Swine & Poultry Ventilation - Controllers

IT WORKS FOR THEM, IT CAN WORK FOR US TOO!

By: Nevin Wagner,
Sales Engr, Business Owner
Ag-One Associates
Apex Ag Solutions, LLC

Credits to:

- Munters Corporation (Aerotech ventilation products)

Controls for Calf Barns: Basic types, limitations

- Thermostats
- Variable Speed Fan Control
- Static Pressure Monitor
- Ten Minute Cycle Timer
- Limitations:
  - Lack of PRECISION
  - Proper SEQUENCE not maintained
  - Difficult to SYNCHRONIZE equipment

Challenges of selecting a controller for dairy cow/calf housing

- Existing Controllers are for “WARM” Barns
- Lower Temperature Set Points May Not Be Available
- Controller Mounted in a COLD Location (below freezing)
- Ability to Handle Neutral Pressure Ventilation (Push-Pull)

Digital controllers: What do they offer?

- Remote Temperature Sensor(s)
- More precise switching between on/off
- Digital Display to View Parameters
- Ability to Maintain Correct Ventilation/Heating Sequence

Four types of digital controllers:

- 4-stage digital thermostat
- Staging controller: 4 to 12 stages
- High End – "Total Barn Controller"
- Mid-range – Total Barn "Junior"

Staging Controller: 4 to 12 stages

- May have all on/off relay stages
- May have variable speed fan outputs
- May have minimum vent cycle timers
- "Advanced" models may integrate curtain control
- May have Temperature & Ventilation CURVES

Farm CCU5000: "Staging Controller"

CCU5124
7 Stage Control, 1 variable, 6 relays

CCU5222
6 Stage Control, 2 variable, 4 relays

CCU5026
8 Stage Control, 8 on/off

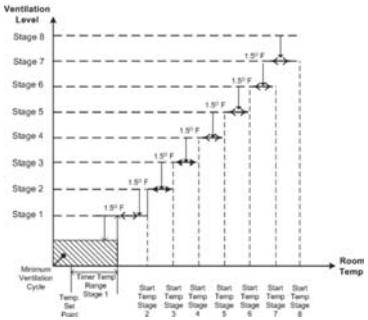
Each includes:

- 1 Temperature Sensor
- 2 Line LCD Display
- Alarm Contact – NO or NC

Munters CCU Farm Series Controls offers common control features required in todays entry level Hog climate controls at a competive price to give Your Perfect Climate

Munters

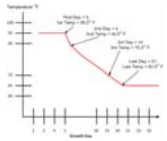
CCU5026 Ventilation



Munters

Main Menu: CCU5000

- Single target temperature or 4points (days) temperature curve:

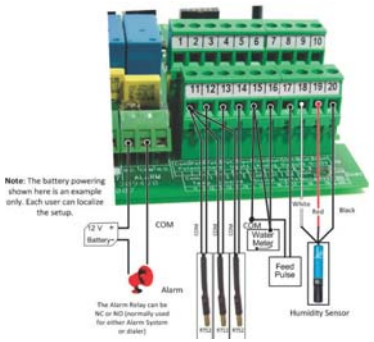


- Automatic temperature adjustment
- Humidity compensation
- Heating and Misting setting
- Alarm setting
- Testing
- History

Munters

Inputs: CCU5000

- 3 temp sensors
- 1 Humidity sensor
- Water meter



Munters

Next Level: High end staging controls, limitations

- Better than what we had but not what it needs to be
- Designed for a specific feature BUT Not Very Flexible

Next Level: High end fully integrated & automated

- Designed to be relatively flexible
- Automate all ventilation equipment in the system
- Driven by “Proprietary” Software

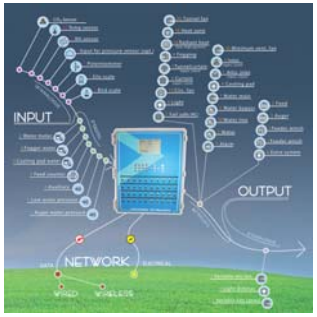
FARM PREMIUM XL

- Fully Integrated “Total Barn Controller”
- 40 On/Off Relays (expandable)
- Variable Speed Fan Outputs

Munters

Main features & technical data

- Modular system to meet specific requirements
- Broilers, Layers and Pigs versions
- Complete remote communication with real-time visual outlook
- SD card port to save history & update software
- Multi-language support
- 16 independent heat zones
- Precise fogging and cooling systems
- Integrated Silo and Bird scale cards
- Feed management with integrated overflow alarm and shut off
- Current sensor for monitoring power consumption
- Up to 80 heavy-duty relays
- Fail safe emergency relay
- Built in static pressure control
- Large Graphic Display



Munters

Available configurations

- Farm Premium XL
  - Available with up to 40 relays
  - Basic configurations including:
    - 1 analogue input card
    - 1 digital input card
    - 1 alarm card
    - 4 temperature sensors
    - 15/20/25/30/35/40 relays (according to the part number)
- Farm Premium P XL
  - Available with up to 30 relays
  - Basic configurations including:
    - 1 analogue input card
    - 1 digital input card
    - 1 alarm card
    - 4 temperature sensors
    - 10/15/20/25/30 relays (according to the par number)

Munters

High end controls: The Pros

- Provide a useful TOOL to help manage a complex the environment for a livestock or poultry production facility
- Everything integrated into ONE controller
- Ability to monitor conditions from remote locations

High end controls: The Cons

- High Cost for the Hardware (relative to the total project)
- Need for extensive automatic Back-up systems
- A multitude of features vs. User-friendliness (trade-offs)

Next Level: Mid-range controllers

- Similar features as High-end models, but fewer of them
- Fewer unused features (settings) to “Wade Through”
- 1/3 to ½ of the inputs & outputs but 60% to 75% of the cost
- Might be the right control for the system

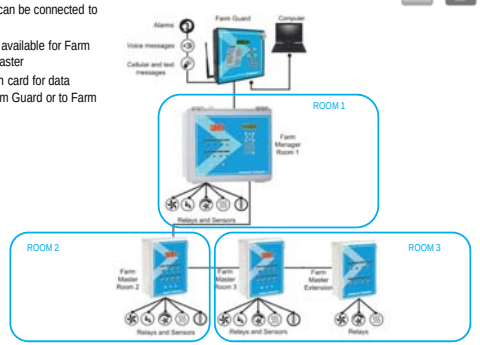
Main features & technical data

- Easy programming
- 8 programmable relays
- Up to 4 temperature sensors
- Water, feed & Humidity control
- Optional Static Pressure control board
- Relay extension box for 8 additional outputs
- Managing a network of up to 9 Farm Master units
- 1 or 2 built-in triac devices for variable speed min. ventilation fans
- 4 programmable analog outputs (0-10V)
- Dynamic Precision Ventilation
- On/Off/Auto override switches
- Extensive history of events & alarms
- Data collection
- Real time visual outlook
- Alarm system

Munters

Main features & technical data

- Up to 9 Farm Master can be connected to one Farm Manager
- Relays extension box available for Farm Manager and Farm Master
- RS485 communication card for data communication to Farm Guard or to Farm Communication Unit



Munters

Farm Manager Control for Neutral Pressure Calf Barn Ventilation

- Variable speed outputs plus on/off relays
- Ability to set the running speed separately for the pressure fans versus the exhaust fans
- Pair of relays can be assigned for curtain control
- Lower stage equipment can be turned off when hot weather equipment is turned on (operator choice through settings)

Farm Manager Control for Neutral Pressure Calf Barn Ventilation

- Base unit has 2 variable speed outputs & 8 relays (On/Off)
- Expandable by adding Extension Box (8 more relays)
- Limitation: Pre-Heater control should be separate (requires individual probe with its own settings)
  - Pre-Heater control can be set independently
  - Pre-Heater set low enough that it just maintains the minimum air temperature entering the barn