

Operational optimisation measures for companies: Indoor climate in summer



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Indoor climate in summer

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Give your heating a summer break

The heating is not needed in the warm summer months – but on cool summer mornings, it will happily switch itself on. This makes it important to have the right setting on the heat generator for heating operation and hot water production during the summer.

Action

Switch the heating off entirely in summer – provided that your hot water production system allows you to. Make sure the priorities for water heating (see below) are set correctly in summer.

Requirement

You have access to the heating control. A separate heat generator is available for hot water.

By giving your heating a “summer break”, you will reduce energy consumption by 3 to 5 percent.

What to do

1. Switch the heating to summer mode

The right setting depends on how the hot water is produced (also see overleaf).

2. Check the heating groups

Five hours after switching off, check whether the flow pipe for the heating groups is cold and the boiler is switched off.

3. Check the heating pumps

With your hand, check whether the circulating pump is warm or whether it is vibrating. In these cases, switch the pump off manually.

4. Reduce the pressure on the thermostat valves (optional)

Set all the thermostat valves in the building to “Central position (3)” (also see overleaf).

5. Check the hot water heating function

Check whether the various heat generators are switched on correctly:



- 1st priority: the thermal solar system
- 2nd priority: heat pump, heat pump boiler
- 3rd priority: heating boiler (wood)
- 4th priority: heating boiler (gas or oil)
- 5th priority: electric (immersion) heating element – legionella circuit (see overleaf)

Costs – effort

Your own labour: approx. 1 hour in the heating basement and approx. 2 hours in a larger building to reduce the pressure on the thermostat valves.

Please note!

- The basic rule is: switch the heating off early. In case of an unexpected cold snap, you can always switch the heating back on for a short time.
- Make sure that the external sensor is not directly exposed to solar radiation. If it is, it will falsify the measurement result and will need to be relocated to a shaded position.

Additional explanations

Year-round controllers

Modern heating controls are equipped with an automatic summer function. This makes it possible to set the heating limit, i. e. the temperature at which the heat generator (heating boiler, heat pump) starts to work. The benefit of this is obvious: the system switches on automatically at unusually low temperatures. There is no manual winter-summer switchover on these controllers. (Also see the fact sheet on heating: 01 Optimise the volume flow)

With or without water heating

The setting for summer operating mode depends on how the hot water is heated.

Case A: hot water is not heated by the heat generator in summer. Switch the heating off completely (operating mode selector switch: “Off”). The heat generator is completely switched off.

Case B: hot water is partially or fully heated by the heat generator in summer. Set the heating to summer mode (operating mode selector switch: “Summer”). The heat generator is now set so that it does not “heat” the building, but does heat up the hot water when required.

Operating check on heating pumps

You can check the temperature and vibration to determine whether the heating pump is operating. If the pump is more than lukewarm or if it is vibrating, it is still running. In this case, it may be that the circulating pump has to be switched off manually from a separate switch, especially on older systems. Newer controls perform this automatically.

Why reduce the pressure on thermostat valves?

In the “Central” position (3), the mechanism that regulates the flow of water into the radiators is somewhat relaxed. This reduces the risk of blockage and having to release the bolts manually in autumn. Reducing the pressure on the thermostat valves is a time-consuming task because you have to go through the entire building in spring (to reduce the pressure) and again in autumn (to reset the correct temperature). This job therefore tends to be performed infrequently in practice.

Switching on the legionella circuit

If your water heater uses an electrical heating element to increase the temperature of the water in the tank periodically – to 60 °C once a week, for example – make sure that the tank is thoroughly warm (e.g. 55 °C) before the electrical element switches on. The electrical element should then be used only for the residual heating (from 55 to 60 °C).

Note: according to the latest scientific investigations, the positive effect of switching on legionella circuits in tanks with hygienically critical temperatures is disputed. Switching on the “legionella circuit” each week is thus no longer recommended.

Additional information

- [Energy manual for caretakers](#)

Indoor temperature in midsummer – not too hot, but not too cool

In summer, work areas should not be cooled to less than 26 °C by the air conditioning system. Employees' behaviour is also a key factor in achieving a pleasant indoor temperature – which is a maximum of six degrees Celsius below the outside temperature.

Action

Set the air conditioning (cooling) system so that the indoor temperature is not reduced to less than 26 °C “mechanically” – i. e. by the air conditioning system.

Requirement

The building is cooled (mechanically) in summer.

Every time you reduce the indoor temperature by 1 °C, your energy costs for cooling increase by 3 percent.

What to do

1. Reduce indoor loads and activate the night cooling

Check whether the internal loads (lighting, electrical devices, etc.) can be reduced and whether the night cooling is working as intended.

2. Set the optimum activation value for the air conditioning

If the activation value for the air conditioning is set too low, the system will switch on even though the (maximum) indoor temperature of 26 °C has not yet been reached. You can use an iterative procedure to find the optimum activation value for your air conditioning (cooling) system:

- During the hottest period in high summer, increase the activation value by 1 °C.
- Wait a few days and measure the indoor temperature in two or three exposed rooms (south-facing server rooms or offices).
- Repeat this until you receive complaints from employees or the maximum indoor temperature of 26 °C can no longer be maintained in the exposed rooms.



- At this point, reduce the activation value by 1 °C again (one step down).

Costs – effort

Your own labour (checking the setpoints, adjustments): depending on the size of the building, ½ day to 2 days.

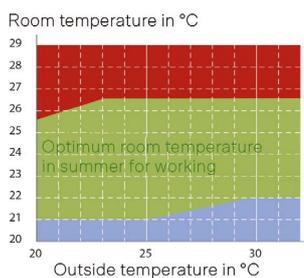
Please note!

- The indoor temperature is regulated by sensors for supply air, exhaust air or room air. The type of sensor and/or the measuring location will have a major influence on the measurement value that should be set. For systems in which the indoor temperature is controlled by a supply air sensor, the supply air setpoint is lower than the setpoint temperature for the room. In this case, the optimum setting value has to be approximated.
- There are various industries where the maximum indoor temperature is dictated by the products or the process. For instance: medicines in pharmacies and drugstores must be stored at a room temperature of less than 25 °C.

Additional explanations

Optimum indoor temperature in summer

A pleasant indoor temperature in offices is a maximum of 6 °C less than the outside temperature, and the same applies to workshops, clothes shops, restaurants, fitness centres, etc. The indoor temperature should not be reduced “mechanically” to below 26 °C.



Free cooling via the ventilation system

Every ventilation system enables “direct free cooling” at outside temperatures of less than 18 °C; this means that “cool supply air” can be blown into the rooms. This direct free cooling is an energy-saving method but, unlike an air conditioning (cooling) system, it cannot guarantee a fixed indoor temperature. As well as the cooling, the air humidity in the room must always be taken into account; this may require the operation of an air-conditioning (cooling) system.

The right way to use small air conditioning units

Recent years have seen noticeable improvements to the energy efficiency of small air conditioning units such as compact units that operate with circulating air or split systems that blow the exhaust air to the outside. But they are still power guzzlers and should only be used for very specific purposes in rooms that are in regular use.

- Only cool a room when it is being used.
- The pre-cooling time should not exceed 1 to 2 hours.
- Position the air conditioning unit in the room so that the air can circulate freely.
- Close all windows and doors.

If the room is cooled by a permanently installed air conditioning (cooling) system, be sure to set this

Correct behaviour for employees

Employees have a critical influence on the amount of energy consumed for cooling. Four points to note:

- Activate the shading early in the day: the sun should never shine directly into the room. Close roller shutters, blinds or awnings in good time. Indoor curtains, blinds or louvres merely provide protection against glare; the rooms still heat up.
- Close windows and doors: keep the warm air out when it’s warmer outside than indoors. Also close windows behind closed blinds.
- Reduce indoor sources of heat: unused devices, screens and lamps should be switched off whenever possible.
- Use night cooling: during the night, use the ventilation system to blow cold air into the building, or leave the windows open. If it is not possible to leave windows open at night (to protect against intrusion or due to weather conditions), open all the windows early in the morning to let the cool air into the rooms.

system correctly. After this is done, there is usually no further need for the small air conditioning unit and it can be removed.

Find the optimum switchover point for the free cooling

In terms of energy efficiency, indirect free cooling (via the cold water network) should be used for cooling for as long as possible. The mechanical cooling (cooling by air conditioning) should only be switched on when temperatures no longer allow full cooling by means of free cooling. To find the optimum switchover point from free to mechanical cooling mode, follow the procedure described on the front page: gradually increase the switchover point and monitor the effects until the maximum indoor temperature of 26 °C is exceeded or complaints are made.

Additional information

- [Pleasant indoor climate: five tips for summer](#)
- [Stay cool](#)
- [Technical book: “Cooling with air conditioning today”, Faktor Verlag, 2019](#)
- [Guideline with measures to optimise cooling systems](#)

Shading – consistently block out the sun in summer

Inadequate shading is often the reason why rooms are too hot. The solar protection control therefore has to protect the rooms against direct solar radiation and, when necessary, rectify incorrect blind settings made by employees.

Action

Set the control for the solar protection (slat blinds, roller shutters, façade awnings, window shutters or indoor blinds) so that the sun never shines directly into the room.

Requirement

The building is equipped with a control that automatically regulates the solar protection.

Reducing the indoor temperature by 1°C increases the energy consumption of the air conditioning (cooling) system by 3 percent

What to do

1. Identify “overheated” rooms

Find out which rooms are too warm in summer.

2. Check and correct the control for the blinds

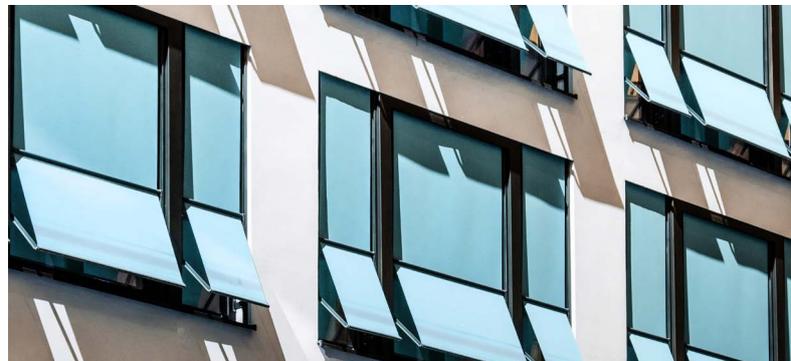
- Solar threshold: is the solar protection closed in case of direct solar radiation? (Also see overleaf.)
- Wind threshold: does the solar protection open correctly? (It should not open simply because there is a gentle wind.)

3. Check the timeswitch programme

Is the timeswitch programme set correctly? If necessary, adjust it to the current situation in your organisation.

4. Inform your employees

Inform your employees about the five tips for a pleasant indoor climate in summer (see overleaf).



5. Note, observe and correct

- Enter the new settings in the logbook.
- Observe the users (are there any complaints?) and correct the set values if necessary.

Costs – effort

Your own labour: about half a working day

Please note!

- On blinds with slats, set the angle so that direct solar radiation is avoided but sufficient light is supplied to the room. This can eliminate the need for electric lighting.
- The solar protection can be operated decentrally (rotary crank handle, roller shutter belts, motor) or centrally (motor). Users should be able to override central systems if necessary. Regardless of the system, employees must be aware that major expenditure (of energy) is required to restore the climate to a comfortable range once rooms become overheated in high summer.

Additional explanations

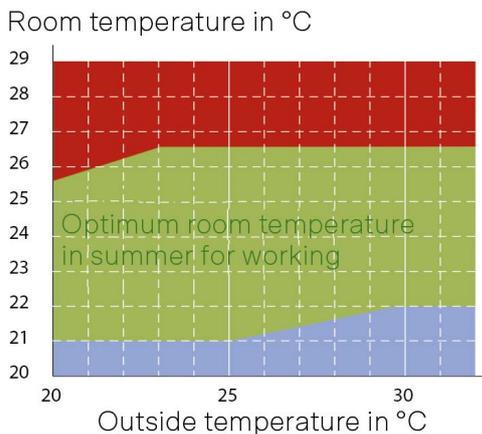
Effectiveness of solar protection

External shading systems with awnings, blinds, shutters or roller shutters are effective. They keep the heat outside the building and reduce incoming thermal radiation by up to 75 percent. If no external shading equipment is available, internal fittings such as roller blinds or curtains are a solution. These are not as effective because sunlight and (thermal) energy are already present in the room. Nevertheless, internal fittings are better than no protection whatsoever.

Solar protection films: special solar protection films are applied to the outside of windows to reflect the sunlight. However, they are not as effective as awnings, blinds or shutters. They also allow less daylight to enter and actually prevent solar radiation from entering when it is wanted in winter.

Correct indoor temperature in summer

When it's hot outside during the summer, the indoor temperature in offices will often rise as well. If you can set the indoor temperature yourself, the values in the following table will guide you:



In summer, the optimum working temperature is between 22 and 26 °C. Avoid lower temperatures because nothing is more disagreeable than coming out of a “cold” office at 18 °C into the blazing summer heat. Please note: your air conditioning system will not cool any faster if you adjust the

thermostat to the lowest possible setting. If you want the indoor temperature to be 24 °C, then set 24 °C. Not 18 °C!

Keep hot air outside!

Close windows and doors when it's warmer outdoors than inside the building. That way, you'll stop the warm outdoor air from entering and keep the pleasantly cool indoor air inside the building at the same time. To help air circulation, you can open the windows on the shaded side of the building or open doors leading into corridors. Also: use night cooling as far as possible. Incidentally: the windows of air-conditioned buildings must always stay closed.

Correct the user settings

To help employees make consistent use of the shading system, the control for the blinds can intervene to take corrective action – for example, to lower all the blinds in the building at 12:30 pm. This closes all the blinds that were open and users must manually “override” the setting again to open them. Another option is to set the control so that it sends out the “Lower blinds” signal every 2 to 3 hours on days when the outside temperature is more than 22 °C and the sun is shining, so “forgotten” blinds are closed. (But please note: users could become annoyed if the intervals are too short).

Correct behaviour for employees

Here are five steps that employees can take to improve the indoor climate noticeably during summer.

- Activate the shading early in the day
- Close doors and windows
- Use night cooling
- Set the right indoor temperature
- Reduce indoor heat dissipation (switch lights off)

Additional information

- [Pleasant indoor climate – five tips for summer; fact sheet to inform employees](#)
- [Stay cool – thermal protection for offices and commercial premises](#)

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