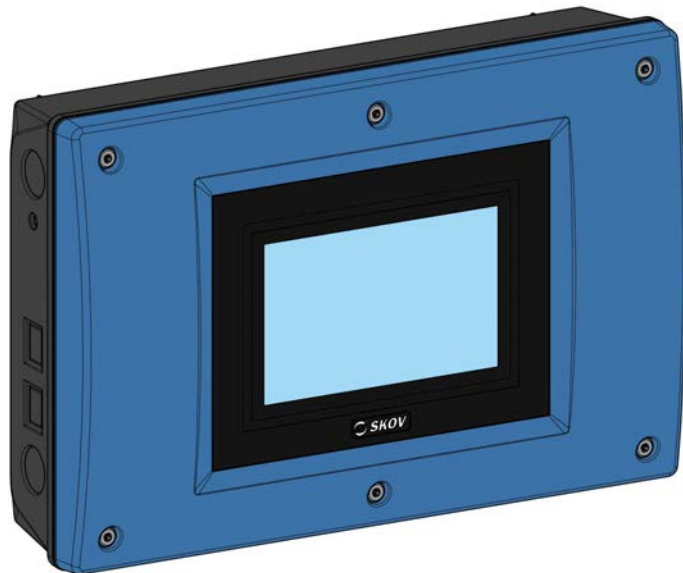


# BlueControl Insect Climate Controller Technical Info





---

<b>1</b>	<b>Product description</b>	<b>4</b>
<b>1.1</b>	<b>Climate control</b>	<b>6</b>
1.1.1	BlueControl insect section climate	6
1.1.2	BlueControl insect central in/out (Central exhaust)	7
<b>1.2</b>	<b>Functionality</b>	<b>8</b>
<b>2</b>	<b>Product survey</b>	<b>11</b>
<b>2.1</b>	<b>Hardware</b>	<b>11</b>
<b>2.2</b>	<b>Software</b>	<b>11</b>
<b>2.3</b>	<b>Language</b>	<b>11</b>
<b>2.4</b>	<b>Accessories</b>	<b>12</b>
<b>3</b>	<b>Technical data</b>	<b>16</b>
<b>3.1</b>	<b>Dimensioned sketch</b>	<b>17</b>
<b>3.2</b>	<b>Minimum requirements with shared equipment</b>	<b>18</b>

## 1 Product description

BlueControl insect is a controller developed for insect farming systems with a focus on the soldier fly and mealworms. It is thus intended for breeding and growth of larvae and pupae, but can be adapted to most types of insect farming systems.

Insect farming is an intensive form of production. The insects generate a lot of heat, just like the level of CO<sub>2</sub> and NH<sub>3</sub> can be high in the room. It requires efficient ventilation with high air change, which ensures good production conditions throughout the house.

BlueControl insect meets the insects' special needs for climate control with recirculation, humidification, ventilation boost and curve control on an hourly basis. The ventilation can be controlled as an equal pressure system and as a central exhaust system.

The controller is available in two variants, both of which are used in a total insect ventilation system:

- BlueControl insect system (section ventilation)
- BlueControl insect central in/out (central exhaust and central air intake)

The controller is operated via a touch display with graphical views of the ventilation status, icons and curves, among other things.

### Nursery, grow-out and pupa house

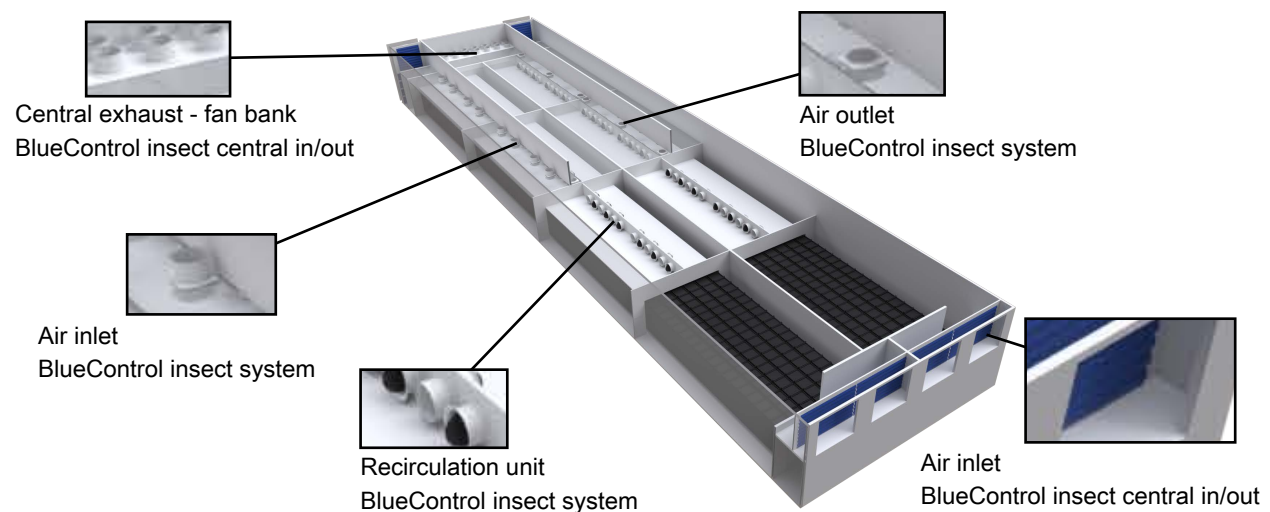


Figure 1: Ventilation components in an insect house with grow-out crates

In production systems for soldier flies, humidity control and removal of humidity with the ventilation air is crucial in pupa, nursery and growth sections. The flies are produced here in a moist substrate, and the heat production of the larvae is released especially in the form of water vapor.

During the growth-out period, the moisture content of the substrate changes. Typically, the substrate has a dry matter content of approx. 30 % at the start, while at the end it must have a dry matter content of 50-60 %. During the production it is important to maintain such a high moisture content in the substrate that the larvae can eat the dry matter. The larvae have no teeth and therefore they have to suck in the food. Likewise, it must be avoided that the surface dries out, as this can make the substrate inaccessible to the larvae, and cause it to form cakes/crusts, which will be sieved off together with the larvae at the end of production. At the end, it must be so dry that the larvae can be sieved from the frass. See the section about Humidity.

## Fly houses

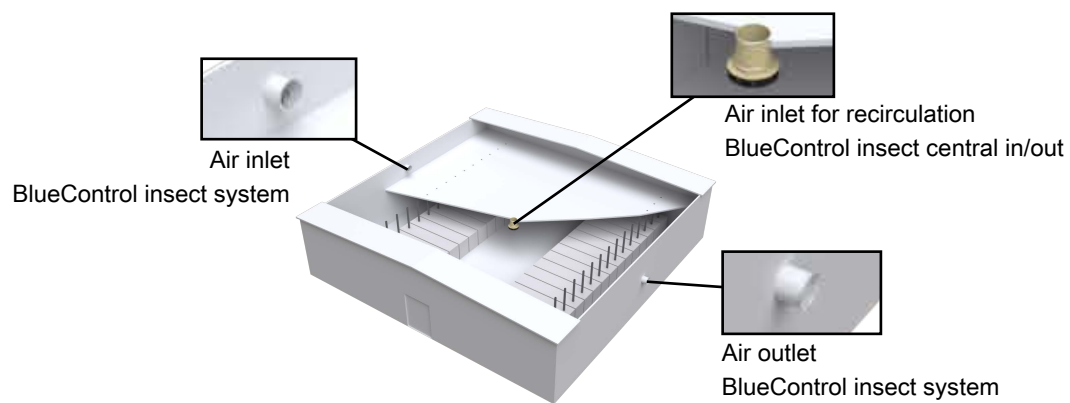


Figure 2: Ventilation components in an insect house with fly cages.

In fly houses, the focus is on good air quality. Here the flies hatch, after which they mate and lay eggs in fly cages over a period of 10-14 days. They consume no nutrition and only a little moisture from a damp surface. Therefore, they have a very modest heat and humidity production. However, it is also important to avoid humid areas inside the fly cages.

## 1.1 Climate control

BlueControl insect can control and monitor the climate in houses with pressure-controlled ventilation and central exhaust.

### 1.1.1 BlueControl insect section climate

The insect climate variant is a classic controller for pressure regulation and the system can be adapted to most houses. The insect house is supplied with fresh air by means of air inlets with adjustable fans and the air is recirculated over the insect crates to achieve the required temperature and humidity in the house.

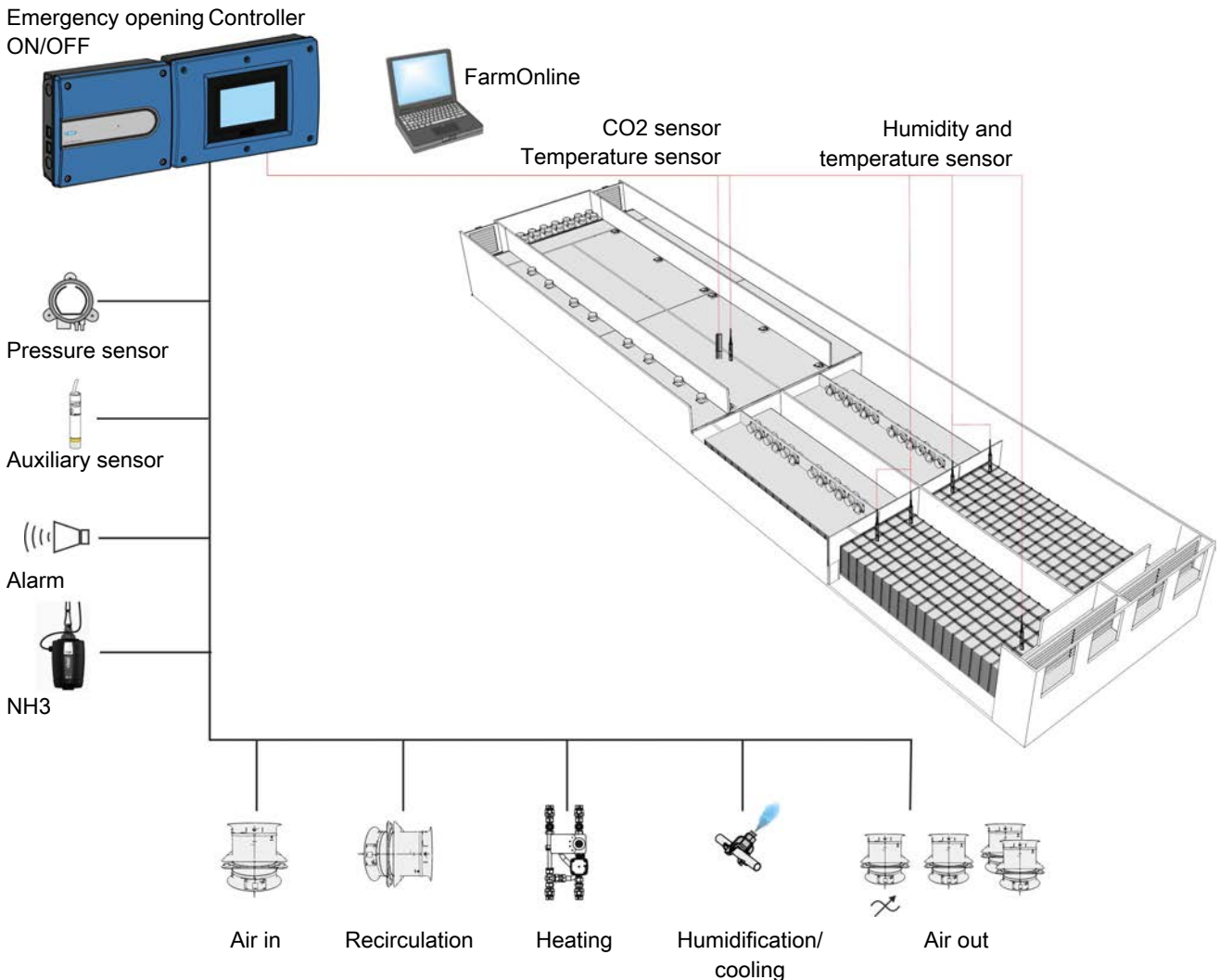
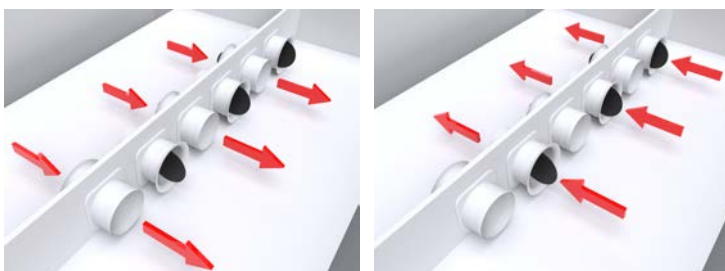


Figure 3: Examples of connections in an insect house.

In a ventilation system for larvae, the air flow must be reversed so that it alternately comes from one side and the other - recirculation. This must ensure the greatest possible uniformity in the farming area.

Recirculation fans are set up in 2 groups; one group for each air direction. Recirculation is based on the difference in the measured temperature in each side of the house.



Recirculation fans for alternating air direction

### 1.1.2 BlueControl insect central in/out (Central exhaust)

The BlueControl insect central in/out variant is intended for houses where central exhaustion is a part of the ventilation system. The BlueControl insect is here used to regulate the pressure in the air outlets. On the air outlet several sections can be concerted to a common central exhaust duct.

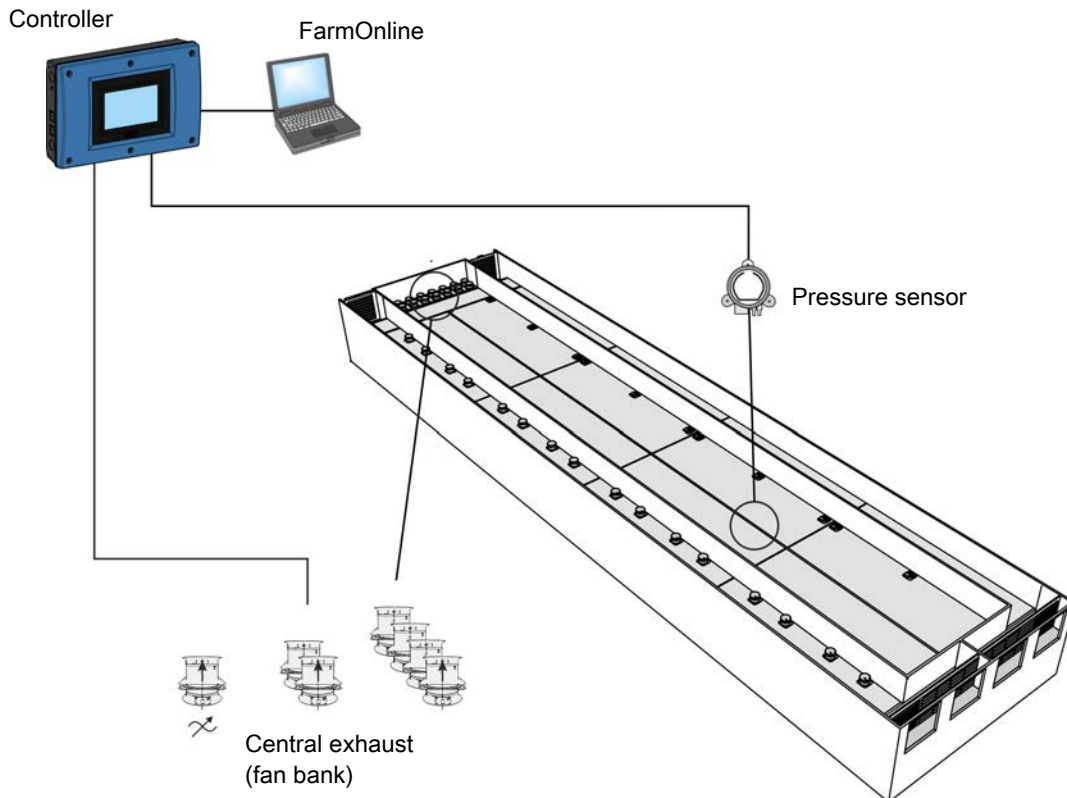


Figure 4: Example of connection of climate components to BlueControl insect central exhaust.

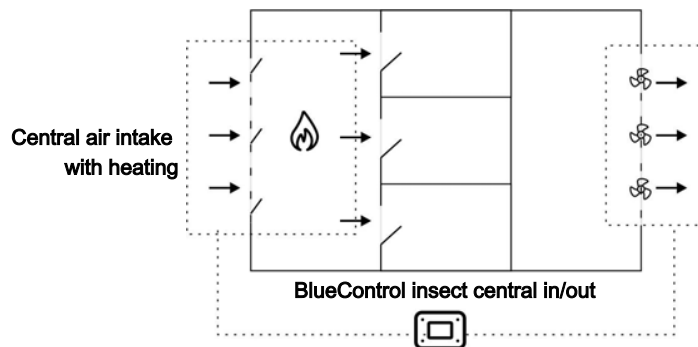


Figure 5: BlueControl insect central air intake

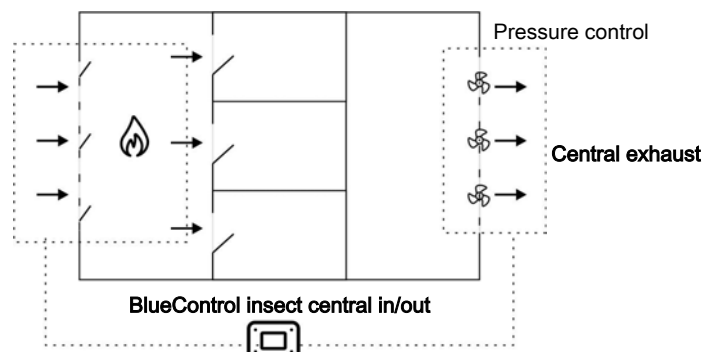


Figure 6: BlueControl insect central exhaust

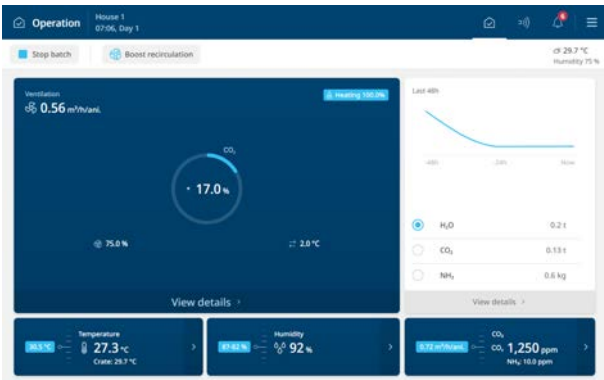
## 1.2 Functionality

	BlueControl Insect system	BlueControl Insect central in/out
<b>System software</b>		
<b>Ventilation and temperature</b>		
Inside temperature sensor	8	4
Outside temperature sensor	1	1
Dynamic Air	X	
MultiStep	16	8
Adaptive ventilation	X	
PID control (or P-band)	X	X
Minimum ventilation in m <sup>3</sup> /h animal	X	
Number of stepless groups controlled separately	2	2
Number of flaps in each stepless group	1	1
Parking of ON/OFF-MultiStep	X	
Recirculation unit (fans in 2 groups)	X	
Active pressure control - inlets	X	
Roof inlet		
Pressure control according to outside temperature	X	X
Positive pressure control (filtering fresh air)	X	X
Central exhaust control (duct pressure control)		X
CO <sub>2</sub> minimum ventilation control	X	
NH <sub>3</sub> monitoring	X	
Display of user offset for temperature setpoint	X	
<b>Heat</b>		
Number of room heating units	6	2
Number of stand-alone heaters	4	
Floor heating control	X	
Adaptive heating control (room heating and stand alone heaters)	X	
<b>Humidity</b>		
Inside humidity sensor	3	1
Outside humidity sensor	X	
Humidity control via "heat control"	X	
Humidification control	X	
Adaptive humidity control	X	
<b>Cooling</b>		
Cooling	3	1
<b>Misc</b>		
Auxiliary sensor	8	16
Curve control on an hourly basis (temp., floor heating, min. ventilation, max, ventilation, humidity and CO <sub>2</sub> )	X	
History curves on an hourly basis	X	X
In-between functions (emptying / disinfection / placement)	X	

	<b>BlueControl Insect system</b>	<b>BlueControl Insect central in/out</b>
External control of house status (batch start/batch end)	<b>X</b>	
Ventilation boost	<b>X</b>	
Water meter	<b>X</b>	<b>X</b>
<b>Safety</b>		
Three password levels	<b>X</b>	<b>X</b>
Comprehensive alarm functions	<b>X</b>	<b>X</b>
Operation and alarm logs	<b>X</b>	<b>X</b>
Energy consumption monitoring	<b>2</b>	<b>2</b>
Status on equipment (current sensor)	<b>64</b>	
Remote Access (via FarmOnline)	<b>X</b>	<b>X</b>

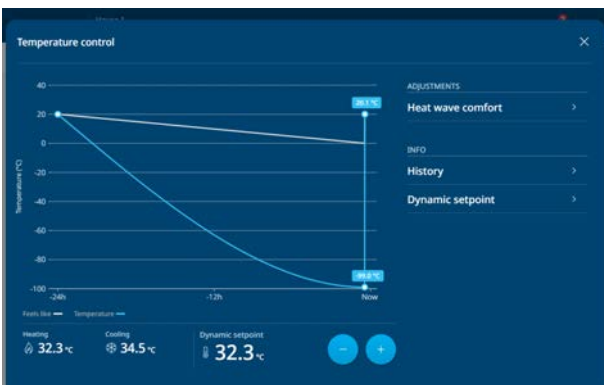
### Page views

The controller has a number of pages which contain exactly the functions and values that are needed in the daily work.



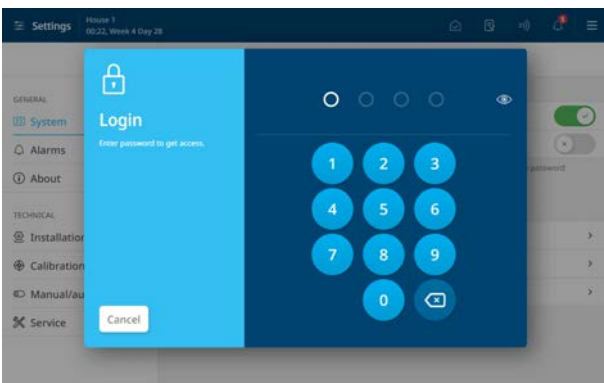
### Dynamic setpoint

Dynamic setpoint continuously takes into account both the current ventilation and the settings you make. It will thus adapt so that there is always the optimum temperature at the given level of ventilation.



### Password

Each user level can be protected against unauthorised changes with a password.



### USB stick/SD card

Using a USB stick enables you to copy the current setting of the controller. This way it is possible to save a backup copy of the setup and also to copy the setup to other controllers.

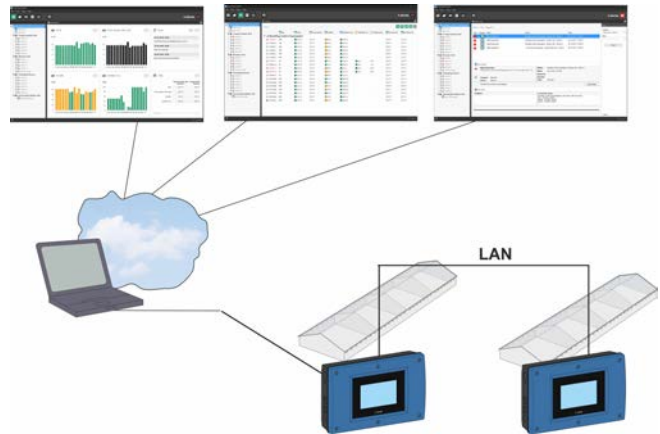
It is also possible to make a backup of historic data on the SD card.

### Safety

- Three access user levels requiring password
- Comprehensive alarm functions
- Operation and alarm logs
- Emergency opening as the standard function

### FarmOnline

Using the FarmOnline management system, the producer can gain access to the house controllers data and setup from any PC with internet connection and from the system's mobile app.



### Remote Access

The function Remote Access enables FarmOnline Explorer direct access to operate the house controller, which can be operated as if you were standing right next to it. The function will therefore make service access easier to controllers in connection with troubleshooting and other support.

## 2 Product survey

### 2.1 Hardware

The standard hardware contains I/O module type 3. Inputs and outputs are described for each type. See below.

The 0-10 V inputs and outputs of the main module can be configured in the following way:

- 11 inputs and 2 output - or
- 9 inputs and 4 output - or
- 7 inputs and 6 outputs



#### 136754 BlueControl HW, 10" 32RL

0-10 V input or 0-10 V output (2+2)  
 0-10 V input or DOL 12 input or digital input (20)  
 0-10 V input or digital input (2)  
 0-10 V output (18)  
 Relays (32)

Temperature sensors must be ordered separately.

No documentation is supplied with the controller. Manual packages must be ordered separately in the relevant language.

### 2.2 Software



#### 136796 BlueControl insect system SW

Software for section ventilation.



#### 136795 BlueControl insect SW, Central in/out

Software for central exhaust ventilation.

### 2.3 Language

#### 137750 BlueControl insect manual package DA

#### 137751 BlueControl insect manual package EN

#### 137752 BlueControl insect manual package DE

#### 137771 BlueControl insect manual package ZH

#### 137780 BlueControl CE manual package DA

#### 137781 BlueControl CE manual package EN

#### 137782 BlueControl CE manual package DE

The manual package contains user documentation in the selected language and technical manuals in English. Some manual packages include the technical documentation in the selected language.

Language in the controller display	DA	Danish	IT	Italian	KO	Korean
	EN	English	RO	Romanian	FA	Farsi
	DE	German	SL	Slovakian	AR	Arabic
	NL	Dutch	HR	Croatian	SQ	Albanian
	FR	French	TR	Turkish	BG	Bulgarian
	ES	Spanish	JA	Japanese	VI	Vietnamese
	FI	Finnish	TH	Thai	UR	Urdu

SV	Swedish	ZH	Chinese	KH	Khmer
NO	Norwegian	SR	Serbian	IS	Icelandic
CS	Czech	ET	Estonian	UK	Ukrainian
PL	Polish	PT	Portuguese	EL	Greek
RU	Russian	ID	Indonesian	LT	Lithuanian
HU	Hungarian				

## 2.4 Accessories



### 140252 DOL 114 humidity and temperature sensor, 2 m cable

### 140253 DOL 114 humidity and temperature sensor, 5 m cable

The DOL 114 is a dual-purpose temperature and humidity sensor that can be used to regulate the livestock house relative air humidity and temperature.

The DOL 114 is a high-quality sensor which is especially useful under particularly harsh conditions and in areas of high air humidity.

The DOL 114 comes with a protective cap.

In general, SKOV A/S recommends that a humidity sensor be installed in livestock houses integrating heat supply.



### 140263 DOL 104 humidity sensor 0-10 V

DOL 104 is a high-precision humidity sensor that can be used for regulating the relative air humidity in the livestock house.

The DOL 104 is a high-quality sensor which is especially useful under particularly harsh conditions and in areas of high air humidity.

DOL 104 has full protection against short circuits and wiring failures.

The DOL 104 comes with a protective cap.

If you want humidity and temperature measurement on two individual sensors DOL 104 can i.a. be used.

In general, SKOV A/S recommends that a humidity sensor be installed in livestock houses integrating heat supply.



### 140200 DOL 12 temperature sensor, 1.4 m cable

### 140210 DOL 12 temperature sensor, 5 m cable

The temperature sensor can be used both outside and inside.



### 140245 Radiation shield for climate sensors

The radiation shield protects an outside temperature and/or humidity sensor from rain and radiant heat.

We recommend that the radiation shield is positioned 2 m above the roof. Alternatively 2 m above the ground and 2 m from other building elements (walls etc.)

The radiation shield is supplied with a mounting bracket.

It may be necessary to order a climate sensor with a long cable when using the radiation shield.



### 140331 DOL 119 CO2 sensor 5000/10000 ppm

Sensor for measuring the CO2 content in the air.

Registration of the CO2 content of the air allows the controller to regulate the minimum ventilation.

If a CO2 sensor has not been installed, the controller regulates the minimum ventilation on the basis of the set values (m3/h per animal).

Supplied with a M12 plug and sealing plug as well as protection cap for DOL 119.



### 140269 Cable 2 m M12 plug incl. sealing plug

2 meter cable for DOL 119/DOL 16 with M12 plug and sealing plug.

When replacing DOL 19 with DOL 119, the cable must be replaced or the connection must be moved.



### 380101 Bracket for DOL 16/104/114

Mounting brackets are used if the sensor is to be mounted in an accurate position.



### 140247 DOL 53 ammonia sensor

### 140236 DOL 53 dust filter (5 pcs)

Can be used for registration of the ammonia level in the air.



### 140333 DOL 18 v2 elec. sub-pressure sensor 100 Pa

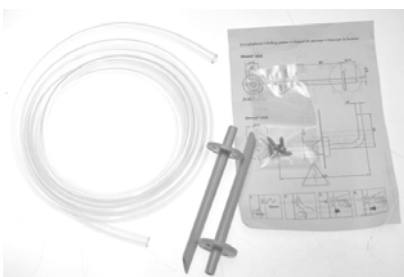
### 140234 DOL 18 elec. sub-pressure sensor 300 Pa

Sensor for measuring the pressure level.

BlueControl Insect: Used for active pressure control the inlets are regulated so the required pressure is maintained in the house.

BlueControl insect central in/out: Used for central exhaust the pressure sensor transmits a signal so the fans are connected. Thus, the required negative pressure in the central exhaust duct can be maintained.

DOL 18 hose set must be ordered separately.



### 140235 DOL 18 hose set

Hose set for DOL 18 electronic sub-pressure sensor.



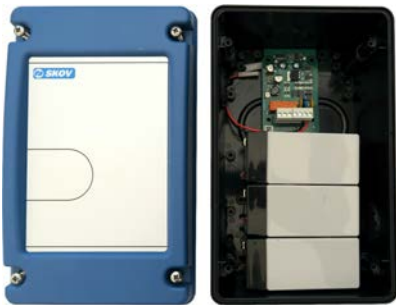
**300085 Transparent plastic hose ø7x5**

To be used if additional plastic hose is needed.  
Ordered by the meter.



**437672 Extension nipple & 5/7 PVC tube set**

Extension nipples must be ordered if another hose type than 300085/140235 is used.



**134718 Mini power backup unit, 20V 1A**

The mini power backup unit is designed to be installed at the side of and connected to a controller.

The mini power backup unit safeguards the controller against disturbances from brief supply outage of supply-interruptions at 115 V / 230 V, where the controller would otherwise restart.

The mini power backup unit is typically used where there is no emergency opening.

To be connected to a controller only if:

- the controller has a maximum of 6 I/O modules *and*
- consumption from the main module does not exceed 0.4 A *and*
- consumption from the +24 V terminals of the loop module does not exceed 0.8 A.

**Sequential restarting of fans**

Can in the event of a power failure give an alarm signal to SKOV controllers that the fans are without power. The controller switches all MultiStep OFF and ensures a sequential restart when the power supply returns. This will ensure the power supply against overload.

**Backup time**

Average backup time: 5 minutes per hour

Maximum backup time: 0.5 – 3 hours with fully charged battery



**560098 Resistance set**

Used for the following purposes:

- Series resistance (500 ohm) used when a 0-10 V input is used for a sensor 4-20 mA output.
- Resistor (15K ohm) is used for connection of the DOL 99B feed weigher.
- A Tranzorb diode for the protection of the relay when the relay activates a coil.

Order resistor sets if additional resistors are needed.



### 136470 BlueControl extension box 10RL

Extension box with 1 pcs. I/O module, 10RL 8AI 10RL, type 3.

0-10 V input or DOL 12 input or digital input (8)

0-10 V outputs (8)

Relays (10)

Used when more I/O modules are needed than are available in the standard hardware.

The inputs can with a jumper be configured individually for either DOL 12, DI (digital input) for water meters or AI (analog input, 0-10 V).

Includes rubber sleeves and ribbon cable

The controller's standard software/hardware supports 13 I/O modules in total. BlueControl extension box 10RL counts for 1 module



### 136471 BlueControl extension box 20RL

Extension box with 2 pcs. I/O module, 10RL 8AI 10RL, type 3.

0-10 V input or DOL 12 input or digital input (16)

0-10 V outputs (16)

Relays (20)

Used when more I/O modules are needed than are available in the standard hardware.

The inputs can with a jumper be configured individually for either DOL 12, DI (digital input) for water meters or AI (analog input, 0-10 V).

Includes rubber sleeves and ribbon cable

The controller's standard software/hardware supports 13 I/O modules in total. BlueControl extension box 20RL counts for 2 modules.



### 134703 M25 cable glands (30 pcs.)

Plastic gland and plastic nut for mounting in a controller or box.

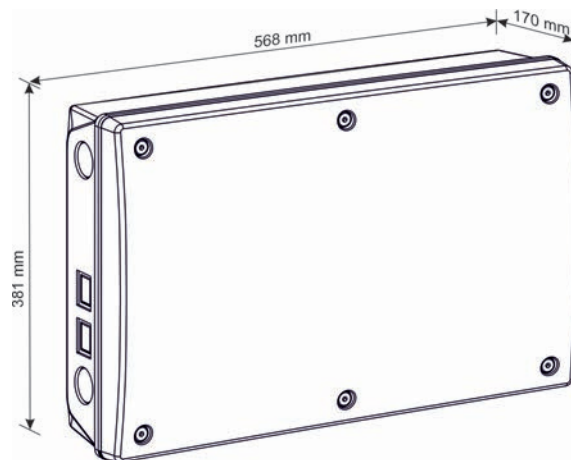
Used when mounting cables in size  $\varnothing 7-14\text{mm}$ .

### 3 Technical data

Electrical		
Rated voltage	V AC	115*, 200* and 230/240 (*not speed controller)
Operating voltage	V AC	103.5-264
Frequency	Hz	50/60
Output	W	75
Max. current consumption	A	0.7
RCD		To be installed in accordance with applicable laws and standards. RCCB can be used in front of the controller.
Max. fuse in front of the controller	A	10
Main module		
Configurable main module.		Number 0-10 V: - 11 inputs and 2 outputs – or - 9 inputs and 4 outputs – or - 7 inputs and 6 outputs
Inputs		7 x 0-10 V DC input impedance 2.1 MOhm.
Pulsing Inputs (E.g., water meter, energy meter)		Minimum pulse length: 75 ms. Minimum pulse interval: 75 ms. Maximum frequency/pulse per sec.: 6 Hz.
Outputs/power supply		2 x 15 V DC power supply +/- 10 % max. 40 mA in total.
		2 x motor supply 24 V DC +/- 20 % max. 0.4 A (in total for the entire controller).
		2 x supply for winch motor potentiometer 10 V DC max. 40 mA in total.
		2 x 0-10 V DC. Output impedance 100 Ohm.
Relays		12 x NO/NC potential free. Max. voltage/current at resistive load ( <b>resistive load</b> ) 250 V AC / 5 A AC. Max. voltage/current at inductive load ( <b>inductive load</b> ) 250 V AC / 2 A AC CosPhi 0.8.
		1 x alarm relay NC, max. 24 V 2 A. Min. 12 V 10 mA (resistive load).
I/O module type 3		
IO type 3, 10RL 8AI 8AO		With jumpers for configuration of inputs.
Inputs		8 x 0-10 V DC input impedance 2.1 MOhm.
Pulsing Inputs (E.g., water meter, energy meter)		Minimum pulse length: 75 ms. Minimum pulse interval: 75 ms. Maximum frequency/pulse per sec.: 6 Hz.
Outputs/power supply		8 x 0-10 V DC output impedance 10 Ohm.
		1 x motor supply 24V DC +/- 20% 0.4 A
Relays		10 x NO/NC potential free max. Max. voltage/current at resistive load ( <b>resistive load</b> ) 250 V AC / 5 A AC. Max. voltage/current at inductive load ( <b>inductive load</b> ) 250 V AC / 2 A AC CosPhi 0.8.
Network		
Network interface		2 x 10/100 BASE+TX RJ 45
USB		2 x USB 2.0 A type

<b>Accessories</b>		
Speed control (output)		Motor load max. 6.8 A 230-240 V AC/min. 150 W.
<b>Environment</b>		
Operating temperature	°C (°F)	-10 to +45 (+14 to 113)
Temperature, storage	°C (°F)	-25 to +60 (-13 to +140)
Ambient humidity, operation	% RH	0-80
Protection class	IP	54 (splashproof) It is assumed that the base surface is level, i.e. $\leq 1.5$ mm height difference, and the front panel screws are tightened to a minimum of 1.5 Nm.
<b>Mechanical</b>		
Cable knock-out punches		30 x M25 For metrical cable glands
<b>Shipment</b>		
Dimensions (H x W x D)	mm	381 x 568 x 170
Dimensions when packed H x W x D	mm	421 x 608 x 230
Weight	g	7800
Shipping weight	g	9200

### 3.1 Dimensioned sketch



## 3.2 Minimum requirements with shared equipment

Controllers that are connected to a common network (LAN) can share equipment such as sensors with each other. Thus, several controllers can receive registrations from one outside temperature sensor.

### BlueControl insect can share:

- Outside temperature sensor
- Outside humidity sensor
- Weather station

### Sharing requires:

- A cabled LAN between the controller providing the shared equipment and the controller also using it.
- A stable network.

If the management program FarmOnline Explorer is used on the farm, you can see in the menu Network information if there are warnings regarding stability.

Specifications for LAN network	
Speed	100 Mbps
Delay	Maximum 100 ms
Average delay	< 5 ms (status can be seen in FarmOnline Explorer Network Information)
Packet drop	<1% (status can be seen in FarmOnline Explorer Network Information)



SKOV A/S • Hedelund 4 • Glyngøre • DK-7870 Roslev  
Tel. +45 72 17 55 55 • [www.skov.com](http://www.skov.com) • E-mail: [skov@skov.dk](mailto:skov@skov.dk)

