CONSISTENT TEMPERATURE WARRANTY
COOL GRAPHICS

Freecool

- Energy saving
- Environmentally friendly
- Low investment
- Minimal running costs
- Easy installation (water & anti-freeze liquid)

COOLGRAPHICS
PRESS TUNING

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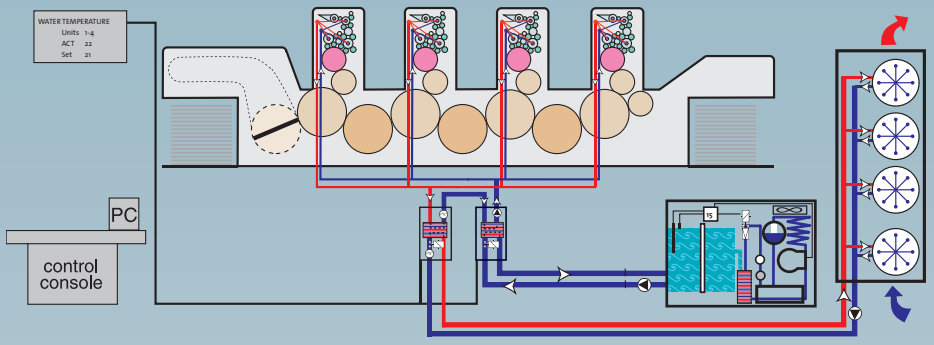


FreeCool

FreeCool is a digitally controlled cooling system containing of a remote condenser and a regulation box, which makes the nature's own cooling an integrated part of some of Cool Graphics' temperature control systems. It simply stops the cooling compressor and consequently its energy consumption. FreeCool can also be retro-fitted to several existing temperature control systems from other manufactures and save energy and money by stopping their cooling compressors.

FreeCool saves energy for a lot of ancillary equipment

FreeCool is a low cost, environmental friendly and energy saving cooling source for IRTCS (Ink Roller Temperature Control), DWCS (dampening water circulators), IR-, UV-dryers, compressor cabinets etc. as soon as the outside air temperature is below the required cooling water temperature. FreeCool cannot be used when the outside temperature is above the required cooling water temperature, so it can only be used as a complementary cooling source to Cool Graphics Aquacools (or similar) compressor coolers, which supply cold water to Cool Graphics' temperature controllers. The exact, accurate temperature in the equipment requiring temperature control is still maintained by Cool Graphics temperature controllers. They just do not use energy for cooling.

FreeCool is a remote condenser, which links directly to the ancillary equipment's cooling circuit before it reaches the compressor cooler. This means that power driven cooling is reduced and ultimately eliminated, depending on the outside air temperature. FreeCool does not use any cooling refrigerant, but operates with plain water mixed with glycol. (Glycol concentration depends on the lowest expected outside temperature). FreeCool only consumes marginal energy for the circulation pump and the external heat exchanger fans, because it stops the cooling compressor. (A cooling compressor has a power consumption of 25%-40% of the cooling capacity it generates).

FreeCool's cooling source is the outside air

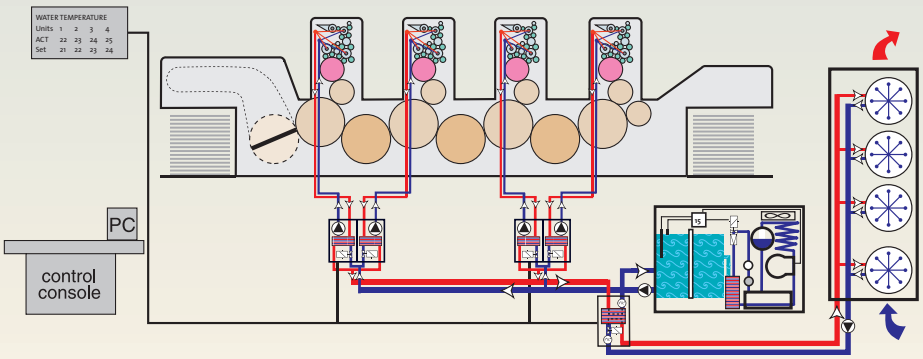
FreeCool's concept is extremely simple: It uses the nature's own cooling capacity to reduce or substitute the consumption of industrially produced energy to save money and protect the environment. When the outside air is cold enough to cool FreeCool's water to the required temperature, FreeCool starts to substitute the cooling from a compressor cooler. Limited temperature differences between the outside air and FreeCool's cooling water only gives a limited cooling contribution, and in this situation FreeCool works parallel with the compressor cooler, and just reduces the energy consumption. The colder it gets outside, the more FreeCool can cool and finally it takes over the total cooling job and stops the cooling compressor. With low outside temperatures and a correctly dimensioned FreeCool, the cooling compressor will not start at all, and the total cooling is performed by the outside air, which is totally environmental friendly and free of charge. This saves money and protects the environment. Besides, the cooling compressor lifetime will increase, as it is running less.

FreeCool is not only for colder areas

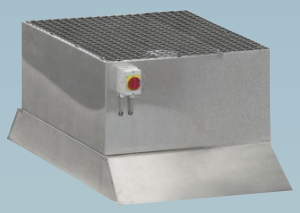
It is obvious that FreeCool performs better when it is colder outside. But FreeCool also functions fine in warmer areas with some ancillary equipment. It all depends on the wished operating temperature of this equipment. The normal water temperature for ink roller temperature control systems in conventional offset is 27°C/80°F. The required water temperatures to maintain UV dryers at their optimum level is the same. FreeCool is configured to operate with a temperature difference of 5°C/8°F, which makes it fully operational with outside temperatures below 22°C/72°F.

FreeCool gets more profitable with higher energy prices

FreeCool's profitability is directly linked to the reduction or elimination of electric generated cooling energy. Increasing energy prices will automatically make FreeCool more profitable. The geographical site is of course also important. Printers in cold areas with high energy costs running the presses around the clock will profit more from FreeCool than printers in warmer areas running the presses in day shifts only.



Special FreeCool Product Features



Large external air/ water heat exchanger

FreeCool's remote condenser is installed outside the pressroom building and has a large and robust air/water heat exchanger, which is cooled by the outside air. It can be positioned any place and is not sensitive to tough weather, rain or snow. The cooling air is blown through the heat exchanger by strong fans. The fan speed can be adjusted to various noise levels, which makes it possible to install it in areas with limitations on the noise level (less noise means a bigger FreeCool for the same cooling capacity). FreeCool can be installed with a vertical or horizontal airflow through the heat exchanger.

The fins of the heat exchanger are designed to perform a maximum cooling capacity in connection with minimal temperature differences between the outside air and the circulating cooling water. The coil is manufactured in resistant aluminum and brass(?) The flow through the heat exchanger coil is fast to get the maximal cooling capacity at minimal temperature differences.

FreeCool does not use a special cooling liquid, but works with a mix of plain water and glycol. The concentration of glycol depends on the lowest possible outside temperature.

Digital controller

FreeCool is operated from a small cabinet with digital controllers for the temperature in the external and internal heat exchangers. Some Cool Graphic's systems are prepared to integrate FreeCool directly into their operation systems.

Large internal water/ water heat exchanger

FreeCool's regulation box holds the internal water/water heat exchanger. This heat exchanger is installed in the return flow from the ancillary equipment (IRTCs, DWCs, IR or UV lamps, compressor cabinets etc.). FreeCool operates with a closed cooling circuit between the external air/water and internal water/water heat exchangers, so no contamination in this circuit is possible. There is no contact between FreeCool's cooling circuit and the water from the ancillary equipment, which also makes contamination of this circuit impossible. De-mineralized water or normal water with a minimal concentration of glycol or anti-rust liquid can be used in the ancillary circuits, without considering the glycol concentration in the FreeCool cooling circuit. (The cooling power decreases with an increased glycol concentration, which means that FreeCool's capacity must be bigger in areas with extreme cold outside temperatures to maintain the same cooling capacity).

One or more control boxes can be connected to the same FreeCool remote condenser. This makes is possible to run a number of independent ancillary equipment (even with different wished temperatures) on the cooling power from one FreeCool remote condenser – of course assuming the overall cooling capacity is sufficient.

Safety features

FreeCool is a closed system running with a marginal over pressure. It has an expansion tank, over pressure valve and automatic air bleeding valve and indication for loss of pressure.

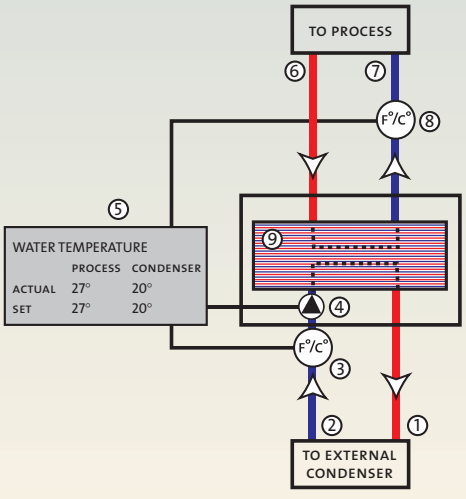
Strong circulation pump

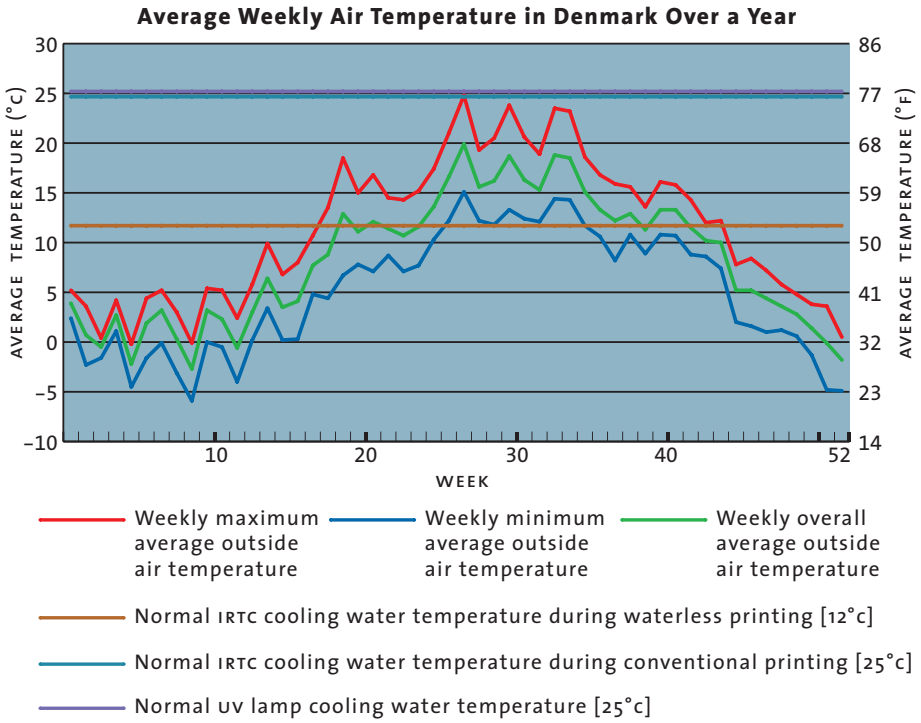
FreeCool's regulation box has a strong frequency controlled Grundfos CH circulation pump (same type driving Aquacools, Eco- and Digitemps), which runs stable 24 hours a day, 7 days a week, 365 days a year. The strong CH pump secures a fast flow through both the internal and external heat exchangers, which makes it possible to use FreeCool as soon as the outside temperature is just marginally below the wished temperature in the temperature circuit.

The frequency control of the circulation pump adjusts the flow through the external and internal heat exchangers, depending on the need for cooling. Flow controlled temperature control is much more accurate and simpler than using solenoid valves, so maintenance is at an absolute minimum and service is easy. Grundfos is one of the world's leaders in pumps. Therefore skilled technicians are on call around the clock all over the world.

FreeCool only supplies cooling, when the water temperature in the external heat exchanger is below the wished temperature in the ancillary equipment. As soon as the temperature sensor indicates that the outside water temperature is low enough, the circulation pump sends cold water to the ancillary equipment, and the fans start to push cold air through the external heat exchanger. If the water in the external heat exchanger gets too warm (because the outside air is too warm in relation to the cooling water) the circulation pump automatically shuts off.

Another temperature sensor adjusts the cooling function in the regulation box with the flow speed of the circulation pump to maintain a consistent temperature (equal to the one in the cooling tank) in the water returning from the ancillary equipment and back into the central compressor cooler's water tank. When the water returning to the compressor cooler has the same temperature as the wished tank temperature, the cooling compressor will not start, and energy and money is saved.





Technical specifications

FreeCool remote condenser	6.500-16	10.000-24	14.000-36	14.000-60
Cooling capacity(kWatt/BTU):	16/54.640	24/81.960	36/122.940	60/204.900
Rating a temperature difference:	5°C/8°F	”	”	”
Power source	3*400V/50Hz	”	”	”
Length (cm/inches)	60/24	”	”	”
Width (cm/inches)	68/27	”	”	”
Height (cm/inches)	40/16	”	”	”
Weight (Kg/pounds)	30	40	50	5
Circulation media	Water	”	”	”
Cooling liquid	Glycol	”	”	”
Type FreeCool regulation box	**6.500-16**	**10.000-24**	**14.000-36**	**14.000-60**
Cooling:	Plate heat exchanger	”	”	”
Cooling regulation	Frequency control of circulation pump		”	”
Power Consumption (kWatt/HP)	1,0/3.415	1,2/4.100	1,8/6.150	1,8/6.150
Pump Circulation (L/h-Gls/m)	6.500/28,5	10.000/43,9	14.000/61,4	14.000/61,4
Max pressure (bars/psi)	3,0/66	”	”	”
Rated pressure (bars/psi)	1,5/33	”	”	”
Noise level	35 dBA	”	”	”
Power source	3*400V/50Hz	”	”	”
Length (cm/inches)	60/24	”	”	”
Width (cm/inches)	68/27	”	”	”
Height (cm/inches)	40/16	”	”	”
Weight (Kg/pounds)	30	40	50	5
Circulation media	Water	”	”	”
Cooling liquid	Glycol	”	”	”

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Cool Graphics is a Danish company, which develops and manufactures dampening water premixers, ink roller temperature control systems and other ancillary equipment for offset presses to improve press performance, productivity and impact on the environment.

PRODUCT LINE

Aquacool Compact & Jumbo compressor water coolers with water/air and water/water condensers

FreeCool remote conderser for nature's own cooling (free of charge) of ancillary equipment

Ecotemp & Digitemp single- and multi-zone ink roller temperature controllers

Clearwater Combi is a compact combination of a fast flow high filtration dampening water circulator and a powerful single-zone ink roller tempeterature controller

Clearwater Digimix RO combines a reverse osmosis system (RO) with digital doser pumps and a premixer tank into a total dampening water premixer system.