

Donaldson®
AirCel®

Donaldson®
Ultrafilter®

Process Water Chillers

Ultracool (UC) Series



Process Water Chillers

Leading the Way in Water Cooling Technology

Cold water is not only used for refreshment! In many industrial applications, cold water is used to keep the productivity of the machinery at a constant high level. The optimal temperature is often critical, as it ensures the correct operation and highest quality of the production process.

In the past, fresh water was used freely for cooling production processes. Today, most processes require cooling water with much closer defined tolerances. Water chillers provide cooling in a controlled closed circuit. This means that the water used for your production processes is **reliable, constant, and defined**.

Chilled to a preadjusted temperature in a generously sized heat exchanger, Donaldson Ultracool process water chillers guarantee a secure and repeatable production process, while saving you money and protecting the environment. All Ultracool water chillers use environmentally friendly, non-ozone depleting refrigerant. Total process security at high efficiency levels makes the Ultracool water chiller the optimum solution.

Easy operation and high reliability have been the cornerstones in the design of this high-efficiency process water chiller series. With over 30 years of expertise in building water chillers and cooling equipment, Donaldson manufactures a complete process water chiller line from 1/4 to 360 ton.



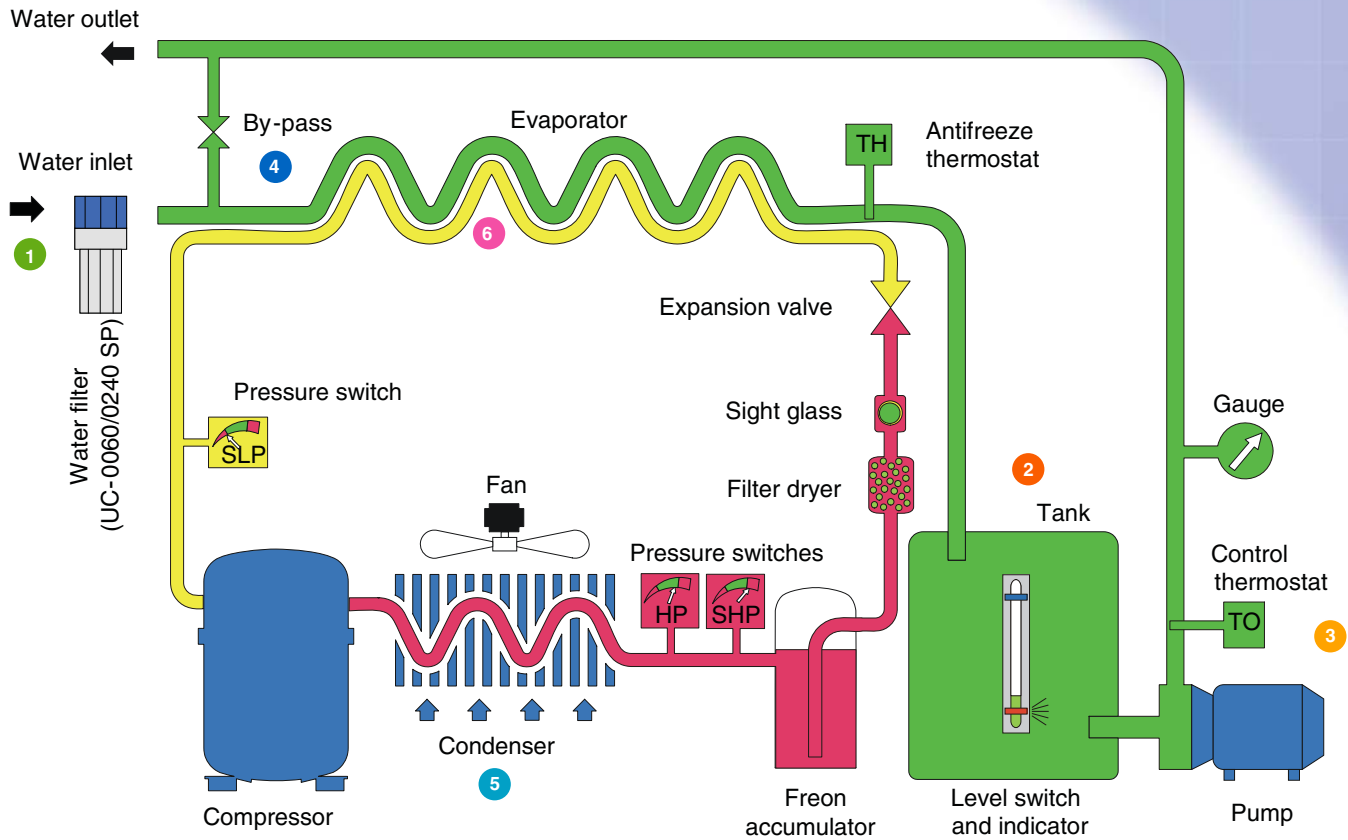
Ultracool water chillers stand out from the crowd through high quality components and an extensive range of standard features.

- All units come standard with an **antifreeze protection thermostat** to prevent freezing of the heat exchanger.
- **Integrated pressure switches** protect the circuit against high or low pressure swings.
- **Galvanized steel, externally coated with epoxy resin**, protects the housings against corrosion – even in aggressive surroundings.
- Ultracool units are also equipped with an **internal water tank**. The tank stores the chilled water, which is then pumped to the production process by the **integrated pump**. This ensures a **constant supply of chilled water even under fluctuating demand**. A **level switch** inside the tank prevents the pump from running dry.

To ensure safe operation of the water pump for any flow rate, Ultracool chillers are equipped with an internal by-pass.

Process Water Chillers

How the Ultracool Works



UC Mini Flow Schematic

- 1 Hot water enters the Ultracool process water chiller through a water filter (optional for mini units), then enters the evaporator of the refrigeration circuit where it is cooled to the required temperature.
- 2 Cold water is stored in the internal tank, which is insulated to avoid thermal losses. This tank keeps the temperature constant even under varying load conditions.
- 3 A centrifugal pump circulates cold water from the chiller to the application.
- 4 A calibrated by-pass between the water inlet and outlet ensures correct operation independent of the position of the outlet valve.
- 5 The Ultracool condenser and 6 evaporator are oversized to achieve maximum cooling efficiency at a reduced power consumption.

UC-0500 SP models and larger are equipped with two independently working refrigeration circuits. This not only increases the capacity of these chillers, but also provides a certain degree of redundancy in case one circuit needs servicing.

Process Water Chillers

Highest Quality Even At Low Flows

The Donaldson Ultracool Mini models UC-0010 - 0240 SP cover nine units with cooling performances between 1/4 and 10 ton. These units can be mounted on wheels as an option, which enables chilling at the point of use, either central or decentral.

Even in our smallest process water chillers, we do not compromise on quality. While the flow may be low, the impact on your process application can be just as critical! That is why Donaldson uses only the best components available for the whole range of our chiller products.

Features & Benefits

- Environmentally friendly refrigerant R-134a, allows ambient temperatures up to 122°F
- Housings in galvanized steel and externally coated with epoxy resin
- Evaporator in stainless steel AISI 316L, water pipes of PE
- Protection degree: IP54 from UC-0060 SP
- Antifreeze thermostat
- Thermal flow switch
- Refrigerant pressure gauges from UC 0100 SP
- Oversized condenser
- Large polyethylene cold water tank
- Level switch, Level indicator
- Pump: impeller, intermediate chambers and shaft in stainless steel
- Internal calibrated by-pass



UC Mini

Process Water Chillers

Chiller Components

Centrifugal Grundfos Pumps with SiC-SiC Mechanical Seal

- Run remarkably quiet
- Flat flow-versus-pressure curve allows for flexibility in flow adjustments, while maintaining the pump in the optimal pressure range



High and Low Pressure Switches

- Protect the compressors

Stainless Steel Plate Evaporators

- By using these high-efficiency heat exchangers, our chillers save up to 30% in energy consumption compared to internal coils

Thermostatic Expansion Valves

- Adjust automatically to the working conditions of the chiller, ensuring stable operation and protection of the compressor from liquid refrigerant compared to capillary tubes



Large, Oversized Cold-Water Reservoir

- Located after the evaporator
- Improves the temperature stability of the cooling water and reduces the ON/OFF cycles of the compressor.

Dimensions & Specifications

Model UC MINI	Cooling Capacity ¹		Water Flow	Connection	Water Pressure		kW		FLA		Voltage	Dimensions (inches)			Weight
	ton	BTU/Hr	GPM	NPT inches	40 psi	70 psi	SP 40 psi	SP 70 psi	SP 40 psi	SP 70 psi	Standard	Height	Width	Depth	(lbs)
UC-0010 SP	0.23	2,853	0.44	3/8	48	—	1.20	—	9.3	—	230-1-60	27	20	16	132
UC-0020 SP	0.45	5,443	0.85	1/2	48	75	1.69	1.99	13.7	16.9	230-1-60	35	21	25	254
UC-0040 SP	1.33	15,894	2.47	1/2	46	73	2.22	2.52	20.8	24.0	230-1-60	44	23	28	276
UC-0060 SP	2.54	30,431	4.73	3/4	51	70	4.17	4.33	12.4	12.9	460-3-60	45	31	35	408
UC-0080 SP	3.09	37,018	5.75	3/4	49	68	4.63	4.79	14.4	14.9	460-3-60	45	31	35	441
UC-0100 SP	4.12	49,447	7.68	1	45	78	5.66	5.88	17.8	18.4	460-3-60	49	33	39	518
UC-0140 SP	5.19	62,181	9.66	1	42	70	6.81	7.03	25.8	26.4	460-3-60	49	33	39	573
UC-0180 SP	7.13	85,629	13.30	1	44	67	8.54	8.90	31.0	31.6	460-3-60	64	37	45	827
UC-0240 SP	9.90	118,829	18.46	1	41	68	11.77	12.60	40.5	41.6	460-3-60	64	37	45	882

¹ Cooling Capacity refers to 50°F water outlet temperature and 77°F ambient temperature.

Mini series is equipped with refrigerant R-134a; maximum ambient temperature 122°F.

Process Water Chillers

Controlled Cooling Capacity...Made Easy!

The Donaldson Ultracool Midi models UC-0300 - 1700 SP cover cooling performances from 11.5 to 58 ton, meeting your higher performance requirements securely and economically. The Midi series uses the non-ozone harming refrigerant R-407C. The Ultracool midi series offers high cooling performance and low energy consumption through generously sized heat exchangers and the high efficiency of the refrigerant.

Features & Benefits

- Environmentally friendly refrigerant R-407C
- Housings in galvanized steel and externally coated with epoxy resin
- Evaporator in stainless steel AISI 316L
- Water circuit made of thermo welded PP-R
- Two independent fridge circuits from UC-0500 SP
- Refrigerant pressure gauges for each circuit
- Antifreeze thermostat
- Flow switch
- Protection degree: IP54



UC Midi

- Large polyethylene cold water tank
- Level switch, Level indicator
- Water filter integrated
- Pump: impeller, intermediate chambers and shaft always in stainless steel

Dimensions & Specifications

Model UC MIDI	Cooling Capacity ¹		Water Flow	Connection NPT	Water Pressure		kW		FLA		Voltage	Dimensions (inches)			Weight
	ton	BTU/Hr	GPM	inches	40 psi	70 psi	SP 40 psi	SP 70 psi	SP 40 psi	SP 70 psi	Standard	Height	Width	Depth	(lbs)
UC-0300 SP	11.30	136,612	21.20	1-1/2	51	80	15.2	15.5	33.0	34.4	460-3-60	73	41	63	1,232
UC-0400 SP	14.50	174,026	27.00	1-1/2	55	73	18.8	19.6	42.9	44.9	460-3-60	73	41	63	1,232
UC-0500 SP	17.60	211,827	32.90	2	51	81	22.7	23.9	52.6	54.3	460-3-60	74	61	88	1,980
UC-0650 SP	22.80	273,267	42.50	2	59	74	28.3	28.6	63.9	64.3	460-3-60	74	61	88	2,156
UC-0800 SP	29.00	348,043	54.10	2	51	80	36.5	39.4	83.6	87.8	460-3-60	74	61	88	2,244
UC-1000 SP	35.30	423,668	65.80	2-1/2	51	75	42.5	45.0	100.0	103.8	460-3-60	78	65	134	3,212
UC-1350 SP	45.60	546,536	84.90	2-1/2	68	75	56.7	58.7	127.2	131.2	460-3-60	78	65	134	3,454
UC-1700 SP	58.00	696,098	108.20	2-1/2	64	73	71.0	73.0	163.2	167.2	460-3-60	78	65	134	3,586

¹ Cooling Capacity refers to 50°F water outlet temperature and 77°F ambient temperature.

Midi series is equipped with refrigerant R-407C; maximum ambient temperature 105°F.
Midi models are equipped with water filter, water tank, water pump and internal by-pass.

Process Water Chillers

UC Water Chiller Options

- Auto-filling kit
- External alarm contacts (standard on Midi)
- External bypass
- Fan motor speed regulator
- Water flow meter
- Water heaters
- Water temperature stability kit
- Water pump: 70 psig and/or stainless steel
- Wheels (available for Mini only)
- Water-cooled condenser

Capacity Correction Factors Ultracool Process Water Chillers (Mini & Midi)

Capacity correction factors — Ambient Temperature (C1)

Ambient Temperature (°F)	77	85	95	105	115*	122*
Correction Factor	1.0	0.9	0.8	0.78	0.72	0.66

Capacity correction factors — Water Outlet Temperature (C2)

Water Outlet Temperature (°F)	23	35	44	50	55	65
Correction Factor	0.38	0.54	0.83	1.0	1.1	1.25

* Applies to models UC-0010 SP – UC-0240 SP

To calculate the capacity of a given process water chiller based on non-standard operating conditions, multiply the standard capacity by the appropriate correction factor(s).

EXAMPLE: Chiller Model: UC-100SP
Standard Capacity: 4.12 ton
Actual Operating Conditions: 85°F ambient temperature: **C1 = 0.9**
44° water outlet temperature: **C2 = 0.83**
Adjusted Capacity = 4.1 ton x 0.9 x 0.83 = 3.08 ton

To choose a process water chiller based on a given capacity at non-standard operating conditions, divide the given capacity by the appropriate correction factor(s).

EXAMPLE: Given Capacity: 7.5 ton
Actual Operating Conditions: 77°F ambient temperature: **C1 = 1.0**
55°F water outlet temperature: **C2 = 1.1**
Adjusted Capacity = 7.5 ton/1.0/1.1 = 6.82 ton
Selected Chiller Model: UC-0180SP

Donaldson®

Trust Donaldson Compressed Air & Gas to deliver a complete range of compressed air purification solutions that improve air quality throughout your plant - from the compressor room to all points of use. With over 30 years of expertise in compressed air filtration and separation, Donaldson manufactures a complete line of drying and filtration equipment in an innovative, cutting-edge design with energy efficient operation and reliable performance to increase your productivity and lower your operating cost for the air volume that fits your needs.

Donaldson Compressed Air & Gas offers a wide variety of solutions to reduce your energy costs, improve your productivity, guarantee production quality and help preserve the environment.

PRODUCTS

- Activated carbon filters
- Adsorption dryers
- Breathing-air purifiers
- Cartridge filters
- Chillers
- Condensate drains
- Coolers
- Cyclone separators
- Demisters
- Disposable filters
- Elements
- Emulsion separators
- Filters
- Fine filters
- Filter housings
- High-performance filters
- High-pressure filters
- Medical vacuum filters
- Membrane dryers
- Oil/vapor absorbers
- Oil/water separation systems
- Pre-filters
- Pre-separators
- Process filter elements
- Process filter housings
- Pure gas filters
- Refrigeration compressed air dryers
- Silicon-free filters
- Steam filters
- Sterile filters
- Submicro filters
- Systems engineering
- System solutions
- Vacuum filters
- Vent filters