5. Agricultural Heating Systems

5.1 Pigsties and Cowsheds

Pig pens should be warm, ventilated, properly lighted, and appropriate for each stage of life. Microclimatic conditions are vital in relation to the health, comfort, and productivity of the animals.

Such conditions are as follows:

- Humidity
- Temperature
- Lighting
- Air pollution

Of these conditions, the most important are humidity and temperature.

Depending on the quality of the building, these conditions are subject to vary, and therefore have substantial influence on the animals.

Pigs that are subjected to colder temperatures are at risk to breathing problems, increased food rations, and lower birth weights. During the time where pigs gain most of their weight (35-70kg), this body mass increase is diminished by 15-20g per day at a 1°C decrease of required air temperature.

Temperature requirements for pigs:

- Piglets: 24-26°C
- Pigs: 17-24°C
- Fattening pigs: 14-22°C
- Boars: 12-20°C
- Sows (little or no piglets): 12-20°C
- Sows (many piglets): 15-25°C
- Feeding sows: 18-26°C

Due to these temperature requirements, floor heating should be used to adapt to the needs of each type of pig. The system should be installed under the entire pen or where the pigs reside the most.

The required power per m^2 depends on the body weight of the animal:

- Pigs below 20kg: 200W/m^2
- Pigs 20-50kg: 150W/m^2
- Pigs above 50kg: 100W/m^2

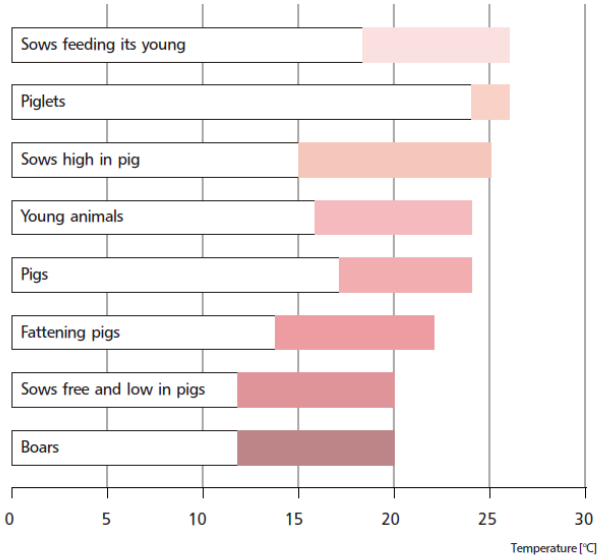
Floor heating may be installed only where the need for heat is required the most, to decrease the costs of heating. Piglets have a need for higher temperatures, as opposed to full-grown animals which can be the lower temperature of 18°C.

Floor heating ensures:

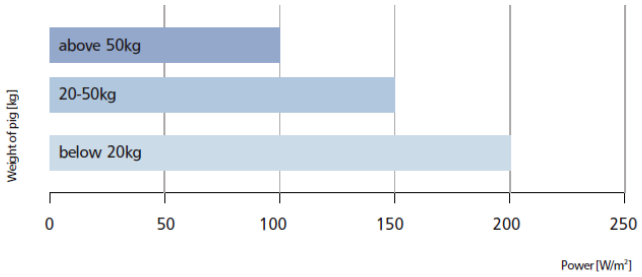
- Temperature control through means of a temperature controller with a floor temperature sensor
- Regular temperature distribution
- Individual control of each pen
- High flexibility with heating cables location
- Dry floors (bedding is advised for excrement removal)

Heating pigsties requires a two cold tail heating cable with a power of 20W/m. Cables should be installed using an assembly net and submerged in 50mm of concrete.

Thermal standards for individual production groups

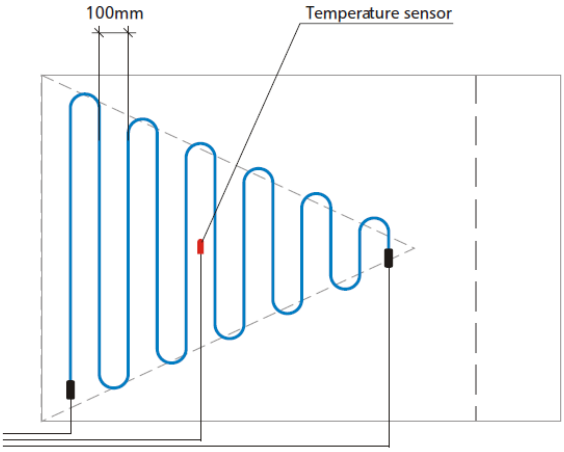


Heating power at 1 m² of surface according to weight of individual



Example: 1.6msq pig pen for pregnant sows. A power rating of 200W/msq is required. The area requiring heat (bedding) is 1.6msq. So, in this instance the power of the heating cable should be 320W/msq

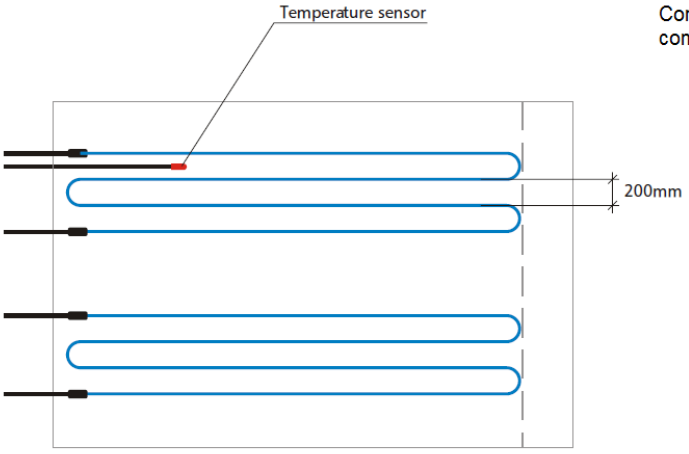
Contact P.A.P. Heating Solutions for correct part number for cable and thermostat.



Layout of heating in a pig pen

Cowsheds Example: Heating cables installed across cowsheds with a width of 600-800mm in accordance to the direction in which animals sleep. The unit power of the surface should be 50-80W/msq

Controls: ELEKTRA ETN-F Din-rail mount controllers



Layout of heating in a cowshed