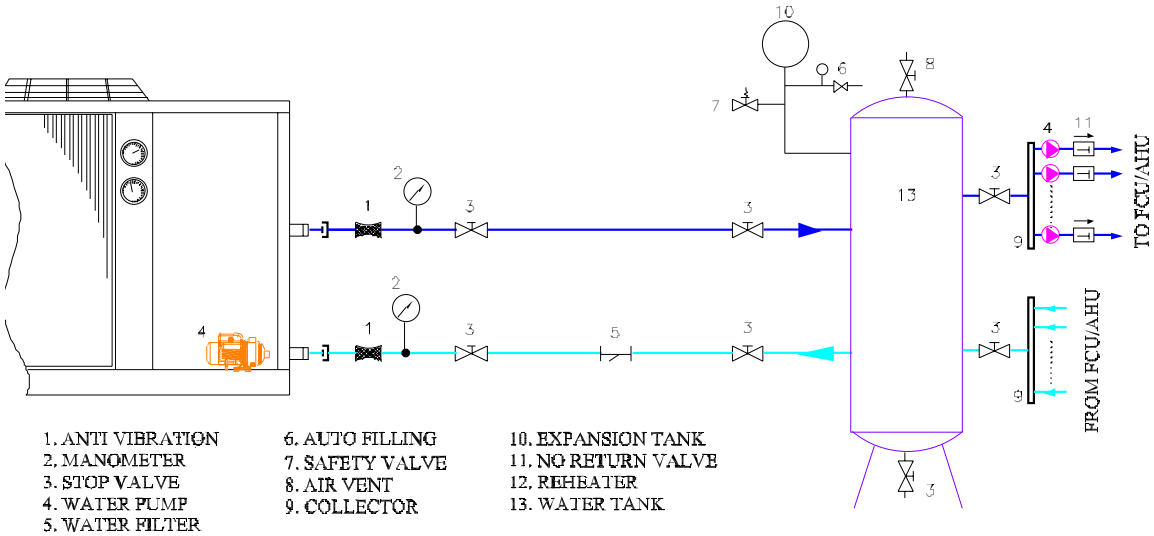
MODEL	Minimum water volume (l)	Minimum water flow (l/h)	Nominal water flow (l/h)	Maximum water flow (l/h)
BAWC/H 001	43	748	1068	1303
BAWC/H 002	55	946	1352	1649
BAWC/H 003	62	1072	1531	1868
BAWC/H 004	95	1628	2326	2838
BAWC/H 005	109	1881	2687	3278
BAWC/H 006	139	2388	3411	4161
BAWC/H 008	183	3159	4513	5506
BAWC/H 010	233	4015	5736	6998
BAWC/H 012	274	4727	6753	8239

ITEMS	Evaporator water		Heated water		
	Circulating water 20°C	Supply water	Circulating water 20 - 60°C	Supply water	Tendency if out of criteria
Items to be controlled:					
PH AT 25°C	6.8 - 8.0	6.8 - 8.0	7.0 - 8.0	7.0 - 8.0	corrosion + scale
Electrical conduct (mS/m) at 25°C	below 30	below 30	below 30	below 30	corrosion + scale
Chloride ion (mg CI-/I)	below 50	below 200	below 30	below 30	corrosion
Sulfate ion (mg SO 2/4/I	below 50	below 50	below 30	below 30	corrosion
M-alkalinity (ph 4.8) (mg SO3/I)	below 50	below 50	below 50	below 50	scale
Total hardness (mg CaCO3/I)	below 70	below 70	below 70	below 70	scale
Calcium hardness (mg CaCO3/I)	below 50	below 50	below 50	below 50	scale
Silica ion (mg SiO2/I	below 30	below 30	below 30	below 30	scale
Items to be referred to:					
Iron (mg Fe/I)	below 1.0	below 0.3	below 1.0	below 0.3	corrosion + scale
Copper (mg Cu/I)	below 1.0	below 0.1	below 1.0	below 1.0	corrosion
Sulfide ion (mg S2-/I)	Not detectable	Not detectable	Not detectable	Not detectable	corrosion
Ammonium ion (mg NH+4/I	below 0.3	below 0.1	below 0.1	below 0.1	corrosion
Remaining chloride (mg CI/I)	below 0.25	below 0.3	below 0.1	below 0.3	corrosion
Free carbide (mg SO2/I)	below 0.4	below 4.0	below 0.4	below 4.0	corrosion
Stability index	-	-	-	-	corrosion + scale

NOTES
The above tables are purely indicative and non-binding.

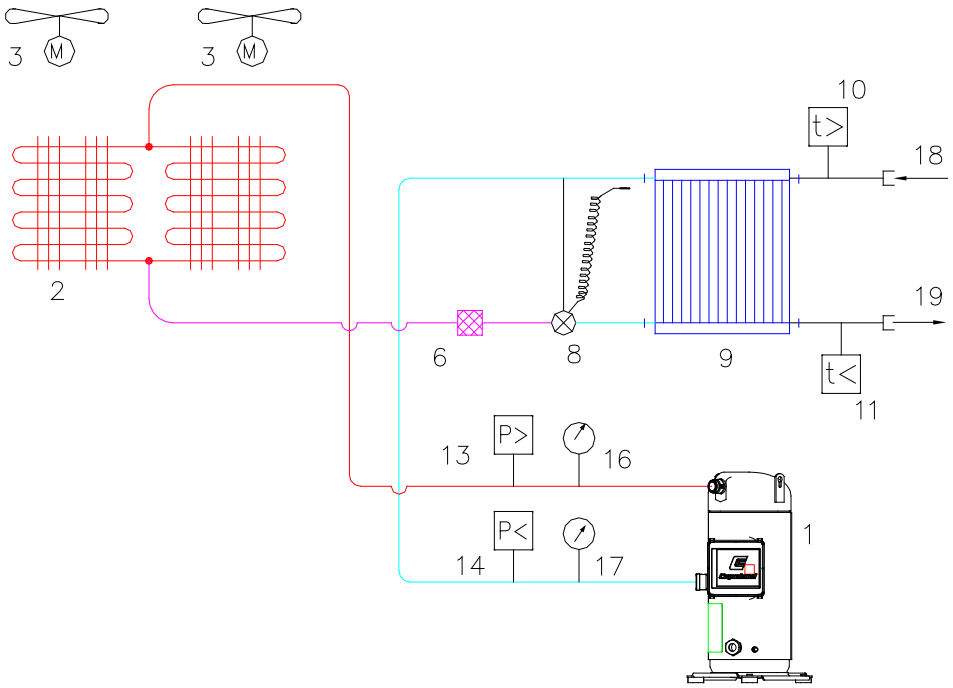




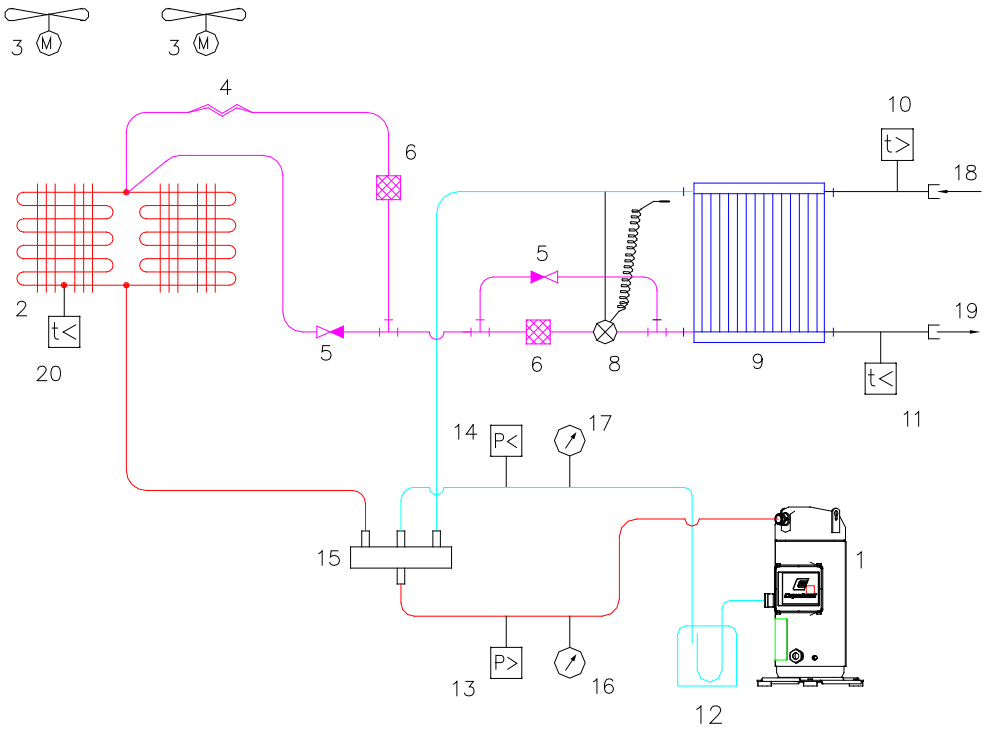


1. ANTI VIBRATION
2. MANOMETER
3. STOP VALVE
4. WATER PUMP
5. WATER FILTER
6. AUTO FILLING
7. SAFETY VALVE
8. AIR VENT
9. COLLECTOR
10. EXPANSION TANK
11. NO RETURN VALVE
12. REHEATER
13. WATER TANK

5.1 BAWC - S



5.2 BAWH - S



1.COMPRESSOR
2.CONDENSER
3.FAN
4.EXPANSION DEVICE (CAPILLARY)
5.CHECK VALVE
6.FILTER DRIER
8.EXPANSION VALVE
9.EVAPORATOR
10.TEMPERATURE PROBE (INLET)
11.TEMPERATURE PROBE (OUTLET)
12.ACCUMULATOR
13.HIGH PRESSURE SWITCH
14.LOW PRESSURE SWITCH
15.4_WAY VALVE
16.HIGH PRESSURE MANOMETER
17.LOW PRESSURE MANOMETER
18.WATER INLET
19.WATER OUTLET
20.DEFROST PROBE

5.3 Operating pressure of the refrigerant circuit

It is important to check the high and low pressure of the refrigerant circuit, to ensure the proper operation of the unit and to guarantee that the rated output shall be obtained.

Attention:

The pressures measured shall vary between a maximum and minimum value, depending on the water and ambient temperatures at the moment of measurement.

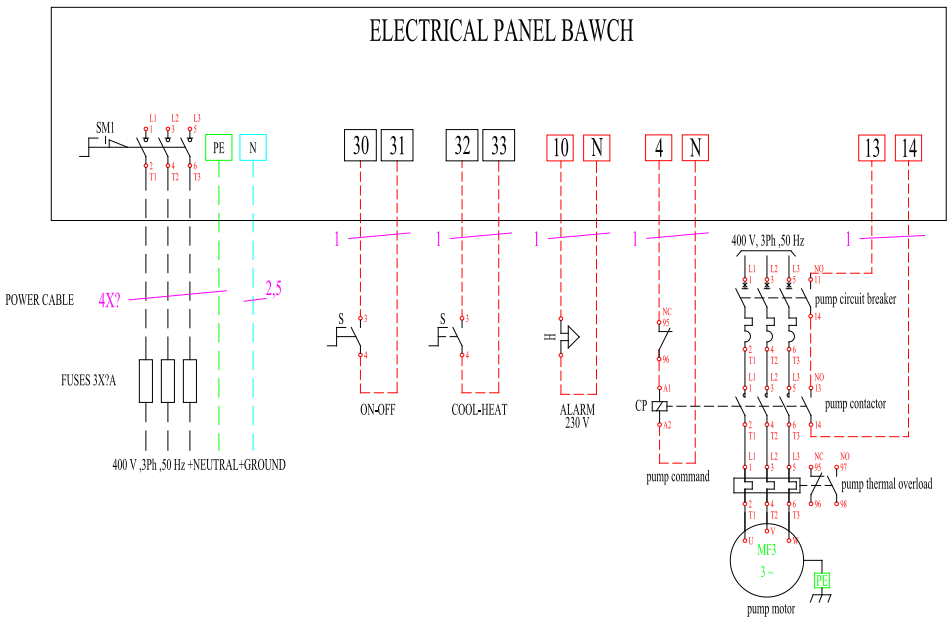
		Minimum	Nomimal	Maximum
R407C	**Cooling mode (region)**	(Ambient temp. 20°C) (leaving water temp. 6°C)	(Ambient temp. 30°C) (leaving water temp. 7°C)	(Ambient temp. 40°C) (leaving water temp. 15°C)
	low pressure	3,5 - 4,0 bar	4,0 - 5,0 bar	5,5 - 6,0 bar
	high pressure	17,5 - 19,0 bar	18,0 - 20,0 bar	21,0 - 23,0 bar

		Minimum	Nomimal	Maximum
R407C	**Heating mode (region)**	(Ambient temp. 0°C) (leaving water temp. 40°C)	(Ambient temp. 7°C) (leaving water temp. 45°C)	(Ambient temp. 15°C) (leaving water temp. 45°C)
	low pressure	2,6 - 2,8 bar	3,5 - 3,9 bar	4,4 - 4,8 bar
	high pressure	19,0 - 21,0 bar	20,0 - 22,0 bar	21,0 - 23,0 bar

		Minimum	Nomimal	Maximum
R410a	**Cooling mode (region)**	(Ambient temp. 20°C) (leaving water temp. 6°C)	(Ambient temp. 30°C) (leaving water temp. 7°C)	(Ambient temp. 40°C) (leaving water temp. 15°C)
	low pressure	7,0 - 7,2 bar	7,1 - 7,6 bar	9,4 - 10,0 bar
	high pressure	19,0 - 21,0 bar	24,0 - 28,0 bar	31,0 - 34,0 bar

		Minimum	Nomimal	Maximum
R410a	**Heating mode (region)**	(Ambient temp. 0°C) (leaving water temp. 50°C)	(Ambient temp. 7°C) (leaving water temp. 45°C)	(Ambient temp. 15°C) (leaving water temp. 45°C)
	low pressure	5,4 - 5,6 bar	6,9 - 7,2 bar	9,2 - 9,6 bar
	high pressure	34,0 - 36,0 bar	29,0 - 31,0 bar	30,0 - 32,0 bar

6.0 Wiring diagram



BAWC/H - S series

The supply, transport to jobsite, installation, commissioning and start-up of an air-cooled water chiller / heat pump with the following technical characteristics:
The unit shall be factory assembled, charged with R407C or R410a refrigerant and factory tested. The capacity of the unit shall be no less than:

Cooling capacity:	kW
In following conditions	
Ambient air temperature (DB)	°C
Entering water temperature	°C
Leaving water temperature	°C

Heating capacity:	kW
In following conditions	
Ambient air temperature (DB / WB)	°C
Entering water temperature	°C
Leaving water temperature	°C

The unit shall operate unhindered within 6 to 15°C/25°C to 50°C (cool/heat) water outlet temperature, 3,5 to 7°C water temperature difference and -5 up to 45°C ambient air temperature. The structural requirements will be the following:

Unit Casing

The unit casing shall be fabricated from heavy gauge galvanized steel sheets, formed to ensure maximum rigidity that shall guarantee and preserve the unit's operation during the years. All metal parts after fabrication shall be degreased, phosphatized and electrostatically powder coated with an epoxy-polyester RAL 9002 coating of a thickness of 60-70 μm. The corrosion resistance treatment must successfully withstand a salt spray test of 500 hours, according to ASTM B- 117. All components shall be assembled together exclusively using bolts, without welding. The unit shall have removable access panels, designed in such a manner as to permit easy access to internal compartments, only by authorized personnel. Electrical and electronic equipment and components for proper unit's operation shall be located inside a water proof (IP55) electrical panel, with access via special key.

Compressor

Shall be of the hermetic scroll type, with low noise and vibration levels, especially optimized for use with R407C or R410a refrigerant. They shall be equipped with a crankcase electrical heater, to separate refrigerant and oil when the unit is not operating. They shall also include internal protection against overloading or electrical spikes. The compressor shall be mounted on special anti-vibration rubber mounts, to absorb and eliminate any vibrations from the unit's operation.

Air Heat Exchanger

The air heat exchanger shall be manfactured from seamless copper tubes with an outside diameter of 9,52 mm (3/8'') of high quality, according to ASTM B-280. The tubes shall be internally grooved to achieve optimized heat transfer between refrigerant and tube. The fins shall be manufactured from aluminium. The fins shall be continuous across the heat exchanger and the fins surface shall be waffle formed and louvered, so as to increase the fin rigidity and heat transfer. The combination of internally grooved copper tubing and louvered fins must result in a heat transfer performance 30% superior to that of a conventional coil. The assembly of the finned pack shall be achieved by mechanical expansion, in such a way as to form a perfect mechanical bond with the fins. For his purpose, the fin holes shall have a peripheral extrusion (collar).

Water Heat Exchanger

The water heat exchanger shall be of the plate heat exchanger type, selected from world-class manufacturers and made of stainless steel plates (AISI 3161.4401), especially formed to achieve optimized heat transfer. The plates shall be assembled by means of an automatic brazing process, under vacuum.

Air Heat Exchanger Fans

All units shall be equipped with axial type fans, single phase, 6 poles, internally protected against potential overheating, noiseless and suitable for outdoor installation. The design of the blades and inlet cones shall be aerodynamic and the fan motor assembly shall be perfectly statically and dynamically balanced, allowing a completely vibration-free operation. The fan motor assembly shall have a protective grid against accidental contact with moving parts, according to ISO regulations. The fan motor shall be of the external rotor type, with permanently lubricated bearings that do not require service. The motor shall be aerodynamically shaped, so as not to interfere with the airflow. The unit shall be equipped with a continuous linear fan speed regulation control, according to coil temperature.

Refrigerant circuit

All units shall have one refrigerant circuit. The refrigerant circuit shall consist of a filter dryer, liquid receiver, suction accumulator, 4-way reversing valve, expansion device (restrictors, thermal or electronic expansion valve), sight glass, solenoid valve, check valve, high pressure switch, low pressure switch and high/low pressure manometers.

Control System with Microprocessor controller

The control system shall possess a sophisticated controller that shall constantly monitor all machine parameters and particularly manage among others:
Automatic compressor control function through return water temperature.
Continuous fan speed control, based on coil heat exchanger temperature.
Defrost control.
Hydraulic circuit pump control.
Compressor start-up time control function.
Compressor running time records.
Over 150 programmable parameters.
Fan motor overload protection.
Auto diagnostic stop function, due to low water circulation, high/low operating pressure and compressor/pump thermal overload.
Auto diagnostic function and digital display of approximately 30 possible error codes, including thermistor faults.
Digital displays of inlet/outlet water, as well as coil temperature.
Remote cool/heat and on/off selection.
Phase sequence - phase failure - reverse phase and voltage monitoring.
Various other optional control capabilities (listed in options).

NOTE

The consultant may add, if required, the below mentioned optional accessories / functions:
Remote keyboard.
Dynamic set point program.
BMS module interface kit for Modbus connection.
Parallel chiller operation with more than 2 units, with optional controller.
Microprocessor parameters reprogramming card.
Condenser fins made of prepainted aluminium or copper and Blygold treatment for additional anti-corrosion protection.
Plate heat exchanger anti-freezing protection (elec. heater), controlled by microprocessor.
Glycol application for low chilled water temperatures.
Pressure relief valve on compressor discharge.
Hydraulic module without buffer tank, or Hydronic module with buffer tank.
Compressor noise reduction jacket.
Two pumps (one stand by).
A-meter, V-meter.
Axial Fans with EC motors, for energy saving.
Heat recovery exchanger.

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