

Microsave® Starter Control System

TECHNICAL DATA NUAIRE

CI/SfB Ref

(57.7) Xh

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Leaflet 670579
240V 1ph 50Hz
415V 3ph 50Hz
MAY 2001

NB.
Also available for
60Hz operation
Refer to NuAire
for details.

Dimensions

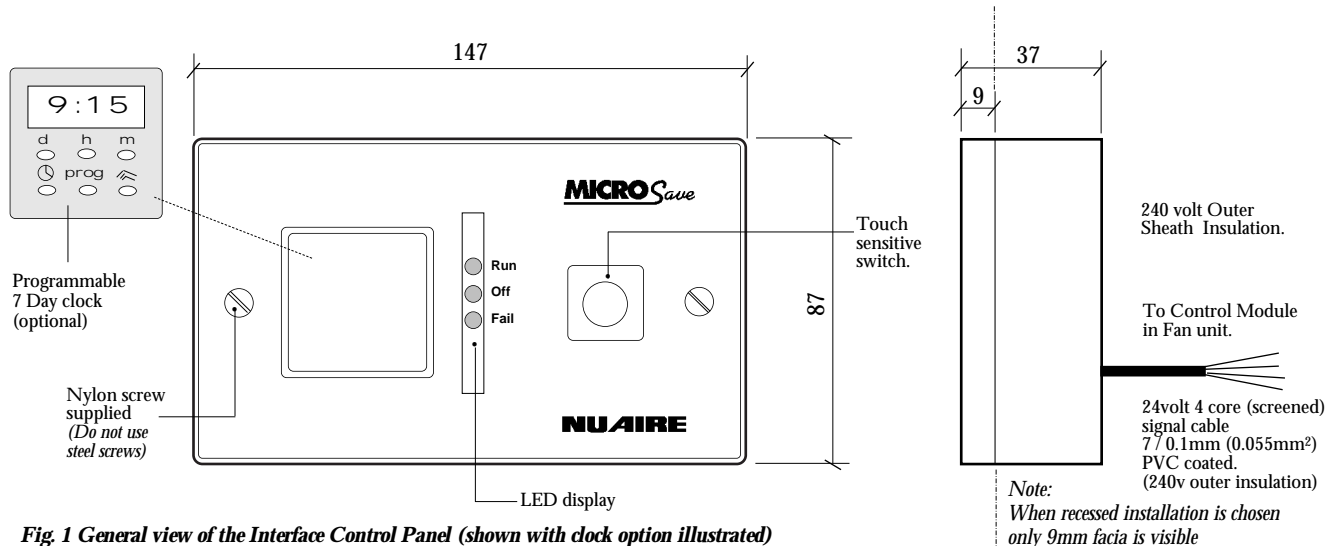


Fig. 1 General view of the Interface Control Panel (shown with clock option illustrated)

General Description

The Microsave Fan Starter Control System comprises two electronic modules connected via safe extra low voltage wiring (24v). The **Control Module** is fitted local to the fan unit (or in any location within the mains supplied to the fan) and the **Interface Control Panel (I.C.P.)** mounted at the desired point of operation. (See Figs. 1 & 2).

This system has been specifically designed for use with NuAire single and three phase fan extract units and utilises **Safe Extra Low Voltage Circuitry (S.E.L.V.)** to control and display the operation of the NuAire fan. The operational control, known as the **Interface Control Panel (I.C.P.)** can be located at any convenient location within the building, its compact size allowing an easy and unobtrusive installation. The fan is controlled via the touch sensitive switch on the I.C.P.

STANDARD FEATURES:
Manual 'ON' / 'OFF' control
with 'FAIL' indication.

Current/Thermal overload protection
Failure detected by the contactor overload signal and/or Heatseeker thermal protection device on the motor (where present).

OPTIONAL FEATURES:
Time Clock control (option)
A programmable clock operates the fan up to three times a day, seven days a week.

Multiple Fan control (option)
A 'NuAire Multistart Control Panel' operates a series of fans from one I.C.P. mounted in the panel to give operational start. Each fan being controlled has individual run, fail and off indicator lights with a manual off switch.

The NuAire Microsave® Starter Control System conforms to EN 50081-1 (1992) EMC Standard (Emissions) and EN 50082-1 (1992) EMC Standard (Immunity).

Starting of the fans is staggered to avoid excessively high start currents.

Switching via remote Microsave Thermostat or Humidistat.

The fan(s) can be operated via a Microsave Thermostat / Humidistat etc. for an automatically controlled environment.

Remote Run / Fail Indicator (option)

A remote Run / Fail Indicator can be connected to the Control Module if more than one display is required. The Fail signal is taken from the contactor overload and/or 'Heatseeker' thermal protection device on the motor.

Normally the controller is designed to operate LED indicators (TRV). It is possible to specify volt free contacts remote from the Microsave Starter (see wiring diagram Fig.9)

B.M.S. Compatible (Interface option)

By the addition of an interface circuit Microsave starters are compatible with Building Management Systems. This offers full fan control and status reporting. NB: There is no I.C.P. on this option. (please refer to B.M.S. section on page 5)

Interface Control Panel (I.C.P.)

At the point of customer control the Safe Extra Low Voltage (S.E.L.V.) circuit is housed behind an ABS fire retardant moulded fascia plate. This plate is supplied fitted onto a standard size, surface mounting, **plastic** double gang socket box.

Note: It is also possible to fit the fascia plate onto a 'recessed' **plastic** double gang power socket box thereby limiting the intrusion into the room to only 9mm.

Use the nylon fixing screws supplied, **do not** use metal screws or fit onto a metal back box.

By placing a fingertip into the concave indent on the fascia front, the touch sensitive switch sequences the controller through the 'RUN' and 'OFF' functions. In the event of fan failure (Current/Thermal) the I.C.P. will display a red 'FAIL' LED.

Control Module

The Control Module is housed in a box of galvanised steel construction with air vents on the cover. The Control Module is connected to the I.C.P. by one, 24v four core screened (7-0.1mm) PVC coated signal cable. The screen should be earthed at the Control Module.

The fan is operated according to the 24v instructions from the I.C.P.

All wiring between the Control Module and I.C.P. is S.E.L.V. (24volt).

Refer to NuAire Installation and Maintenance Instructions for the particular fan in use.

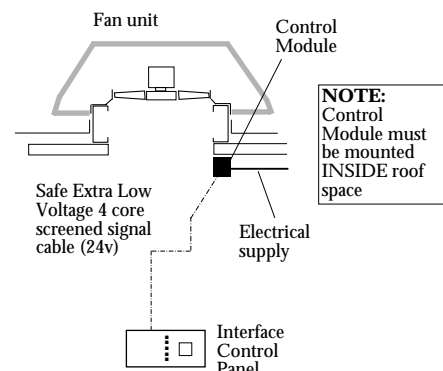


Fig. 2 Schematic layout of system

General Information

The Starter System

The Starter system operates single and three phase units using a contactor fitted with suitable overload protection. The contactor is pre-wired so that in the event of overload it automatically resets. However, the Microsave system recognises that an overload has occurred and 'latches' the system in its 'FAIL' condition. It is therefore possible to reset the fan by sequencing the I.C.P. from 'FAIL' to 'OFF'. Failure to reset would indicate a significant motor problem needing further investigation. On some fan units a thermal trip device is used to signal excessive motor temperatures for added fan protection.

Control Options

Control options available:

- * Programmable clock control
- * Multiple fan control
- * Operation via remote sensors
- * Remote run / fail indicators
- * Remote run / fail volt free contacts

Option Code /description

Programmable clock control

A programmable clock can be specified to control the fan (not available when a BMS option is chosen).

The clock offers three 'OFF' and three 'ON' programmable time periods during any 24 hour period, seven days a week. The clock has a battery back-up which will retain the set operating program for up to 72 hours. See 'Using the I.C.P.'

Multiple fan control

Utilising a single I.C.P. as an operational Start, it is possible to operate a series of fans. A time delay is incorporated to minimise starting loads. Control may be manual or timeclock initiated. Once activated, the operational Start I.C.P. relays information to slave circuits mounted in a specially designed Multiple Start Control Panel (see page 3).

Operation via Microsave Thermostats / Humidistats.

Automatic control of fans can be achieved by using Microsave Thermostats and Humidistats (24v) in conjunction with a Microsave Starter Control System. The fans can then be switched ON/OFF depending on the environmental conditions. The humidistat/thermostat should be located in the ventilated area and connected to the fan control module by screened signal cable as previously specified (only 3 cores required).

Local speed control can be achieved by using a Microsave Speed Control in conjunction with the Microsave Starter Control System (Please check NuAire Microsave Speed Control Selection Sheet) as not all fans can be speed controlled.

Remote Options

Indicators.

TRA ELV

As a remote extension of the Microsave Starter System the TRA ELV provides an audible warning of a fault condition. The warning can be silenced by a manually operated muting switch. This lights an LED indicator which remains on as an indication that the audible warning has been switched off.

TRV ELV

Another remote indicating extension of the starter system is the TRV ELV which provides visual indication at a remote location of fan condition by means of 'RUN' and 'FAIL' LED indicators.

Remote Run/Fail Volt Free Contacts

RELAY BOX 3

As a further extension of the Microsave Twin Fan System the RELAY BOX provides volt free contacts for both the RUN and FAIL conditions. Refer to wiring diagram 9.

Key to Coding

First refer to Microsave Selection

Guide to find the basic Starter code.
For a typical example, with Single Phase Airmover AM 315-1

M STAR 7

M STAR = Microsave starter

7 = NuAire ref No.

For another example:

M STAR 7 TC

Is a Single Phase Microsave Starter, NuAire ref. 7, with a Timeclock option. For the Multistart option please refer to page 5 in this data sheet.

Multistart coding:

MULTISTART - (No. of fans)
eg. **MULTISTART - 7 = (Multistart with 7 fans)**

Note: When ordering it is vital to match the correct starter to the appropriate fan. Also on site care MUST be taken to ensure the correct starters are fitted to each fan.

Using the Clock option

The clock will not operate until the battery back-up has been charged. 15 minutes may be required to fully charge the battery.

When the system is ready, a display will be seen on the clock. To initiate the clock display it is necessary to press all four corner buttons simultaneously. The seconds counter will then 'pulse'. To adjust the time, hold down the clock symbol and set the days, hours and minutes.

To set the three 'ON/OFF' times, press the PROG button to set each period. Note: Manual override is not available during the programmed 'OFF' periods. Other control functions are available on the clock. Refer to the accompanying booklet within the ICP.

Using the Interface Control Panel (I.C.P)

Manufactured in flame retardant ABS plastic (V.O.rated), the Interface Control Panel is designed to fit a standard double gang power socket.

The unit may be installed using the surface mounting box supplied, or it can be recessed using a plastic flush mounting 2 gang power socket box, (not supplied).

The Fan is operated by a touch sensitive switch on the facia (see fig 1). By placing a fingertip in the concave recess the controller will sequence between OFF and RUN as shown in Fig. 3.

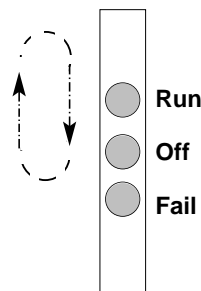


Fig. 3 Facia LED sequence

When the mains supply is first switched on, the I.C.P. will display an amber LED indicating that the fan is 'OFF'. To start the fan, touch the concave recess on the facia. The I.C.P. will display a green LED indicating that the fan is now 'ON'. If the controller senses a failure condition (Thermal or Current Overload) power is removed from the fan and the red failure LED illuminates.

Note: If the current overload has tripped it resets itself and the controller latches itself in the above failure mode. Operating the ICP again cancels the failure LED

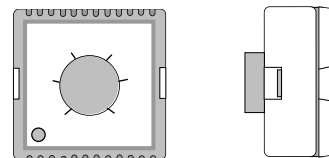
Sizes and weights of the Control Modules are shown in the relevant NuAire Product Selection Sheet.

Microsave Thermostat / Humidistat

To give 'ON / OFF' control of individual fans. A GREEN LED shows when the fan is switched ON.

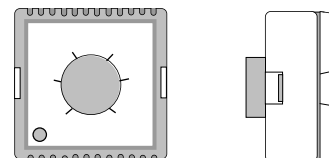
Microsave Thermostat

Codes: Adjustable:- MTSTAT - A
Tamperproof:- MTSTAT - B



Microsave Humidistat

Codes: Adjustable:- MHSTAT - A
Tamperproof:- MHSTAT - B



Multistart Option

Using the Multistart Option

This option has an operational Start I.C.P. recessed into a specially designed panel. The multistart can be activated manually (standard) or by incorporating a time clock (optional). The starting signal is relayed from the operational start ICP to slave circuits mounted behind the individual fan run/fail and off indicators and manual 'off' switch.

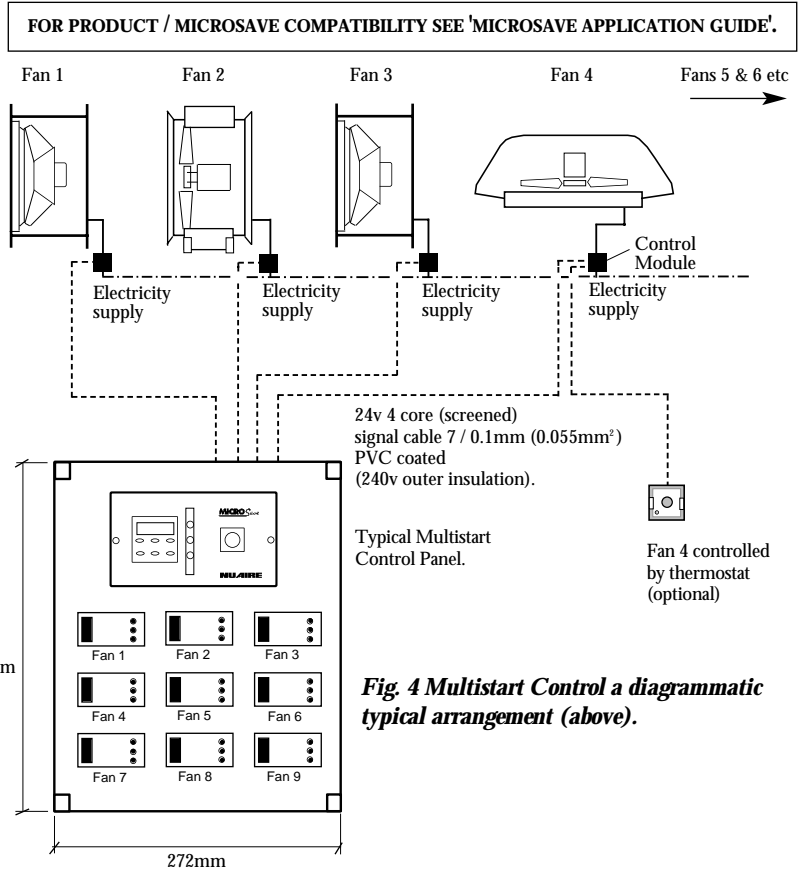
The multistart system comprises a control panel with indicator lights for each fan being controlled and a control module (one for each fan) which is normally fitted near to the fan unit. Connections between multistart panel and control module to be in 24v 4 core signal cable.

Instructions are passed to fan 1, fan 2, fan 3 etc in sequence. It is therefore necessary to specify the required number of fan units when ordering. Each slave circuit introduces a 2 / 3 second time interval to prevent excessive start currents.

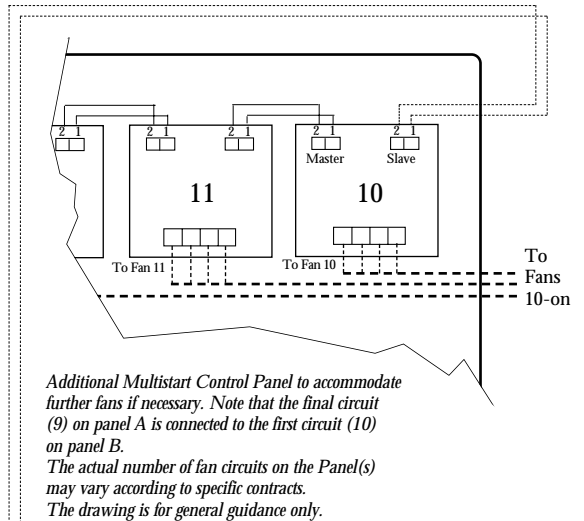
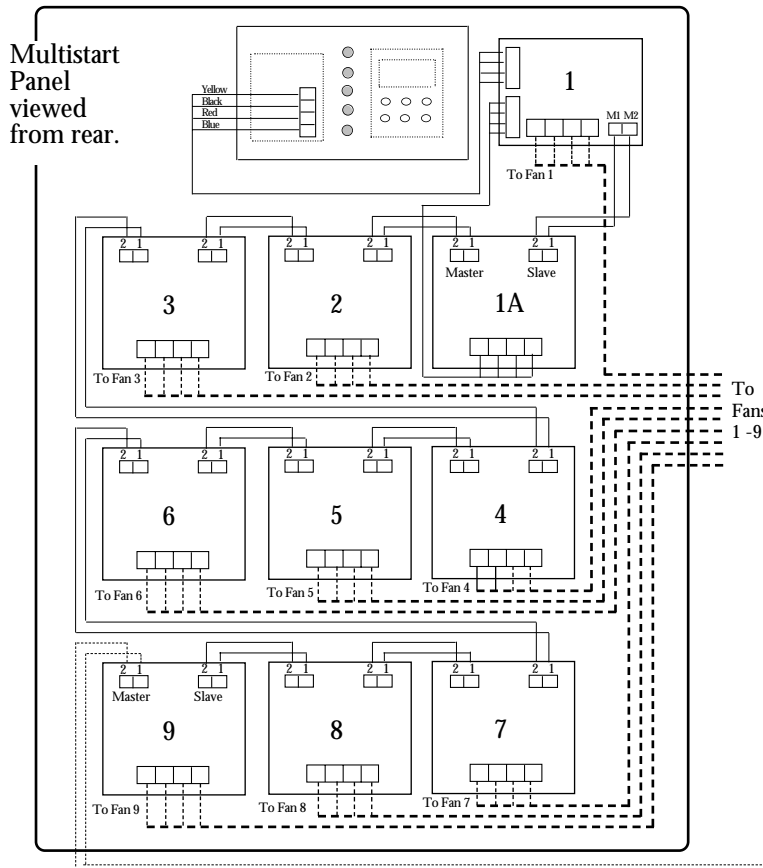
The fans are individually connected to the slave circuits in the panel. Each fan can be manually switched off at the Multistart panel without affecting the operation of the remaining fans. Overall fan operating times are controlled by the time clock when fitted. Any fan in the series can be individually controlled by remote Microsave 'stats if required. For further details refer to wiring diagrams on page 4.

NOTE:

Each fan is independently linked to the system so that, in the event of an electrical fault condition, only the affected fan fails. A single Microsave Multistart Panel can control up to 9 fans. Additional panels will be required for larger fan numbers. Consult NuAire for further details.



Indicated below: Reverse side of Multi-Start Control Panels (Dimensions 365mm x272mm x100mm) showing wiring connections.



Wiring the Panel to the fans

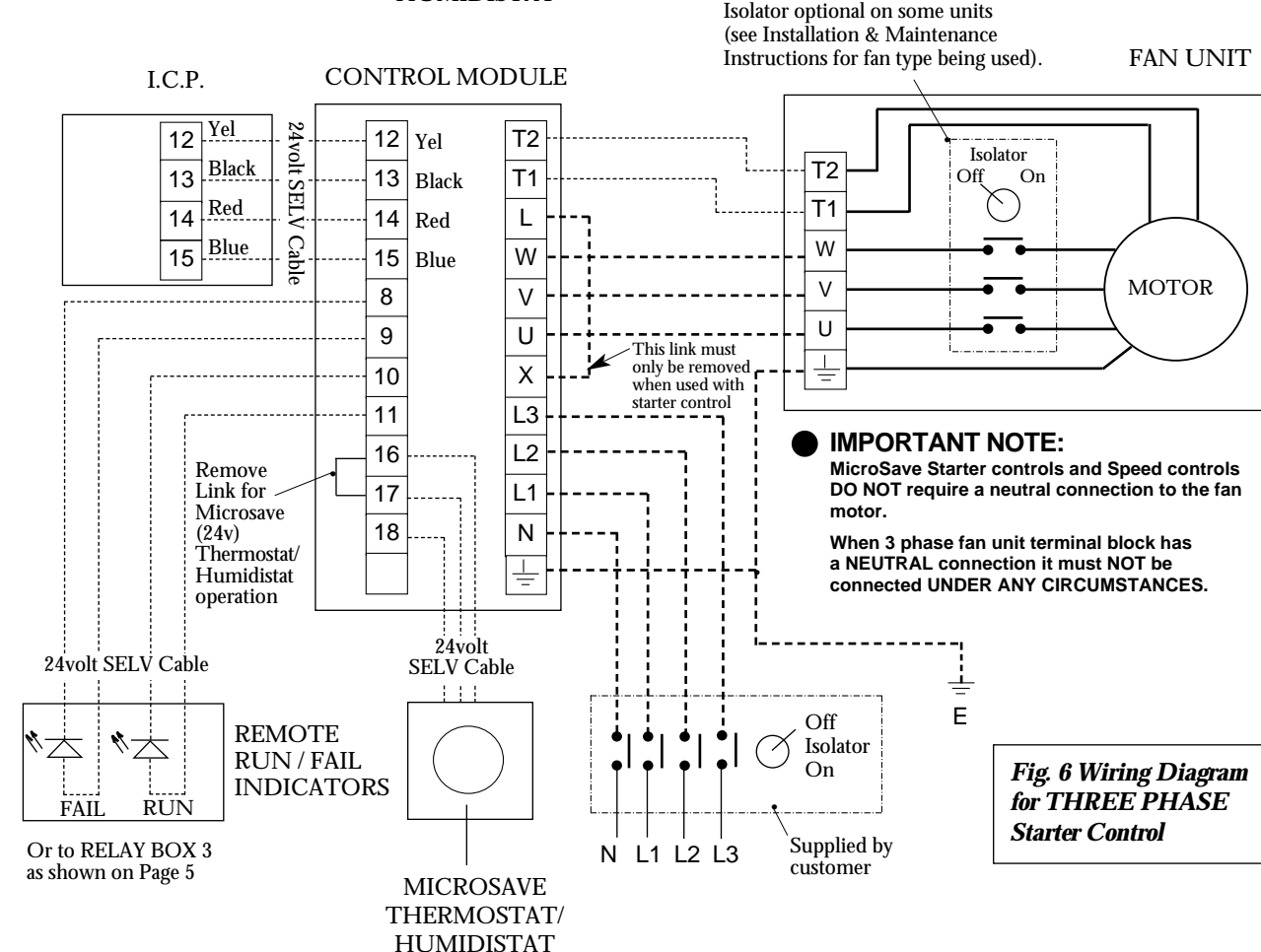
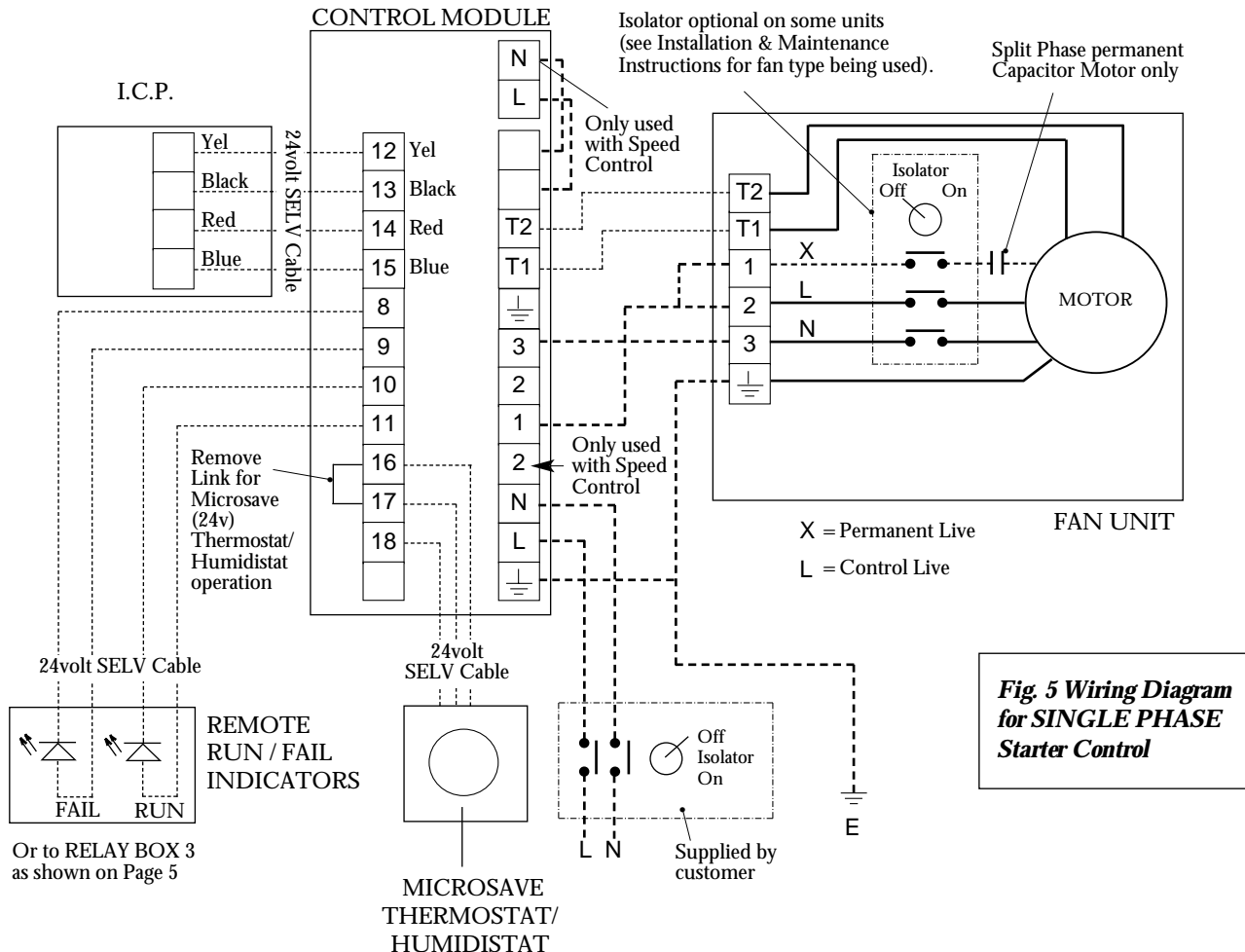
The fans are individually connected to the Multi-Start Panel by the customer using the Blue/Red/Black/Yellow block at the bottom of each slave circuit board. Note that circuits 1 and 1A constitutes the control circuitry for Fan 1. The connection for Fan 1 is at the bottom of circuit 1 as shown. All other fans are connected to the individual circuit boards as shown.

Warning: Do not change any pre wired connections.

KEY TO WIRING MULTISTART INTERNALS
 Customer installation wiring
 Prewired by NuAire. _____

Wiring Diagrams

240V 1ph 50Hz
 415V 3ph 50Hz



Wiring Diagrams for Remote Run / Fail indicators

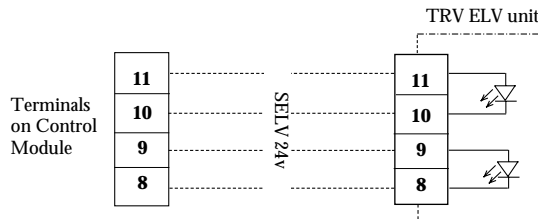


Fig. 7. TRV ELV Option remote 'Run and Fail' indicator (visual warning).

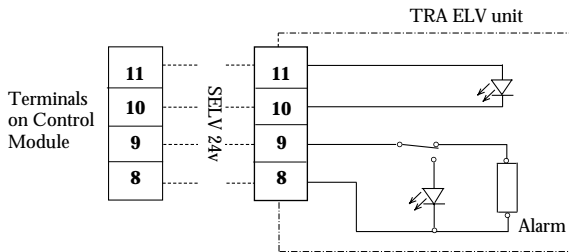


Fig. 8. TRA ELV Option remote 'Run and Fail' indicator (audible warning).

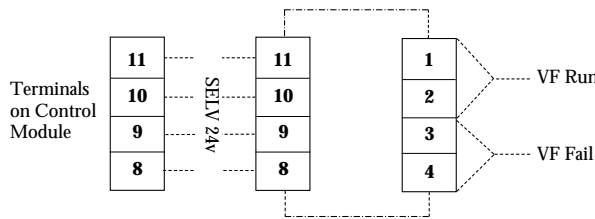


Fig. 9. RELAY - BOX 3 Run and Fail volt free.
 (Note: Volt free contacts are rated at 240V 2A 50 Hz)

Using the B.M.S. option

By adding an additional circuit to the Microsave system, the starter may be operated and monitored by a building Management System (B.M.S.)

This additional circuit is called the B.M.S. Interface.

NB. The manual operated I.C.P is not required on the B.M.S. option as all signal connections are wired to the B.M.S. Interface.

The B.M.S. computer can operate the starter in a similar way to the conventional I.C.P. The B.M.S. Interface can receive a pulsed signal from the B.M.S. computer which replaces the operation of the touch sensitive switch. This will sequence the fan between its 'OFF' and 'RUN' functions. The B.M.S. Interface outputs one coded signal to report the three functions ie. 'OFF', 'RUN', 'FAIL'.

Milliamps or Voltage Inputs/Outputs

It is possible to alter the input / Output channels to read in either milliamps or volts. This is achieved by simply opening or closing the 'links' on the B.M.S. Interface Circuit Board.

The Interface units are despatched with all channels set to operate on milliamp

reading. Please specify if voltage settings are to be used. (When specifying or ordering, please indicate whether output is required in milliamps or volts).

B.M.S. Interface connections

Note:

Output to B.M.S. is 0-10v or 4-20mA.

The channels report the status of the following items:-

Channel 1 (Yellow) - FAN STATUS
 Coded (Voltage & Current)

- 0 - 2.5v or 0 - 8 mA (OFF)
- 2.5 - 7.5v or 8 - 16 mA (RUN)
- 7.5 - 10v or 16 - 20 mA (FAIL)

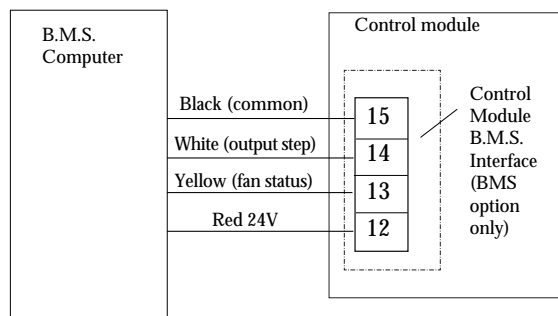


Fig. 10. B.M.S. Control Option Wiring Diagram for Single and Three Phase units.

Channel 2 (White) - CONTROL SIGNAL FROM B.M.S.

Output Pulse of 7V minimum for a duration of 10mS, minimum to sequence the controller through its functions (see note on Channel 4)

Channel 3 (Black) - COMMON

As with all control equipment a common signal must be connected as a reference between the B.M.S. and the Interface Circuit. This is a voltage or ampage reference signal. **This black wire (common) from the B.M.S. Interface to the building Management System must be connected in all B.M.S. installations.**

Channel 5 (Red) - OPTIONAL 24V D.C.

To connect 24V D.C. external supply from B.M.S. (this is used when the normal power supply from the Control Module is not required).

Power Supply to Interface circuit

The Interface unit normally receives its power from the Control Module. However, if required, it is possible for the customer to power the Interface circuit directly from the B.M.S. (Channel 4 on the B.M.S. Interface) See NuAire Microsave Starter Control Installation and Maintenance sheet.

NOTE:

If the Interface receives its power from the control Module, 24V D.C. will be present on Channel 4 (Red). This may be used to provide the 'step' input (Channel 2)

When installing the B.M.S. option, power is supplied as normal to the Control Module. All necessary wiring between the Control Module and Interface circuit is carried out by NuAire. The customer is only required to connect the chosen input and output channels to the B.M.S. computer.

All power supplied to the Interface circuit is opto-isolated from the B.M.S. therefore it is impossible to damage the B.M.S. in the event of incorrect wiring to the unit.

If required, the TRA ELV and the TRV ELV remote failure warning indicators can be specified in addition to the B.M.S. These are connected as they would be in the standard installation.

Specification

240V 1ph 50Hz
415V 3ph 50Hz

Short Form Specification

General Note for all systems except B.M.S. and Multistart options.

All fans shall be controlled by a NuAire Microsave Control System utilising the Extra Low Voltage Interface System.
code ref:

The system is to comprise a Control Module fitted within the mains supply to the fan unit and shall be connected to the Interface Control Panel (I.C.P.) via 24 volt 4 core screened signal cable 7 / 0.1mm (0.055mm²) PVC coated (240v outer insulation).

The I.C.P. shall have a touch sensitive switch to select the fan mode and shall incorporate coloured L.E.D.'s to indicate fan status.

The I.C.P. shall be the same size as a surface mounted double gang power socket. Dimensions: 87mm x 147mm x 37mm and the fascia plate incorporating electronics shall be suitable for recessing into a plastic double gang power socket.

The I.C.P. shall be manufactured in fire retardant ABS plastic (VO rated).

Manual 'ON' / 'OFF' control (with 'FAIL' indication).

code ref:

The control shall allow manual ON /OFF selection via a touch sensitive switch on the I.C.P. control fascia and shall include a FAIL indication by means of a red LED.

Time Clock (optional) code ref: (TC)

The Interface Control Panel shall incorporate an integral digital time clock, being of a 7 day type having 3 off and 3 on functions per day. The time clock to include a battery back up in case of power failure.

Multistart option

The System shall be able to control a series of fans from a Multistart Control Panel. This shall contain a recessed mounted operational Start I.C.P. and 'RUN / FAIL / OFF' LED displays to monitor the functions of each fan and an individual 'off' switch. Each fan to have a matched 'Control Module'.

Additional Multistart Control panels to be provided if more than nine fans are to be operated, all being controlled from the 'operational Start I.C.P.'

Each fan to be independently connected to the system so that in the event of an electrical fault condition, only the affected fan will fail.

A time delay of minimum 2 seconds shall be incorporated in the system to stagger the starting currents.

The system to be operated by a manual signal or, if specified, from a time clock control, built into the operational Start I.C.P.

Individual fans within the loop shall be able to be controlled via remote Microsave Thermostats / Humidistats if specified.

Technical or commercial considerations may, from time to time, make it necessary to alter the design, performance and dimensions of equipment and the right is reserved to make to make such alterations without prior notice.