

CROPSCAN 16

OPERATOR INSTRUCTIONS

GENERAL DESCRIPTION OF UNIT FUNCTION

The controller is a scanning thermostat capable of scanning up to 16 crop sensors.

Desired crop temperature can be pre-set and the unit can control cooling via the ambient cooling fan with or without air mix and also refrigeration if available.

Digital LED display of crop temperatures, ambient temperatures, duct temperature, crop, frost, air mix set points can be selected.

Crop sensor on duty is digitally displayed.

Recirculation control is available on a timed interval/period basis if required.

Total ambient fan hours run is also totalized on the Cropscan 16 fascia mounted hours run meter.

FIVE CONTROL PROGRAMS ARE AVAILABLE VIA THE "**PROGRAM SELECTOR**" SWITCH. The operation of these program selections is detailed below.

SELECTION - "**Read Out Only**"

Select "**Read Out Only**" on Program Selector switch.

Crop temperatures etc can now be read without any automatic control relay output functions. This selection can be used during manual control in order to monitor the sensors only.

SELECTION - "**Cooling**" How to Set the Parameters.

Select "**Cooling**" on Program Selector switch.

Turn the Display Selector switch to :- "**Set Frost**"

- set the lowest acceptable cooling (blown) air temperature using the "**Frost Set**" knob on the main digital display in degrees C.

After setting these two dials turn the Display Selector switch back to the "**Crop Temp**" position.

To set the Recirculation operation set the unit as follows:

Set the interval between recirculation (1-8 hrs) using the Recirculation "**Interval**" knob.

Set the run time on the fans during recirculation (5-30 mins) using the Recirculation "**Period**" knob.

CROPSCAN 16

OPERATOR INSTRUCTIONS (cont.)

SELECTION - "Cooling" **How the program operates**

When any crop sensor is found above "**Crop Set**" level the temperature is compared with ambient sensor temperature. If it is 2°C (standard Offset Value) or more above the ambient temperature cooling is initiated. Cooling will continue until this differential is reduced or the crop sensors are cooled below the "**Crop Set**" level.

Hot sensors can be seen when scanned by the "**Cooling Required**" Red LED which will flash as this sensor is read by the CropsScan 16. A twelve minute run on timer is initiated each time the "**Cooling Required**" LED flashes. This will prevent the system "Hunting " the cooling fans on/off as the Cooling demand is lost.

If the ambient temperature falls below the "Frost Set" level cooling will immediately cease. Frost cut off is indicated by the "**Frost**" Red LED.

During periods of no demand for cooling or a Frost condition the recirculation "**Interval**" begins timing. If this times out the cooling fans will be run for the recirculation "**Period**". When fan is running on Recirculation the "**Recirc On**" Red LED will illuminate.

SELECTION - "Cooling + Refrig." **How to set the parameters.**

Select "**Cooling + Refrig.**" on Program Selector switch.

Set up the parameters as described for "**Cooling**" above.

SELECTION - "Cooling + Refrig." **How the program operates.**

Operation is as for Cooling except if Cooling is still required but no suitable ambient air temperature differential exists or a frost condition exists the refrigeration plant will be initiated. This also has a twelve minute minimum run timer reset by the "**Refrig. Required**" Red LED.

SELECTION - "Cooling + Air Mix" **How to set the parameters.**

Select "**Cooling + Refrig.**" on the Program Selector switch.

Set up the parameters as described above for cooling.

Turn the Display Selector switch to "**Air Mix Set**"

-set the desired cooling air temperature (the temperature of the air duct used to cool the crop) using the "**Air Mix Set**" knob.

The normal setting for this is 2°C below the "**Crop Set**" temperature.

CROPSCAN 16

OPERATOR INSTRUCTIONS (cont.)

NB. The Air Mix function ignores the "**Frost Set**" level as the system has an automatic in-built frost cut off 2.5°C below whatever "**Air Mix Set**" temperature level is set.

Set the shut off interval time (0.25-4 hrs) on the "**Shut Off Interval**" knob.

SELECTION - "Cooling + Air Mix" How the program operates.

Operation is as for cooling except the motorised louvres will be modulated during cooling to maintain the tunnel (blown air) cooling temperature +/- 1°C around the "**Air Mix Set**" temperature level.

This is achieved on a timed pulse control of the Motorised Louvres.

ie. if the Tunnel temperature is more than 1°C above the "**Air Mix Set**" level - the louvres will pulse open for 3 seconds.

- if the Tunnel temperature is more than 1°C below the "**Air Mix Set**" level - the louvres will pulse close for 3 seconds.

After each louvre movement (pulse) the Cropsan 16 waits 3 minutes before attempting further louvre movement. If the temperature is still out of limit a further movement (pulse) will take place.

This louvre modulation is indicated by 3 LEDs on the Cropsan 16 fascia panel. These are labelled - "**Step Close**" Red LED. Will illuminate during a close pulse.

"**In Limit**" Green LED. Will illuminate when the tunnel temperature is OK.

"**Step Open**" Red LED. Will illuminate during an open pulse.

If the Motorised Louvres get fully closed during Air Mixing (due to a very cold ambient air temperature) a micro switch fitted to the Main Air Intake louvre is pressed. This signals the Cropsan 16 to cease ambient cooling. The "**Shut off Interval**" timer is activated which has to time out before ambient air cooling by the Shut Off Timer this is indicated from cooling by the "**Shut off Interval**" Yellow LED. This will remain on until the time set on the "**Air Mix Interval**" knob has elapsed.

During this period the Recirculation function can take place if demanded.

CROPSCAN 16

OPERATOR INSTRUCTIONS (cont.)

This shut off will also be brought in if a tunnel frost temperature is registered (preset 2.5°C below "**Air Mix Set**"). The timer will also be activated at the end of every Ambient Cooling operation and therefore acts as a restart delay to prevent too many cooling starts occurring when the crop temperature is very close to the "**Crop Set**" level.

SELECTION - "**Cooling + Air Mix + Refrig.**" **How to set the parameters.**

Select "**Cooling + Air Mix + Refrig.**" on the Program Selector switch.

Set up the parameters as described above for Cooling + Air Mix.

SELECTION - "**Cooling + Air Mix + Refrig.**" **How the program operates**

Operation is as for Cooling + Air Mix except Refrigeration will be initiated whenever a demand for cooling exists but ambient air is unavailable to cool.

The demand for Refrigeration is shown by the "**Refrig. Required**" Red LED, which flashed when a crop sensor which requires cooling is scanned.

CROPSCAN 16

OPERATOR INSTRUCTIONS (cont.)

GENERAL POINTS FOR THE SUCCESSFUL OPERATION OR THE UNIT

Ensure all **Crop Temperature Sensors** that are in use are always in the crop.

Un-plug any Crop Sensor that cannot be placed in the stored crop. These un-plugged sensors will be ignored for control purposes.

At the end of storage season always coil up crop sensors and store in safe dry place.

Do not skewer potatoes etc with sensor.

Either drop the Crop Sensors down prepositioned tubes in the stack (bulk) or bury sensor under the crop (box).

It is a good idea to record fan hours run daily or weekly on record sheets (available on request) or in a note book to see what operations are taking place. **Remember** the Cropsan 16 is a very useful management aid which will make best use of cooling air when available. It should never however be left in sole control of a store without regular inspections to see the store condition and monitor operations.

Always leave control unit switched on even when not in use. This will maintain electronics in a sound, dry condition. Switch to "**Readout Only**" to eliminate control outputs.

During normal auto operation after the parameters have been set for control program you have selected the Display Selector switch would normally be left in the "**Croptemp**" position. This will show a continuous readout of all the Crop Temperature sensors as they are scanned in turn. The Cropsan locks onto each sensor for approximately 5 seconds in turn.

CROPSCAN 16

INSTRUCTIONS FOR INSTALLATION. **Single Live Output Version**

GENERAL

Screw unit to a firm flat surface using external black brackets on casing.

Try and ensure unit is at operator eye-line height to give ease of viewing readouts.

The unit required a 240 volt AC 50HZ power supply fused at 5 amp (max).
Output connections depend on the complexity of the installation. (see terminal list).

In principal however cooling, recirc, louvres open, louvres close give a single live output when the controller wishes to activate these functions.

The common of these relays can be linked to any voltage required (normally 240 volt AC 50HZ).

Refrigeration control is via a normally open voltage free contact.

On air mix systems a micro switch is required to show when the air intake louvre is fully closed. This is linked to the controller wired normally open when the louvres are open (unpressed). The switch contact should make when the louvres are closed (pressed).

An output is provided (ext. frost) for an additional cut out if required (ie. frost stat) This cuts off control outputs if the terminals are shorted together (contact closed).

Up to 16 crop sensors can be connected to the controller.

This is via a two-way splitter box which plugs into the 25 way dee socket on the unit. One or two 8-way sensor junction boxes can then be plugged into this.

On units with only 8 crop sensors a single 8 way junction box will plug directly into the Cropscan 16 via the 25 way dee socket.

The Ambient sensor plugs into its own blue socket on the unit side and is positioned near air intake on the stand off bracket provided.

The Air Mix (duct) sensor is positioned after the fans (usually part way down the air tunnel) to detect cooling air temperature.

This plugs into blue socket on side of the unit.

Mount at least 3m from fans if possible.

Important Note: Avoid running all sensor cables and multicore with mains cable as electrical interference can be induced in the cables in extreme cases.

CROPSCAN 16

INSTRUCTIONS FOR INSTALLATION. **Volt Free Contacts Version.**

GENERAL

Screw unit to a firm flat surface using external black brackets on casing.

Try and ensure unit is at operator eye-line height to give ease of viewing readouts.

The unit required a 240 volt AC 50HZ power supply fused a 5 amp (max).

Output connections depend on the complexity of the installation. (see terminal list).

In principal however cooling, recirc, louvres open, louvres close and refrigeration relays provide a Volt Free contact which makes when the controller wished to activate these functions.

On Air Mix systems a micro switch is required to show when the air intake louvre is fully closed. This is linked to the controller wired normally open when the louvres are open (unpressed). The switch contact should make when the louvres are closed (pressed).

An output is provided (ext. frost) for an additional cut out if required (ie. frost stat) This cuts off control outputs if the terminals are shorted together (contact closed).

Up to 16 crop sensors can be connected to the controller.

This as via a two-way splitter box which plugs into the 25 way dee socket on the unit. One or two 8-way sensor junction boxes can then be plugged into this.

On units with only 8 crop sensors a single 8 way junction box will plug directly into the Cropscan 16 via the 25 way dee socket.

The Ambient sensor plugs into its own blue socket on the unit side and is positioned near air intake on the stand off bracket provided.

The Air Mix (duct) sensor is positioned after the fans (usually part way down the air tunnel) to detect cooling air temperature.

This plugs into blue socket on side of the unit.

Mount at least 3m from fans if possible.

Important Note: Avoid running all sensor cables and multicore with mains cable as electrical interference can be induced in the cables in extreme cases.