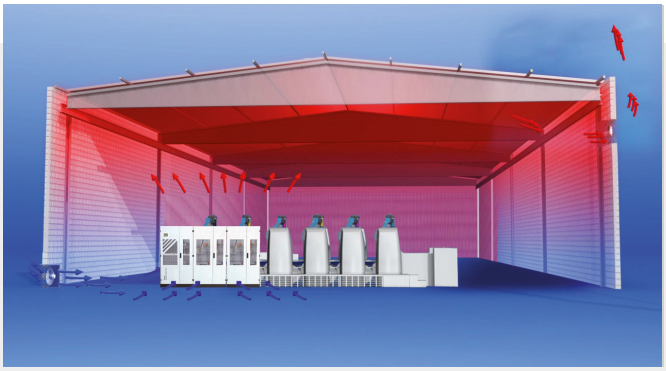
technotrans

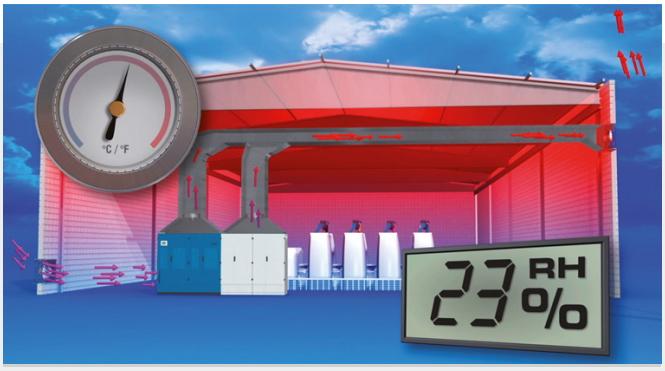
power to transform

central.cooling

Central water cooling systems



› Air-cooled peripheral units discharge this hot waste air directly into the printing room. An apparently easy and inexpensive solution that however causes severe changes of the room climate.



› By adding waste air ventilation and exhaust ducting, the heat can be removed but the extra air needed for pressurisation permanently disturbs the climate of the printing room.

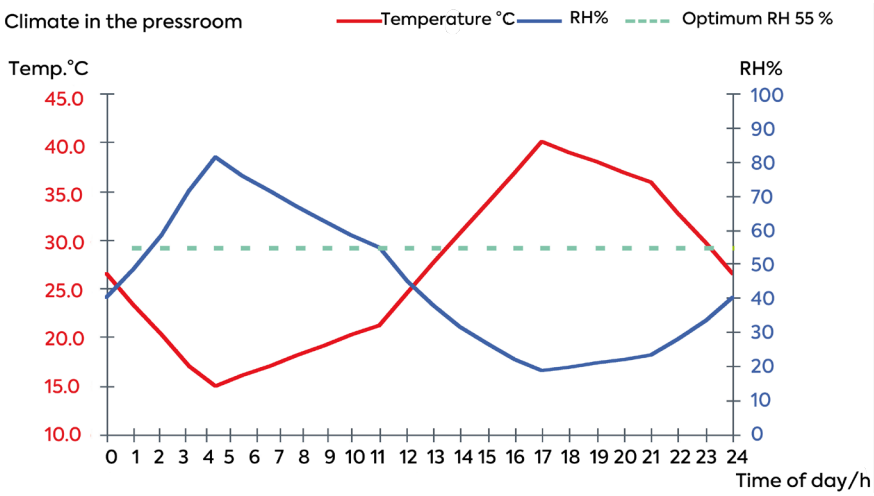
Success factor: stable pressroom climate

Stable humidity and temperature are a prerequisite for producing high quality print, especially when printing periodicals. Any heat source negatively effects the fragile ratio of relative humidity and temperature.

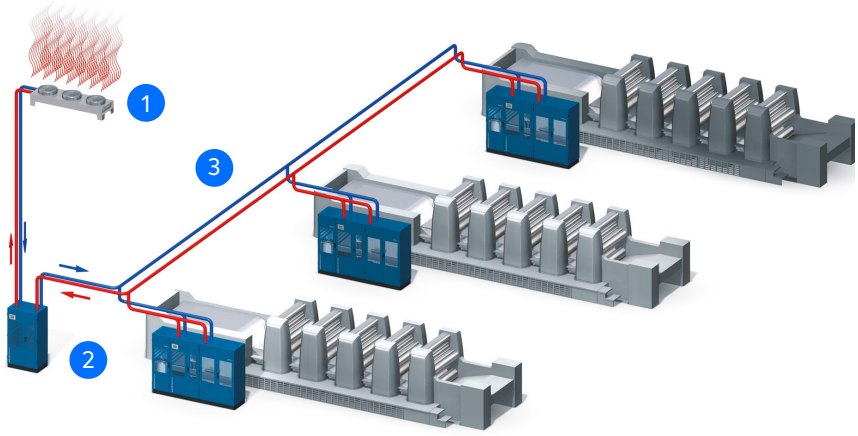
Today, water-cooled peripheral equipment is often implemented to work against this effect. technotrans reliably ensures the cooling water supply of these units based on 30 years of engineering experience.

The productivity of printing companies is continuously improving and modern printing presses can reach speeds as high as 18,000 sheets per hour. This leads to a changing demand for peripheral equipment. The increasing performance of dampening solution circulators, ink unit temperature controls, blowing and suction air supply systems, results in greater amounts of excess heat.

Correlation of air temperature and relative humidity:



› The relative humidity of an area is directly dependent on the air temperature. The physical law shown here is quite simple: rising air temperature leads to decreasing relative humidity and vice versa. Fluctuating ambient conditions have a notable negative impact on the printing papers.



1 Free cooling with a water/glycol mixture for press configurations allowing a max. feed temperature of 40 °C/104 °F

2 Pump station

3 Piping system for water- or water/glycol mixture

Central water cooling systems– the effective alternative

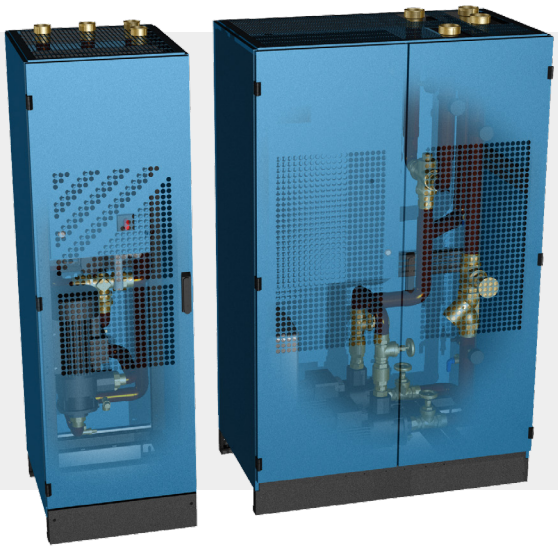
Water cooling is by now well established in the automotive industry as the standard for engines. Just as well, water is capable of absorbing the heat from a printing press and removing it from the printing room.

When compared to air cooling, the physical characteristics of water allow higher performances to be transmitted by smaller pipe diameters. The decision of which cooling system to implement is based on the individual cooling requirements as well as the local climate.

Typically the principals of free cooling are used. This method needs no refrigeration and stands out due to its very low operating costs and high reliability. Compact chillers are mainly used for special applications that need constant water temperature.

An effective approach for a better climate:

– Low and easily controllable air temperature in the printing room
– No overload of existing ventilation and air conditioning systems
– Smaller air velocity in the press room resulting in less distributed dust
– Smaller maintenance effort for peripheral units
– Smaller heating energy requirements
– Less humidification required
– Saving in overall operating costs



Advantages at a glance:

- Efficient operation by frequencycontrolled pump and intelligent free cooler air control
- CO2 and reduction of operational costs
- Special operating mode for the free cooler operation of hybrid cooling systems such as e. g. the beta.c eco
- Special operating mode for heat recovery operation
- Functional design

System components

The pumping and control cabinet is available in different sizes with one or two circulation pumps and also includes the control equipment for free cooling with glycol.
The new series beta.ps eco is always equipped with an infinitely variable speed-controlled pump. The speed control is carried out via a frequency transformer. Therefore the capacity of the pump will always be adapted to the operating conditions, so if less capacity is required the pump will reduce capacity and consequently also the power consumption. As a pump station must always be dimen-sioned for the worst case – warmest day in the year at full machine capacity utilization - in practice this means considerable energy savings.

So if the full volumetric flow is required at an ambient temperature of 35 °C. Then at an ambient temperature of 20 °C only half that volumetric flow is required. At the same time the power consumption of the pump drops to under 30 %!

The new basic.ps is the ideal addtional for retrofits and compact solutions. It is available in six different sizes from 8 m^3/h to 25 m^3/h.

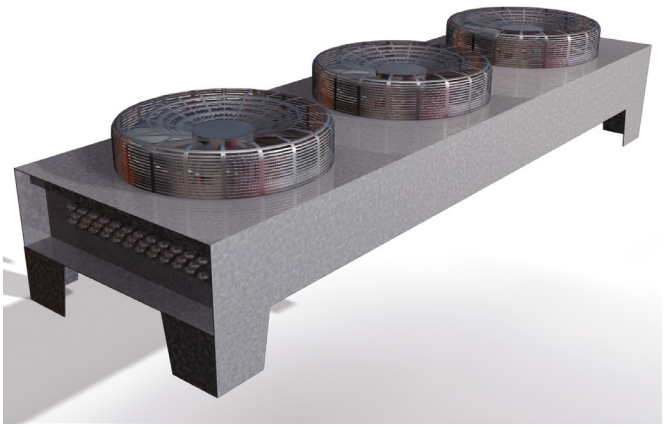
Technically comparable to the functionality of the integrated pump modules from the beta.c units, the basic.ps units are more flexible in their application as they are autarkic with their own control system, offer higher performance and are available with two pumps.

As required the units can be installed on the floor or e. g. space-saving on consoles on the wall over other peripheral units. For this purpose there is the possibility to install the switch box with the control unit up to 5 m away from the unit, for easy access.

Free cooling

The free cooling using glycol as an outdoor unit works as a simple heat exchanger discharging the heat from the printing press to the outside air via a water/glycol mixture using fans.

These units are available with different capacities and sound pressure levels for horizontal or vertical installation.
A heat recovery unit for heating purposes may be connected optionally.



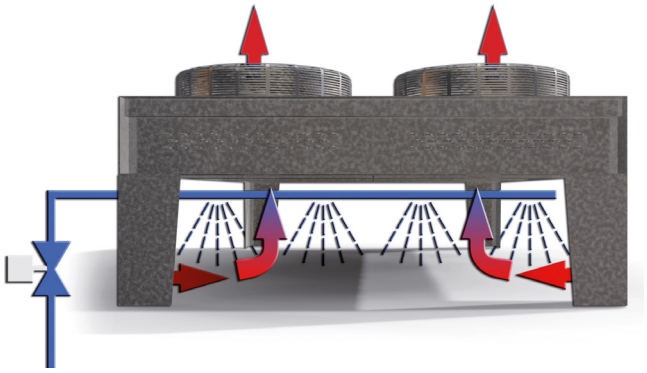
› Free cooling with technotrans re-cooling system

Adiabatic cooling

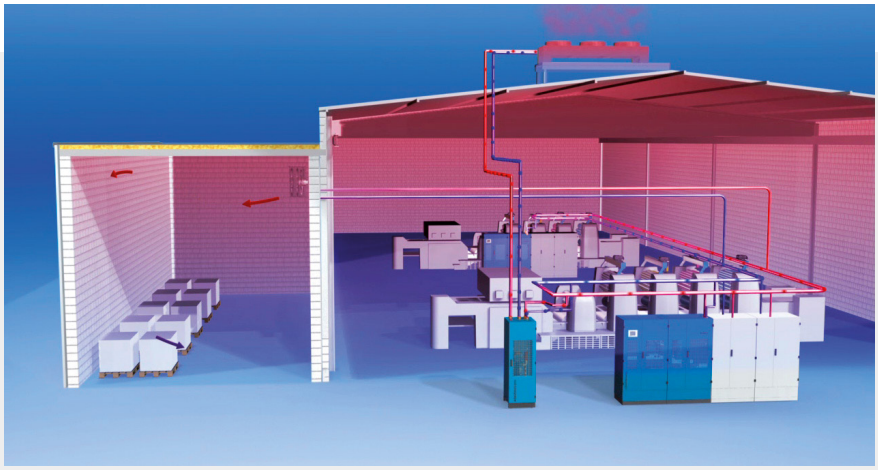
The limits for dry cooling are reached when the ambient temperature exceeds 38 °C. Normally a chiller with compressor refrigeration unit is then used.

Adiabatic cooling can be used anywhere where extremely high temperatures occur for several hours on a few days a year (peaks). A fine fog, that easily evaporates, is sprayed by the use of special nozzles. The latent heat of evaporation cools the suctioned air down and allows the continued use of the free cooler.

As soon as the air temperature drops the free cooling system returns to “dry“ mode.



› Adiabatic cooling as an alternative to water chillers



Utilize the heat

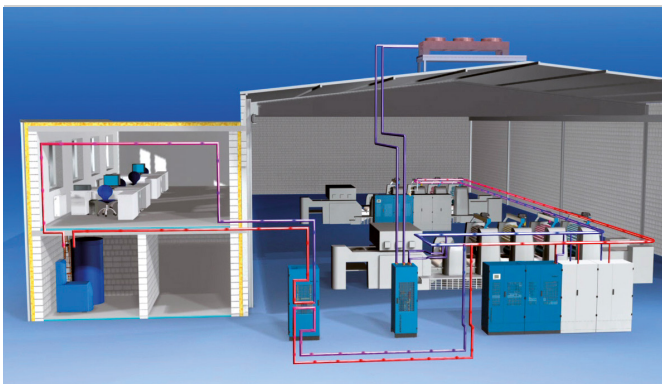
Basically you have two options. Either the heat is used directly to heat production halls or storage areas or it can be integrated into the existing heat distribution system.

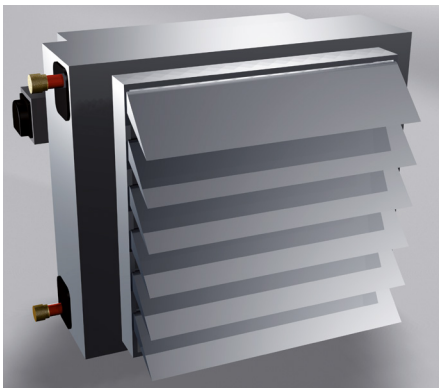
The direct solution for use of waste heat

Heat is supplied directly from the circulation of the machine and used e. g. for cooling the paper store via a simple fan. If print hall and storage areas have roughly the same temperature then the paper needs hardly any time to acclimatize and can be used sooner. This is something technotrans offers as a turnkey solution.

Two air heaters with capacities of 14 kW and 33 kW are available. Both units can be used individually as well as in combination. A complete set is made up of the air heater with outlet flap, appropriate wall and ceiling brackets, a room thermostat and a control unit.

If further air heaters are to be connected to the same package, then this is possible for up to 4 units.
In addition to the further units you then also require a distribution switch box.



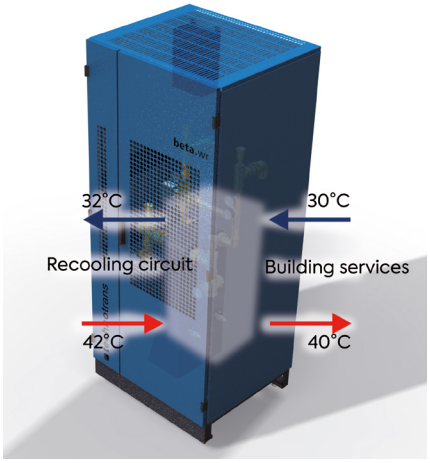


Interface for uncomplicated use of the waste heat in the facility services

Excess energy in form of heat is directly discharged from the circulation of the machine into the heat recovery module and in this way it is used in the existing building services. The capacity range is covered by modules from 50 kW to 200 kW.

The user has three benefits: heating and hot water supplied without affecting the cost, less conventional heating required - and the CO2 emission of the company is considerably reduced. technotrans delivers the interface that the technician connects to the building services. The heat recovery module is connected e. g. to the return pipe of the cold water supply of the peripheral instruments of the printing machines. The intelligent control of the module ensures that heat cannot be supplied from the facility services to the cooling circuit of the print production.

On the other hand it ensures that the temperature is not reduced below the level required for the safe operation of the peripheral units.



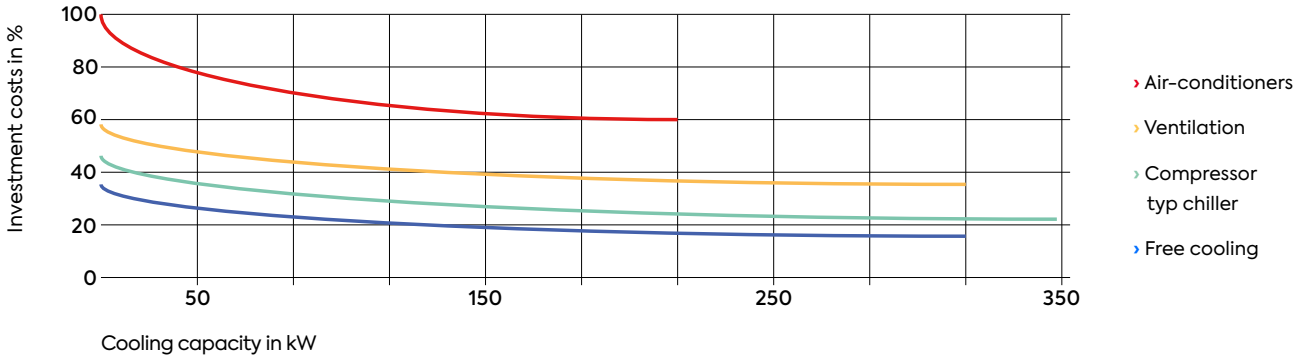
› Heat recovery module available from 50 kW to 200 kW

Compact chillers with air-cooled condenser for outdoor installation can be used for supplying cooling water with a feed line temperature between 6 °C/42.8 °F and 20 °C/68 °F with outside temperatures of up to 45 °C/113 °F.

An integrated buffer tank and circulation pumps make a separate pump cabinet unnecessary. Available with cooling capacities from 25 kW up to 500 kW, with hermetically sealed scroll-type or semihermetical reciprocating compressors, various cooling agents, different sound pressure levels and more options. A combination system with integrated free cooling allows saving 40 %–60 % of the energy costs per year, depending on the desired cooling water temperature and the local climate.

Today, technotrans recoolers are being used throughout the world. Benefit from our experience and the operational safety of well proven technology.

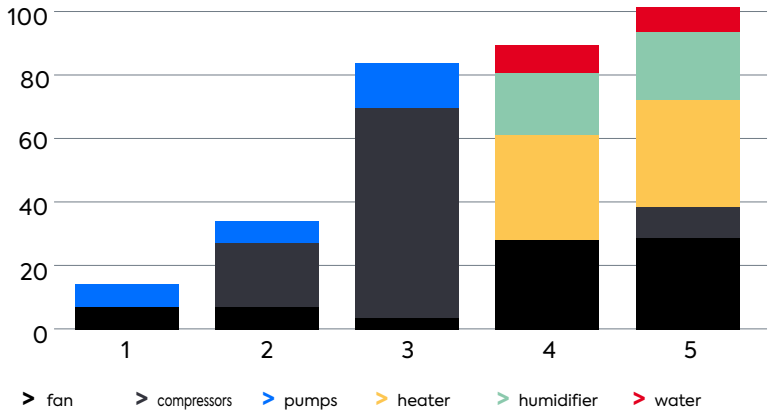
› technotrans compact chillers from 25 kW to 150 kW



Investment in savings

At first, the necessary investment into a cooling water system seems higher than for a conventional ventilation system. However, when comparing the different systems from the point of view of achieving ideal ambient conditions (21 °C/70 °F/55 % rel. humidity) for constant quality production, it becomes apparent that the cooling water system actually saves money. It can be seen that the specific investment cost per kW of cooling capacity decreases as the system capacity increases and thus that central cooling systems for more than one printing press make sense. The flexibility for the future installation of further printing presses remains fully intact since system extensions can be taken into account in the planning stage The different systems can be compared, depending on the local climatic conditions:

Operating costs of different cooling systems



1 Re-cooling with water/glycol

2 Water chiller combined with free cooling

3 Compressed water chiller

4 Ventilation system

5 Ventilation system similary to 4, with additional air cooling in summer

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- Efficient operation by frequency controlled pump and intelligent free cooler air control
- CO_2 and reduction of operational costs
- Special operating mode for the free cooler operation of hybrid cooling systems such as e.g. the beta.c eco
- Special operating mode for heat recovery operation
- Functional design in the familiar cabinet with and without pedestal

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central.cooling/EN/09.2021– Subject to technical alterations