



# MSC-3

AC Motor Speed Controller



## Commanding features

- Plain English Display
- Sensorless Flux Vector
- Flux Plus Motor Torque Maximiser
- Quiet Motor Operation
- IP30, IP66 or Stainless Steel
- High Ambient Operation
- PID Controller
- Communications



**ZENER ELECTRIC**

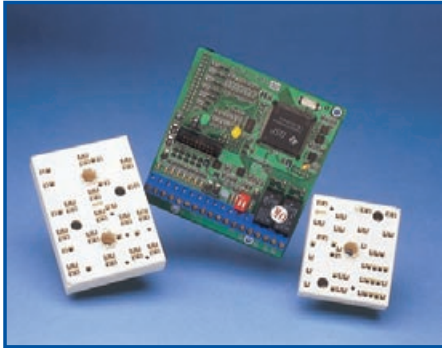
**Australian Manufacturers of Variable Speed Drives and Soft Starters**

## KEY FEATURES OF THE MSC-3

### FLUX PLUS MOTOR TORQUE OPTIMISER:

The Zener MSC-3 offers a 'flux plus' feature, an advanced flux vector algorithm designed to provide optimum and independent control of motor flux. This unique feature produces more torque in the motor for the same motor current.

- Ideal for applications requiring high torque throughout the speed range of the motor.



### ADVANCED TECHNOLOGY

The Zener MSC-3 has been engineered using the latest technology in DSP (Digital Signal Processor) control to achieve high performance motor control.

Zener's commitment to quality, performance and reliability has resulted in a massive investment into surface mount and SKiiP technology.



### USER FRIENDLY OPERATION

A user friendly interactive alphanumeric screen makes for easy and intuitive setup of the drive.

The LCD display gives indication of run & trip status in Plain English. A simple menu system provides ease of programming.



### IP30 OR IP66 ENCLOSURE:

The MSC-3 is available in either an IP30 or IP66 enclosure depending on the protection required.

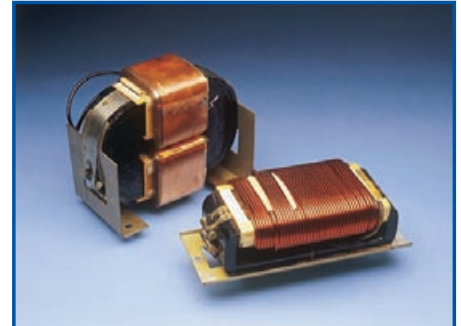
### 50°C OPERATION:

The MSC-3 is designed for operation at high ambient temperatures of 50°C. Refer to your Zener distributor for correct selection and rating.



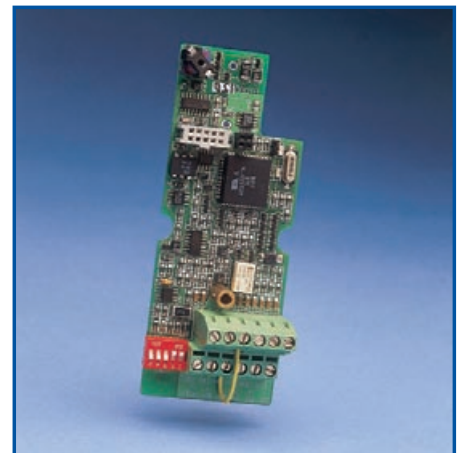
### IP66 STAINLESS STEEL

Also available in a stainless steel IP66 enclosure for added durability in aggressive environments.



### DC BUS CHOKE: (optional)

The DC bus choke provides reduction of power line harmonics with the added benefit of reducing peak inrush currents, improved power factor and enhanced protection against AC line transients.



### OPTION BOARD – EXTENDED I/O:

Provides additional I/O control, preset speeds, thermistor input, analogue output, PID controller and 24Vdc power supply.

### OPTION BOARD – COMMUNICATIONS:

Provides run/trip, kWh log and serial communications via RS485 communications port for control via PLC or computer. Protocol available includes Lonworks, Modbus & Metasys.

Refer to your nearest Zener distributor for up to date communications protocol available.

### SILENT MOTOR OPERATION (AUTO CARRIER OPTIMISING):

The latest generation Insulated Gate Bipolar Transistors (IGBT) are used in conjunction with selectable switching frequencies up to 16kHz. The audible sound produced by a variable speed drive is reduced significantly at higher frequencies. An automatic selection is available which automatically controls the drive to achieve optimum efficiency with low audible noise.

- Ideal for commercial and Industrial HVAC applications where motor noise must be kept at a minimum.

# TECHNICAL SPECIFICATIONS

## MSC-3R series

Supply: 380Vac (-15%) to 480V (+10%)  
Output: 0 to 480Vac, 3 Phase, 0-200Hz

## MSC-3L series

Supply: 208Vac (-15%) to 246V (+10%)  
Output: 0 to 240Vac, 3 Phase, 0-200Hz

## MSC-3J series

Supply: 440Vac (-15%) to 600V (+10%)  
Output: 0 to 600Vac, 3 Phase, 0-200Hz

### \*Single Phase Supply

The MSC-3 has been engineered to also operate from a single phase supply. Consult your Zener distributor for further details and selection.

Ideal for 240V, 480V single Phase supplies

### Enclosure:

IP Rating: IP30 (NEMA 1) or IP66 (NEMA 4)  
Stainless Steel: IP66 (NEMA 4)  
Dimensions: see table below

### Control Specification

Control System: Sensor-less Flux Vector, sine coded PWM  
Audible Frequency: 2 to 16Khz  
(Maximum is load, speed & temp. dependant)  
Frequency resolution: 0.10%  
Frequency Linearity: 0.20% of maximum frequency

### Standard Compliances

- C-Tick:  Integral EMC Filter for compliance with the Australian EMC Framework

- UL508C, AS3100  
- AS61800.3, IEC61800.3

### Options Available:

- DC Bus Choke
- Dynamic Braking
- Option Board - Extended Features incl. PID control and 24Vdc (20mA) Power Supply
- Option Board - Communications (Modbus) with trip/run log
- Option Board - Communications (Metasys) with trip/run log
- Low leakage EMC Filter (select models only)
- Remote display/control station

Note: The above features may require 1 or 2 option boards to be fitted. A maximum of two option boards may be fitted per drive to achieve these additional features and more. Consult your Zener Distributor for further details on options required.

### User Interface:

Display: Plain English LCD display  
User defined variable and display units using alphanumeric character set.  
Up, Down, Enter, Escape, Stop/Reset.

### Local Controls

### Speed Reference

Local: Up/Down push buttons  
Analogue Inputs: 2 Analogue Input  
0-5V, 0-10V, 0-20mA, 4-20mA  
Differential, common mode range +/-25Vdc  
7 programmable Speeds  
Remote Up/Down speed control  
+5V reference provided for remote speed  
Essential Service Over-ride,  
User selectable reference

Preset Speeds:

Motorised Pot:

Potentiometer:

ESO

### Inputs

Thermistor input: Thermistor, micro-therm, thermal switch or thermal overload

Digital Inputs: 5 Digital Inputs with programmable control functionality.

Selection: 3 digital inputs for speed ref. selection  
ESO, FWD, REV, FWD latch, REV latch, JOGFWD, JOGREV, Remote, Up, Down Stop/Reset

### Outputs

Digital Outputs: 2 Relays with programmable functionality, Additional relays available with option board

Selection: Run, Trip, ESO, Proof, Zero speed, At speed, Under speed, Over speed, On, Off, Auto restart Fail, FWD, REV, Enabled, I<sup>2</sup>T Trip, Over temperature, PV Over, PV Under.

Analogue Outputs: Up to 2 Analogue Outputs with programmable functionality.

Selection: 0-5V, 0-10V, 0-20mA, 4-20mA  
Hz, rpm, %load, Amps, Volts DC, kW, Volts AC, °C/°F, I<sup>2</sup>T used.

	General Purpose		Extended Duty		Enclosure Dimensions	
	Amps	kW/HP	Amps	kW/HP	IP30	IP66
<b>Chassis A</b>						
MSC-3R3	3.6	1.5 / 2.0	2.7	1.1 / 1.5	248h 102w 237d (mm) 9.8h 4.0w 9.3d (in)	310h 190w 236d (mm) 12.2h 7.5w 9.3d (in)
MSC-3R5	5.0	2.2 / 3.0	4.2	1.5 / 2.0		
MSC-3R7	7.2	3.0 / 4.0	6.1	2.2 / 3.0		
MSC-3R11	10.8	5.5 / 7.5	9.1	4.0 / 5.5		
<b>Chassis B</b>						
MSC-3R15	14.9	7.5 / 10	12.7	5.5 / 7.5	459h 234w 243d (mm) 18.1h 9.2w 9.6d (in)	459h 234w 243d (mm) 18.1h 9.2w 9.6d 9 (in)
MSC-3R20	19.7	10 / 13.3	16.7	7.5 / 10		
MSC-3R23	22.5	11 / 15	19.1	7.5 / 10		
MSC-3R30	30.1	15 / 20	25.6	11 / 15		
MSC-3R40	40.3	22 / 30	34.1	15 / 20		
<b>Chassis C</b>						
MSC-3R55	55	30 / 40	46.6	22 / 30	715h 470w 290d (mm) 28.1h 18.5w 11.4d (in)	715h 470w 290d (mm) 28.1h 18.5w 11.4d (in)
MSC-3R82	82	45 / 60	68.9	37 / 50		
MSC-3R109	109	55 / 75	92.0	45 / 60		
MSC-3R140	140	75 / 100	116.9	55 / 75		
MSC-3R170	170	90 / 125	132.6	75 / 100		
<b>Chassis D</b>						
MSC-3R220	220	132 / 175	161	90 / 120	1370h 550w 550d (mm) 53.9h 21.6w 21.6d (in)	1370h 550w 550d (mm) 53.9h 21.6w 21.6d (in)
MSC-3R290	290	170 / 230	212	125 / 165		
MSC-3R350	350	200 / 270	256	150 / 200		
MSC-3R410	410	240 / 325	300	175 / 235		
MSC-3R480	480	280 / 375	352	205 / 275		

(Note: 3R170 not available in IP66)

(Preliminary ratings & dimensions)

- For Motors exceeding the above, contact your Zener distributor for information on the larger sizes of Variable Speed Drives available
- The above ratings are based on 40°C ambient and Nominal Power for 415Vac 3 Phase
- 50°C rating available (Refer to your Zener distributor for details)

# A World Class Product by a World Class Manufacturer



Zener Electric's Head Office in Sydney

## The Company:

Zener Electric is a successful wholly owned Australian company with over 25 years experience in engineering and manufacturing Variable Speed Drives and Soft Starters. All products are designed in Australia. Manufacturing is based in Australia and selected overseas locations to deliver Australian expertise in a competitive environment. Zener Electric's network of distributors stretches across Australia and extends to 23 countries world wide.

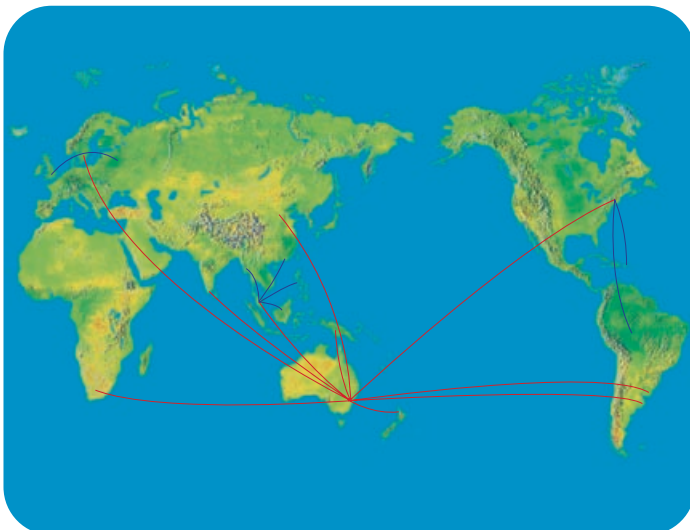
## The Product:

Zener Electric specialises in the research, development and manufacturing of electronic motor control equipment. Zener Variable Speed Drives and Soft Starters are used in a broad range of applications including mining, pumping, food & beverage, water & sewerage and HVAC.

## Support & Service:

Zener Electric's commitment to customer service extends well beyond the point of sale with support from a friendly and competent team of technicians and engineers. With assistance from distributors, Zener provides an extensive network of national and international support.

**For further assistance contact your nearest ZENER distributor**



## Distributed By:

**ROTOTECH**

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