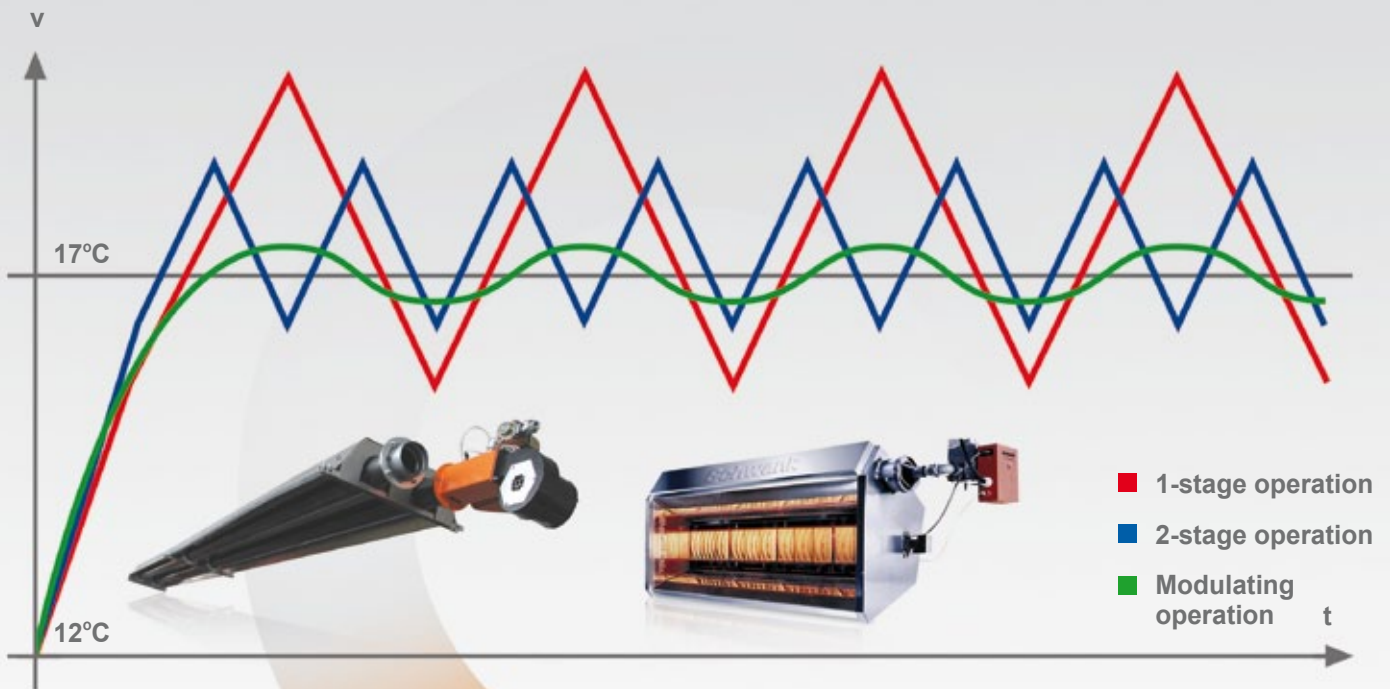


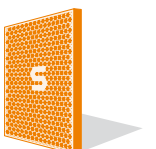
Fully Modulating Schwank Infrared Heaters



Save up to 14%
energy and enhance
your thermal comfort!



Schwank
INNOVATIVE HEATING SOLUTIONS



Thermal Comfort coupled with Energy Savings

■ Fully Modulating Schwank Infrared Heaters

Fully modulating boilers have become the standard for water heating systems. Now this energy-saving and thermal comfort optimised operation mode becomes accessible for gas infrared heaters.

All Schwank infrared heaters are now available as fully modulating appliances. This not only reflects the current state of the art, but reinforces that Schwank assumes its role as an innovator in the industry.

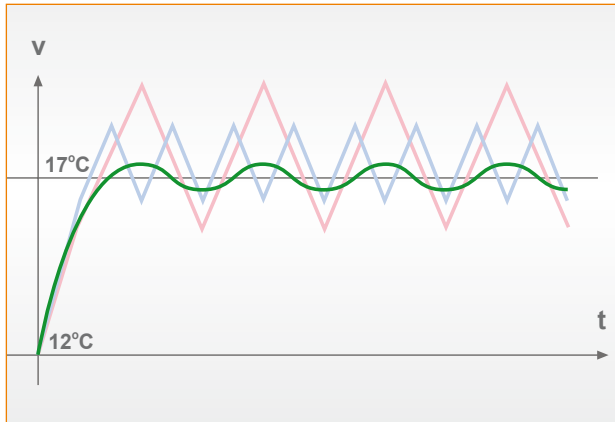


■ Heat Loss Calculation for Industrial Buildings

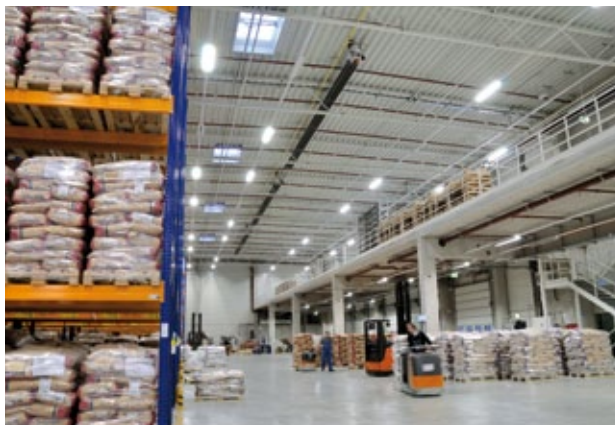
For calculation and design of the heating systems a heat loss calculation is carried out according to European standards [i.e., DIN 12831]. Important parameters of this calculation are the desired room temperature and the minimum temperatures of the location. For instance, for Birmingham this means for example a minimum outside temperature of -5°C . However, the average outside temperature of the heating time is just $+7.9^{\circ}\text{C}$. In order to heat up the building in these conditions, the heating system has to be designed for the minimum outside temperature. This means that the heating system is oversized for about 95% of the time.



■ **The adjustment of the heating power can be reached by different types of control**



- 1-stage operation [red]
The desired temperature is controlled by switching the heaters On/Off – 100% output or 0% output
- 2-stage operation [blue]
The control of the heaters is based on On/Off switching and reducing the heat output to 50% [2nd stage]
- Modulating operation [green]
Using modulating control the heating power will be continuously adapted to the actual heat demand of the building. The heat output is adjustable – depending on the requirements – anywhere between 50% and 100%.



■ **The Fully Modulating feature saves up to an additional 14% of energy costs**

Similar to a motor vehicle an infrared heating system has the highest consumption of fuel at full throttle. Since full throttle is only needed a few days a year, the modulation control provides the possibility to adapt the performance of the heating system to the actual heat demand. Therefore, the energy cost can be reduced by up to an additional 14%. Furthermore, the thermal comfort is improved. While at 1-stage control the actual temperature can vary around several Kelvin to the required value, Schwank fully modulating controlled heaters are adjusting to the actual required room temperature. Temperature peaks are being avoided. People feel this constant temperature adjustment as being pleasant.

■ **Sample calculation**

Building parameters:

- 154 kW heated with luminous heaters [plaque] type supraSchwank
- 2 shift operation
- +17°C desired room temperature
- Minimum outside temperature -12°C
- Gas price €/kWh

Energy costs*:

■ 1-stage operation mode	9,128 €		
■ 2-stage operation mode	8.394 €	↓ 8%	
■ Fully modulating operation mode	7,864 €		↓ 14%

Additional cost for fully modulating control compared to 1-stage control

ROI in 2,9 years

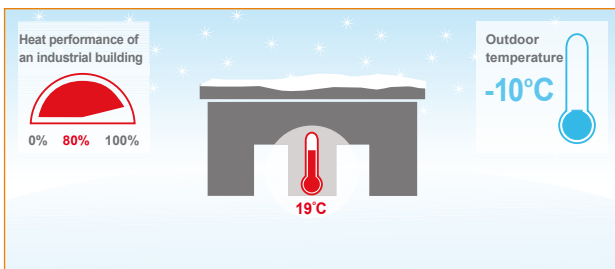
* Energy costs calculated for a statistical year and in accordance to DIN EN 12831

Innovative. Experienced. Competent.

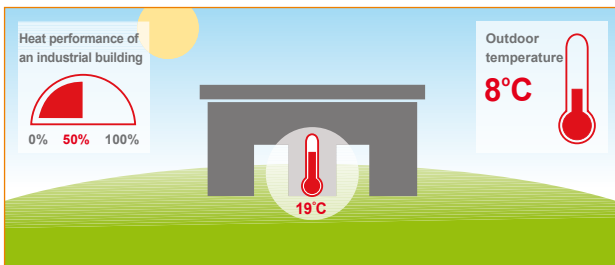
Advantages at a Glance

- Additional energy savings of up to 14%
- High level of comfort, avoidance of temperature peaks
- Constant thermal comfort
- Less wear & tear by reducing the on/off cycles by up to 43%
- Simple operation due to ThermoControl Plus M
- Full integration into Building Management Systems

Required heat performance of an industrial building:



Winter



Spring / Autumn

About Schwank

Schwank is a synonym for high quality and energy-saving industrial heating systems. As the worldwide market leader of gas infrared heaters Schwank has extensive experience in the development, production and implementation of heating systems. Over 150 000 satisfied customers and more than two million units speak for themselves [see references at www.schwank.de].

Being a German manufacturer, we stand by our claim to deliver products and services with the highest possible quality. Providing energy saving and CO₂-minimising products is the foundation of our philosophy. Meaningful innovation is our passion.



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