

## C.F. Whaler Ltd.

For over 40 years C.F. Whaler Ltd. have specialised in the design, manufacture and installation of state of the art electrical and electronic control systems and equipment for agriculture and industry.

The company offers large comprehensive range of standard manufactured products to satisfy the majority of environmental control requirements, and a service to build to customers specific requirements.

### WHALER PRODUCT RANGE

- Fan Speed Controllers.
- Automatic Fan Controllers with switched Heater Interlocks.
- Electronic Sequential fan Controllers.
- PRESCON 2 Digital Air-Pressure controller.
- Lighting Control Systems.
- Total Refurbishment Programmes.
- Maintenance Contracts.

## C.F. Whaler Ltd.

### WHALER MICROLIGHT

- "Dawn to Dusk" Controls
- High and Low Temperature Alarms
- Supply failure Alarms
- Alarm Monitoring Systems
- Magnetically Held Door Control Systems
- MICRO-STAT Digital Thermostat.
- MICRO-TIMER Digital Cycle Timer.
- Transducers, Sensors and Thermostats.
- Vent Drive Motors/linear Actuators and Power Supplies
- STICK Microcomputer Total Environment Controller

For further details of any product or service please do not hesitate to contact us:-

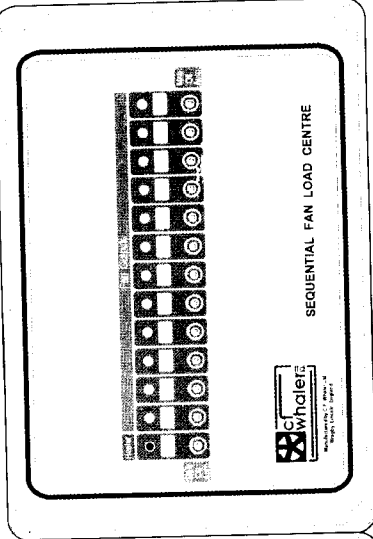
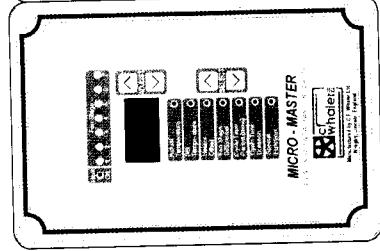
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Ventilation Engineers  
and  
Controlled Environment  
Specialists

# MICRO-MASTER

DIGITAL SEQUENTIAL FAN CONTROLLER  
AND  
SEQUENTIAL FAN LOAD CENTRE



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## SETTING PARAMETERS

In order to make any adjustments to the adjustable parameters, the **MICRO-MASTER** initially requires a Security Password number to be entered. Your **SECURITY PASSWORD NUMBER** for the **MICRO-MASTER 222** and should remain confidential to prevent unauthorised adjustments.

## ENTERING SECURITY PASSWORD NUMBER

- 1) Select the Security Password Parameter by operating the lower touch pads marked **SELECT** until the appropriate LED indicator is illuminated.
- 2) Using the upper **ADJUST** touch pads, set the security password to 222.

## ENTERING SET TEMPERATURE

- 3) Select the Set Temperature Parameter using the **SELECT** lower touch pads. Note that the Set Temperature LED is now illuminated.
- 4) Using the upper **ADJUST** touch pads, set the Set Temperature to the desired value within the range 10 - 35°C.

## ENTERING HEATER OFFSET

This parameter allows the user to set the Offset Temperature at which the heater will be switched on and may be either above or below the desired Set Temperature value depending on requirements. Considering the diagram on page 3 the heater is switched on at 19°C when the ambient temperature has fallen to 1°C below the Set Temperature value.

- 5) To select the Heater Offset Parameter use the **SELECT** lower touch pads. Note that the Heater Offset LEWD is now illuminated.

- 6) Using the upper **ADJUST** touch pads, set the Heater Offset to the desired value within the range of -5 to +5°C

## ENTERING FAN STAGE DIFFERENTIAL

The flexible **MICRO-MASTER** unit permits the user to set the Fan Stage Differential temperature that the fans switch from one stage of ventilation to the next, when the ambient temperature rises above the Set Temperature value. If for example shown in the diagram the set temperature is 20°C and the ambient temperature is rising above 20°C Assuming a Fan Stage Differential (continued)

## DESCRIPTION

The precision micro-computer based **MICRO-MASTER** designed by C.F. Whaler Ltd. provides touch button control of the switched sequential operation of ventilating fans over a temperature range of 0- 40°C. When operating in the auto mode the temperature is virtually maintained constant by signals that operate a heat source when the ambient temperature falls below a set level or sequentially switching on ventilating fans when the temperature exceeds the desired set conditions.

When the ambient temperature falls below the set level the heating may be switched on and the cyclic timer activated. This timer cyclically switches stage one ventilating fans to ensure there is no stale air build up within the building being controlled.

To prevent unauthorised changes in parameter settings, a security password number has to be used to make modifications.

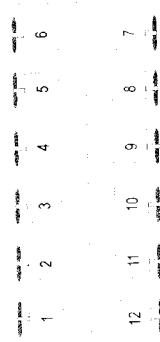
Signals from the **MICRO-MASTER** are supplied to the **SEQUENTIAL LOAD CENTRE** providing the user with full protection of each ventilating fan channel which can be switched to operate in either manual/off or auto modes.

## EXAMPLE

### Parameter set values

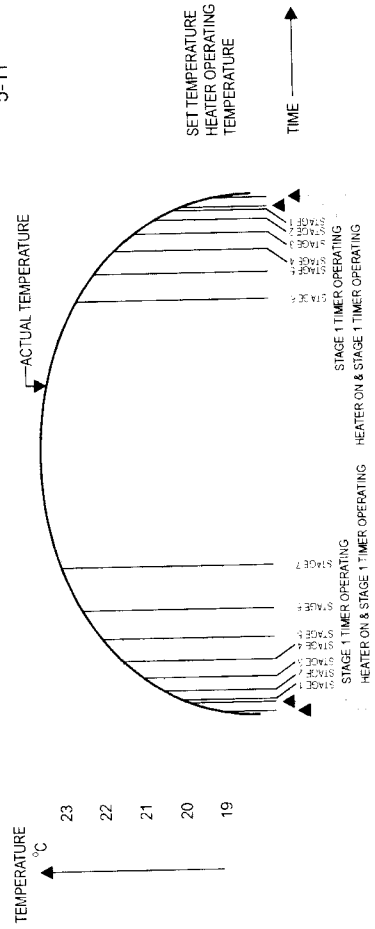
- Set Temperature 20°C
- Heater Offset -1.0°C
- Fan Stage Differential 0.5°C
- Cycle Time Period 10 minutes
- Cycle Time Duration 25% (2.5 minutes)

Ventilating Fan Assumed Layout



## FAN SEQUENCE

STAGE	1	2	3	4	5	6	7
FANS ON	6-12 3	6-12 3	6-12 3 9	6-12 3 9 1-7	6-12 3 9 1-7 4-10	6-12 3 9 1-7 4-10 2-8	6-12 3 9 1-7 4-10 2-8 5-11



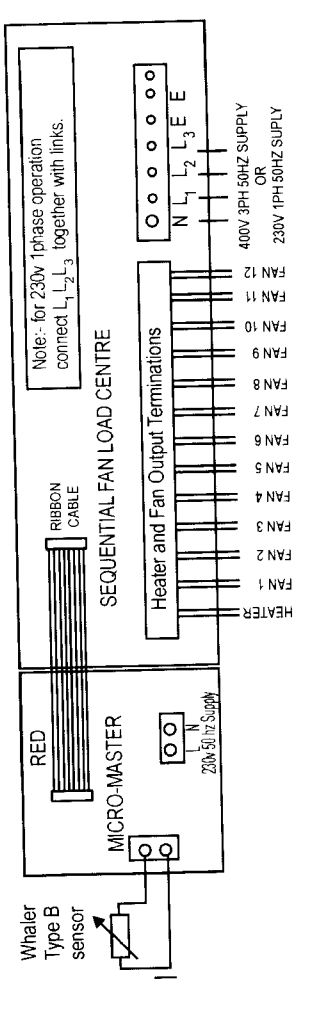
- Cycle Timer Duration.....Adjustable 0 - 100%
- Sensor ..... "Whaler" Type B
- Security..... Password Number
- Output Drive Signals..... To Load Centre
- Operational Indication..... Red or Yellow LED's
- Robust Polycarbonate Enclosure..... IP55 185x275x130mm

**SEQUENTIAL FAN LOAD CENTRE SPECIFICATION**

- Supply..... 400/230v -6%+10% 14Kva
- Max. number of switched and protected Fan Channels..... 12
- Max. output Load Current for per Channel..... 5A
- Individual Fan Output Channel Protection..... 5A (T)Fuse(11/4x 1/4")
- Operational Modes for Each Channel..... Switched Man/Off/Auto
- Operational Indication..... Red or Yellow LED's

Robust Polycarbonate Enclosure..... IP55 375x275x130mm

**SUPPLY CONNECTIONS**



**ENTERING FAN STAGE DIFFERENTIAL (continued)** Page 5  
 setting of 0.5°C the first stage of ventilation will function at 20°C followed by the second stage, as the temperature surrounding the sensor reaches 20.5°C. This procedure will continue until all possible seven stages of ventilation are functioning which should cause the ambient temperature to fall. When this occurs, the sequence reverses, switching OFF the ventilating fan stages as the temperature falls at 0.5°C intervals until the desired Set Temperature is achieved within the environment being controlled.

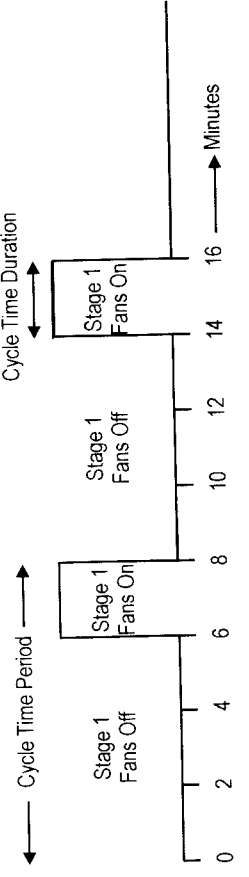
- 7) Using the **SELECT** touch buttons, select the Fan Stage Differential temperature required. Note that the adjacent LED will be illuminated.
- 8) Using the upper **ADJUST** touch pads, set the Fan Stage Differential to the required value within the range of 0.1 to 1°C.

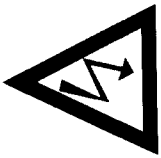
**ENTERING CYCLE TIME PERIOD**

The Cycle Time Period and Cycle Time Duration Parameters allow the user to set up the **MICRO-MASTER** so that the stale air build up is prevented even when the heating within the controlled environment is in operation. The precise cyclic operation of stage one ventilation fans is fully adjustable to meet the application demands. Initially the Cycle Time Period is set to an assumed value of, for example 8 minutes. Secondly the Cycle Time Duration is set to an assumed value of 25%. With these settings the first stage of ventilation will be switched on for 2 minutes and then off for 6 minutes. This occurs when the ambient temperature falls below the Set Temperature. Considering the diagram on page 3, the cyclic operation of Stage 1 fans occurs at 19.9°C below the Set Temperature.

**PARAMETER SETTINGS**

- Cycle Time Period 8 minutes
- Cycle Time Duration 25%
- Stage 1 Fans OFF Time 6 Minutes
- Stage 1 Fans 1 ON Time 2 Minutes





**DANGER**  
ELECTRIC SHOCK RISK

**ELECTRICAL DEVICES CAN CONSTITUTE A SAFETY HAZARD**

It is the responsibility of the user to ensure that the installation and maintenance of the product are carried out in strict compliance with any relevant instructions, regulations, codes of practice or bylaws in force. This equipment should be installed and commissioned by appropriately qualified personnel who have read and fully understood this user's manual. If in doubt contact your supplier or C.F. Whaler Ltd for technical advice. Every care has been taken to ensure that the contents of this construction booklet are accurate, however no liability is accepted for any consequence of its use. The manufacturers reserve the right to revise the product specification and other technical features resulting from improvement and continual development.

**MICRO-MASTER SPECIFICATION**

Supply.....	230v 50hz -6%+10% 10va
Setting Parameters.....	Front Panel Touch Pads.
Temperature Range.....	0 - 40°C.
Set Temperature Range.....	Adjustable 10 - 35°C.
Resolution.....	0.1°C.
Heater Offset Range.....	Adjustable -5°C - 5°C.
Maximum Number Ventilating Fans Stage.....	7 Stages plus Heater.
Fan Stage Differential Temperature Range.....	Adjustable 0.1°C - 1°C.
Cycle Timer Period.....	Adjustable 12 sec. - 10 mins

**ENTERING CYCLE TIME PERIOD (CONTINUED)**

- 9) Select the Cycle Time Period Parameter using the select lower touch pads. Note Cycle Time Period LED is now illuminated.
- 10) The Cycle Time Period can now be set between 12 seconds and 10 minutes to suit a particular application by using the upper **adjust** touch pads. Note that the digital display records time in minutes therefore 8.4 minutes displayed, is actually a Cycle Time Period of 8 minutes 24 seconds.

**ENTERING CYCLE TIME DURATION**

This parameter is a percentage of the Cycle Time Period,

- 11) Select the Special Function Parameter using the **select** touch pads. Note that the Cycle Time Duration LED is now illuminated.
  - 12) Using the upper Adjust touch pads, set the Cycle time Duration percentage value so that the **MICRO-MASTER** automatically calculates the desired on time for those ventilating fans operating in the cyclic mode.
- Note:- The micro-master calculates the Cycle Time Duration to the nearest 6 seconds.

**APPLYING SECURITY**

- 13) Select the Special Function Parameter using the **SELECT** touch pads.
- 14) Set the displayed number to **any number except 222**

Note:- After a short period the unit will operate in a secure mode and the display will return to indicate the Actual Temperature.

**FAN STAGES**

The **MICRO-MASTER** controller determines the stage of ventilation fans required to be switched on to satisfy particular conditions.

The actual fans designated to switch on for each stage of ventilation is as per customer's specification and controlled by the **sequential load centre**.