PURESTREAM
CWT CHILLERS
BY FRIULAIR

Technical Manual

Air cooled liquid chillers
R410A refrigerant
Cooling capacity 2.1 – 44.8 Tons, scroll and rotary compressors
60 Hz

2013 Rev.1

Tabel of Contents:

THE CWT SERIES OVERVIEW

The new CWT range is specifically designed to meet the stringent cooling requirements of today's advanced equipment and processes. The CWT range proivides precise temperature control of chilled water temperature while operating over long periods of time with varying load demands for many industries and applications. The range includes 14 models with capacities from 2.1 to 44.8 tons and designed to be installed indoors or outdoors. All units are equipped with the necessary components to provide safe, reliable and energy saving operation.

All units are equipped with:

- rotary or scroll hermetic compressors
- environmentally friendly refrigerant gas R410A
- plate heat exchanger evaporator
- aluminium finned micro-channel condenser
- electric fans with continual speed control
- microprocessor controller
- ventilated control panel
- inertial water collection tank
- hydraulic pump
- stainless steel condenser filters
- water filter and shut-off valves

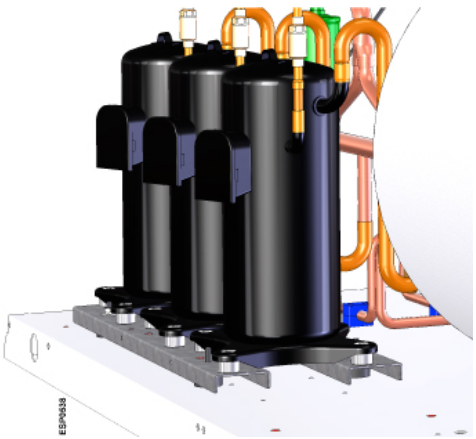
FRAME AND CABINET COVERING

All frame and cabinet material is made from galvanized steel that is then powder coated making the chiller suitable for outdoor installation and for protection in harsh environments. All fasteners are either stainless steel or electro-galvanized. The CWT was designed so that all parts, particularly those requiring maintenance and cleaning are easy to access without interfering with chiller operations or creating a safety hazard for the operator. The compressor cabinet is accessible on three sides in order to allow for easy maintenance. It is also separate from the fan cabinet and allows maintenance staff to work on the chiller while it is still operating. The hydraulic section is also easily accessible.

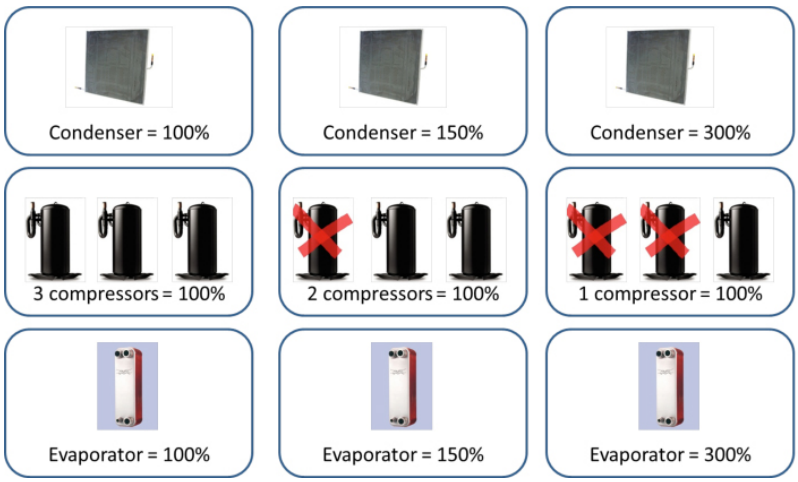
THE MULTI-COMPRESSOR CHOICE

The multi compressor configuration from model CWT030 allows the chiller to:

- adapts to the load required at any time by automatically starting the correct number of compressors for the load
- provides a lower start up current in-rush and increases the average life of the compressors
- operates more efficiently during partial loads: the chiller is generally sized for the maximum output required, but this condition rarely occurs and only for limited periods; during split operations (that is only a part of the compressors working) chiller efficiency (EER) can increase by over 35% compared to full power; this means that at an expense of 1 electric kW, you have - for example – 1.14 Tons chilling instead of 0.85 tons and considerable energy cost savings



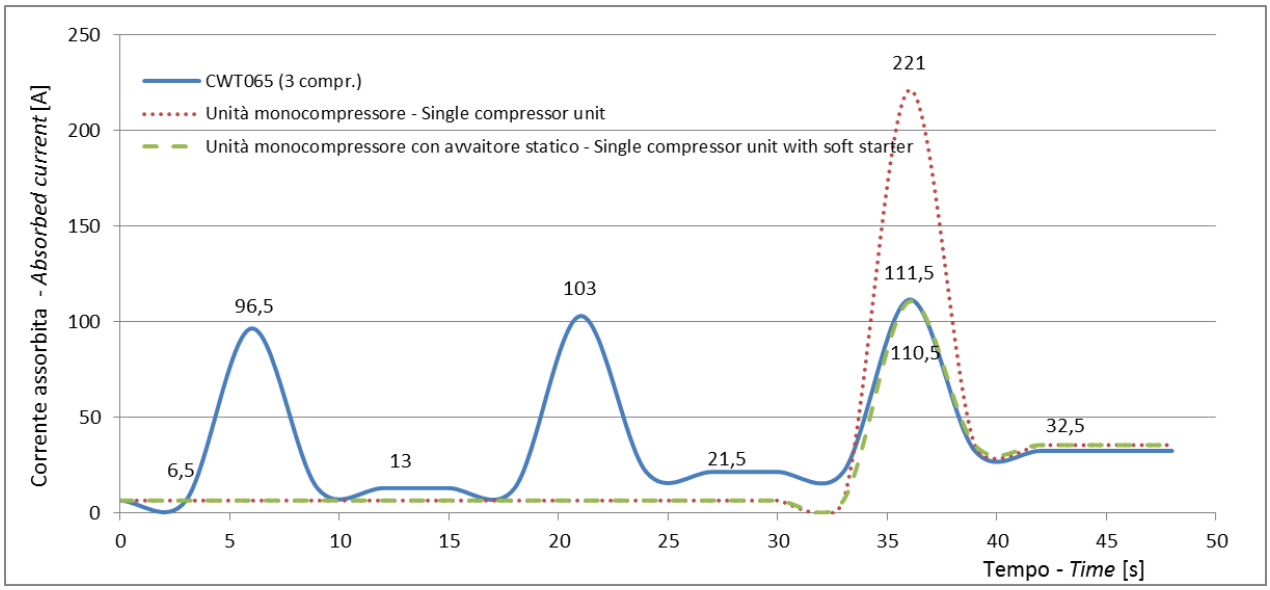
When the machine is operating at partial load i.e. with only some of the compressors on, the cooling occurs with the exchangers which are actually oversized as illustrated:



EER = 4.1 **EER = 5.0** **EER = 5.7**

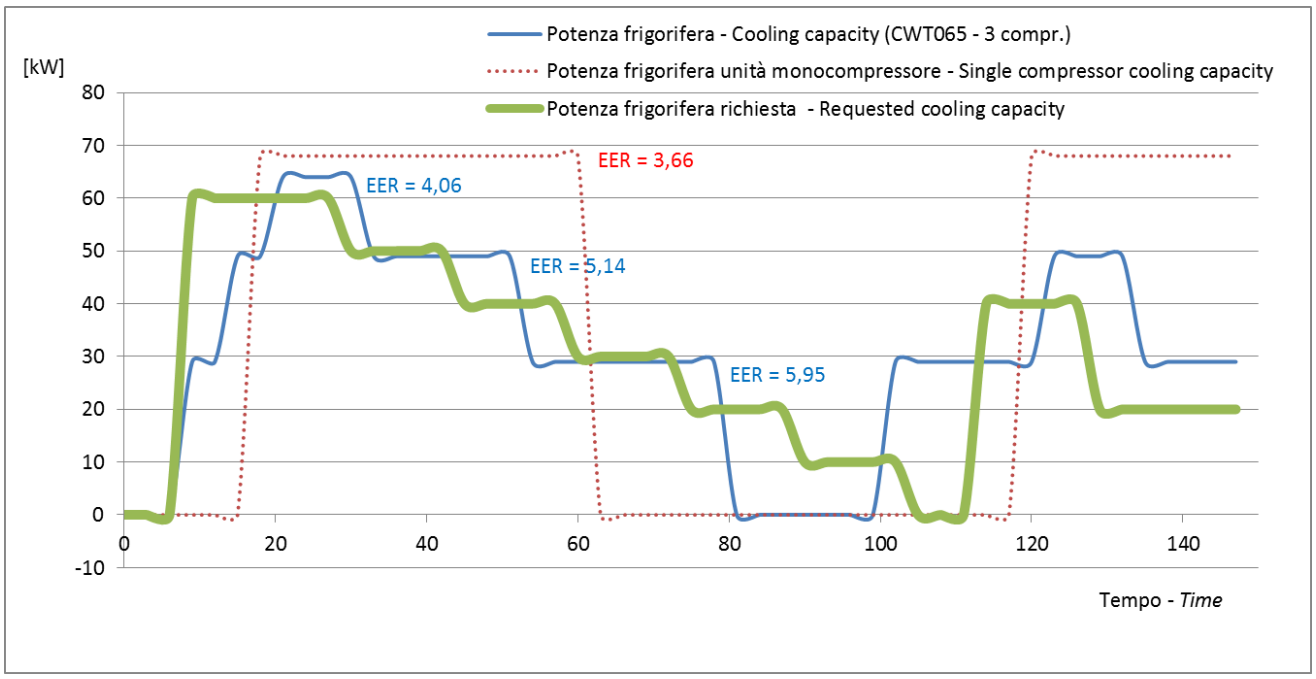
Machines with several compressors in the same circuit can achieve much better efficiency levels compared with machines with just one compressor per circuit.

Machines with several compressors in the same circuit have lower in-rush current and an increase in the average life of the compressors:



Inrush current comparison between a CWT065 and a single compressor unit of same capacity without and with soft starter

Machines with several compressors in the same circuit better adapt to the load required at any time, starting the right number of compressors.



REFRIGERANT GAS

Due to its thermal dynamic performance the R410A refrigerant gas allows the refrigeration system to operate at its highest efficiency. The higher operating pressure of the R410A refrigerant allowed for the development of a more compact chiller line.

COMPRESSORS

CWT chillers use rotary and scroll hermetic compressors. These are the highest technological level on this product range. They are noted for reliability and efficiency through their widespread use in the air conditioning sector. The scroll compressor has the additional benefits of quiet operations, no vibration and the ability to adsorb liquid returns. Compressors are all equipped with heating resistor for the carter which comes on when the compressors are switched off as long as the machine is still powered. Compressors are mounted on rubber anti-vibration blocks to reduce noise even further. They are also protected by an electronic device controlling phase sequences to avoid any contrary rotation.

CONDENSERS

Micro-channel aluminium plate condensers: guarantee a greater exchange surface than the traditional copper tube condenser and also means the refrigerant load can be minimised (from 30% to 35% less than a traditional condenser). The all-aluminium structure prevents these condensers of any galvanic corrosion risks. Stainless steel condenser filters are provided on all units. They can be easily removed for service and cleaning.

FANS

With 4/6/8 pole, axial motors and an external rotor, rotation speed is regulated by a phase-cutting regulator (standard), based on condensation pressure measured by a pressure transducer, thus leading to more regular operation and lower consumption, extending machine operating limits and making it quieter when the outer temperature is low or when it operates with a reduced load. All fans have a protection grid, internal heat protection with automatic resetting, class F insulation.

EVAPORATOR

The evaporator is made of stainless steel brazed plates, compact in size and very efficient. The evaporator is separated and independent of the water storage tank. The electronic control's anti-freeze function keeps the evaporator's outlet water temperature under control to prevent it from freezing up. A differential pressure gauge protects the evaporator against a lack of water. A mechanical inlet water filter (standard) protects the entire hydraulic circuit against any dirt contaminatents. Models from CWT075 to CWT130 has double evaporator refrigerant circuit and single water circuit. This configuration is very efficient with partial loads, compared to independent evaporator solutions.

REFRIGERANT CIRCUIT

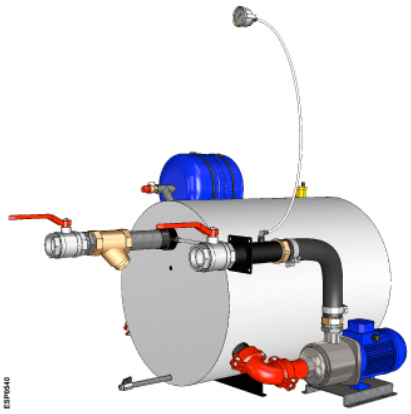
Made with high quality materials by specialised personnel following rigorous brazing procedures, conforming with directive 97/23; it includes:

- rotary (model CWT010) and scroll compressors designed for R410A
- AISI 316 stainless steel brazed plates
- micro-channel aluminium condensers
- dehydrator filter
- flow light indicating presence of humidity
- thermostatic expansion valve and external equalisation
- one-way valve (just for multi-compressor units)
- manual reset high pressure gauge and automatic reset low pressure gauge
- high and low pressure gauges
- testing and maintenance refrigerant pressure connections

HYDRAULIC CIRCUIT

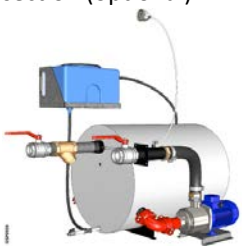
Including:

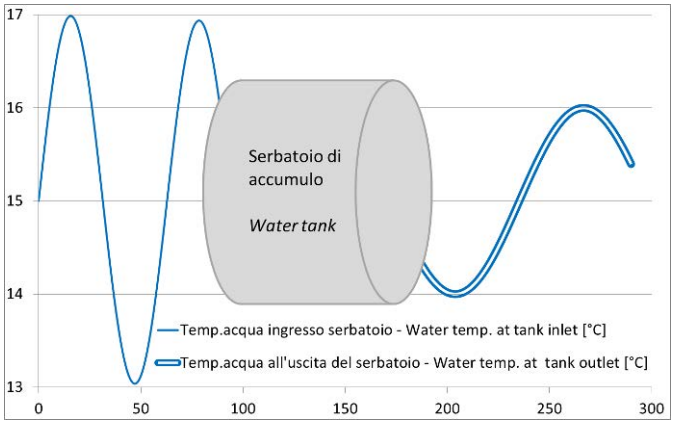
- thermally insulated storage tank in carbon steel
- thermally insulated electric pump
- water bypass (prevents problems linked to the shut-off valves being closed by mistake)
- expansion vessel
- safety valve
- automatic vent valve
- level sensor
- differential water gauge
- ball shut-off taps
- inlet water filter
- gauge
- draining tap



The high litres/KW (liquid volume / compressor cooling capacity) ratio maintains a constant outlet water temperature while minimizing compressor starts and stops. Where the multi-compressor configuration is used, the storage tank is smaller than with a single compressor, allowing for a faster start up to reach plant cooling water requirements.

CWT models are also available with atmospheric pressure hydraulic section (optional).





The storage tank is on the unit outlet to limit temperature variations due to compressors being switched on and off.

CIRCULATION PUMPS

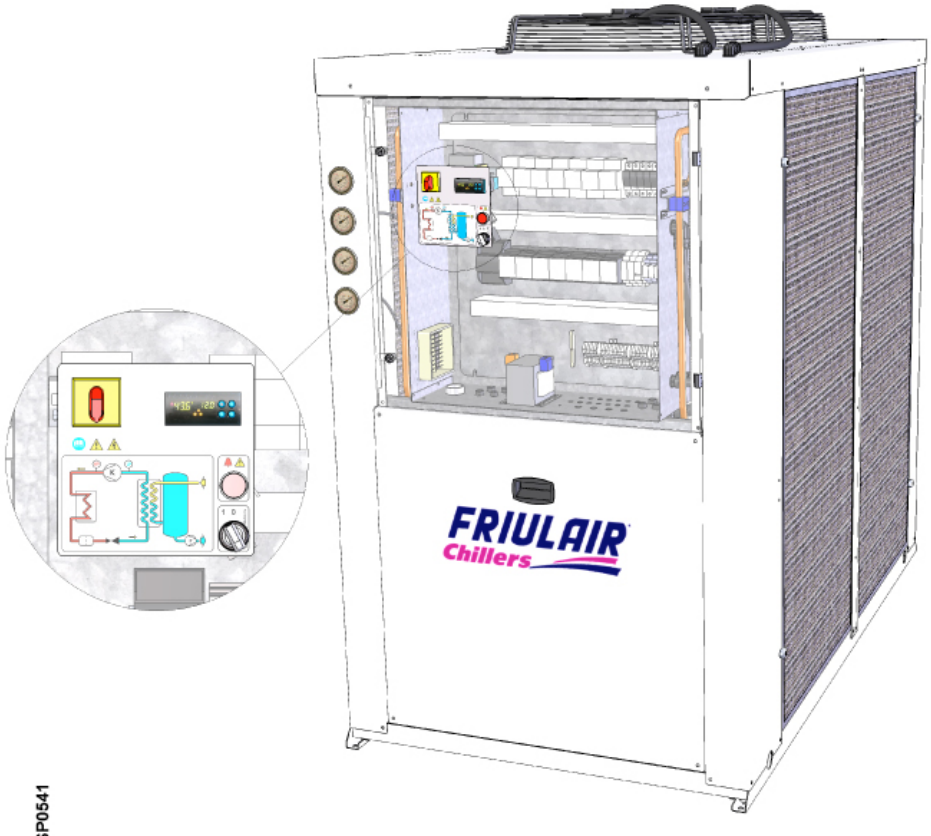
All units are equipped with a high efficiency multi-stage centrifugal pump, with steel impeller. All parts coming into contact with fluid are AISI 304 stainless steel, mechanical seal in carbon/ceramic/EPDM (standard) making it possible to use water and ethylene glycol mixtures of up to 30%. The motor is asynchronous, 2-pole, self-ventilated, class F insulation and IP55 protection level. The entire CWT series is available with two pressure levels (P3 and P5) P3 being the standard. Also available from model CWT038 a dual pump option is available with a rotatating system designed to electronically equalize operating times for each pump.

SAFETY AND CONTROL DEVICES

- Temperature probes: to control and display evaporator inlet and outlet water temperatures, for the anti-freeze function.
- High pressure gauge: blocks the machine if it reaches anomalous pressures on the refrigerant circuit's high pressure side; manual reset.
- Low pressure gauge: blocks the machine if refrigerant pressures are too low; reset is automatic and only after the pressure has gone back up to a preset value.
- Pressure transducer: registers high refrigeration system pressure allowing ongoing fan speed regulation with phase-cutting electronic regulator. Thanks to this device units can work with an outdoor air temperature of up to 14°F.
- Emergency compressor splitter system: in really bad conditions (high outdoor temperatures, even over operating limits established) this device stops one or more compressors to guarantee that the unit keeps on operating.
- Level sensor: installed on tank, blocks machine if there is no water.
- Water differential pressure gauge: blocks machine if water capacity is too low.
- Compressor heating resistors: avoid refrigerant gas in compressors migrating when the machine is off, resulting in oil being dragged out of them when it starts up again.
- Phase sequence control: stops the machine starting if the electric power phase sequence is wrong to avoid compressors rotating in the opposite direction to the one set.

CONTROL PANEL

Control panel complying with EN 60204 EC, with a door lock disconnector which prevents access to the control panel when it is live. The control panel door is watertight and equipped with an active ventilation system when the unit is operating; includes thermo-magnetic motor protectors for compressors and pump, contactors, autotransformers, compressor rotation direction control devices; panel wires are numbered. There is also an ON/OFF switch on the front panel door.



ESP0541

MICROPROCESSOR CONTROLLER

The electronic control micro-processor controls and optimizes all CWT chiller components and functions. In particular the controller:

- regulates evaporator water outlet temperature
- turns pump on and off
- regulates fan speed
- compressors' on and off cycles based on water temperature required (with division of operating times for multi-compressor machines)
- compressor emergency splitter function (for multi-compressor machines) if operating with water or air temperature too high outside limits set
- division of pump operating times (double pump models)
- measurement and display of evaporator inlet and outlet temperature
- measurement and display or condensation pressure
- alarm message management:
    - high refrigerant pressure gauge
    - low refrigerant pressure gauge
    - differential water gauge
    - compressor thermal/phase sequence control
    - pump thermal
    - temperature probe failure
    - pressure probe failure
    - high water temperature
    - anti-freeze

User interface is easy and intuitive. It is possible to enable the “remote” function with its clear, visible alarm indicator. The easy-to-follow set up menu allows for easy access to set main operating parameters. The integrated double display with its clear icons provides a complete real time display of the chiller's operation and alarm status. Remote control panels are also available.

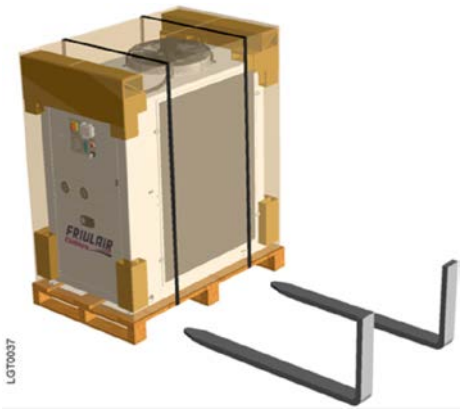
UNIT TESTING

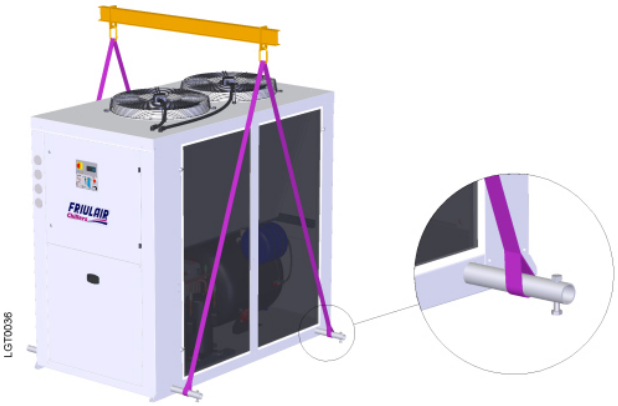
Each CWT is tested with full load conditions prior to leaving the factor. The following tests are also carried out:

- correct component assembly
- pressurizing of refrigerating circuit and tested for leaks using helium leak detector
- pressurizing of water/hydraulic circuit
- electric tests in compliance with standard EN60204
- test to ensure that protection and safety components function correctly
- test the electronic controller performance
- measurement of electrical performance

HANDLING

All machines are supplied packed on pallets so they can be handled using pallet truck and transpallet. The main frame has holes so that tubes can be inserted for lifting with belts as shown in the diagram below. On request, all models are available with feet and wheels making it easy to move the machine when it has been unpacked.





OPTIONAL COMPONENTS

CWT model	010-030	038-090	110-160
P5 Pump	O	O	♠
Double P3 pump	✖	O	O
Double P5 pump	✖	O	✖
Version without tank	O	O	O
Version without pump	O	O	O
Open hydraulic circuit with additional loading tank	O	O	O
Non ferrous material version	O	O	O
Automatic filling kit	O	O	O
Remote control panel	O	O	O
Wheels	O	O	O
Feet	O	O	O

Legend: ✖ not available; ● as standard; O optional; ♠ on demand.

TECHNICAL DATA

CWT Unit		010	015	018	020	030	038	040
Cooling capacity (1)	[Tons]	2.1	3.4	4.4	5.3	6.5	9	10.9
Cooling capacity (1)	[kW]	7.4	11.9	15.4	18.7	22.8	31.5	38.4
Compressors power input (1)	[kW]	1.8	3.2	3.6	5.0	6.7	7.1	10.0
Total power input (1) (2)	[kW]	2.9	4.4	4.8	6.3	7.9	9.8	12.7
Total absorbed current (1) (2)	[A]	5.30	7.44	9.56	11.72	13.80	18.45	22.75
EER (pump excluded) (1)	--	3.81	3.70	4.30	3.83	3.60	4.43	3.96
Water flow (1)	[gal/min]	6.4	10.2	13.3	16.1	19.5	27.3	33.1
Available pressure (1) (2)	[psig]	55.5	39.1	54.0	48.9	42.2	50.8	37.3
Maximum power input (total) (2) (3)	[kW]	3.9	5.8	7.2	8.5	10.6	14.7	17.1
Maximum absorbed current (total) (2) (3)	[A]	6.6	9.5	12.6	14.5	17.6	24.6	28.4
Starting current (2) (3)	[A]	35.7	41.7	58.1	74.1	49.9	70.1	88.0
Fan power	[kW]	0.40	0.40	0.50	0.50	0.50	0.50	0.50
Fan current	[A]	1.80	1.80	4.60	4.60	4.60	4.60	4.60
Number of fans	[#]	1	1	1	1	1	2	2
Pump power input (2)	[kW]	0.74	0.74	0.74	0.74	0.74	1.70	1.70
Pump absorbed current (2)	[A]	1.80	1.80	1.80	1.80	1.80	2.98	2.98
Refrigerant	--	R410A						
Power supply	[V/Ph/Hz]	575/3/60 as standard (460/3/60 optional)						
Compressor type	--	Rotary	Scroll					
Evaporator type	--	Brazed plates						
Condenser type	--	Microchannel						
N° of compressors	[#]	1	1	1	1	2	2	2
N° of refrigerant circuits	[#]	1	1	1	1	1	1	1
Air flow	[cfm]	2,558	2,667	4,814	4,814	4,738	9,063	9,063
Sound pressure level (4)	[dB(A)]	43	43	50	50	50	53	53
Water connections diameter NPT	["]	1"	1"	1"	1"	1"	1 1/2"	1 1/2"
Tank capacity	[gal]	25.1	25.1	25.1	25.1	25.1	35.7	35.7
Expansion vessel capacity	[gal]	1.3	1.3	1.3	1.3	1.3	2.1	2.1
Maximum pressure in hydraulic circuit	[psig]	87						
IP protection degree	--	IP44						
Width	[inch]	26.1	26.1	26.1	26.1	26.1	29.6	29.6
Depth	[inch]	39.0	39.0	51.4	51.4	51.4	64.4	64.4
Heigth	[inch]	52.6	52.6	56.1	56.1	56.1	60.4	60.4
Weigth	[lb]	474	573	584	606	717	882	904
P5 pump data								
Pump power input	[kW]	0.7	0.7	1.3	1.3	1.3	2.5	2.5
Pump absorbed current	[A]	1.8	1.8	2.5	2.5	2.5	4.3	4.3
Available pressure (1) (5)	[psig]	85.8	61.6	85.4	77.8	67.0	81.2	64.9

(1) Data referred to following conditions: water temperature in/out: 59/50°F (15/10°C) - ambient air temperature: 77°F (25°C)
(2) Data referred to unit with standard P3 pump
(3) Data related to most heavy condition allowed by safety devices fitted on the unit.
(4) Based on 10 meter distance in an open environment
(5) Data referred to unit with P5 pump (optional)
(6) For models from CWT010 to CWT065 with additional loading tank, length increases by 12 inches.

CWT Unit		**045**	**055**	**065**	**075**	**090**	**110**	**130**
Cooling capacity [1]	[Tons]	10.3	13.0	15.6	17.5	21.5	26.4	32.2
Cooling capacity [1]	[kW]	36.1	45.8	54.8	61.5	75.5	92.7	113.1
Compressors power input [1]	[kW]	9.4	11.4	16.1	14.0	19.6	20.7	30.8
Total power input [1] [2]	[kW]	12.9	16.0	20.7	21.9	27.5	31.9	42.0
Total absorbed current [1] [2]	[A]	22.67	26.28	33.18	34.06	42.47	49.99	65.04
EER (pump excluded) [1]	--	3.96	3.85	3.42	3.63	3.45	4.13	3.58
Water flow [1]	[gal/min]	31.1	39.5	47.1	53.3	65.5	80.4	97.3
Available pressure [1] [2]	[psig]	50.7	48.0	45.3	42.5	34.6	56.9	55.0
Maximum power input (total) [2] [3]	[kW]	17.6	22.6	26.2	31.9	36.7	43.7	54.5
Maximum absorbed current (total) [2] [3]	[A]	29.2	34.6	40.3	46.7	54.3	67.9	81.0
Starting current [2] [3]	[A]	61.4	80.1	99.9	92.2	113.9	145.5	140.6
Fan power	[kW]	0.50	1.05	1.05	2.70	2.70	2.50	2.50
Fan current	[A]	4.60	4.80	4.80	4.20	4.20	4.20	4.20
Number of fans	[#]	2	2	2	2	2	2	2
Pump power input [2]	[kW]	2.50	2.50	2.50	2.50	2.50	6.20	6.20
Pump absorbed current [2]	[A]	4.30	4.30	4.30	4.30	4.30	10.20	10.20
Refrigerant	--	R410A						
Power supply	[V/Ph/Hz]	575/3/60 as standard (460/3/60 optional)						
Compressor type	--	Scroll						
Evaporator type	--	Brazed plates						
Condenser type	--	Microchannel						
N° of compressors	[#]	3	3	3	4	4	4	6
N° of refrigerant circuits	[#]	1	1	1	2	2	2	2
Air flow	[cfm]	9,063	11,060	11,060	19,382	19,382	26,006	26,006
Sound pressure level [4]	[dB(A)]	53	49.5	49.5	58.5	58.5	52	52
Water connections diameter NPT	["]	1 1/2"	1 1/2"	1 1/2"	2"	2"	2"	2"
Tank capacity	[gal]	35.7	35.7	35.7	54.2	54.2	54.2	54.2
Expansion vessel capacity	[gal]	2.1	2.1	2.1	3.2	3.2	3.2	3.2
Maximum pressure in hydraulic circuit	[psig]	87						
IP protection degree	--	IP44						
Width	[inch]	32.8	32.8	32.8	43.7	43.7	47.6	47.6
Depth	[inch]	72.8	72.8	72.8	79.7	79.7	87.8	87.8
Heigth	[inch]	66.9	66.9	66.9	74.8	74.8	88.8	88.8
Weigth	[lb]	1102	1102	1135	1587	1698	2161	2205
P5 pump data								
Pump power input	[kW]	4.0	4.0	4.0	4.0	4.0	on demand	
Pump absorbed current	[A]	7.5	7.5	7.5	7.5	7.5	on demand	
Available pressure [1] [5]	[psig]	80.6	75.8	71.3	67.1	57.1	on demand	

(1) Data referred to following conditions: water temperature in/out: 59/50°F (15/10°C) - ambient air temperature: 77°F (25°C)
(2) Data referred to unit with standard P3 pump
(3) Data related to most heavy condition allowed by safety devices fitted on the unit.
(4) Based on 10 meter distance in an open environment
(5) Data referred to unit with P5 pump (optional)
(6) For models from CWT010 to CWT065 with additional loading tank, length increases by 12 inches.

PERFORMANCE DATA

CWT010_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	3.9	3.9	3.9	3.9	3.7	3.5	3.4	32	3.0	2.8
30%	-5	49	4.9	4.9	4.8	4.6	4.4	4.1	39	3.6	3.3
20%	0	6.1	6.1	6.1	5.8	5.6	5.3	5.0	47	4.3	4.0
15%	5	7.3	7.3	7.2	6.9	6.6	6.2	5.9	55	5.1	4.7
0%	7	7.9	7.9	7.7	7.4	7.1	6.7	6.4	60	5.5	5.1
0%	10	8.8	8.8	8.5	8.1	7.8	7.4	6.9	65	6.0	5.5
0%	12	9.3	9.3	8.9	8.6	8.2	7.8	7.3	69	6.4	5.9
0%	15	10.2	10.2	9.7	9.3	8.9	8.4	7.9	74	6.9	--
0%	20	11.8	11.8	10.9	10.4	9.8	9.3	8.7	81	7.5	--
0%	25	11.8	11.8	10.9	10.4	9.8	9.3	8.7	81	7.5	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	1.1	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.8
30%	23	1.4	1.4	1.4	1.4	1.3	1.2	1.2	1.1	1.0	0.9
20%	32	1.7	1.7	1.7	1.7	1.6	1.5	1.4	1.3	1.2	1.1
15%	41	2.1	2.1	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.3
0%	45	2.3	2.3	2.2	2.1	2.0	1.9	1.8	**1.7**	1.6	1.4
0%	50	2.5	2.5	2.4	2.3	2.2	2.1	2.0	1.8	1.7	1.6
0%	54	2.7	2.7	2.5	2.4	2.3	2.2	2.1	2.0	1.8	1.7
0%	59	2.9	2.9	28	2.6	2.5	**2.4**	2.3	2.1	2.0	--
0%	68	3.4	3.3	3.1	2.9	2.8	2.6	2.5	2.3	2.1	--
0%	77	3.4	3.3	3.1	2.9	2.8	2.6	2.5	2.3	2.1	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	2.5	2.5	2.5	2.5	2.6	2.8	2.9	3.0	3.1	3.2
	23	2.5	2.5	2.5	2.6	2.7	2.8	3.0	3.1	3.2	3.3
	32	2.5	2.5	2.5	2.6	2.8	2.9	3.0	3.2	3.3	3.5
	41	2.5	2.5	2.5	2.7	2.8	3.0	3.1	3.3	3.4	3.6
	45	2.5	2.5	2.6	2.7	2.8	3.0	3.1	**3.3**	3.5	3.6
	50	2.5	2.5	2.6	2.7	2.9	3.0	3.2	3.4	3.5	3.7
	54	2.5	2.5	2.6	2.8	2.9	3.1	3.2	3.4	3.6	3.8
	59	2.5	2.5	2.7	2.8	3.0	**3.1**	3.3	3.5	3.6	--
	68	2.5	2.6	2.8	2.9	3.0	3.2	3.3	3.5	3.7	--
	77	2.5	2.6	2.8	2.9	3.0	3.2	3.3	3.5	3.7	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	3.2	3	3	3	3	3	3	3	2	2
30%	23	4	4	4	4	4	4	3	3	3	3
20%	32	5	5	5	5	4	4	4	4	3	3
15%	41	6	6	6	5	5	5	5	4	4	4
0%	45	6	6	6	6	5	5	5	**5**	4	4
0%	50	7	7	6	6	6	6	5	5	5	4.2
0%	54	7	7	7	6	6	6	6	5	5	4.4
0%	59	8	8	7	7	7	**6**	6	6	5	--
0%	68	9	9	8	8	7	7	7	6	6	--
0%	77	9	9	8	8	7	7	7	6	6	--

Tair: external air temperature
Tw out: outlet water temperature
(1) Referred to unit with P3 pump
(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT015_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	7.4	7.4	7.4	7.0	6.6	6.2	5.7	5.3	4.9	4.4
30%	-5	8.7	8.7	8.6	8.2	7.8	7.3	6.8	6.3	5.8	5.3
20%	0	10.5	10.5	10.1	9.7	9.2	8.7	8.1	7.6	7.0	6.3
15%	5	12.5	12.5	11.8	11.3	10.8	10.2	9.5	8.9	8.2	7.5
0%	7	13.5	13.5	12.7	12.2	11.6	11.0	10.3	9.6	8.8	8.0
0%	10	14.8	14.8	13.8	13.2	12.6	11.9	11.1	10.4	9.5	8.6
0%	12	15.8	15.7	14.6	13.9	13.3	12.5	11.7	10.9	10.0	9.1
0%	15	17.3	17.0	15.7	15.0	14.3	13.5	12.6	11.7	10.7	--
0%	20	19.9	19.0	17.4	16.5	15.6	14.6	13.6	12.5	11.4	--
0%	25	19.9	19.0	17.4	16.5	15.6	14.6	13.6	12.5	11.4	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	2.1	2.1	2.1	2.0	1.9	1.8	1.6	1.5	1.4	1.2
30%	23	2.5	2.5	2.5	2.3	2.2	2.1	1.9	1.8	1.7	1.5
20%	32	3.0	3.0	2.9	2.8	2.6	2.5	2.3	2.2	2.0	1.8
15%	41	3.5	3.5	3.4	3.2	3.1	2.9	2.7	2.5	2.3	2.1
0%	45	3.8	3.8	3.6	3.5	3.3	3.1	2.9	**2.7**	2.5	2.3
0%	50	4.2	4.2	3.9	3.8	3.6	3.4	3.2	2.9	2.7	2.5
0%	54	4.5	4.5	4.1	4.0	3.8	3.6	3.3	3.1	2.8	2.6
0%	59	4.9	4.8	4.5	4.3	4.1	**3.8**	3.6	3.3	3.1	--
0%	68	5.7	5.4	4.9	4.7	4.4	4.2	3.9	3.6	3.2	--
0%	77	5.7	5.4	4.9	4.7	4.4	4.2	3.9	3.6	3.2	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	3.2	3.2	3.2	3.4	3.6	3.8	4.1	4.4	4.7	5.0
	23	3.3	3.3	3.3	3.5	3.7	3.9	4.2	4.5	4.9	5.2
	32	3.3	3.3	3.4	3.6	3.8	4.1	4.4	4.7	5.0	5.4
	41	3.3	3.3	3.5	3.7	4.0	4.2	4.5	4.9	5.2	5.6
	45	3.3	3.3	3.5	3.8	4.0	4.3	4.6	**4.9**	5.3	5.7
	50	3.2	3.2	3.6	3.8	4.1	4.4	4.7	5.0	5.4	5.8
	54	3.2	3.2	3.6	3.9	4.2	4.4	4.8	5.1	5.5	5.9
	59	3.1	3.2	3.7	4.0	4.2	**4.5**	4.9	5.2	5.6	--
	68	3.0	3.3	3.8	4.1	4.4	4.7	5.0	5.4	5.7	--
	77	3.0	3.3	3.8	4.1	4.4	4.7	5.0	5.4	5.7	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	6.1	6	6	6	5	5	5	4	4	4
30%	23	7	7	7	7	6	6	6	5	5	4
20%	32	8	8	8	8	7	7	7	6	6	5
15%	41	10	10	9	9	8	8	7	7	6	6
0%	45	10	10	10	9	9	8	8	**7**	7	6
0%	50	11	11	10	10	10	9	8	8	7	6.5
0%	54	12	12	11	11	10	9	9	8	8	6.9
0%	59	13	13	12	11	11	**10**	10	9	8	--
0%	68	15	14	13	12	12	11	10	9	9	--
0%	77	15	14	13	12	12	11	10	9	9	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT018_60Hz

Cooling Capacity [kW]		Tair [°C]								
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	9.0	9.0	9.0	8.9	8.4	7.9	7.4	6.8	6.3	5.7
30%	-5	10.7	10.7	10.7	10.4	9.9	9.3	8.8	8.2	7.6	6.9
20%	0	12.8	12.8	12.8	12.3	11.7	11.1	10.5	9.8	9.1	8.4
15%	5	15.2	15.2	15.0	14.4	13.8	13.1	12.4	11.6	10.8	9.9
0%	7	16.5	16.5	16.2	15.5	14.9	14.1	13.3	12.5	11.6	10.7
0%	10	18.1	18.1	17.6	16.9	16.2	15.4	14.5	13.6	12.7	11.6
0%	12	19.3	19.3	18.6	17.9	17.1	16.3	15.4	14.4	13.4	12.2
0%	15	21.1	21.1	20.2	19.4	18.5	17.6	16.6	15.6	14.4	--
0%	20	24.4	24.4	22.8	21.9	20.9	19.8	18.5	17.2	15.8	--
0%	25	25.2	25.2	23.2	22.1	21.0	19.8	18.5	17.2	15.8	--

Cooling Capacity [Tons]		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	2.6	2.6	2.6	2.5	2.4	2.2	2.1	1.9	1.8	1.6
30%	23	3.0	3.0	3.0	3.0	2.8	2.7	2.5	2.3	2.2	2.0
20%	32	3.6	3.6	3.6	3.5	3.3	3.2	3.0	2.8	2.6	2.4
15%	41	4.3	4.3	4.3	4.1	3.9	3.7	3.5	3.3	3.1	2.8
0%	45	4.7	4.7	4.6	4.4	4.2	4.0	3.8	**3.6**	3.3	3.0
0%	50	5.1	5.1	5.0	4.8	4.6	4.4	4.1	3.9	3.6	3.3
0%	54	5.5	5.5	5.3	5.1	4.9	4.6	4.4	4.1	3.8	3.5
0%	59	6.0	6.0	5.7	5.5	5.3	**5.0**	4.7	4.4	4.1	--
0%	68	6.9	6.9	6.5	6.2	6.0	5.6	5.3	4.9	4.5	--
0%	77	7.2	7.2	6.6	6.3	6.0	5.6	5.3	4.9	4.5	--

Power input [kW] (1)		Tair [°F]								
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	4.0	4.0	4.0	4.0	4.3	4.5	4.8	5.2	5.6	6.0
	23	4.1	4.1	4.1	4.2	4.4	4.7	5.0	5.3	5.7	6.1
	32	4.1	4.1	4.1	4.3	4.5	4.8	5.1	5.5	5.9	6.3
	41	4.1	4.1	4.2	4.4	4.6	4.9	5.3	5.6	6.1	6.5
	45	4.1	4.1	4.2	4.4	4.7	5.0	5.3	**5.7**	6.1	6.6
	50	4.0	4.0	4.2	4.4	4.7	5.0	5.4	5.8	6.3	6.7
	54	4.0	4.0	4.2	4.4	4.8	5.1	5.5	5.9	6.4	6.9
	59	3.9	3.9	4.2	4.5	4.8	**5.2**	5.6	6.1	6.5	--
	68	3.7	3.7	4.2	4.6	5.0	5.4	5.8	6.3	6.8	--
	77	3.6	3.6	4.2	4.6	5.0	5.4	5.8	6.3	6.8	--

Water Flow [gal/min] (2)		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	7.4	7	7	7	7	7	6	6	5	5
30%	23	9	9	9	9	8	8	7	7	6	6
20%	32	10	10	10	10	9	9	8	8	7	7
15%	41	12	12	12	11	11	10	10	9	8	8
0%	45	12	12	12	12	11	11	10	**9**	9	8
0%	50	14	14	13	13	12	12	11	10	10	8.8
0%	54	15	15	14	14	13	12	12	11	10	9.3
0%	59	16	16	15	15	14	**13**	13	12	11	--
0%	68	18	18	17	17	16	15	14	13	12	--
0%	77	19	19	18	17	16	15	14	13	12	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT020_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	11.3	11.3	11.3	10.9	10.3	97	9.1	8.4	7.7	7.0
30%	-5	13.8	13.8	13.6	13.0	12.3	11.6	10.9	10.1	9.3	8.5
20%	0	16.6	16.6	16.1	15.4	14.6	13.8	13.0	12.1	11.1	10.1
15%	5	19.7	19.7	18.7	17.9	17.0	16.1	15.1	14.0	12.9	11.8
0%	7	21.3	21.3	20.0	19.2	18.2	17.2	16.2	15.1	13.9	12.7
0%	10	23.3	23.3	21.7	20.8	19.8	18.7	17.6	16.4	15.1	13.8
0%	12	24.7	24.6	22.8	21.9	20.8	19.7	18.5	17.3	15.9	14.5
0%	15	27.0	26.5	24.6	23.6	22.5	21.3	20.0	18.6	17.2	--
0%	20	31.2	29.9	27.8	26.6	25.3	24.0	22.4	20.7	19.0	--
0%	25	33.0	31.0	28.4	27.0	25.5	24.0	22.4	20.7	19.0	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	3.2	3.2	3.2	3.1	2.9	2.8	2.6	2.4	2.2	2.0
30%	23	3.9	3.9	3.9	3.7	3.5	3.3	3.1	2.9	2.7	2.4
20%	32	4.7	4.7	4.6	4.4	4.2	3.9	3.7	3.4	3.2	2.9
15%	41	5.6	5.6	5.3	5.1	4.8	4.6	4.3	4.0	3.7	3.3
0%	45	6.1	6.1	5.7	5.4	5.2	4.9	4.6	**4.3**	4.0	3.6
0%	50	6.6	6.6	6.2	5.9	5.6	5.3	5.0	4.7	4.3	3.9
0%	54	7.0	7.0	6.5	6.2	5.9	5.6	5.3	4.9	4.5	4.1
0%	59	7.7	7.5	7.0	6.7	6.4	**6.0**	5.7	5.3	4.9	--
0%	68	8.9	8.5	7.9	7.6	7.2	6.8	6.4	5.9	5.4	--
0%	77	9.4	8.8	8.1	7.7	7.3	6.8	6.4	5.9	5.4	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	4.8	4.8	4.8	5.0	5.4	5.7	6.1	6.6	7.1	7.6
	23	4.9	4.9	5.0	5.2	5.6	5.9	6.4	6.8	7.4	7.9
	32	4.9	4.9	5.1	5.4	5.8	6.2	6.6	7.1	7.6	8.2
	41	5.0	5.0	5.3	5.6	6.0	6.4	6.9	7.4	7.9	8.5
	45	5.0	5.0	5.4	5.7	6.1	6.5	7.0	**7.5**	8.0	8.6
	50	5.0	5.0	5.5	5.8	6.2	6.7	7.1	7.7	8.2	8.8
	54	5.0	5.0	5.6	5.9	6.3	6.8	7.3	7.8	8.3	9.0
	59	5.0	5.1	5.7	6.1	6.5	**6.9**	7.4	8.0	8.6	--
	68	5.0	5.3	6.0	6.4	6.8	7.3	7.8	8.3	8.9	--
	77	5.0	5.4	6.0	6.4	6.8	7.3	7.8	8.3	8.9	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	9.4	9	9	9	9	8	8	7	6	6
30%	23	11	11	11	11	10	10	9	8	8	7
20%	32	13	13	13	12	12	11	10	10	9	8
15%	41	15	15	15	14	13	13	12	11	10	9
0%	45	16	16	15	15	14	13	12	**11**	11	10
0%	50	18	18	16	16	15	14	13	12	11	10.4
0%	54	19	19	17	17	16	15	14	13	12	11.0
0%	59	20	20	19	18	17	**16**	15	14	13	--
0%	68	24	23	21	20	19	18	17	16	14	--
0%	77	25	23	22	20	19	18	17	16	14	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT030_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	14.2	14.2	14.2	13.5	12.7	11.8	11.0	10.2	9.3	8.4
30%	-5	16.9	16.9	16.6	15.8	14.9	14.1	13.2	12.2	11.2	10.2
20%	0	20.3	20.3	19.5	18.6	17.7	16.7	15.7	14.6	13.4	12.2
15%	5	24.1	24.1	22.7	21.8	20.7	19.5	18.3	17.0	15.6	14.2
0%	7	26.1	26.1	24.4	23.4	22.2	21.0	19.7	18.3	16.8	15.3
0%	10	28.7	28.6	26.5	25.4	24.1	22.8	21.4	19.8	18.2	16.5
0%	12	30.5	30.1	27.9	26.7	25.4	24.0	22.4	20.8	19.1	17.3
0%	15	33.3	32.5	30.1	28.8	27.3	25.8	24.1	22.3	20.4	--
0%	20	38.4	36.6	33.8	32.2	30.3	28.4	26.3	24.2	21.9	--
0%	25	39.8	37.3	34.0	32.2	30.3	28.4	26.3	24.2	21.9	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	4.0	4.0	4.0	3.8	3.6	3.4	3.1	2,9	2,6	2.4
30%	23	4.8	4.8	4.7	4.5	4.2	4.0	3.7	3,5	3,2	2.9
20%	32	5.8	5.8	5.6	5.3	5.0	4.8	4.5	4,1	3,8	3.5
15%	41	6.9	6.9	6.5	6.2	5.9	5.6	5.2	4,8	4,4	4.0
0%	45	7.4	7.4	6.9	6.6	6.3	6.0	5.6	**5,2**	4,8	4.3
0%	50	8.1	8.1	7.5	7.2	6.9	6.5	6.1	5,6	5,2	4.7
0%	54	8.7	8.6	7.9	7.6	7.2	6.8	6.4	5,9	5,4	4.9
0%	59	9.5	9.2	8.6	8.2	7.8	**7.3**	6.9	6,3	5,8	--
0%	68	10.9	10.4	9.6	9.2	8.6	8.1	7.5	6,9	6,2	--
0%	77	11.3	10.6	9.7	9.2	8.6	8.1	7.5	6,9	6,2	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	5.7	5.7	5.7	6.1	6.5	6.9	7.5	8.1	8.7	9.5
	23	5.8	5.8	5.9	6.3	6.7	7.2	7.8	8.4	9.1	9.8
	32	5.9	5.9	6.2	6.6	7.0	7.5	8.1	8.8	9.5	10.2
	41	5.8	5.8	6.4	6.8	7.3	7.9	8.5	9.2	9.9	10.7
	45	5.8	5.8	6.5	6.9	7.4	8.0	8.6	**9.3**	10.0	10.8
	50	5.8	5.8	6.6	7.1	7.6	8.2	8.8	9.5	10.3	11.1
	54	5.7	5.8	6.7	7.2	7.7	8.3	9.0	9.7	10.4	11.2
	59	5.6	5.9	6.8	7.4	7.9	**8.6**	9.2	10.0	10.7	--
	68	5.4	6.0	7.1	7.6	8.2	8.9	9.6	10.3	11.0	--
	77	5.3	6.1	7.1	7.6	8.2	8.9	9.6	10.3	11.0	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	11.8	12	12	11	10	10	9	8	8	7
30%	23	14	14	14	13	12	12	11	10	9	8
20%	32	16	16	16	15	14	13	13	12	11	10
15%	41	19	19	18	17	16	15	14	13	12	11
0%	45	20	20	19	18	17	16	15	**14**	13	12
0%	50	22	22	20	19	18	17	16	15	14	12.5
0%	54	23	23	21	20	19	18	17	16	14	13.1
0%	59	25	25	23	22	21	**20**	18	17	15	--
0%	68	29	28	26	24	23	21	20	18	17	--
0%	77	30	28	26	24	23	21	20	18	17	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT038_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	18.0	18.0	18.0	17.9	16.8	15.8	14.7	13.7	12.6	11.4
30%	-5	21.5	21.5	21.5	21.0	20.0	18.9	17.7	16.5	15.3	14.0
20%	0	26.0	26.0	26.0	25.0	23.9	22.7	21.4	20.0	18.5	17.0
15%	5	31.0	31.0	30.7	29.5	28.2	26.8	25.3	23.7	22.0	20.2
0%	7	33.6	33.6	33.0	31.8	30.3	28.9	27.3	25.6	23.7	21.8
0%	10	37.0	37.0	36.0	34.6	33.1	31.5	29.8	27.9	25.9	23.8
0%	12	39.3	39.3	38.1	36.6	35.0	33.3	31.5	29.5	27.3	25.1
0%	15	43.0	43.0	41.2	39.6	37.9	36.0	34.0	31.8	29.5	--
0%	20	49.6	49.6	46.7	44.6	42.3	39.9	37.3	34.7	31.8	--
0%	25	50.3	50.3	46.7	44.6	42.3	39.9	37.3	34.7	31.8	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	5.1	5.1	5.1	5.1	4.8	4.5	4.2	3.9	3.6	3.3
30%	23	6.1	6.1	6.1	6.0	5.7	5.4	5.0	4.7	4.3	4.0
20%	32	7.4	7.4	7.4	7.1	6.8	6.4	6.1	5.7	5.3	4.8
15%	41	8.8	8.8	8.7	8.4	8.0	7.6	7.2	6.7	6.2	5.7
0%	45	9.6	9.6	9.4	9.0	8.6	8.2	7.8	**7.3**	6.8	6.2
0%	50	10.5	10.5	10.2	9.8	9.4	9.0	8.5	7.9	7.4	6.8
0%	54	11.2	11.2	10.8	10.4	10.0	9.5	8.9	8.4	7.8	7.1
0%	59	12.2	12.2	11.7	11.3	10.8	**10.2**	9.7	9.1	8.4	--
0%	68	14.1	14.1	13.3	12.7	12.0	11.3	10.6	9.9	9.1	--
0%	77	14.3	14.3	13.3	12.7	12.0	11.3	10.6	9.9	9.1	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	8.0	8.0	8.0	8.0	8.5	9.0	9.6	10.3	11.1	11.9
	23	8.2	8.2	8.2	8.3	8.8	9.3	9.9	10.6	11.3	12.2
	32	8.2	8.2	8.2	8.6	9.0	9.6	10.2	10.9	11.7	12.5
	41	8.2	8.2	8.3	8.7	9.2	9.8	10.5	11.2	12.1	13.0
	45	8.1	8.1	8.3	8.8	9.3	9.9	10.6	**11.3**	12.2	13.1
	50	8.0	8.0	8.3	8.8	9.4	10.0	10.8	11.6	12.5	13.5
	54	7.9	7.9	8.3	8.9	9.5	10.2	10.9	11.8	12.7	13.7
	59	7.7	7.7	8.3	8.9	9.6	**10.3**	11.2	12.1	13.0	--
	68	7.3	7.3	8.4	9.1	9.8	10.6	11.5	12.5	13.5	--
	77	7.3	7.3	8.4	9.1	9.8	10.6	11.5	12.5	13.5	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	14.9	15	15	15	14	13	12	11	10	9
30%	23	18	18	18	17	17	16	15	14	13	12
20%	32	21	21	21	20	19	18	17	16	15	14
15%	41	24	24	24	23	22	21	20	19	17	16
0%	45	25	25	25	24	23	22	21	**19**	18	17
0%	50	28	28	27	26	25	24	23	21	20	18.0
0%	54	30	30	29	28	27	25	24	22	21	19.0
0%	59	33	33	31	30	29	**27**	26	24	22	--
0%	68	38	38	35	34	32	30	28	26	24	--
0%	77	38	38	35	34	32	30	28	26	24	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT040_60Hz

Cooling Capacity [kW]		Tair [°C]								
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	23.0	23.0	23.0	22.2	20.9	19.7	18.3	17.0	15.6	14.1
30%	-5	28.1	28.1	27.9	26.5	25.1	23.7	22.2	20.6	18.9	17.2
20%	0	33.9	33.9	33.0	31.5	29.9	28.2	26.4	24.6	22.6	20.6
15%	5	40.3	40.3	38.3	36.6	34.8	32.9	30.9	28.8	26.5	24.1
0%	7	43.6	43.6	41.1	39.3	37.4	35.4	33.2	31.0	28.5	26.0
0%	10	47.9	47.9	44.6	42.7	40.6	38.4	36.1	33.6	31.0	28.3
0%	12	50.9	50.7	47.0	45.0	42.8	40.5	38.1	35.5	32.7	29.9
0%	15	55.6	54.7	50.7	48.5	46.2	43.7	41.1	38.3	35.4	--
0%	20	64.3	61.7	57.2	54.5	51.6	48.5	45.3	41.9	38.4	--
0%	25	66.0	62.5	57.3	54.5	51.6	48.5	45.3	41.9	38.4	--

Cooling Capacity [Tons]		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	6.5	6.5	6.5	6.3	6.0	5.6	5.2	4.8	4.4	4.0
30%	23	8.0	8.0	7.9	7.5	7.1	6.7	6.3	5.8	5.4	4.9
20%	32	9.7	9.7	9.4	8.9	8.5	8.0	7.5	7.0	6.4	5.8
15%	41	11.5	11.5	10.9	10.4	9.9	9.4	8.8	8.2	7.5	6.9
0%	45	12.4	12.4	11.7	11.2	10.6	10.1	9.5	**8.8**	8.1	7.4
0%	50	13.6	13.6	12.7	12.1	11.6	10.9	10.3	9.6	8.8	8.0
0%	54	14.5	14.4	13.4	12.8	12.2	11.5	10.8	10.1	9.3	8.5
0%	59	15.8	15.5	14.4	13.8	13.1	**12.4**	11.7	10.9	10.1	--
0%	68	18.3	17.5	16.3	15.5	14.7	13.8	12.9	11.9	10.9	--
0%	77	18.8	17.8	16.3	15.5	14.7	13.8	12.9	11.9	10.9	--

Power input [kW] (1)		Tair [°F]								
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	9.1	9.1	9.1	9.5	10.1	10.8	11.6	12.5	13.5	14.6
	23	9.2	9.2	9.3	9.8	10.5	11.2	12.0	13.0	14.0	15.1
	32	9.3	9.3	9.7	10.2	10.9	11.7	12.5	13.5	14.6	15.7
	41	9.4	9.4	10.0	10.6	11.4	12.2	13.1	14.1	15.2	16.3
	45	9.4	9.4	10.2	10.8	11.5	12.4	13.3	**14.3**	15.4	16.6
	50	9.4	9.4	10.4	11.1	11.8	12.7	13.6	14.6	15.8	17.0
	54	9.4	9.5	10.6	11.3	12.0	12.9	13.9	14.9	16.0	17.3
	59	9.4	9.7	10.8	11.5	12.3	**13.2**	14.2	15.3	16.5	--
	68	9.4	10.0	11.3	12.0	12.9	13.8	14.8	15.8	16.9	--
	77	9.3	10.0	11.3	12.0	12.9	13.8	14.8	15.8	16.9	--

Water Flow [gal/min] (2)		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	19.1	19	19	18	17	16	15	14	13	12
30%	23	23	23	23	22	21	20	18	17	16	14
20%	32	27	27	26	25	24	23	21	20	18	16
15%	41	32	32	30	29	27	26	24	23	21	19
0%	45	33	33	31	30	28	27	25	**23**	22	20
0%	50	36	36	34	32	31	29	27	25	23	21.4
0%	54	39	38	36	34	32	31	29	27	25	22.6
0%	59	42	41	38	37	35	**33**	31	29	27	--
0%	68	49	47	43	41	39	37	34	32	29	--
0%	77	50	47	43	41	39	37	34	32	29	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT045_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	21.5	21.5	21.5	20.8	19.6	18.3	17.0	15.7	14.4	13.1
30%	-5	25.7	25.7	25.7	24.5	23.2	21.9	20.5	19.0	17.5	15.9
20%	0	31.0	31.0	30.4	29.1	27.7	26.2	24.6	22.9	21.1	19.2
15%	5	36.9	36.9	35.6	34.1	32.5	30.8	28.9	27.0	24.9	22.7
0%	7	40.0	40.0	38.3	36.7	35.0	33.2	31.2	29.1	26.8	24.4
0%	10	44.0	44.0	41.7	40.0	38.1	36.1	33.9	31.6	29.2	26.5
0%	12	46.8	46.8	44.0	42.2	40.2	38.1	35.8	33.3	30.7	27.9
0%	15	51.3	51.1	47.6	45.6	43.4	41.0	38.5	35.9	33.0	--
0%	20	59.1	57.8	53.2	50.6	47.8	44.9	41.9	38.7	35.3	--
0%	25	59.6	57.9	53.2	50.6	47.8	44.9	41.9	38.7	35.3	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	6.1	6.1	6.1	5.9	5.6	5.2	4.8	4.5	4.1	3.7
30%	23	7.3	7.3	7.3	7.0	6.6	6.2	5.8	5.4	5.0	4.5
20%	32	8.8	8.8	8.7	8.3	7.9	7.4	7.0	6.5	6.0	5.5
15%	41	10.5	10.5	10.1	9.7	9.2	8.8	8.2	7.7	7.1	6.4
0%	45	11.4	11.4	10.9	10.4	10.0	9.4	8.9	**8.3**	7.6	7.0
0%	50	12.5	12.5	11.9	11.4	10.8	10.3	9.6	9.0	8.3	7.5
0%	54	13.3	13.3	12.5	12.0	11.4	10.8	10.2	9.5	8.7	7.9
0%	59	14.6	14.5	13.5	13.0	12.3	**11.7**	11.0	10.2	9.4	--
0%	68	16.8	16.4	15.1	14.4	13.6	12.8	11.9	11.0	10.0	--
0%	77	17.0	16.5	15.1	14.4	13.6	12.8	11.9	11.0	10.0	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	9.0	9.0	9.0	9.2	9.8	10.4	11.2	12.1	13.0	14.1
	23	9.1	9.1	9.1	9.6	10.2	10.9	11.6	12.5	13.5	14.6
	32	9.1	9.1	9.3	9.9	10.5	11.3	12.1	13.0	14.0	15.1
	41	9.1	9.1	9.6	10.2	10.9	11.7	12.6	13.5	14.6	15.7
	45	9.0	9.0	9.7	10.3	11.0	11.9	12.7	**13.7**	14.8	15.9
	50	9.0	9.0	9.8	10.5	11.3	12.1	13.0	14.1	15.1	16.3
	54	8.9	8.9	9.9	10.6	11.4	12.3	13.2	14.3	15.4	16.5
	59	8.7	8.8	10.1	10.8	11.7	**12.6**	13.5	14.6	15.7	--
	68	8.3	8.8	10.3	11.1	12.0	12.9	13.9	15.0	16.1	--
	77	8.3	8.8	10.3	11.1	12.0	12.9	13.9	15.0	16.1	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	17.8	18	18	17	16	15	14	13	12	11
30%	23	21	21	21	20	19	18	17	16	14	13
20%	32	25	25	24	23	22	21	20	18	17	15
15%	41	29	29	28	27	26	24	23	21	20	18
0%	45	30	30	29	28	27	25	24	**22**	20	19
0%	50	33	33	32	30	29	27	26	24	22	20.1
0%	54	35	35	33	32	30	29	27	25	23	21.1
0%	59	39	39	36	35	33	**31**	29	27	25	--
0%	68	45	44	40	38	36	34	32	29	27	--
0%	77	45	44	40	38	36	34	32	29	27	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT055_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	27.0	27.0	27.0	26.3	24.7	23.2	21.6	20.0	18.3	16.6
30%	-5	32.3	32.3	32.3	30.9	29.3	27.7	25.9	24.1	22.2	20.2
20%	0	38.9	38.9	38.5	36.8	35.0	33.1	31.1	29.1	26.8	24.5
15%	5	46.4	46.4	45.0	43.2	41.1	39.0	36.7	34.3	31.7	28.9
0%	7	50.3	50.3	48.5	46.5	44.3	42.0	39.6	37.0	34.2	31.2
0%	10	55.4	55.4	52.8	50.6	48.3	45.8	43.1	40.2	37.1	33.9
0%	12	58.9	58.9	55.7	53.4	50.9	48.3	45.4	42.4	39.1	35.7
0%	15	64.5	64.5	60.2	57.7	55.0	52.1	49.0	45.7	42.1	--
0%	20	74.3	73.1	67.8	64.5	61.0	57.4	53.5	49.4	45.2	--
0%	25	75.5	73.8	67.8	64.5	61.0	57.4	53.5	49.4	45.2	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	7.7	7.7	7.7	7.5	7.0	6.6	6.1	5.7	5.2	4.7
30%	23	9.2	9.2	9.2	8.8	8.3	7.9	7.4	6.9	6.3	5.8
20%	32	11.1	11.1	10.9	10.5	10.0	9.4	8.9	8.3	7.6	7.0
15%	41	13.2	13.2	12.8	12.3	11.7	11.1	10.4	9.7	9.0	8.2
0%	45	14.3	14.3	13.8	13.2	12.6	12.0	11.3	**10.5**	9.7	8.9
0%	50	15.7	15.7	15.0	14.4	13.7	13.0	12.2	11.4	10.6	9.6
0%	54	16.7	16.7	15.8	15.2	14.5	13.7	12.9	12.0	11.1	10.1
0%	59	18.3	18.3	17.1	16.4	15.6	**14.8**	13.9	13.0	12.0	--
0%	68	21.1	20.8	19.3	18.3	17.4	16.3	15.2	14.1	12.9	--
0%	77	21.5	21.0	19.3	18.3	17.4	16.3	15.2	14.1	12.9	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	10.2	10.2	10.2	10.5	11.2	12.0	13.0	14.0	15.2	16.5
	23	10.5	10.5	10.5	11.0	11.7	12.5	13.4	14.5	15.7	17.0
	32	10.6	10.6	10.8	11.4	12.1	13.0	13.9	15.0	16.2	17.6
	41	10.5	10.5	11.0	11.7	12.5	13.4	14.5	15.6	16.9	18.3
	45	10.4	10.4	11.0	11.8	12.6	13.6	14.7	**15.9**	17.2	18.6
	50	10.3	10.3	11.1	11.9	12.9	13.9	15.0	16.3	17.7	19.1
	54	10.1	10.1	11.2	12.1	13.0	14.1	15.3	16.6	18.0	19.5
	59	9.8	9.8	11.3	12.3	13.3	**14.5**	15.8	17.1	18.6	--
	68	9.3	9.7	11.6	12.6	13.8	15.1	16.4	17.9	19.4	--
	77	9.2	9.7	11.6	12.6	13.8	15.1	16.4	17.9	19.4	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	22.3	22	22	22	20	19	18	17	15	14
30%	23	27	27	27	26	24	23	21	20	18	17
20%	32	31	31	31	29	28	26	25	23	21	20
15%	41	36	36	35	34	32	31	29	27	25	23
0%	45	38	38	37	35	34	32	30	**28**	26	24
0%	50	42	42	40	38	37	35	33	30	28	25.7
0%	54	45	45	42	40	39	37	34	32	30	27.0
0%	59	49	49	46	44	42	**39**	37	35	32	--
0%	68	56	55	51	49	46	43	41	37	34	--
0%	77	57	56	51	49	46	43	41	37	34	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT065_60Hz

Cooling Capacity [kW]		Tair [°C]								
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	34.1	34.1	33.9	32.1	30.3	28.4	26.4	24.4	22.3	20.1
30%	-5	41.6	41.6	40.4	38.4	36.3	34.1	31.8	29.4	26.9	24.3
20%	0	50.3	50.3	47.7	45.4	43.0	40.5	37.8	35.0	32.1	29.0
15%	5	59.8	59.8	55.4	52.8	50.1	47.1	44.1	40.8	37.4	33.8
0%	7	64.8	64.4	59.4	56.6	53.7	50.6	47.3	43.9	40.2	36.4
0%	10	71.1	69.7	64.3	61.3	58.2	54.8	51.3	47.6	43.6	39.5
0%	12	75.6	73.4	67.7	64.6	61.2	57.7	54.0	50.1	45.9	41.6
0%	15	82.7	79.0	72.9	69.5	66.0	62.2	58.2	54.0	49.5	--
0%	20	95.0	88.9	82.0	78.0	73.5	68.9	64.0	59.0	53.8	--
0%	25	97.4	90.2	82.3	78.0	73.5	68.9	64.0	59.0	53.8	--

Cooling Capacity [Tons]		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	9.7	9.7	9.6	9.1	8.6	8.1	7.5	6.9	6.3	5.7
30%	23	11.8	11.8	11.5	10.9	10.3	9.7	9.0	8.4	7.7	6.9
20%	32	14.3	14.3	13.6	12.9	12.2	11.5	10.8	10.0	9.1	8.2
15%	41	17.0	17.0	15.7	15.0	14.2	13.4	12.5	11.6	10.6	9.6
0%	45	18.4	18.3	16.9	16.1	15.3	14.4	13.5	**12.5**	11.4	10.3
0%	50	20.2	19.8	18.3	17.4	16.5	15.6	14.6	13.5	12.4	11.2
0%	54	21.5	20.9	19.2	18.4	17.4	16.4	15.4	14.2	13.1	11.8
0%	59	23.5	22.5	20.7	19.8	18.8	**17.7**	16.5	15.3	14.1	--
0%	68	27.0	25.3	23.3	22.2	20.9	19.6	18.2	16.8	15.3	--
0%	77	27.7	25.7	23.4	22.2	20.9	19.6	18.2	16.8	15.3	--

Power input [kW] (1)		Tair [°F]								
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	11.9	11.9	12.0	12.8	13.7	14.8	16.1	17.5	19.0	20.7
	23	12.1	12.1	12.5	13.4	14.4	15.6	16.9	18.3	19.9	21.6
	32	12.2	12.2	13.2	14.1	15.2	16.4	17.7	19.2	20.8	22.6
	41	12.3	12.3	13.8	14.8	16.0	17.2	18.6	20.2	21.8	23.7
	45	12.3	12.4	14.1	15.1	16.3	17.6	19.0	**20.5**	22.2	24.1
	50	12.4	12.8	14.5	15.6	16.8	18.1	19.6	21.2	22.9	24.7
	54	12.4	13.0	14.8	15.9	17.2	18.5	20.0	21.6	23.4	25.2
	59	12.4	13.4	15.3	16.4	17.7	**19.1**	20.7	22.3	24.1	--
	68	12.4	14.0	16.2	17.4	18.7	20.1	21.6	23.2	25.0	--
	77	12.6	14.1	16.2	17.4	18.7	20.1	21.6	23.2	25.0	--

Water Flow [gal/min] (2)		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	28.2	28	28	27	25	23	22	20	18	17
30%	23	34	34	33	32	30	28	26	24	22	20
20%	32	40	40	38	36	34	32	30	28	26	23
15%	41	47	47	44	41	39	37	35	32	29	27
0%	45	49	49	45	43	41	38	36	**33**	30	28
0%	50	54	53	49	46	44	42	39	36	33	29.9
0%	54	57	56	51	49	46	44	41	38	35	31.5
0%	59	63	60	55	53	50	**47**	44	41	38	--
0%	68	72	67	62	59	56	52	48	45	41	--
0%	77	74	68	62	59	56	52	48	45	41	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT075_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	35.0	35.0	35.0	35.0	32.9	30.8	28.7	26.6	24.4	22.2
30%	-5	41.8	41.8	41.8	41.1	39.0	36.8	34.5	32.2	29.7	27.2
20%	0	50.4	50.4	50.4	48.9	46.6	44.2	41.6	38.9	36.1	33.1
15%	5	60.1	60.1	59.9	57.5	54.9	52.2	49.3	46.1	42.8	39.3
0%	7	65.2	65.2	64.5	62.0	59.2	56.3	53.2	49.8	46.3	42.5
0%	10	71.7	71.7	70.3	67.6	64.7	61.5	58.1	54.4	50.5	46.4
0%	12	76.3	76.3	74.3	71.5	68.4	65.0	61.4	57.5	53.4	49.0
0%	15	83.5	83.5	80.5	77.4	74.0	70.4	66.5	62.2	57.7	--
0%	20	96.2	96.2	91.3	87.7	83.8	79.5	75.0	69.9	64.3	--
0%	25	100.7	100.7	94.0	89.8	85.2	80.4	75.3	69.9	64.3	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	10.0	10.0	10.0	9.9	9.4	8.8	8.2	7.6	6.9	6.3
30%	23	11.9	11.9	11.9	11.7	11.1	10.5	9.8	9.1	8.5	7.7
20%	32	14.3	14.3	14.3	13.9	13.2	12.6	11.8	11.1	10.3	9.4
15%	41	17.1	17.1	17.0	16.3	15.6	14.8	14.0	13.1	12.2	11.2
0%	45	18.5	18.5	18.3	17.6	16.8	16.0	15.1	**14.2**	13.2	12.1
0%	50	20.4	20.4	20.0	19.2	18.4	17.5	16.5	15.5	14.4	13.2
0%	54	21.7	21.7	21.1	20.3	19.4	18.5	17.5	16.4	15.2	13.9
0%	59	23.7	23.7	22.9	22.0	21.1	**20.0**	18.9	17.7	16.4	--
0%	68	27.4	27.4	26.0	24.9	23.8	22.6	21.3	19.9	18.3	--
0%	77	28.6	28.6	26.7	25.5	24.2	22.9	21.4	19.9	18.3	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	16.7	16.7	16.7	16.7	17.6	18.7	19.9	21.3	22.8	24.5
	23	17.1	17.1	17.1	17.4	18.3	19.3	20.5	21.8	23.3	25.0
	32	17.3	17.3	17.3	17.8	18.7	19.8	21.0	22.4	23.9	25.6
	41	17.2	17.2	17.3	18.1	19.1	20.2	21.6	23.0	24.6	26.4
	45	17.1	17.1	17.3	18.2	19.2	20.4	21.8	**23.3**	24.9	26.7
	50	16.9	16.9	17.4	18.3	19.4	20.7	22.1	23.7	25.4	27.3
	54	16.7	16.7	17.4	18.4	19.6	20.9	22.4	24.0	25.8	27.8
	59	16.4	16.4	17.4	18.5	19.8	**21.2**	22.8	24.6	26.5	--
	68	15.7	15.7	17.4	18.8	20.2	21.9	23.7	25.6	27.6	--
	77	15.4	15.4	17.5	18.8	20.3	21.9	23.7	25.6	27.6	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	29.0	29	29	29	27	25	24	22	20	18
30%	23	35	35	35	34	32	30	29	27	25	22
20%	32	40	40	40	39	37	35	33	31	29	26
15%	41	47	47	47	45	43	41	39	36	34	31
0%	45	49	49	49	47	45	43	40	**38**	35	32
0%	50	54	54	53	51	49	47	44	41	38	35.1
0%	54	58	58	56	54	52	49	47	44	40	37.1
0%	59	63	63	61	59	56	**53**	50	47	44	--
0%	68	73	73	69	66	63	60	57	53	49	--
0%	77	76	76	71	68	65	61	57	53	49	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT090_60Hz

Cooling Capacity [kW]		Tair [°C]									
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	44.7	44.7	44.7	43.4	40.9	38.4	35.9	33.2	30.5	27.6
30%	-5	54.5	54.5	54.5	51.9	49.2	46.3	43.4	40.3	37.0	33.7
20%	0	65.9	65.9	64.6	61.6	58.6	55.3	51.9	48.2	44.4	40.4
15%	5	78.4	78.4	75.2	71.9	68.4	64.7	60.8	56.6	52.2	47.5
0%	7	84.9	84.9	80.8	77.3	73.6	69.6	65.4	61.0	56.2	51.2
0%	10	93.3	93.3	87.8	84.0	80.0	75.7	71.2	66.3	61.2	55.9
0%	12	99.2	99.2	92.6	88.6	84.4	79.9	75.1	70.1	64.7	59.1
0%	15	108.7	107.7	100.0	95.8	91.3	86.4	81.3	75.9	70.1	--
0%	20	125.8	121.9	113.2	108.4	103.3	97.9	91.5	84.8	77.9	--
0%	25	131.9	126.0	115.6	110.0	104.1	98.0	91.5	84.8	77.9	--

Cooling Capacity [Tons]		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	12.7	12.7	12.7	12.3	11.6	10.9	10.2	9.4	8.7	7.9
30%	23	15.5	15.5	15.5	14.8	14.0	13.2	12.3	11.5	10.5	9.6
20%	32	18.8	18.8	18.4	17.5	16.6	15.7	14.7	13.7	12.6	11.5
15%	41	22.3	22.3	21.4	20.5	19.5	18.4	17.3	16.1	14.8	13.5
0%	45	24.1	24.1	23.0	22.0	20.9	19.8	18.6	**17.3**	16.0	14.6
0%	50	26.5	26.5	25.0	23.9	22.7	21.5	20.2	18.9	17.4	15.9
0%	54	28.2	28.2	26.3	25.2	24.0	22.7	21.4	19.9	18.4	16.8
0%	59	30.9	30.6	28.4	27.2	25.9	**24.6**	23.1	21.6	19.9	--
0%	68	35.8	34.7	32.2	30.8	29.4	27.8	26.0	24.1	22.1	--
0%	77	37.5	35.8	32.9	31.3	29.6	27.9	26.0	24.1	22.1	--

Power input [kW] (1)		Tair [°F]									
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	19.0	19.0	19.0	19.6	20.8	22.2	23.7	25.5	27.5	29.7
	23	19.3	19.3	19.3	20.3	21.6	23.0	24.6	26.5	28.5	30.7
	32	19.5	19.5	19.9	21.1	22.4	23.9	25.6	27.5	29.6	31.8
	41	19.6	19.6	20.6	21.8	23.2	24.8	26.6	28.6	30.7	33.0
	45	19.6	19.6	20.9	22.2	23.6	25.2	27.0	**29.0**	31.2	33.5
	50	19.7	19.7	21.4	22.7	24.1	25.8	27.7	29.7	31.9	34.3
	54	19.7	19.7	21.7	23.0	24.5	26.2	28.1	30.2	32.4	34.8
	59	19.7	19.9	22.2	23.6	25.1	**26.9**	28.8	31.0	33.2	--
	68	19.6	20.6	23.0	24.5	26.2	28.1	30.1	32.2	34.4	--
	77	19.5	20.7	23.2	24.7	26.3	28.1	30.1	32.2	34.4	--

Water Flow [gal/min] (2)		Tair [°F]									
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	37.0	37	37	36	34	32	30	27	25	23
30%	23	45	45	45	43	41	38	36	33	31	28
20%	32	53	53	52	49	47	44	41	39	35	32
15%	41	62	62	59	57	54	51	48	44	41	37
0%	45	64	64	61	59	56	53	50	**46**	43	39
0%	50	71	71	66	64	61	57	54	50	46	42.3
0%	54	75	75	70	67	64	61	57	53	49	44.7
0%	59	82	82	76	73	69	**65**	62	57	53	--
0%	68	95	92	86	82	78	74	69	64	59	--
0%	77	100	95	88	83	79	74	69	64	59	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT110_60Hz

Cooling Capacity [kW]		Tair [°C]								
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	52.9	52.9	52.9	52.5	49.6	46.6	43.5	40.4	37.2	33.9
30%	-5	64.6	64.6	64.6	62.9	59.7	56.3	52.8	49.2	45.4	41.4
20%	0	78.2	78.2	78.2	74.8	71.2	67.4	63.4	59.1	54.7	50.0
15%	5	92.9	92.9	91.3	87.5	83.4	79.1	74.5	69.6	64.5	59.0
0%	7	100.6	100.6	98.2	94.1	89.7	85.1	80.2	75.0	69.5	63.7
0%	10	110.5	110.5	106.7	102.3	97.7	92.7	87.4	81.8	75.9	69.6
0%	12	117.5	117.5	112.6	108.0	103.2	98.0	92.4	86.5	80.3	73.7
0%	15	128.6	128.6	121.8	116.9	111.7	106.1	100.2	93.9	87.2	--
0%	20	148.6	148.1	138.2	132.7	126.8	120.1	112.7	104.9	96.8	--
0%	25	153.4	151.9	140.2	133.9	127.1	120.1	112.7	104.9	96.8	--

Cooling Capacity [Tons]		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	15.1	15.1	15.1	14.9	14.1	13.2	12.4	11.5	10.6	9.6
30%	23	18.4	18.4	18.4	17.9	17.0	16.0	15.0	14.0	12.9	11.8
20%	32	22.2	22.2	22.2	21.3	20.2	19.2	18.0	16.8	15.5	14.2
15%	41	26.4	26.4	26.0	24.9	23.7	22.5	21.2	19.8	18.3	16.8
0%	45	28.6	28.6	27.9	26.8	25.5	24.2	22.8	**21.3**	19.8	18.1
0%	50	31.4	31.4	30.3	29.1	27.8	26.4	24.9	23.3	21.6	19.8
0%	54	33.4	33.4	32.0	30.7	29.3	27.9	26.3	24.6	22.8	21.0
0%	59	36.6	36.6	34.6	33.3	31.8	**30.2**	28.5	26.7	24.8	--
0%	68	42.3	42.1	39.3	37.7	36.0	34.1	32.0	29.8	27.5	--
0%	77	43.6	43.2	39.9	38.1	36.1	34.1	32.0	29.8	27.5	--

Power input [kW] (1)		Tair [°F]								
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	21.4	21.4	21.4	21.6	22.9	24.3	26.0	27.9	30.1	32.5
	23	21.7	21.7	21.7	22.3	23.6	25.2	26.9	28.9	31.1	33.5
	32	21.9	21.9	21.9	23.0	24.4	26.0	27.8	29.9	32.1	34.6
	41	22.1	22.1	22.5	23.8	25.2	26.9	28.8	30.9	33.2	35.8
	45	22.1	22.1	22.8	24.1	25.5	27.3	29.2	**31.3**	33.7	36.2
	50	22.1	22.1	23.2	24.5	26.0	27.8	29.8	32.0	34.4	37.0
	54	22.1	22.1	23.4	24.8	26.4	28.2	30.2	32.4	34.9	37.5
	59	22.1	22.1	23.8	25.3	26.9	**28.8**	30.9	33.2	35.6	--
	68	22.0	22.1	24.6	26.1	27.9	29.8	32.0	34.2	36.7	--
	77	21.9	22.2	24.7	26.2	27.9	298	32.0	34.2	36.7	--

Water Flow [gal/min] (2)		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	43.8	44	44	43	41	39	36	33	31	28
30%	23	53	53	53	52	49	47	44	41	38	34
20%	32	62	62	62	60	57	54	51	47	44	40
15%	41	73	73	72	69	66	62	59	55	51	46
0%	45	76	76	74	71	68	64	61	**57**	53	48
0%	50	84	84	81	77	74	70	66	62	57	52.7
0%	54	89	89	85	82	78	74	70	66	61	55.8
0%	59	97	97	92	89	85	**80**	76	71	66	--
0%	68	113	112	105	100	96	91	85	79	73	--
0%	77	116	115	106	101	96	91	85	79	73	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT130_60Hz

Cooling Capacity [kW]		Tair [°C]								
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40	45
30%	-10	68.7	68.7	68.7	65.7	62.0	58.1	54.2	50.2	46.0	41.6
30%	-5	83.8	83.8	82.5	78.5	74.4	70.0	65.5	60.7	55.7	50.5
20%	0	101.3	101.3	97.6	93.1	88.3	83.3	78.0	72.5	66.6	60.4
15%	5	120.2	120.2	113.4	108.3	102.9	97.1	91.1	84.6	77.8	70.7
0%	7	130.1	130.1	121.6	116.2	110.4	104.3	97.8	91.0	83.7	76.0
0%	10	142.8	142.3	131.7	125.9	119.7	113.1	106.1	98.7	90.8	82.6
0%	12	151.7	149.8	138.7	132.6	126.0	119.1	111.8	104.0	95.8	87.1
0%	15	165.8	161.4	149.4	142.9	135.9	128.4	120.5	112.2	103.4	--
0%	20	191.3	181.7	168.3	160.8	151.9	142.6	132.9	122.9	112.5	--
0%	25	197.9	185.0	169.3	160.8	151.9	142.6	132.9	122.9	112.5	--

Cooling Capacity [Tons]		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	19.5	19.5	19.5	18.7	17.6	16.5	15.4	14.3	13.1	11.8
30%	23	23.8	23.8	23.5	22.3	21.1	19.9	18.6	17.3	15.8	14.4
20%	32	28.8	28.8	27.7	26.5	25.1	23.7	22.2	20.6	18.9	17.2
15%	41	34.2	34.2	32.2	30.8	29.2	27.6	25.9	24.1	22.1	20.1
0%	45	37.0	37.0	34.6	33.0	31.4	29.7	27.8	**25.9**	23.8	21.6
0%	50	40.6	40.5	37.5	35.8	34.0	32.2	30.2	28.1	25.8	23.5
0%	54	43.1	42.6	39.4	37.7	35.8	33.9	31.8	29.6	27.2	24.8
0%	59	47.1	45.9	42.5	40.6	38.6	**36.5**	34.3	31.9	29.4	--
0%	68	54.4	51.7	47.8	45.7	43.2	40.5	37.8	34.9	32.0	--
0%	77	56.3	52.6	48.1	45.7	43.2	40.5	37.8	34.9	32.0	--

Power input [kW] (1)		Tair [°F]								
	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
	14	25.8	25.8	25.8	27.1	28.9	31.1	33.5	36.2	39.3	42.6
	23	26.1	26.1	26.6	28.3	30.2	32.5	35.0	37.8	40.9	44.3
	32	26.4	26.4	27.7	29.5	31.6	33.9	36.6	39.5	42.7	46.2
	41	26.6	26.6	28.9	30.8	33.0	35.5	38.2	41.2	44.5	48.1
	45	26.7	26.7	29.4	31.4	33.6	36.1	38.9	**42.0**	45.3	48.9
	50	26.7	26.9	30.1	32.2	34.5	37.1	40.0	43.1	46.5	50.2
	54	26.7	27.2	30.7	32.8	35.2	37.8	40.7	43.9	47.4	51.0
	59	26.7	27.9	31.5	33.7	36.2	**38.9**	41.9	45.2	48.7	--
	68	26.6	29.0	33.0	35.4	37.9	40.7	43.7	46.9	50.3	--
	77	26.5	29.2	33.1	35.4	37.9	40.7	43.7	46.9	50.3	--

Water Flow [gal/min] (2)		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104	113
30%	14	56.8	57	57	54	51	48	45	41	38	34
30%	23	69	69	68	65	62	58	54	50	46	42
20%	32	81	81	78	74	71	67	62	58	53	48
15%	41	95	95	89	85	81	76	72	67	61	56
0%	45	99	99	92	88	84	79	74	**69**	63	58
0%	50	108	108	100	95	91	86	80	75	69	62.5
0%	54	115	113	105	100	95	90	85	79	73	66.0
0%	59	126	122	113	108	103	**97**	91	85	78	--
0%	68	145	138	127	122	115	108	101	93	85	--
0%	77	150	140	128	122	115	108	101	93	85	--

Tair: external air temperature

Tw out: outlet water temperature

(1) Referred to unit with P3 pump

(2) Water flow referred to a water temperature difference of 9°F (ΔT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

CWT160_60Hz

Cooling Capacity [kW]		Tair [°C]								
Glycol	Tw out [°C]	-10	0	10	15	20	25	30	35	40
30%	-10	77.9	77.9	77.9	77.4	73.2	69.0	64.6	60.1	55.5
30%	-5	95.1	95.1	95.1	92.8	88.2	83.5	78.5	73.2	67.8
20%	0	114.9	114.9	114.9	110.4	105.2	99.8	94.0	88.0	81.5
15%	5	136.3	136.3	134.4	128.9	123.1	117.0	110.4	103.4	96.0
0%	10	161.7	161.7	156.7	150.6	144.0	**136.9**	129.4	121.4	112.8
0%	12	171.7	171.7	165.3	158.9	152.0	144.6	136.7	128.3	119.3
0%	15	187.4	187.4	178.7	171.8	164.4	156.5	148.0	139.0	129.4
0%	20	215.9	215.9	202.2	194.5	186.2	177.4	167.9	157.3	145.2
0%	25	230.1	227.8	210.3	200.8	190.7	180.1	169.0	157.3	145.2
0%	25	230.1	227.8	210.3	200.8	190.7	180.1	169.0	157.3	145.2

Cooling Capacity [Tons]		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104
30%	14	22.16	22.16	22.16	22.00	20.82	19.62	18.38	17.10	15.78
30%	23	27.04	27.04	27.04	26.39	25.09	23.73	22.31	20.82	19.26
20%	32	32.67	32.67	32.67	31.39	29.93	28.38	26.74	25.01	23.18
15%	41	38.76	38.76	38.21	36.66	35.02	33.26	31.39	29.40	27.29
0%	50	45.96	45.96	44.57	42.82	40.94	**38.94**	36.79	**34.51**	32.08
0%	54	48.81	48.81	47.01	45.18	43.21	41.11	38.87	36.47	33.92
0%	59	53.29	53.29	50.80	48.84	46.74	44.49	42.08	39.52	36.79
0%	68	61.37	61.37	57.50	55.31	52.95	50.44	47.75	44.74	41.30
0%	77	65.42	64.78	59.80	57.08	54.22	51.20	48.04	44.74	41.30
0%	77	65.42	64.78	59.80	57.08	54.22	51.20	48.04	44.74	41.30

Power input [kW] (1)	Tair [°F]								
Tw out [°F]	14	32	50	59	68	77	86	95	104
14	31.18	31.18	31.18	31.41	33.28	35.48	38.02	40.91	44.14
23	31.59	31.59	31.59	32.47	34.43	36.72	39.35	42.32	45.64
32	31.90	31.90	31.90	33.51	35.58	37.98	40.71	43.78	47.19
41	32.12	32.12	32.72	34.57	36.76	39.28	42.13	45.31	48.82
50	32.23	32.23	33.66	35.65	37.97	**40.62**	43.60	**46.90**	50.52
54	32.24	32.24	34.05	36.10	38.48	41.19	44.22	47.57	51.24
59	32.22	32.22	34.65	36.80	39.27	42.07	45.19	48.62	52.37
68	32.08	32.08	35.71	38.03	40.67	43.63	46.91	50.44	54.15
77	31.97	32.39	36.08	38.37	40.96	43.84	47.00	50.44	54.15
77	31.97	32.39	36.08	38.37	40.96	43.84	47.00	50.44	54.15

Water Flow [gal/min] (2)		Tair [°F]								
Glycol	Tw out [°F]	14	32	50	59	68	77	86	95	104
30%	14	64.46	64.46	64.46	64.00	60.58	57.07	53.47	49.75	45.90
30%	23	78.66	78.66	78.66	76.77	72.99	69.04	64.91	60.59	56.05
20%	32	91.73	91.73	91.73	88.13	84.02	79.67	75.08	70.22	65.08
15%	41	107.13	107.13	105.61	101.34	96.79	91.93	86.77	81.28	75.44
0%	50	122.42	122.42	118.70	114.04	109.05	**103.70**	98.00	**91.92**	85.45
0%	54	130.00	130.00	125.20	120.32	115.09	109.50	103.51	97.14	90.35
0%	59	141.94	141.94	135.31	130.09	124.49	118.50	112.09	105.25	97.98
0%	68	163.46	163.46	153.13	147.30	141.04	134.34	127.18	119.16	109.99
0%	77	174.24	172.54	159.28	152.03	144.40	136.37	127.95	119.16	109.99
0%	77	174.24	172.54	159.28	152.03	144.40	136.37	127.95	119.16	109.99

Tair: external air temperature

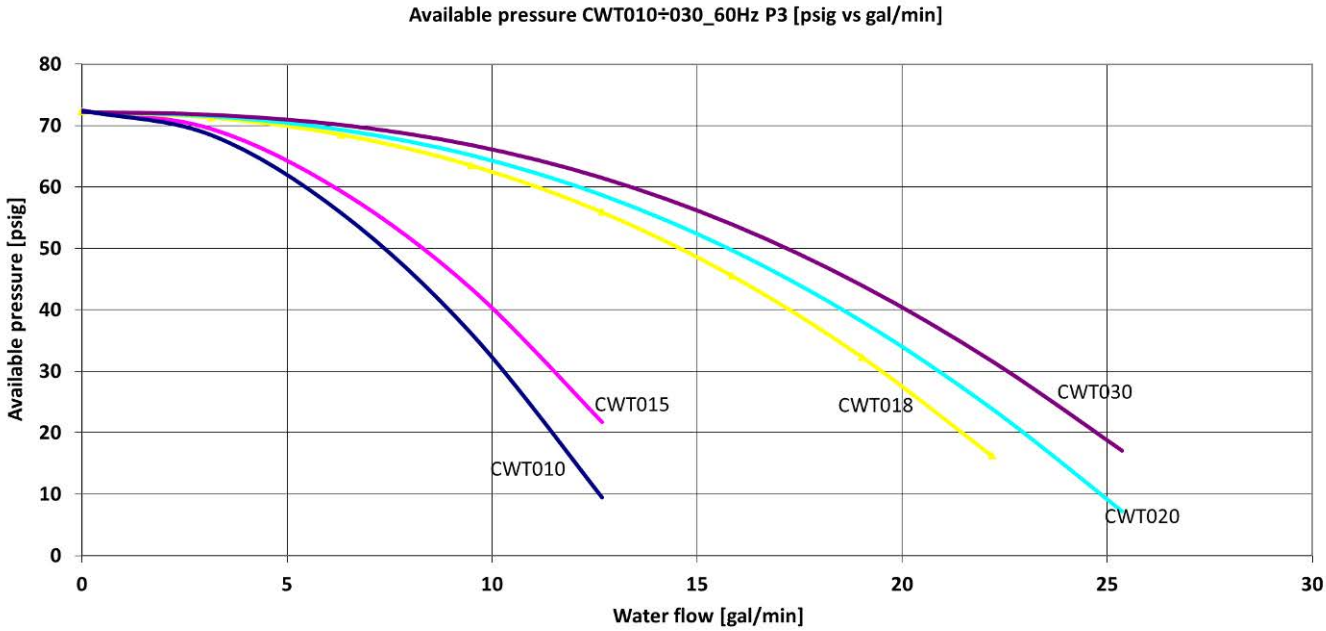
Tw out: outlet water temperature

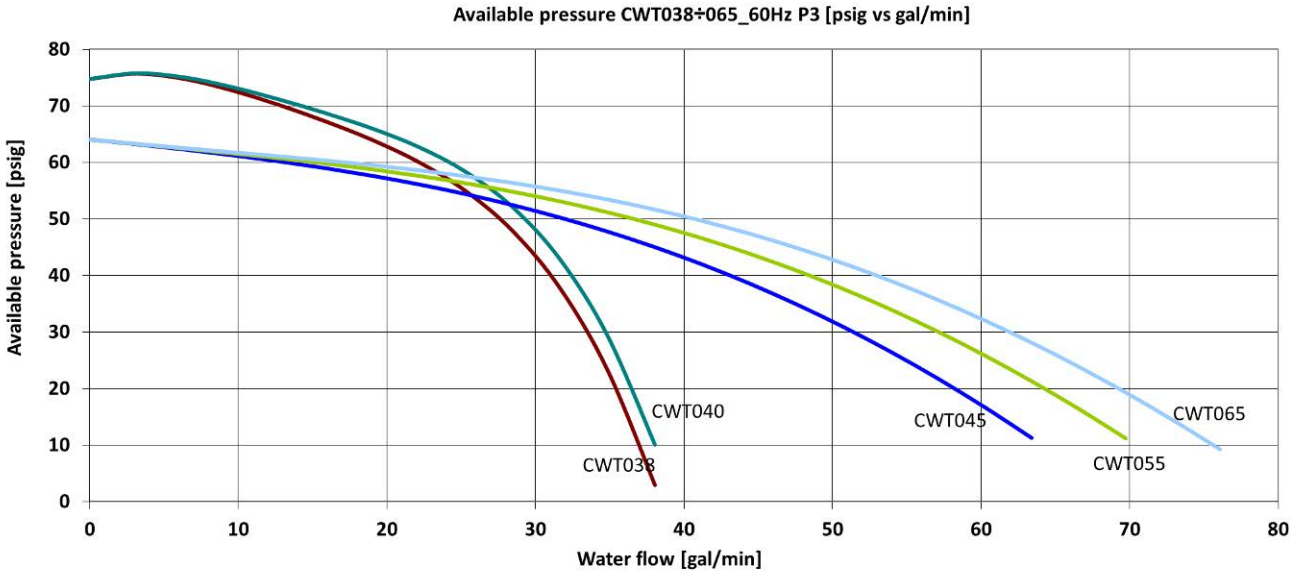
(1) Referred to unit without pump

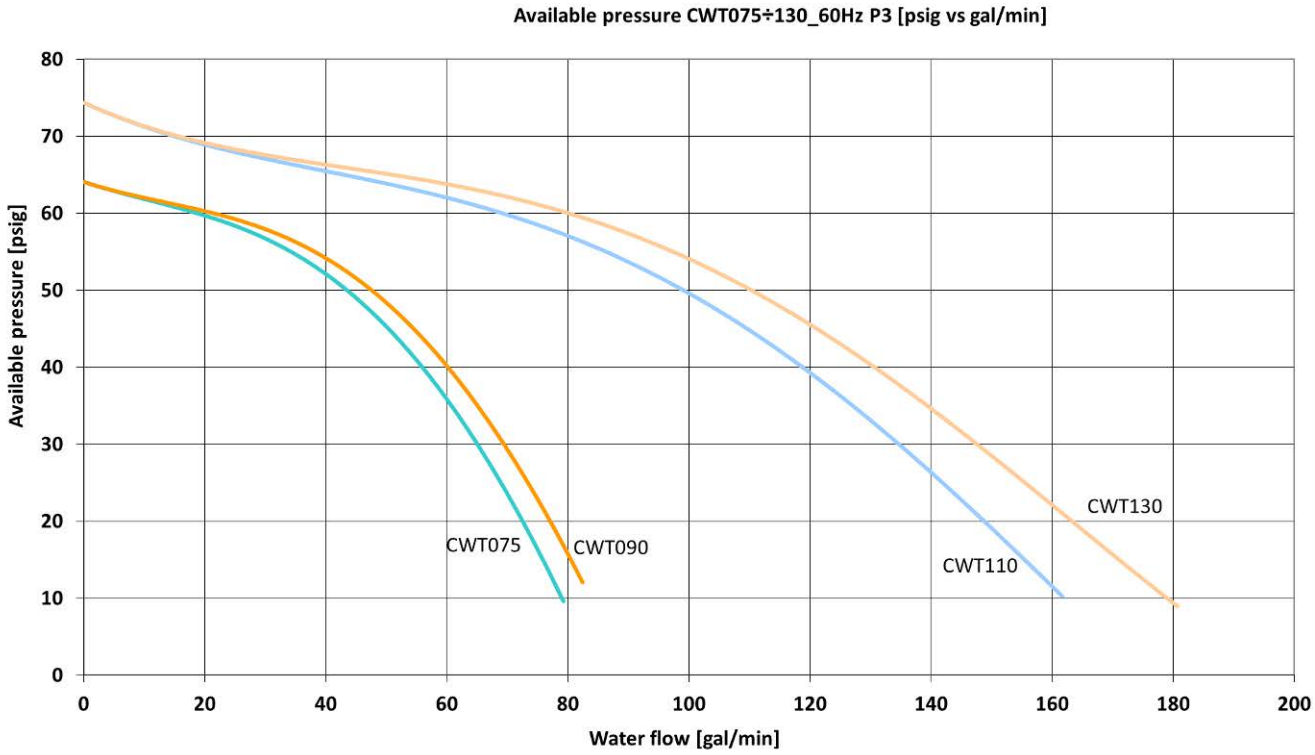
(2) Water flow referred to a water temperature difference of 9°F (DT = Tw in - Tw out = 9°F) and calculated consistently with indicated glycol percentage value.

AVAILABLE WATER PRESSURE

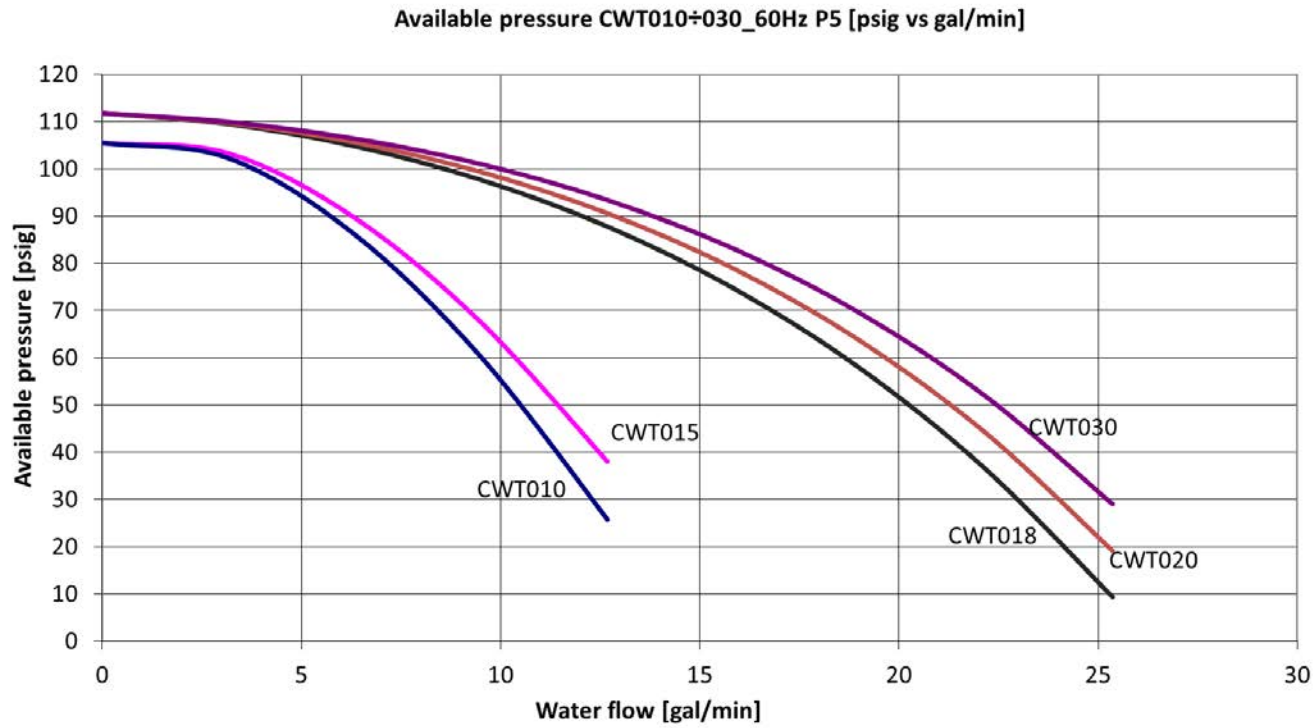
P3 version (standard) available water pressure

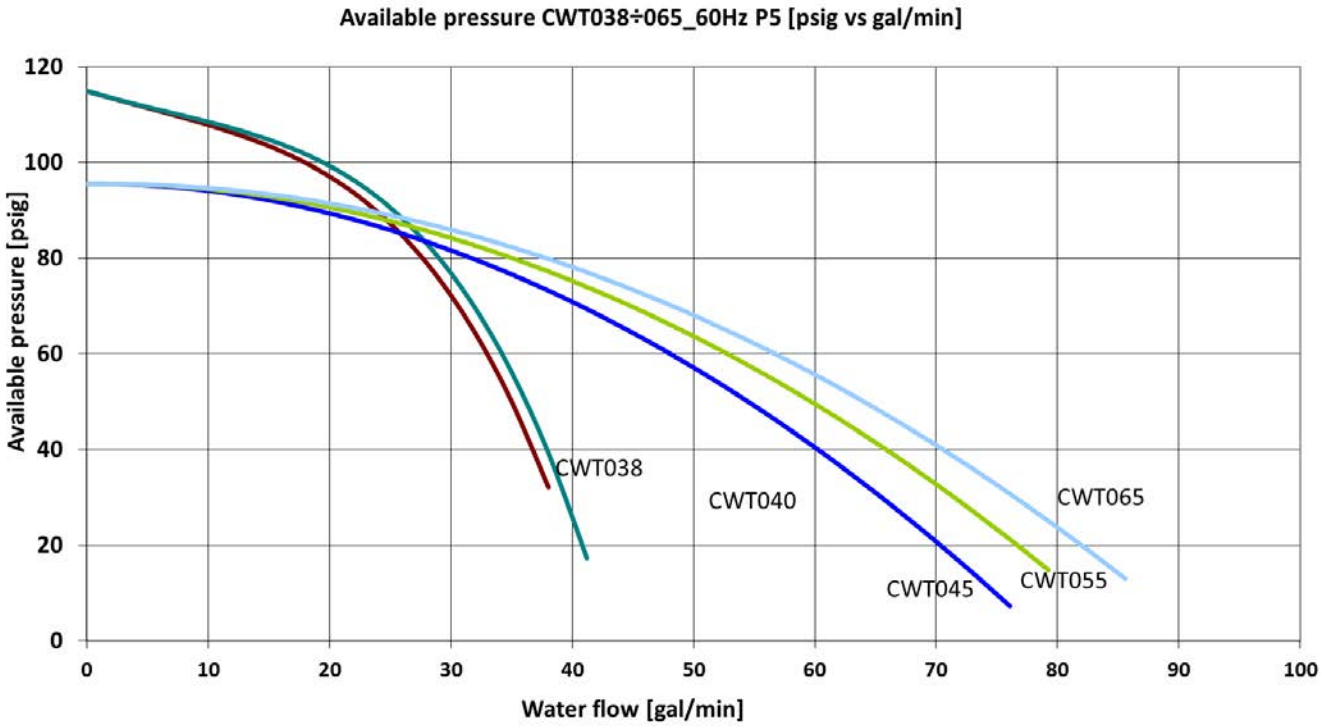


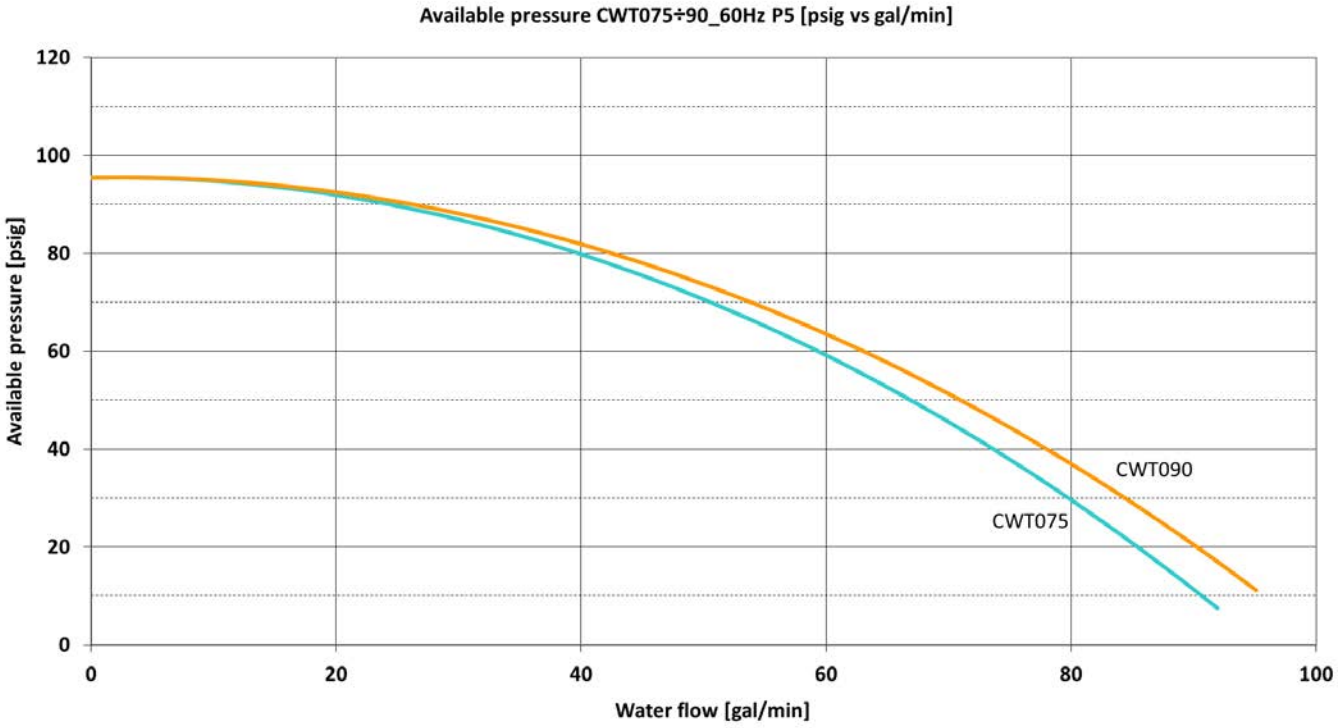




P5 version (optional) available water pressure




Available pressure CWT038÷065_60Hz P5 [psig vs gal/min]
Available pressure [psig]
Water flow [gal/min]
CWT038
CWT040
CWT045
CWT055
CWT065


Available pressure CWT075÷90_60Hz P5 [psig vs gal/min]
Available pressure [psig]
Water flow [gal/min]
CWT075
CWT090

CORRECTION FACTORS – WATER FLOW CALCULATION

Correction factor $F_{\Delta T}$ for cooling capacity with a water temperature difference other than 9°F (ΔT = Tw in - Tw out)

ΔT	°F	5	7	9	11	13	15	16	18
$F_{\Delta T}$	--	0.98	0.99	1	1.012	1.027	1.033	1.037	1.04

Correction factor F_{Gly}, for water flow for glycol concentration values different from 0%

Glycol %	0%	15%	20%	25%	30%
F_{Gly}	1.00	1.04	1.05	1.07	1.09

With reference to water flow tables of chapter "Performance data", apply this correction only for water flow values corresponding to a glycol percentage of 0%; other data are already calculated consistently with indicated glycol percentage value.

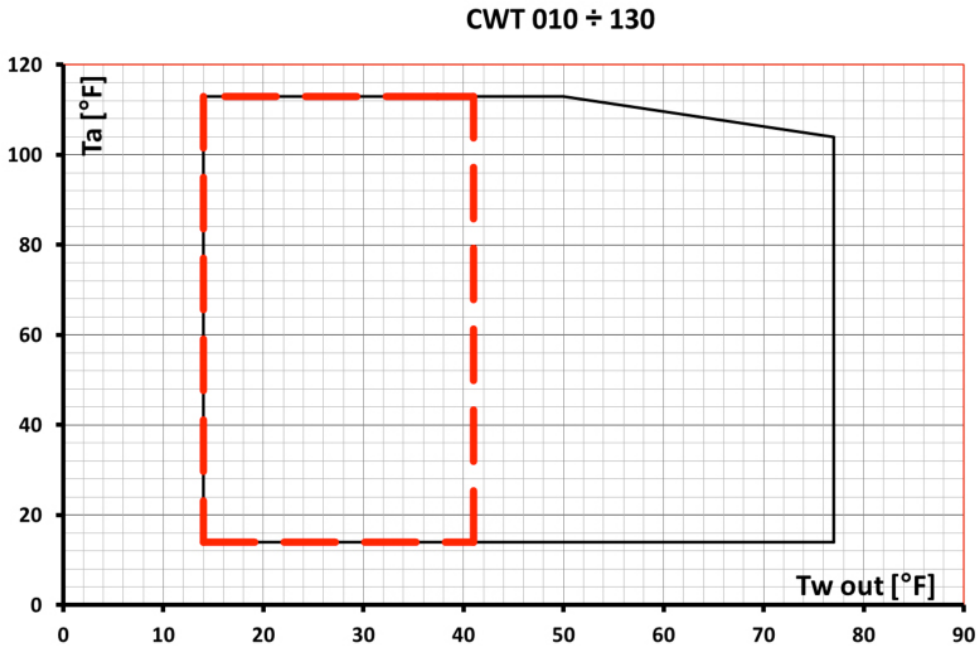
Water flow calculation with a new water ΔT and new glycol concentration:

$Wf = (Cc \times 23.97 \times F_{Gly}) / \Delta T$

Legend:
Cc = Cooling capacity in Tons
Wf = Water flow in gal/min
F_{Gly} = Correction factor for glycol
ΔT = water temperature difference °F

WORKING LIMITS

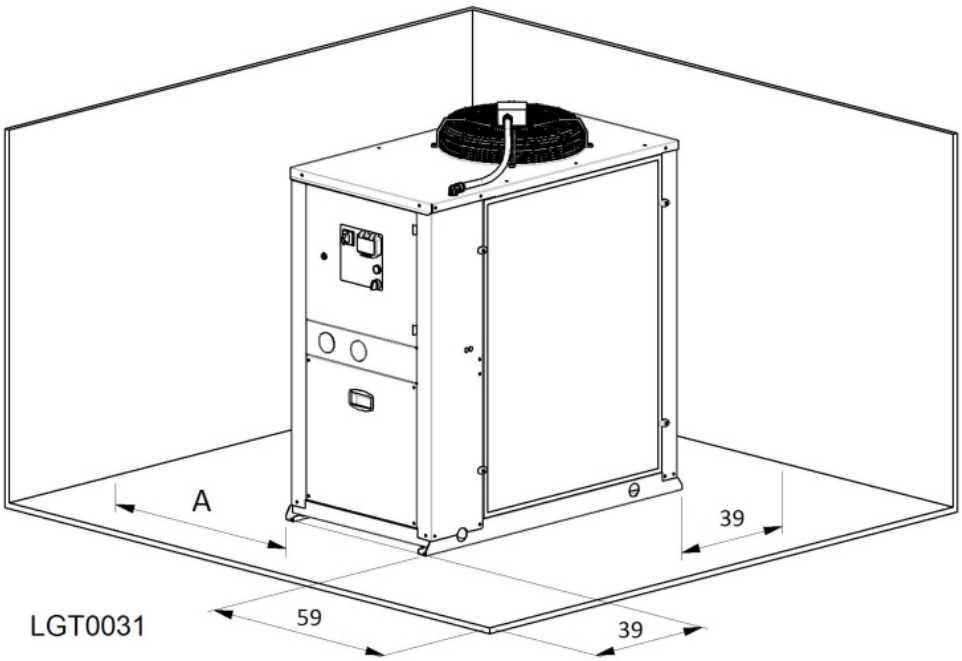
CWT series units feature broad operating limits in relation to the temperature of the outside air; all models thanks to the condensation control (standard) can reach very low external air temperature; they can be also prepared to produce water at low temperature: in this case, it is necessary to contact our company.
The graph shows the continuous operating limits of CWT units in relation to the temperature of the water exiting the machine (Tw out) and the temperature of the outside air (Ta).



Legend
Tair: external air temperature [°F]
Tw out: outlet water temperature [°F]
Glycol mixture needed – contact our company

INSTALLATION CLEARANCE

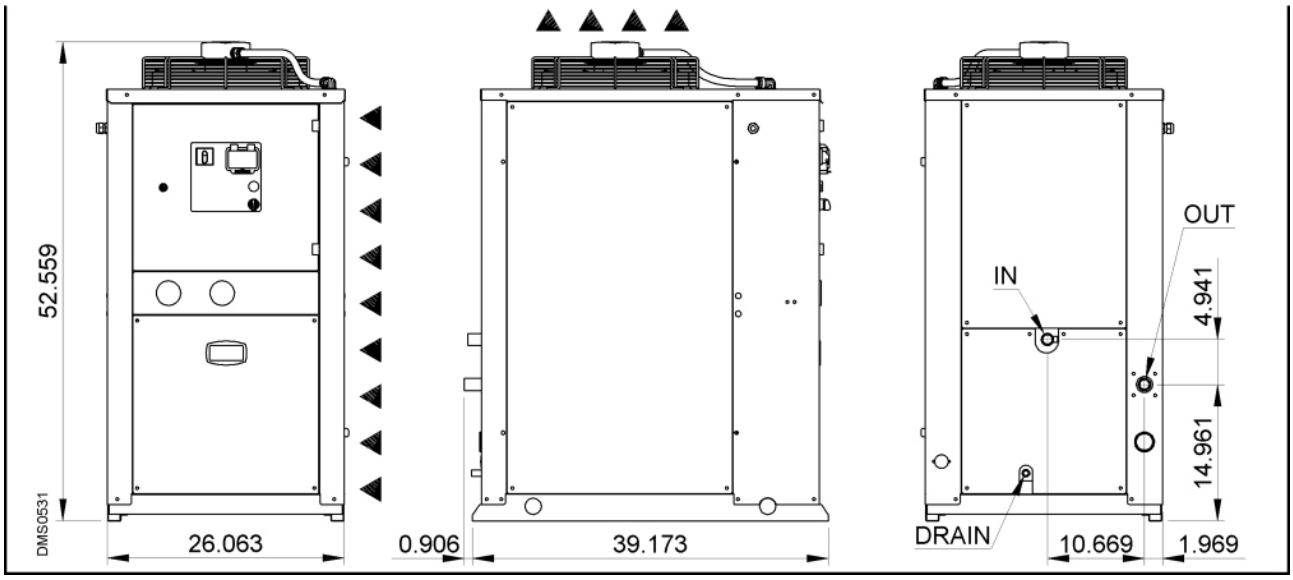
To ensure proper functioning of the unit and accessability for maintenance you must allow the minimum installation space shown in the illustration below. The air condenser fans must not be obstructed. Avoid all situations in which hot discharge air can circulate between the output of the fans and the fresh air intake of the chiller.
Contact our office to verify feasibility in all cases where one of the preceding conditions cannot be met.



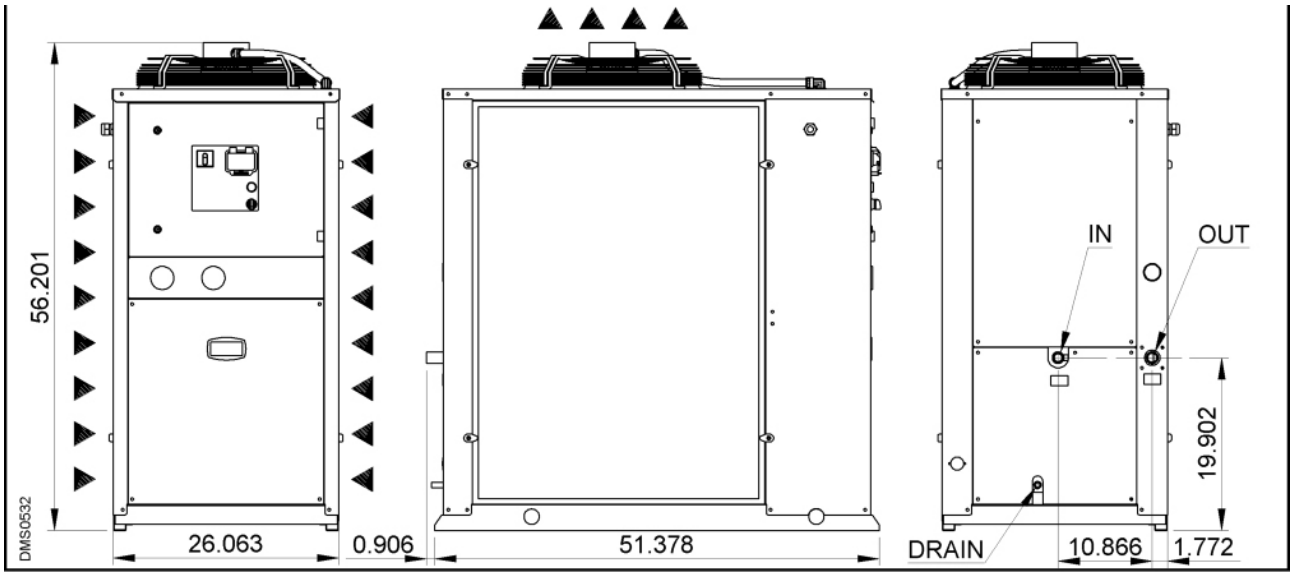
Model	A
CWT 010-015	31 inches (access for maintenance)
CWT 018-160	59 inches

DIMENSIONAL DRAWINGS

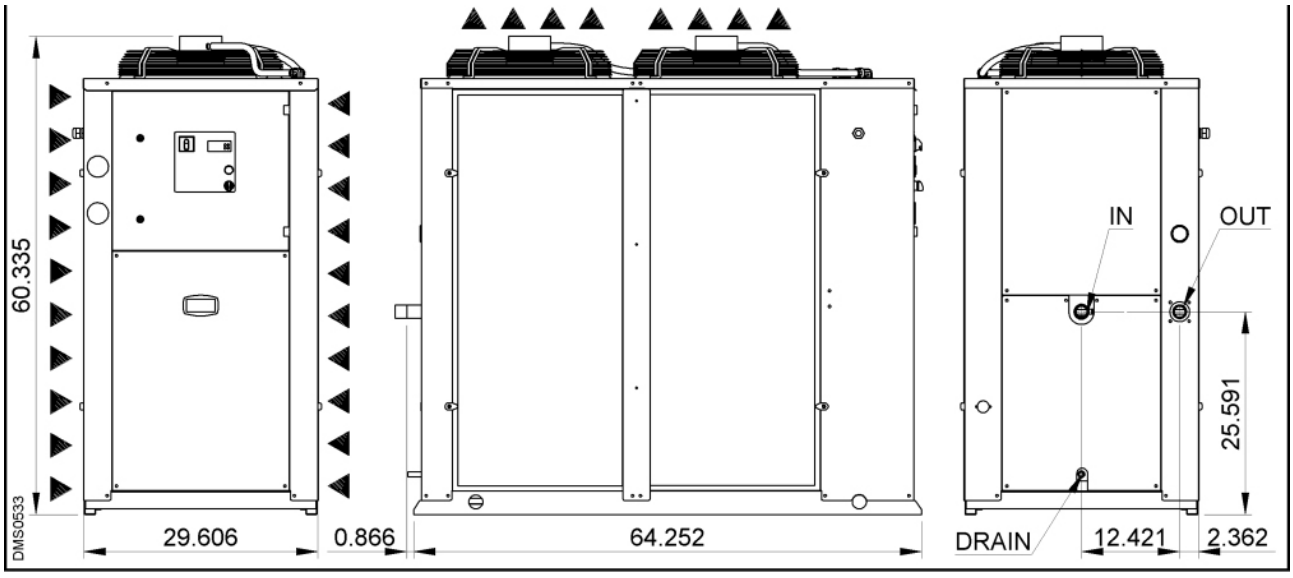
CWT010 – CWT015



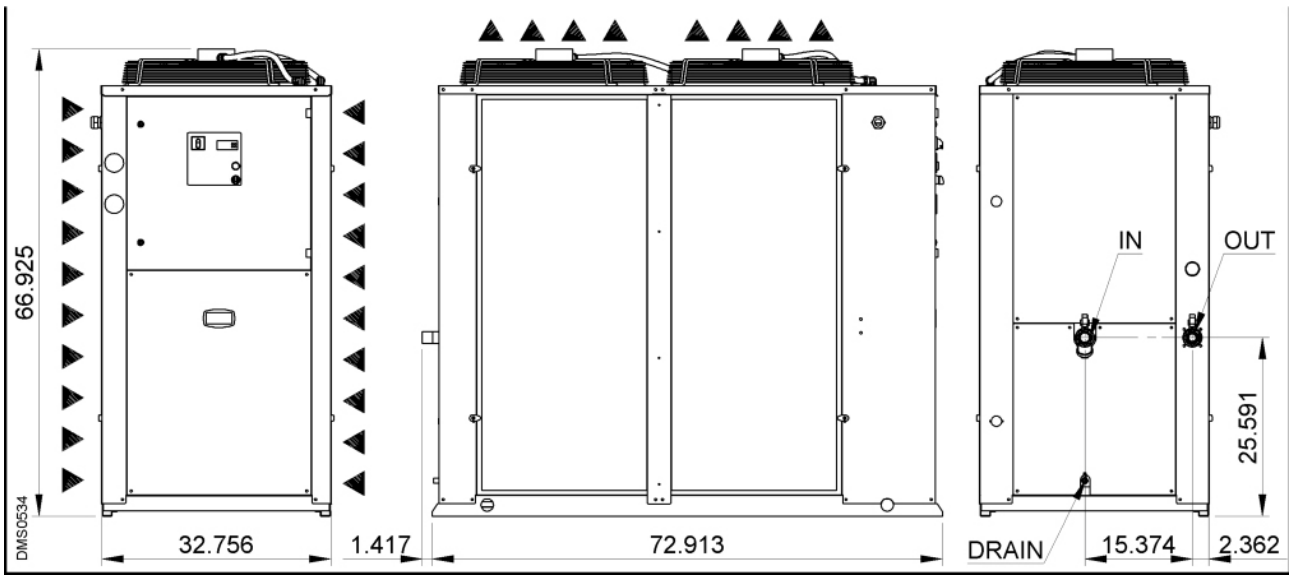
CWT018 – CWT020 – CWT030



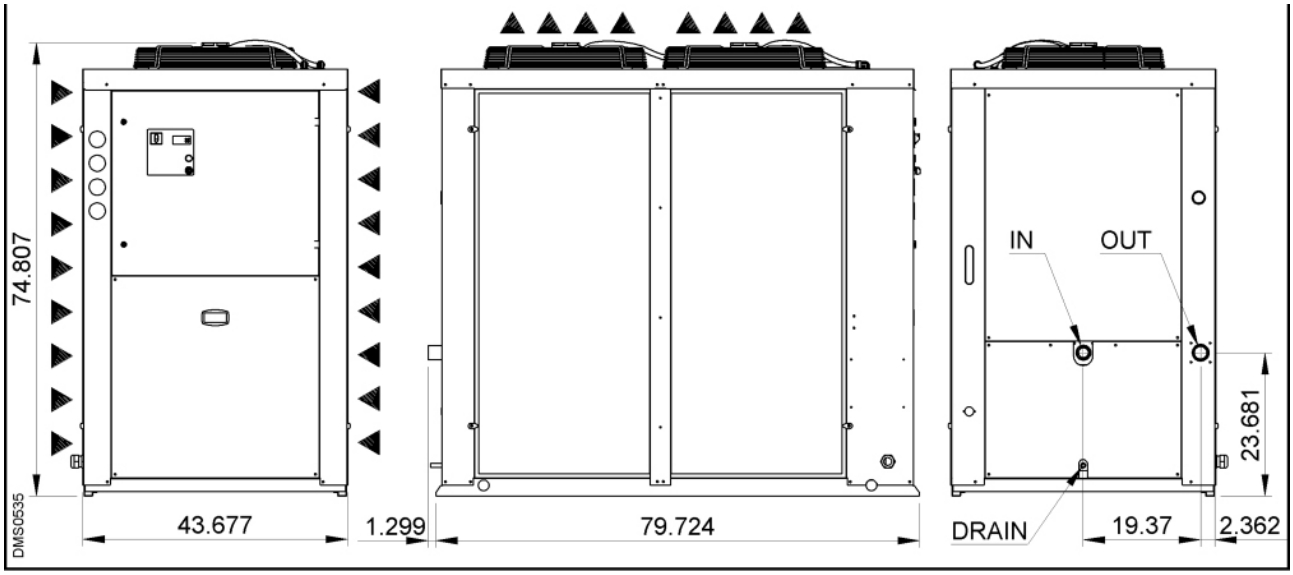
CWT038– CWT040



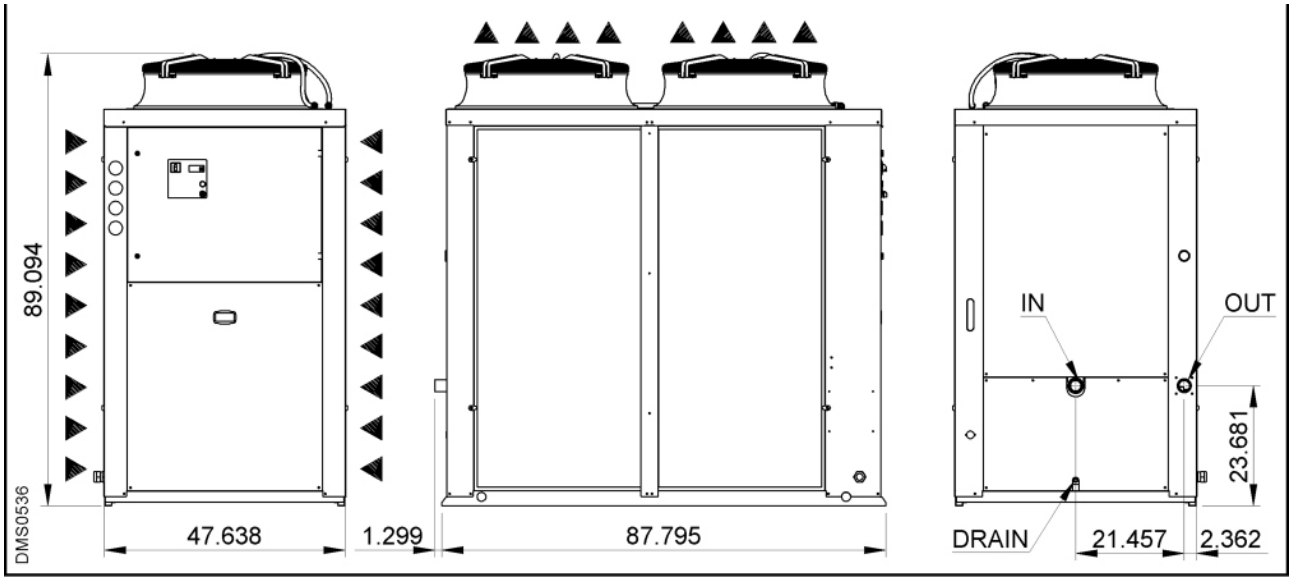
CWT045 – CWT055 – CWT065



CWT075 – CWT090



CWT110 – CWT160



CAG COOLING SOLUTIONS
(A Division of CAG Purification)
3770B Laird Road, Mississauga, ON. L5L 0A7
Tel: 800-951-0777
Fax: 905-820-3490
chillers@cagcooling.com
www.cagcooling.com