

"Did you hear something?"



For over 20 years Stock Electronics has manufactured, in ever increasing volumes, variable voltage AC motor speed controls for fans and pumps using triac phase cutting techniques. This method of motor speed control, although economic may not meet the specification for certain environments and motors.

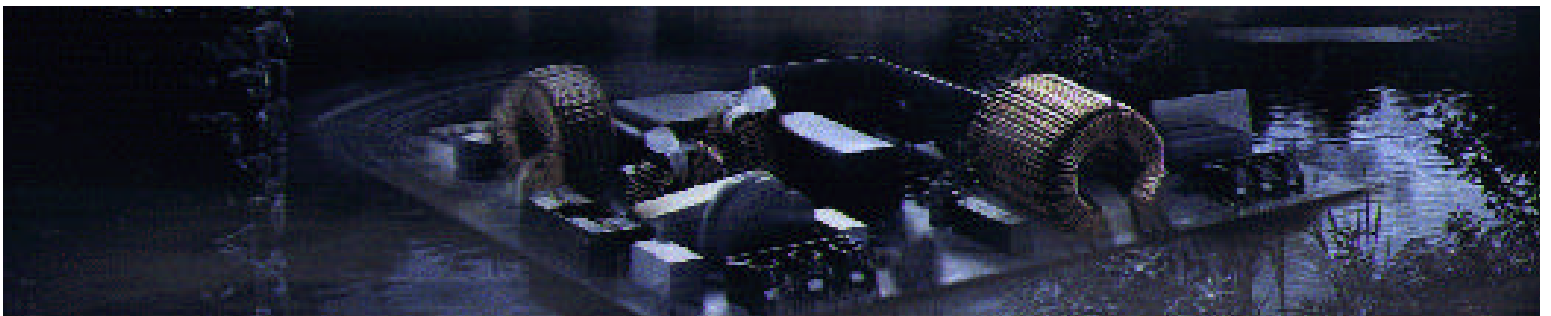
The Quiet Motor Control

Alternative Technology, the Quiet Motor (QMC), recently developed by Stock Electronics involves the use of power transistors known as Mosfets which provide a pure sine wave to the motor. Infinitely variable speed control is achieved by varying the amplitude of this wave.

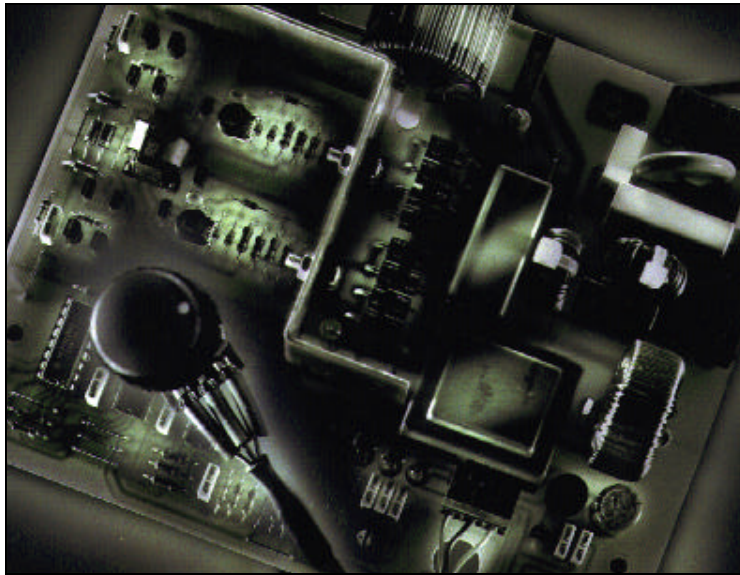
User Experience

A consultant was concerned about noise levels in a special temperature controlled breeding cage he was designing, being aware that different animals experience discomfort when subjected to electrically generated sound waves.

The cage needed optimum conditions to encourage breeding, and precise temperature control, using QMC technology, "Works like a dream".



The Benefits



Manually operated QMC

The features of the MOSFET Circuit

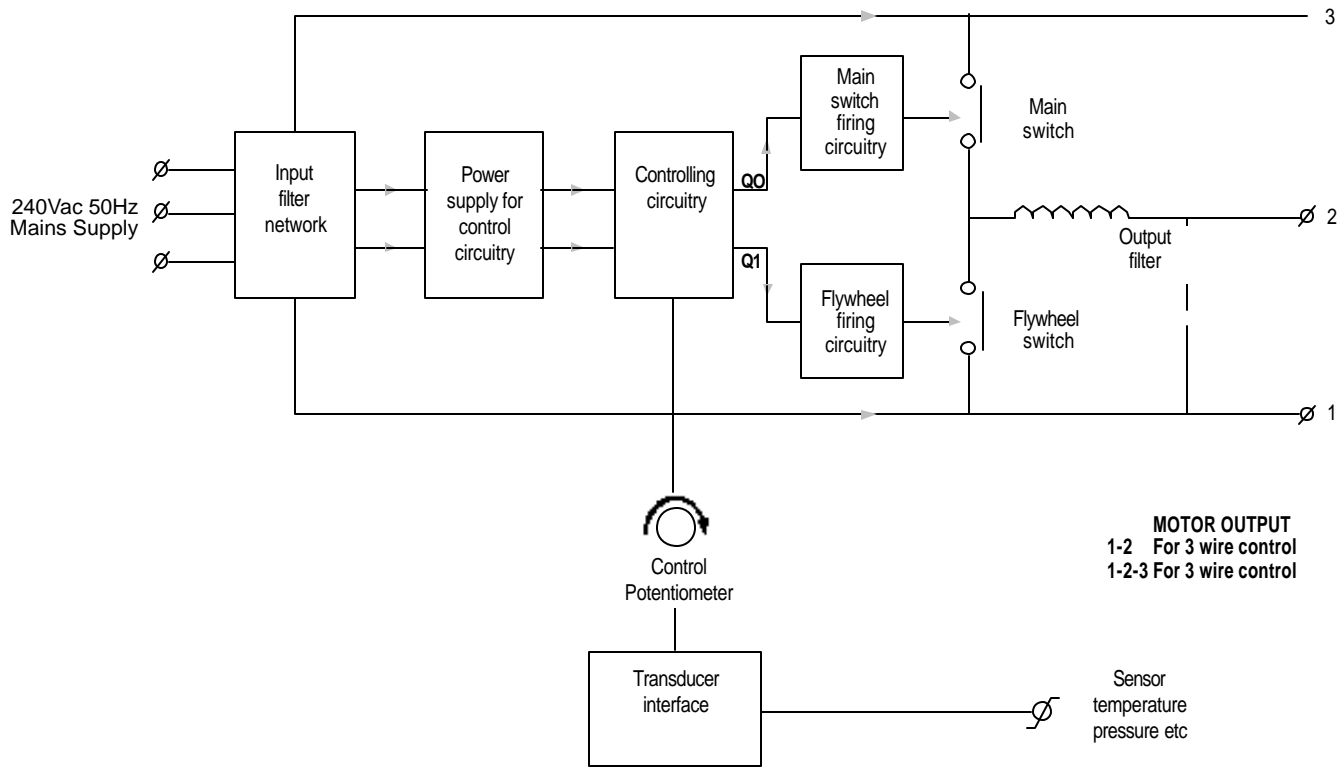
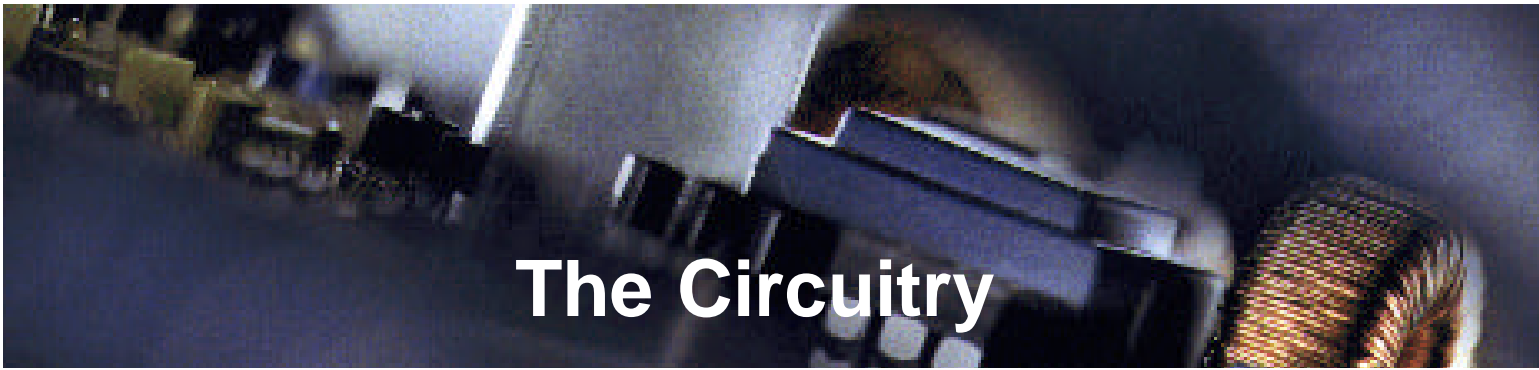
- Eliminates motor magnetic hum
- It improves the efficiency of the motor which runs cooler without the switching harmonics associated with triacs.
- It provides stable voltage settings, unaffected by motor load conditions, ensuring use with a wider range of motors that is recommended for Triac control – even 2 pole motors!
- The unit is more compact and lighter than the transformer technology it replaces.
- Enhances stability of control – even 2 pole motors!
- Manual adjustment of motor speed is achieved by 0-10v d.c signal input proportional to sensed values of air temperature, pressure, flow or quality or by infra red remote control.
- Can be retrofitted, with careful regard to EMC requirements.



The Specification

	QMC CJ	QMC P	QMC RP
Control Features	0-10v d.c. signal from various sensing devices	Infinitely variable control achieved via manually operated potentiometer mounted on front facia.	Infinitely variable control achieved via manually operated remote potentiometer upto 30m.
Enclosure	Can be incorporated into OEM fan box or supplied as stand alone enclosure to a required IP rating		
Maximum Current Rating at 30° C	1.0 amps in 2 wire 1.5 amps in 3 wire		
Maximum Start Current Rating	3.0 amps		
Circuit Protection Fuse Size	2.0 amps		
Supply Voltage Minimum Voltage	220/240 volts Adjustable by board mounted potentiometer		
Hard Start	5.0 seconds		
Motor Protection	The installer should provide adequate protection (as recommended by IEE Regulations)		
Weight (Exc. Enclosure)	370 grams		
P.C.B Size	135 x 158 x 35mm		

All dimensions are subject to revision and may change subject to demand.



Schematic Diagram of the Mosfet Circuitry

Technology Briefing

QMC technology compared with Triac Phase Control Technology

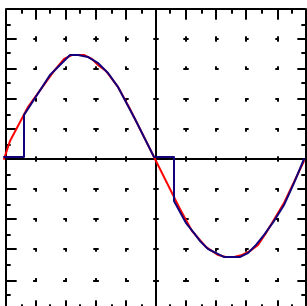
To appreciate the benefits of the QMC technology over that of triac phase control, it is helpful to understand the conceptual difference between them.

The triac control acting as a switch 'cuts' the supply to the motor 100 times a second – creating differing peaks of current at switching. This causes sharp edges as illustrated by the blue line on the graphs below. It is inevitable that this switching creates varying levels of magnetic hum which in turn produce mechanical noise.

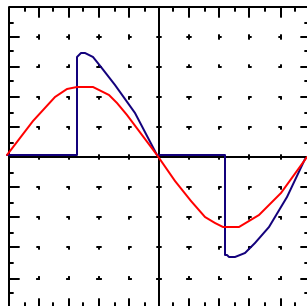
The QMC method, incorporating MOSFETS simulates a variable amplitude sine wave by

modifying the sinusoidal supply illustrated by the red line on the graphs below. The amplitude determines the rotational speed of the motor load, whilst avoiding the magnetic hum associated with triacs.

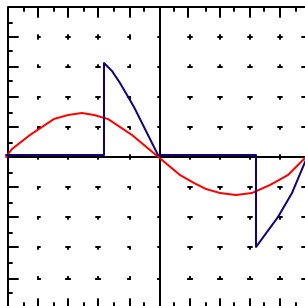
To illustrate the point four examples are shown graphically. The output voltage of the QMC was set to 70, 100, 170 and 240 volts rms. The speed of the motor was recorded and the same speed was set on the motor when connected to the triac control. The fan motor would perform at a similar speed – but not necessarily the same voltage under either control method for comparison.



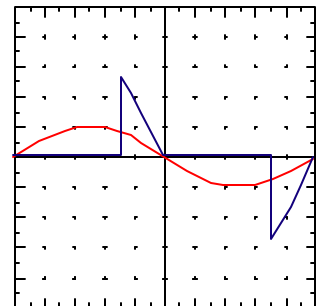
Output of QMC set
for 240 volts rms



Output of QMC set
for 170 volts rms



Output of QMC set
for 100 volts rms



Output of QMC set
for 70 volts rms

■ = QMC output waveform
■ = Triac controller waveform



Technical Briefing

Motor Compatibility

The QMC controls 2-8 pole permanent split capacitor, shaded pole and Steinmetze motors, single phase 220/240 volts 50Hz

Electromagnetic compatibility

Stock Electronics will ensure that the module meets the EMC requirements of the OEM.

It is the installers responsibility to ensure that guidelines are followed. It should be remembered that when two or more EMC compliant components are combined, the resulting system may not be compliant. Emissions from combined components tend to be additive whilst immunity remains constant. It is the EMC compliance of the final system which counts in law.

All products carry a two year guarantee when correctly connected to fan motors specified as suitable for electronic speed control.

Installation

Circuit Board Mounting to meet E.M.C requirements

- The board should be adjacent to or within 3 metres of the fan motor.
- The motor frame and circuit board must be separately earthed.

Connections

- Terminal blocks are standard. Spade terminals are optional.

Enclosure/Lid

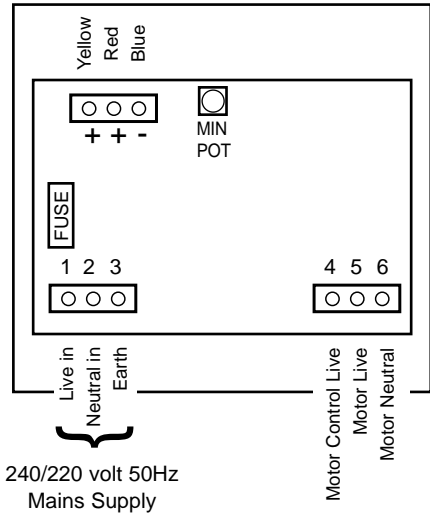
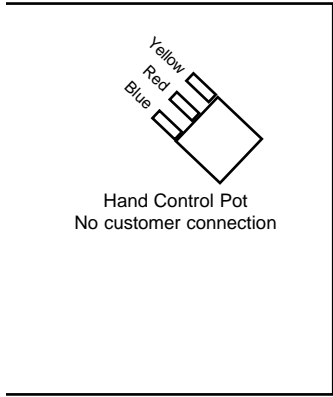
- OEM manufacturers benefit from mounting the unit within their own equipment to ensure it complies with the limit specified above.



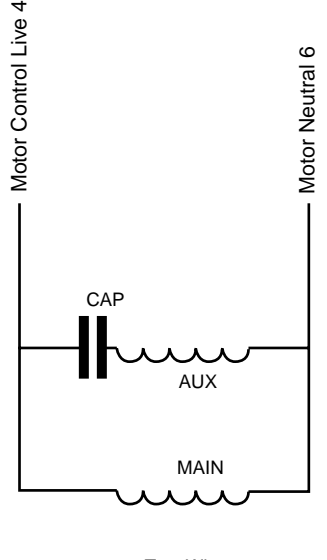
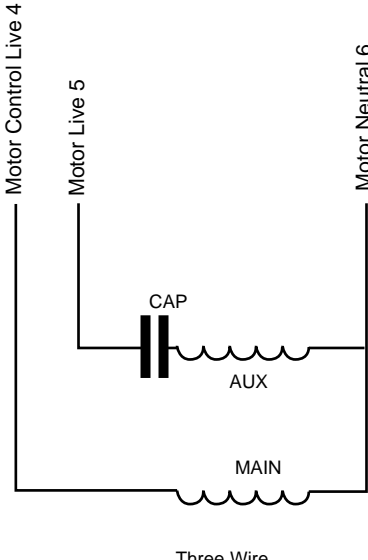
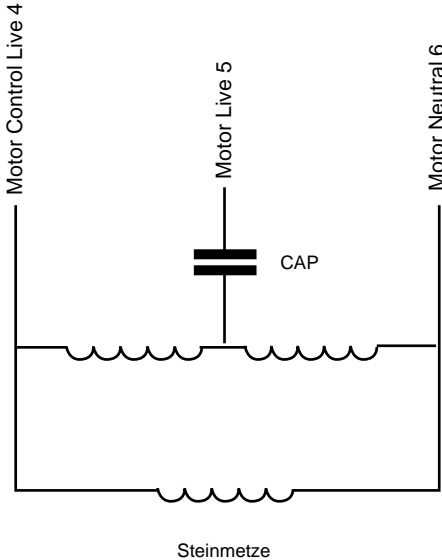
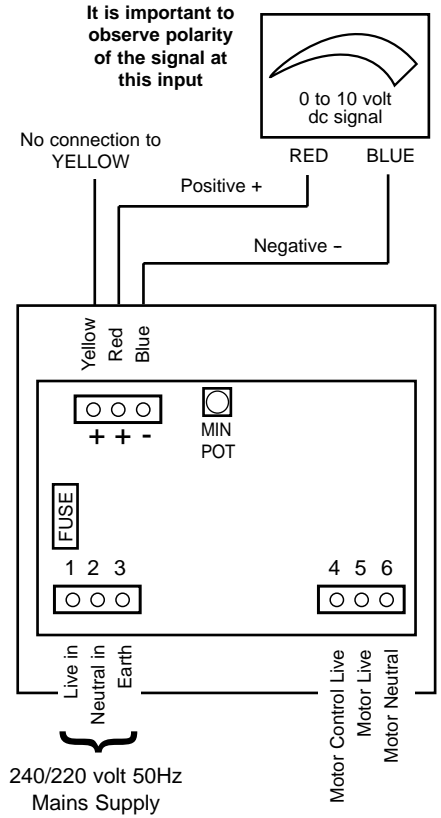
Wiring the Control

Automatic Speed Control

Hand operated speed control



OR





Customer Response Form

Please print and fax to us on 01722-413079

Name.....

Company

Address

.....

.....Post Code.....

Telephone numer

Fax Number

Details of application/enquiry

I would like a Technical Representative

to telephone me

to visit by appointment

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