

Lumina 16

Lumina 16 Touch

F16



PRODUCT APPLICATION MANUAL

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Art. Nr.

The Lumina 36 controls climate conditions in single mechanical and natural ventilated pig houses applied for Simple Wean-to-Finish barns to huge sow operations, up to 64 fans, positive/negative pressure based.

The Lumina 36 ensures optimal conditions in your house under all circumstances. It distinguishes itself by a number of unique control options for extra user advantages with a well-organized and simple control.

The Lumina 36 control groups the following concepts:

- Power ventilation with chimneys or pit fans
- PNT (Power Natural Tunnel) ventilation with chimneys or pit fans
- Natural ventilation
- Tunnel ventilation
- All combinations of the above

Features

- Very user-friendly user interface, graphical display (320 x 240 pixels), with variable menu.
- Intelligent dials with color information for easy overview and changing temperature and ventilation
- Access with optional password protection up to 3 different levels (operator, advanced user and installer), the so-called "Multi Level Data Protection".
- Extensive combi table with 32+16 set points, 16 combi groups (64 relays), 2 linear/modulating parts, 1 inlet control (or winter inlet), 1 tunnel control or summer inlet) and negative or positive pressure.

Sensors

- Room temperature measurement using maximum 16 room sensors and temperature setting per 0.1°F.
- 1 RH measurement using 1 electronic RH sensor, 0-100 %.
- 1 Pressure measurement using negative pressure sensor, setting 0.00 - 0.40 "WC.
- 1 CO2 measurement using CO2 sensor 5000 PPM, setting in 0 – 5000 ppm
- 1 NH3 measurement using NH3 sensor, not available yet
- Weather station connection (outside temperature, outside RH, wind direction and wind speed).

Ventilation

- Ventilation is calculated based on animal weight or %.
- Maximum 8 ventilation zones.
- Ventilation control based on house temperature, with low and high temperature and relative humidity, CO2 and NH3 influence.
- Night correction on set point house and/or ventilation percentage, connected to a light clock.

Exhaust

- Maximum 16 groups (64 relays) for ON/OFF fans
- 2 Linear fan control groups to control variable speed wall, chimney or pit fans (Triac, frequency driver, or iFans (DC fans)) or modulating ON/OFF fans. Rotation (changing between fans) can be used with modulating fans.
- Up to maximum 4 ITM's can be controlled using the I/O network.
- Separate vortex damper control, linked to linear exhaust using a settable factor.

Inlet control

- 8 Inlet control groups (8 zones) to control inlets or valves using the same setting. The inlets can mutually be corrected based on temperature difference.
- 8 Curtain control groups (8 zones) to control curtains using the same setting. The curtains can mutually be corrected based on temperature difference.
- 2 Tunnel inlets. Separate inlet control to control 1 or 2 tunnel shutters or curtains.

Curve

The following settings can be programmed in a curve (maximum 20 set points):

- Day number
- House temperature
- Extra temperature (e.g. for heating)
- Desired RH
- Animal weight
- Minimum ventilation (in ft/min/lb.)
- Maximum ventilation (in % or a tunnel position)

Heating / cooling

- 8 Heating control groups, ON/OFF, time modulating, analog, based on their own sensor and linked to:
 - Set point house temperature or
 - Extra temperature (e.g. floor heating or brooders)
- 8 Cooling control groups, ON/OFF or time modulating, based on their own sensor and linked to:
 - Set point house temperature or
 - Set point house temperature + bandwidth or
 - Extra temperature or
 - Tunnel position

Stir fans / humidification

- 4 Stir fan control groups, ON/OFF or time modulating, based on their own sensor and linked to:
 - Heating set point or cooling set point or
 - Set point house temperature or
 - Set point house temperature + bandwidth or
 - Extra temperature or
 - Set point natural stop
- 1 Humidification control, ON/OFF or time modulating based on relative humidity in the house.
- 1 Dehumidification control, increase minimum ventilation or start heating.
- Heat demand through F-Net; in combination with a central heating control (e.g. Lumina 21).
- OptiSec® control.

Time clocks and registration

- 1 Feed clock with 4 relays to enter maximum 24 start and stop times for feeding. Feed consumption is registered for a settable time interval (Management & Monitoring®), of today, yesterday, day before yesterday and total. Dosing mode for restricted feeding is available.
- A pulsed weighing system or external weighing systems generating pulses (e.g. directly on an auger) can be used for registration. Feed flow (under- and overflow) alarm and maximum runtime alarm.
- 1 Water clock to enter maximum 24 start and stop times for water dosage. Water consumption is registered for a settable time interval (Management & Monitoring®), of today, yesterday, day before yesterday and total. Dosing mode for restricted watering is available. A water meter can be used for the water registration. Water flow (leaks, underflow and overflow) alarm.
- 8 Light clocks to enter maximum 24 start and stop times. Setting possibilities: increase/decrease times (dimmer functions), settable light intensity (with light meter) and connection to light curve.
- 8 Time clocks to enter maximum 24 start and stop times. This time clock has several applications, but no registration functions.
- 32 Registration groups for feed, water or other purposes.

Alarm

- 12 External alarms (free programmable) and application alarms via 1 alarm relay.
- Temperature differential signaling for giving a signal to an external automatic fire alarm system (AFAS).

Operation overview

Control & Sensors	
Power ventilation	YES
Natural ventilation	YES
Tunnel ventilation	YES
Minimum ventilation control	Variable speed groups (2) Modulating and rotating
Fan relay groups (max fans)	16 (64)
Power stages	32
Tunnel stages	16
Inlet zones	8
Curtain zones	8
Tunnel zones	2
Stir fan zones	4
Heating zones	8
Cooling zones (Misting / Pad cooling)	2
Humidification control	1
Temperature sensors	8
Humidity sensor	1
Static pressure sensor	1
Ammonia sensor	1
CO2 sensor	1
Clocks & Registration	
Water clock	8
● Registration	YES
● Dosing	YES
Feed clock	1
● Registration	YES
● Dosing	YES
Time clock	8
Light clock	8
● Light control	ON/OFF - Analog
● Light measurement	YES
● Light scheme	1
Feed/Water curve	1
Registration groups	32
History	Today, Yesterday, Total, 24 hrs
External alarms	12

Hardware

IOB.12 I/O board

- 6 Analogue outputs
- 12 Analogue inputs
- 8 Digital inputs

Power supply

- 90-264Vac, 50/60Hz
- 45 W

Actuator control

- 3x IMS (Intelligent Motor Switch) on board for tunnel (1) and curtains (2)
- 3x Manual override (CLOSE-0-AUTO-0- OPEN) for tunnel and curtains
- Manual override (0-10V) for inlets, controlled by iM.60 or iM.125

Relays

- 16x 1 HP relays on board
- 16x Manual override switch (MAN-0-AUTO) for fans, heating, cooling, clocks, etc.
- Number of relays can easily be extended by I/I-net modules

Communication

- I/O-net (Intelligent Proprietary Network) for extending I/O via I/O-modules (option), e.g.



ISB.16 1 HP

- F-Net (PC communication)
- SD socket for software updates or backup/restore settings

Wiring

← 2 x 0,8 mm (0,5 mm ²)	_____	Max. 16 x room temp. sensor
← 3 x 0,8 mm (0,5 mm ²)	_____	RH sensor
← 3 x 0,8 mm (0,5 mm ²)	_____	Negative pressure
← 3 x 0,8 mm (0,5 mm ²)	_____	CO2 sensor
← 3 x 0,8 mm (0,5 mm ²)	_____	NH3 sensor
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Voltage output (0-10V) Max. 8 x air inlet control
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Voltage output (0-10V) Max. 8 x natural control
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Voltage output (0-10V) Max. 2 x tunnel control
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Max. 8 x heating relay
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Humidification relay
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Max. 2 x cooling relay
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Max. 16 x ventilation group
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Max. 4 x stir fan group
_____ 2 x 0,8 mm (0,5 mm ²)	_____ →	Alarm
← 2 x 0,8 mm (0,5 mm ²)	_____	Outside temperature
← 3 x 0,8 mm (0,5 mm ²)	_____	Outside RH sensor
← 2 x 0,8 mm (0,5 mm ²)	_____	Wind direction
← 2 x 0,8 mm (0,5 mm ²)	_____	Wind velocity

Technical specifications

FDP45	
Mains voltage	90Vac – 264Vac
Mains frequency	50/60Hz
Maximum power consumption	45VA
IOB.12	
Power available for sensors	
24Vdc, fused	Max. 200mA
12Vdc, short circuit resistant	Max. 70mA
Power available for sensors and peripheral equipment	
24Vdc, short circuit resistant	Max. 500mA
6x analog outputs (AO)	
Voltage range	0 – 10Vdc
Maximum load	1mA
Output resistance	570Ω

12× analog inputs (AI)		
Type selectable through jumpers		Resistance or voltage
Resistance:	Temperature range sensor type S.7	-50°C to +110°C (-58°F to +230°F)
	Accuracy -25°C to +100°C (-32°F to -140°F)	<0.2°C (<0.4°F)
	Measuring range for position feedback	0 – 20kΩ
Voltage:	Measuring range (input resistance 100kΩ)	0 – 10Vdc
	Accuracy	± 15mVdc
8× Digital inputs (DI)		
Open contact voltage		12Vdc
Low level		<1.0Vdc
Application: Counter input, min. pulse width 25mSec		Max. frequency 20Hz
Application: Frequency input		Max. frequency 5kHz
16× Digital outputs (DO)		
1 – 8 connection for FRM.8 printed circuit board		
9 – 16 connection for FRM.8 printed circuit board		
Alarm contact		
Relay: make-and-break contact, voltage free		Max. 2A 60Vdc/30Vac
Communication		
I/O-Net for extra inputs and outputs using I/O-modules.		
FNet, Fancom network for intercommunication of control computers and PC connection.		
FRM.8		
8 Digital outputs (relays)		
Relay 1, 3, 5, 7: make-and-break contact		Max. 2A 60Vdc/30Vac
Relay 2, 4, 6, 8: voltage free		Max. 2A 60Vdc/30Vac
Housing		
Plastic housing with screw-on lid		IP54
Dimensions (l×w×h)		430×620×200mm (17"×24"×8")
Weight (unpacked)		8.0kg (18lb.)
Ambient climate		
Operating temperature range		0°C to +40°C / 32°F to 104°F
Storage temperature range		-10°C to 50°C / 14°F to 122°F
Relative humidity		< 95%, uncondensed