



## Climate and Production Control for Poultry Production

## DOL 534 Climate Computer



## DOL 535 Production Computer



The demand for meat rises together with economic development on a global scale, which creates ever-larger demands for efficient agricultural production globally. This development has led to modernisation of agriculture, not least for poultry production, which today is one of the most efficient forms of animal production.

### One Series - Numerous Options

SKOV has developed a series of house computers for climate and production control in the production of broilers and breeders. The house computers are designed on a modular principle, which means they can easily be adapted to the needs of the individual grower.

### User-Friendly and Intuitive

What the SKOV house computers have in common is that they are operated using a large touch screen with graphic icons. The icons ensure recognition and make the computer easy to operate in daily routines.

The menus are simple logically structured, and allow for individual setup of outline menus at different user levels. Each user level can be protected against unauthorised changes with a password.

### Several livestock houses, one set-up

A poultry producer often has several livestock houses that are controlled according to the same settings. With a house computer from SKOV it is possible to copy the settings from one house computer to another using a USB flash drive. If the producer has the management program FarmOnline, the settings can also be easily transferred from the central office using a PC.

### One Controller - Many Languages

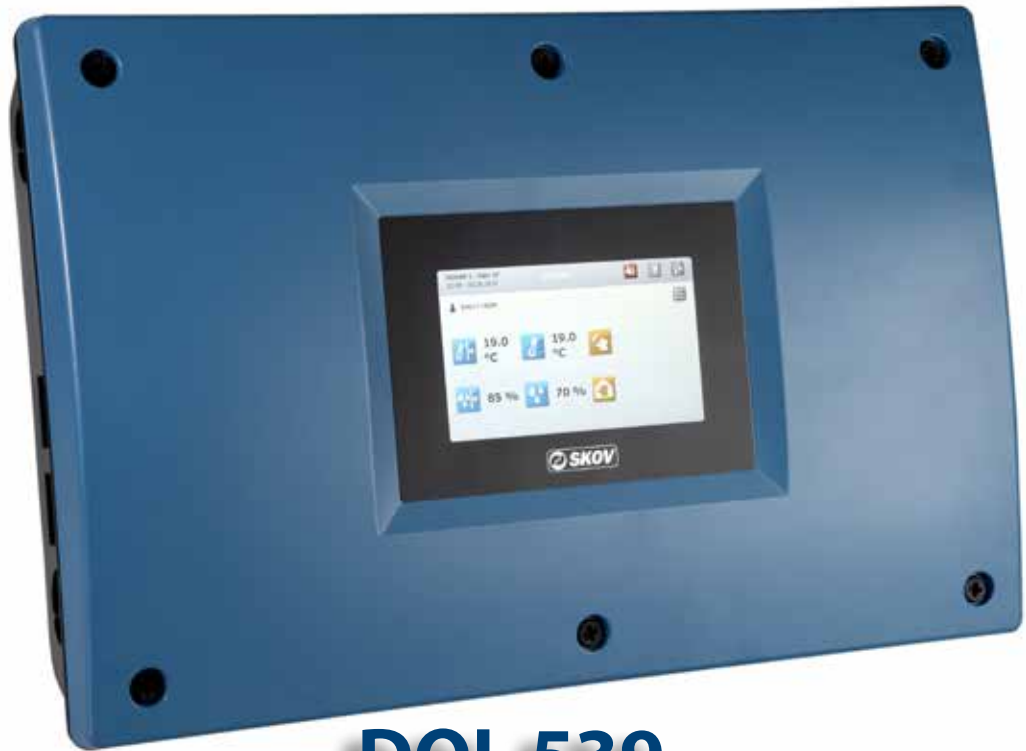
It is easy to change the language shown on the computer display, which has more than 25 different language options. This means that foreign employees can easily change the display language and use the house computer without language barriers.

### DOL 53X Models

DOL 53X versions of climate and production computers:

- DOL 534 Climate Computer
- DOL 535 Production Computer for Broiler Production
- DOL 535 Production Computer for Parent Stock
- DOL 539 + P Climate and Production Computer
- DOL 539 Climate and Production Computer for Broiler Production
- DOL 539 Climate and Production Computer for Parent Stock

The above models are available in different hardware versions, as well as all being available in a version designed to be fitted in a wiring box.

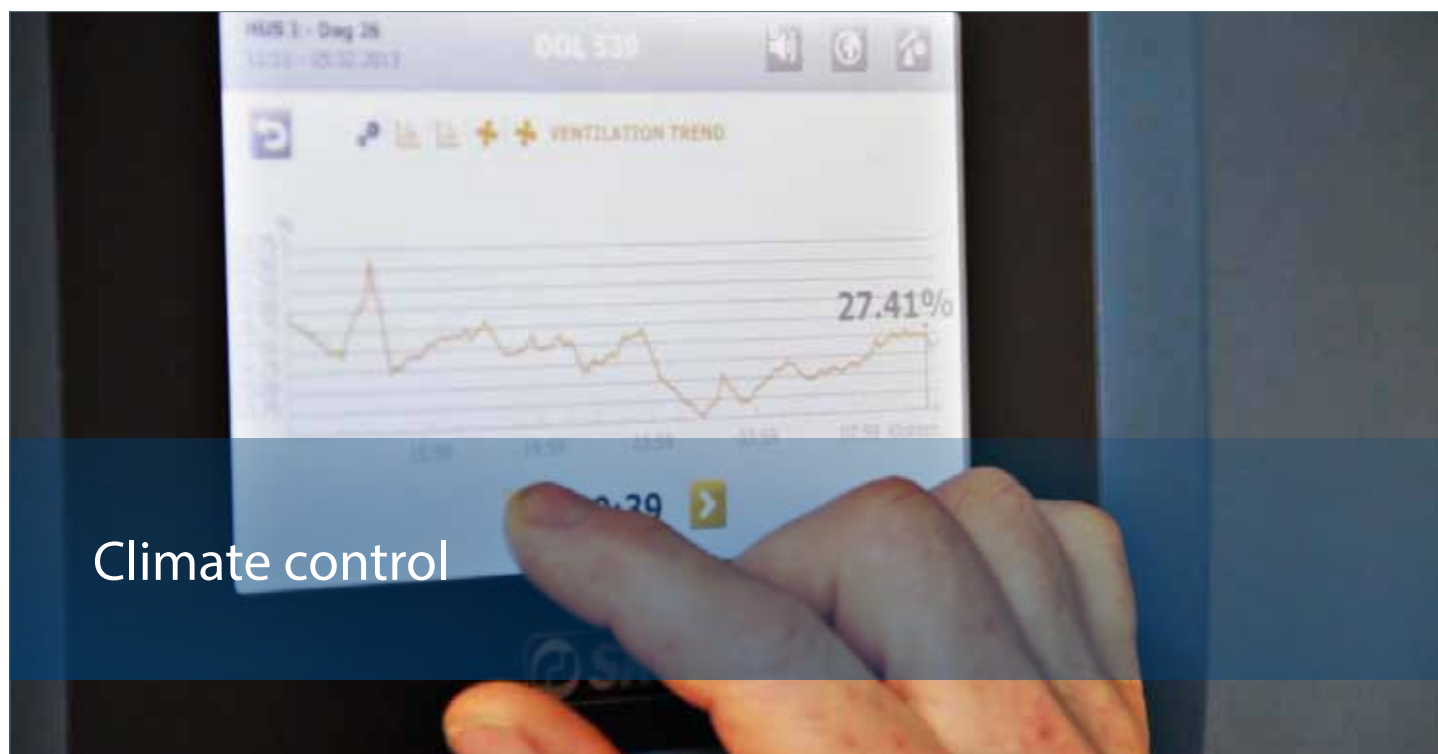


## DOL 539

### Climate and Production Computer



*The SKOV house computers are available in a version for wiring box installation.*



## Climate control

### Climate Functions

The house computer is available in several versions, all ensuring that the grower has the right climate in the livestock house based on the type of production and climatic conditions.

### Precise Control - Improved Gain

A uniform climate provides the best growing conditions for animals, and because of this it is important to have a climate controller that is precise and efficiently regulates and maintains the climate at a set level. The house computers from SKOV provide a precise and efficient control of livestock house climate, as well as being easy to use for those working with them.

### Numerous options

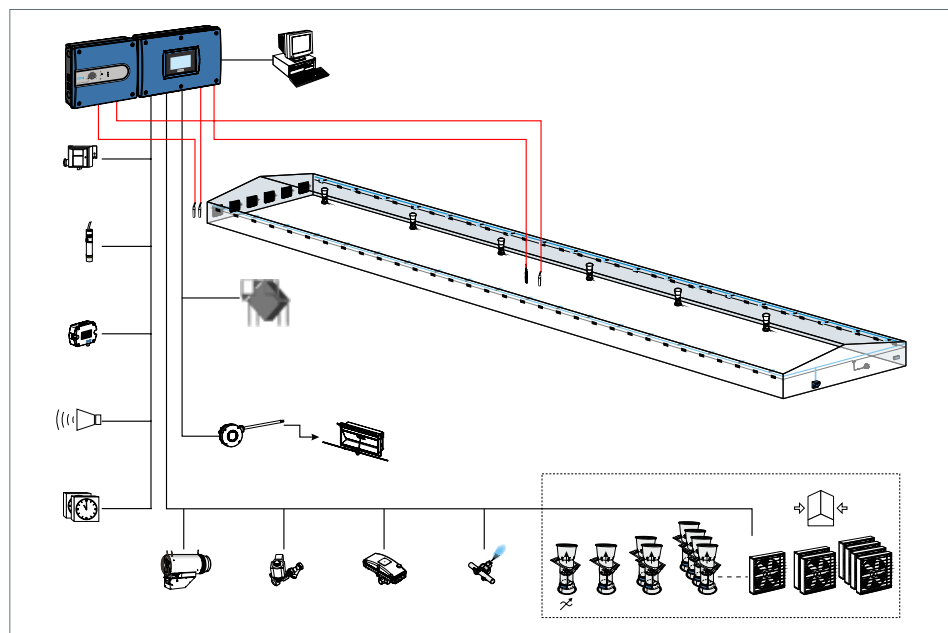
The house computers come with an array of possibilities for adjustment, where it is possible to adjust the livestock house climate according to set curves, for ventilation, heating and cooling. The climate can be regulated based on temperature and humidity, but also on the CO<sub>2</sub> level. It is possible to control several sources of heat and cooling, which can be activated according to requirement. Similarly, the house computer has an array of "batch end" functions that make the cleaning between batches easier. In addition to this, the house computers are one of the few controllers on the market that can control heat recovery as an integrated part of the ventilation system.



*The house computers from SKOV are easy to operate and contain many functions that create the best conditions for productivity in livestock houses.*

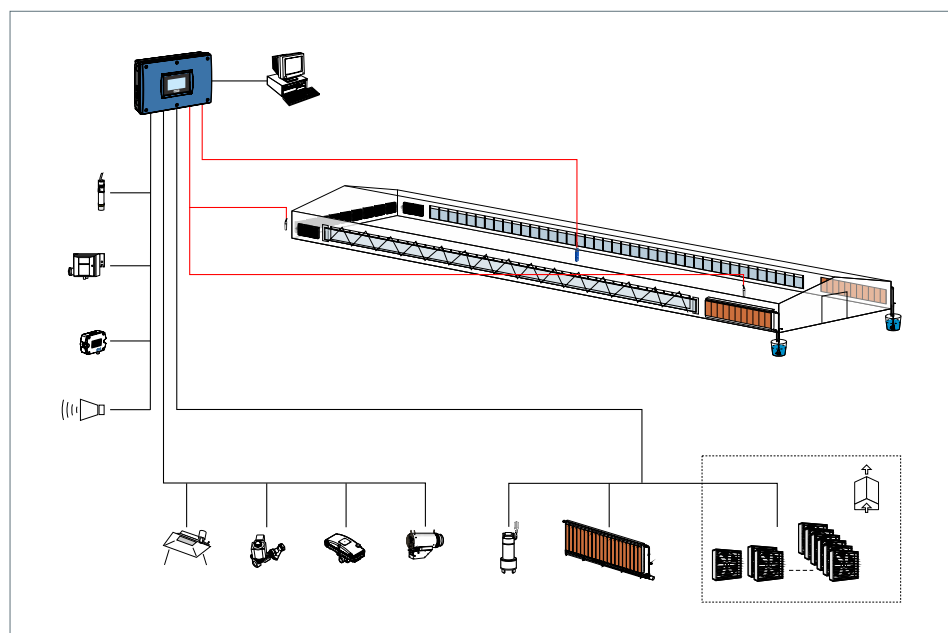


## DOL 539 Possible Connections



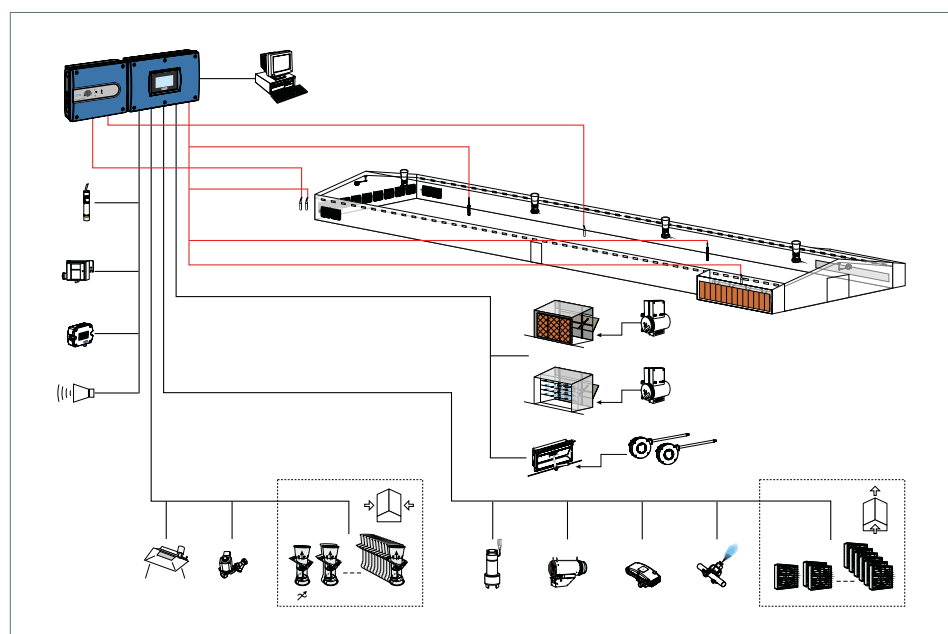
### DOL 534/539 LPV

The house computer can control the climate based on the LPV principle (Low Power Ventilation) which is most often used in the temperate parts of the world. The fresh air is directed into the house through either wall or ceiling inlets and the air outlet is conducted through wall fans or exhaust units in the roof.



### DOL 534/539 Tunnel

The house computer can also control the ventilation based on the Tunnel principle, which is used in tropical parts of the world. Air is taken in through cooling pads at one end of the house and let out through large gable fans at the other end of the house. This creates a cool air current lengthwise in the house.



### DOL 534/539 Combi-Tunnel

The house computer can also integrate both the LPV and Tunnel principles in one intelligent Combi-Tunnel ventilation system, which is the best solution in subtropical parts of the world. The controller ensures optimum conditions for the animals by making the ventilation dependent on the outside temperature and the age of the animals. At low outside temperatures, the system ventilates according to the LPV principle and at high outside temperatures according to the Tunnel principle.



## Climate Functions

- PID regulation technique
- MultiStep and Dynamic MultiStep
- Control according to outside temperature
- Comfort control
- Night temperature setback
- Regulation with CO<sub>2</sub> minimum ventilation
- Control of several heat sources, including heat recovery units
- Air circulator
- Humidity control with/without heating
- Pad cleaning function
- High-pressure cooling and cooling pads
- In-between functions (soaking/cleaning/drying)
- Extended curve control (temperature, heating, humidity, Tunnel start, minimum and maximum ventilation)
- Trend curves
- Reduced energy consumption

## Production Functions

- Feed control (pan feeding, chain feeding, separate outlet feeding)
- Feed programs for filling and feeding
- Electronic silo weighing with two feed demand sensors
- 2 or 4 silos
- Supervision and control of water supply
- Egg counter
- Interval timers
- Customisable values
- Light control with light program and dimmer
- Automatic and manual bird weighing
- Recording of animals
- 5 feed components
- Mixing of feed (drum weigher)
- Feed consumption monitoring
- Calculation and display of FCR and EPEF
- Calculation and display of feed and water per animal

## Low Energy Consumption - Large

- ✓ Major Energy Savings
- ✓ Optimal Livestock House Climate for the Animals
- ✓ Less Noise in the Livestock House
- ✓ Quick Return on Investment

**S**KOV focuses on developing solutions that in addition to creating optimal conditions for animals also use the least energy possible. We have several solutions that lower energy consumption significantly as they are all designed and optimised in relation to the overall system, so that SKOV's customers are sure to have a ventilation system that works well and is energy-efficient.

**33%**

Using Dynamic MultiStep with an LPV system it is possible in temperate, climatic conditions to lower energy consumption in a broiler production (40 000 animals) from 20 000 to 13 000 kWh per year.

The SKOV DOL 534/539 house computer controls the air intake using SKOV's two regulation principles: MultiStep® or Dynamic MultiStep, which, in addition to ensuring the best livestock house climate, also lowers energy consumption significantly.

The difference between the two regulation principles is that MultiStep provides continuously variable regulation from 0 - 100%, while the other fans are connected in groups as needed. The Dynamic MultiStep utilises the low energy consumption that fans with EC technology have at low ventilation level. All fans are continuously variable to approx 40% of their output based on the MultiStep principle. Thereafter they are connected in parallel up to full output.

### MultiStep or Dynamic MultiStep?

There are different factors that come into play when selecting regulation method, e.g.:

- Climatic conditions
- Current ventilation solution
- Investment profile

The regulation principle Dynamic MultiStep provides the largest energy saving. As a matter of fact, the energy consumption in a broiler house can be reduced to only 13 000 kWh/year (at 40 000 birds). Deciding which regulation principle is the best investment is a very individual matter, and we will of course provide advice and directions about which one is best suited for individual projects.



## Production Control

In order to have a high and uniform growth in modern poultry production, it is important to have an efficient controller to regulate and systematically monitor feed, water and light, among other things. With a house computer from SKOV efficient production control and systematic monitoring are ensured, which give a complete overview of productivity.

The house computer has the following primary functions:

- Ensuring that the animals get the right amount of feed and water so their growth potential can be completely utilised.
- Ensuring good and uniform conditions for all the animals in the livestock house.
- To collect updated and valid data, upon which the producer can base his decisions.
- To provide the producer with effective production monitoring so he can take measures in case of irregularities.

- To detect problems before they are visible during the daily inspections. At the start of an outbreak of a disease or if bad feed is supplied, the producer will detect an irregularity in the water and feed consumption ratio many hours before visible symptoms appear.

### Monitoring – the Key to Control

Constant production monitoring makes it possible for a grower to control production efficiently.

The road to success depends on data that is up to date and correct, providing the bases for grower decisions. Regardless of whether the birds are broilers or parent stock, their productivity can be very high; however, only if they are produced under the best conditions.

The house computer contains an array of options that makes it easy to install and adjust. In addition to this, SKOV is happy to create a feed program together with the customer, which can be adjusted based on customer wishes and earlier production results.

The house computer contains an array of standard references, but the grower can also choose to enter their own references.

### The Key to Success

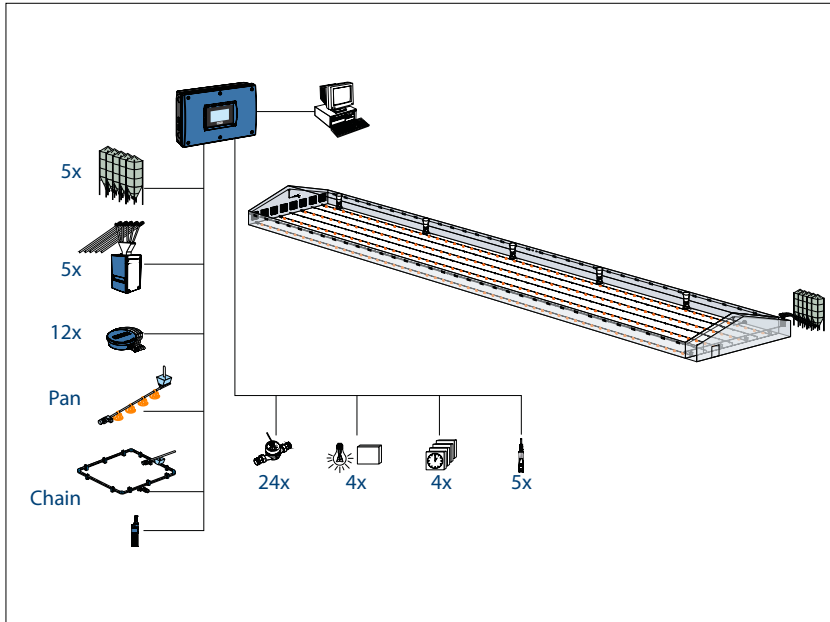
The success of a grower is not only based on the livestock house equipment, but to a great extent also on the ability to analyse and act on data supplied by a house computer.

It is possible to see an array of key figures on the house computer, including:

- Daily gain
- Feed consumption per animal
- Feed conversion (FCR)
- Water/feed ratio
- Mortality
- Feed
- EPEF

With a thorough review of these key figures it is possible to get the best out of your production.



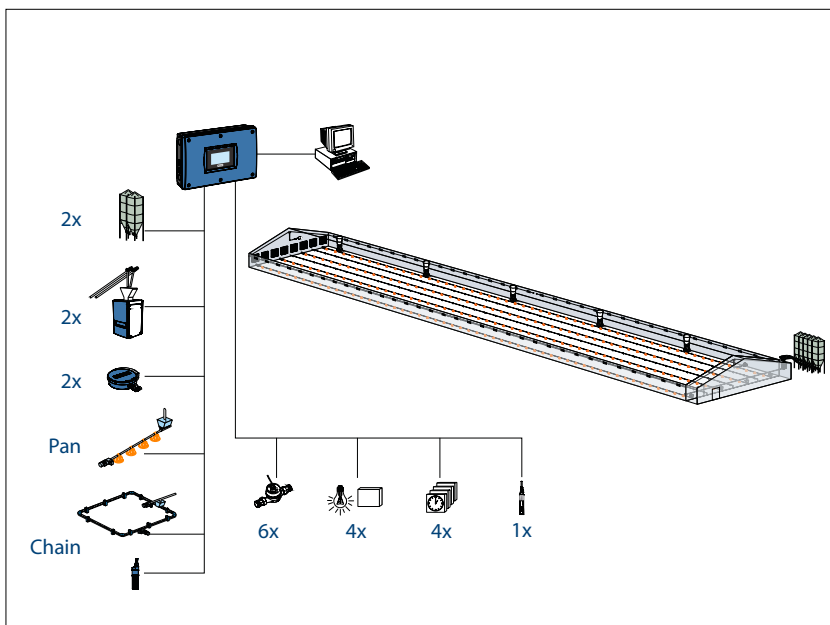


### DOL 535/539 for Broilers

In broiler production it is essential that the animals utilise their potential for growth and that the batch growth is uniform so that they weigh the same at the end of the batch.

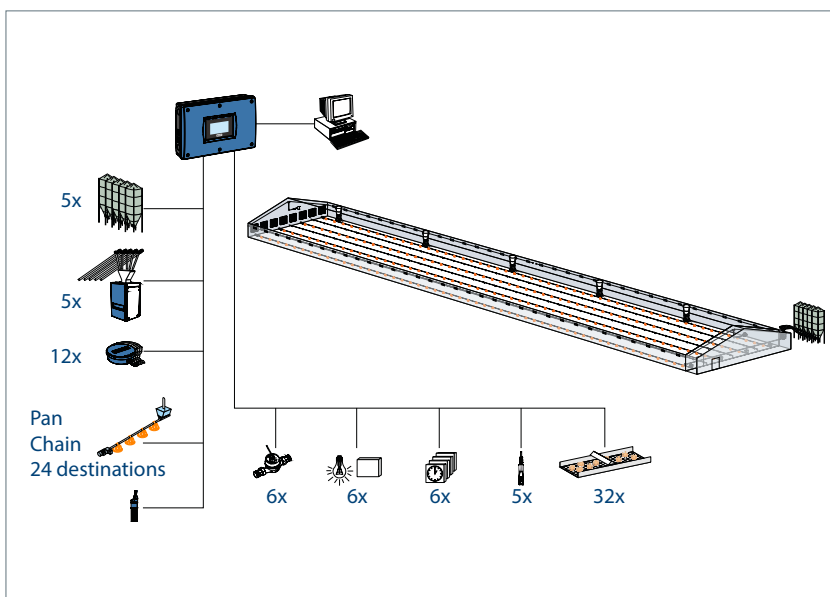
Because of this it is important to monitor animal weight as well as water and feed consumption. The house computer receives and records this data, and uses it to calculate the most important key figures such as animal gain, weight, weight dispersion as well as feed and water consumption.

Feed is the most cost-intensive part of production, and at the same time one of the most important to optimise animal productivity and gain. Feeding is controlled by an advanced program that can distribute up to five different feed components. The program records provided amount of feed and generates an alarm if a silo reaches its minimum level.



### DOL 535/539 P Version

This version has many of the same functions as the DOL 535/539 for broilers, but the controller does not allow for set mixing of feed through a feed program. The controller is primarily used where a grower is supplied with ready-mixed feed - for example if the grower is a part of a larger company and gets ready-mix feed delivered. The number of connected components is also fewer than for the DOL 535/539 for broilers.



### DOL 535/539 for Parent Stock

When working with parent stock it is important to correctly adjust the feed levels for males and females respectively. With a DOL 535/539 the feed can be weighed and delivered in feed lines with up to 24 destinations. Filling and feeding procedures take place in line with time control, and different time programs can be made based on the age of the animals. The amount of feed can be set and adjusted manually or can be run on a schedule according to the required amount of feed per female and male respectively. Feed can be used from up to five silos and the feed can be mixed prior to feeding. During egg laying, the eggs produced are automatically recorded by one or more electronic egg counters. It is also possible to record floor eggs, system eggs, and nest eggs. The eggs produced can be entered manually if automatic egg counters are not installed.

# SKOV Alarm and Emergency Opening

In livestock houses with mechanical ventilation there is a risk that animals may suffer serious harm if the ventilation system fails and is not quickly reestablished. The oxygen content of the air is reduced; air humidity increases and the animals cannot get rid of their excess heat.

A quick and efficient reaction is necessary. The SKOV alarm and emergency opening systems are user-friendly, reliable, stable and extremely efficient.

## DOL 2200 Alarm System

DOL 2200 is a series of alarms that by using local alarm indicators - e.g. sirens or lights - or telephone alarms if any irregularities occur. The alarms have a built-in module for fixed-line or GSM, and can monitor the temperature in 10 sections. Alternatively, ON/OFF can be selected for each input terminal so that it can be used to trigger alarms for empty silo, stuck augers, oil burner defects, etc. Extension modules are available if more alarm inputs are required. DOL 2200 has a large graphic display that shows the temperature and alarm status for

each input terminal. If DOL 2200 is connected to a telephone line, alarms can be transmitted to several telephones at the same time or in a specific order. Calls can be acknowledged thus stopping the alarm. All functions can be controlled remotely via a telephone.

## DOL 2100 Alarm System

DOL 2100 has the same functionality as DOL 2200 but no graphical display.

An external thermostat unit is required for connecting temperature sensors.



*The DOL 2200 has a voice computer installed that provides messages in a clear voice when alarms are triggered.*



### Temperature-Controlled Emergency Opening

Together with SKOV's climate computer, DOL 278T is an independent emergency opening system for opening the ventilation system in case of a power or technical failure or an operational error.

The emergency opening is based in DOL 278 and is activated when the housing temperature exceeds the temperature set point of DOL 278.

The opening depends on how much the set temperature is exceeded and happens gradually in accordance with need, so that the animals are not exposed to cold outdoor air.

DOL 278 has a separate temperature sensor and therefore does not depend on climate computer measurements. DOL 278 is equipped with high outdoor temperature compensation, that is, that the outside temperature overrides/defers the emergency opening if it is hot outdoors.



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Dealer



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