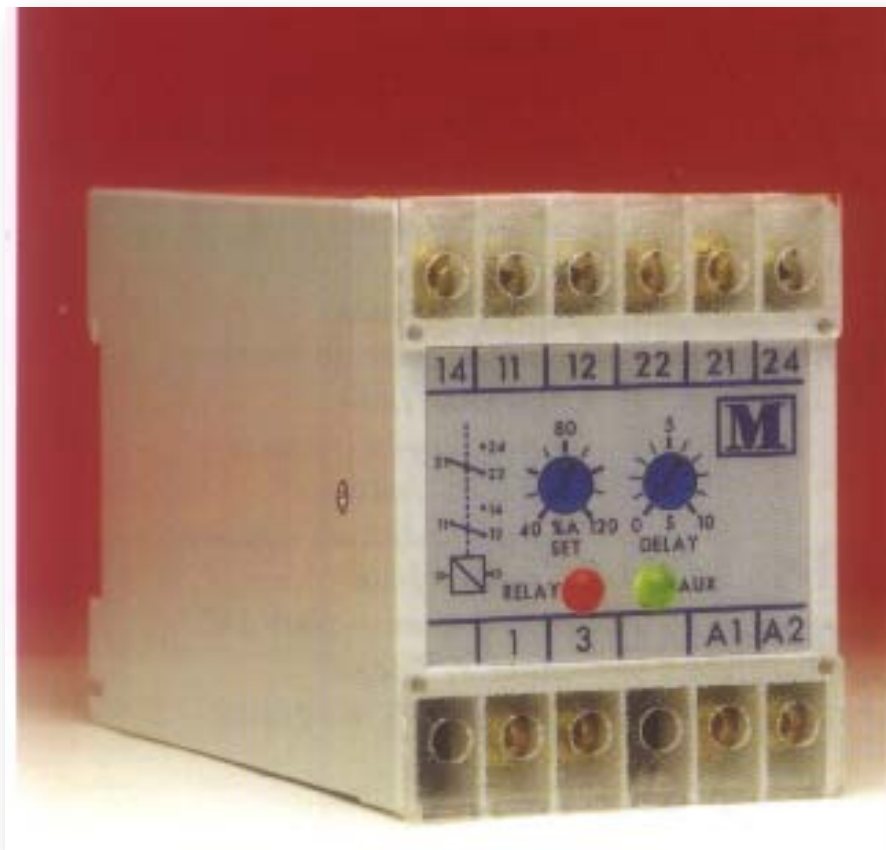


# MONITORING RELAYS



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## GENERAL SPECIFICATIONS

### ENVIRONMENTAL

Working temperature	0 to +60 deg C
Functional temperature	-25 to +70 deg C
Storage temperature	-40 to +85 deg C
Temperature Coefficient	0.03% per deg C (300ppm/°C)
Relative humidity	95% non condensing
Class of climate	HSE complying with DIN 40040 -3 complying with VDE/VDJ 3540

### INSULATION

Test voltage	4kV RMS 50Hz 1min between Input / Case / Auxiliary
Impulse test	EMC 5kV transient complying with IEC 801 / EN55020
HF interference test	EHF 2.5kV 1MHz complying with IEC 255 -4
Protection class	II complying with IEC 348

### APPLIED STANDARDS

General	IEC 144/ BS 5420/ VDE/ VDI0435/ IEC 947 / EN60947
Safety	BS EN 61010 DIN 57411 / VDE 0411 ANSI C37
Surge withstand	IEC 801 / EN 55020 ANSI C37 -90a
Radio screening	RFI degree N complies with VDE087S
EMC	Emissions EN50081-2 Immunity EN50082-1

### RELAY OUTPUT

Relay type	dual pole change over
Material	Silver/ Cadmium
Contact resistance	200m Ohm max Typically <50m Ohm
Rating AC	250V 5A non resistive 1200VA
Rating DC	125V 1A resistive 120 watts
Electrical life	1 x 10 <sup>6</sup> at above load
Mechanical life	5 x 10 <sup>6</sup>
Operating time approx.	7ms (20ms max)
Dielectric strength	Between coil and contacts

5kV RMS 1min
Between open contacts
1kV RMS 1min
Between adjacent contacts
1kV RMS 1min
Insulation resistance
1000M Ohm at 500V DC
Operating temperature
-30 to +75 deg C
Approval
UL and CSA recognised

### ENCLOSURE

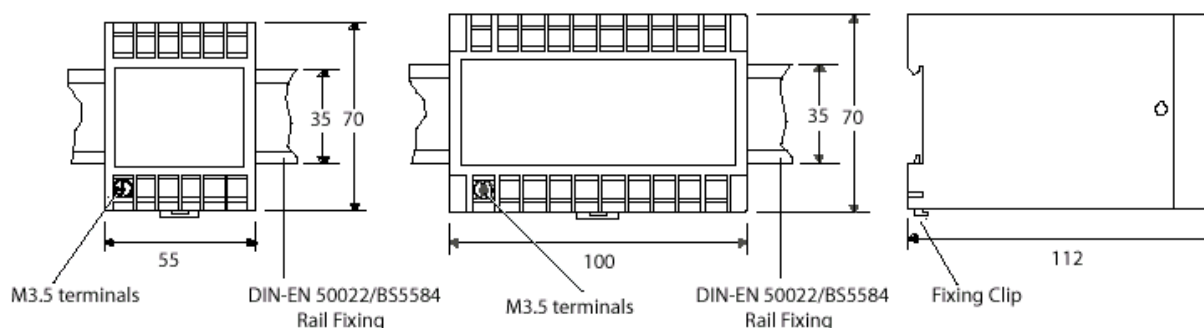
Fixing	Snap on to DIN rail 35 x7.5 mm complies with DIN-EN 50022 BS 5584
Mounting	Any position
Enclosure Code	Case IP 50/ terminals IP 30 Complies with IEC 529 BS 5490 DIN 40050
Material	Complying with UL 94 VO

### APPROVALS

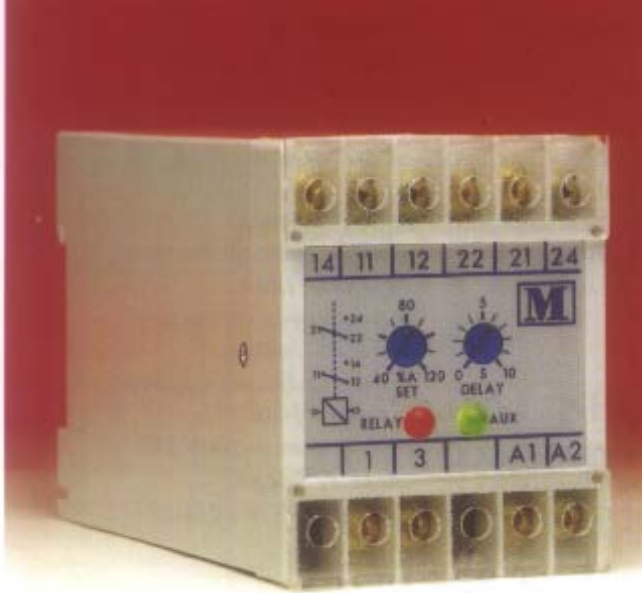
U.L. Approval File No EI57034

## CASE DIMENSIONS

All Dimensions in mm



# AC CURRENT



## TECHNICAL SPECIFICATION

### INPUT

Rated value In	1A or 5A from CT 0.2 to 10 Amp direct connected
Frequency	50 /60 /400 Hz
Burden	<0.5 VA per phase
Overload	2 x In continuous 10 x In for 3 seconds

### SETPOINT

Range Over	Adjustable 40% to 120% In
Range Under	Adjustable 0% to 80% In
Repeatability	Better than 0.5% of full span
Differential	Fixed 5%
Time Delay seconds	Adjustable 200ms to 10 seconds

### AUXILIARY

AC Voltage	115/230/400V ( $\pm 25\%$ /45-65 Hz / <2 VA)
DC Voltage	24 volt ( $\pm 20\%$ /galvanically isolated) <3 watt

### WEIGHT & CASE SIZE

Single units	Approx. 0.4kg. 55mm case
Combined units	Approx. 0.6kg. 100mm case

## ORDERING INFORMATION

Product Code	Input	Freq.	Aux.	Options
M200-A30	5A	50Hz	230V	

## OPTIONS

- 1.Adjustable time delay max 30 seconds
- 2.AC Auxiliary in the range 57.7 to 480 volts
- 3.Calibration at nominal Hz 35 450Hz
- 4.Calibration at temperature other than 23° C

## SELECTION GUIDE

M200-A1U	Single phase under current
M200-A1O	Single phase over current
M200-A1C	Single Phase combined current
M200-A3U	3 Phase under current
M200-A3O	3 Phase over current

## TYPICAL APPLICATIONS

The M200 AC current relays provide current monitoring and protection in both single and 3 phase systems. Used in applications such as motor protection, load detection and generator control.

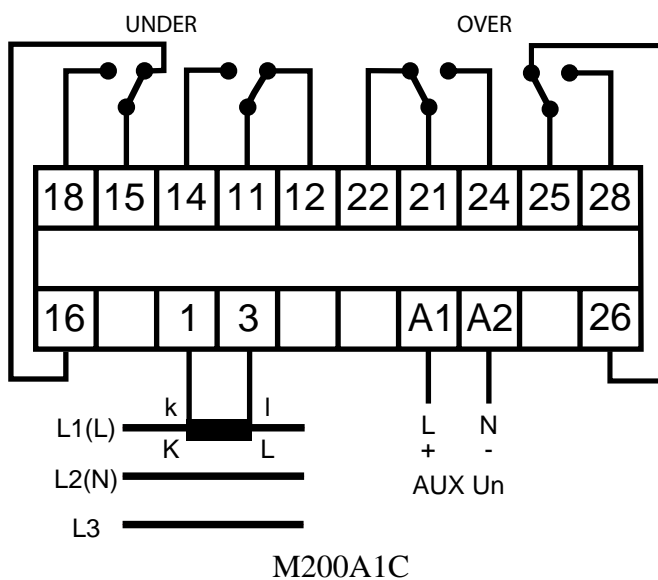
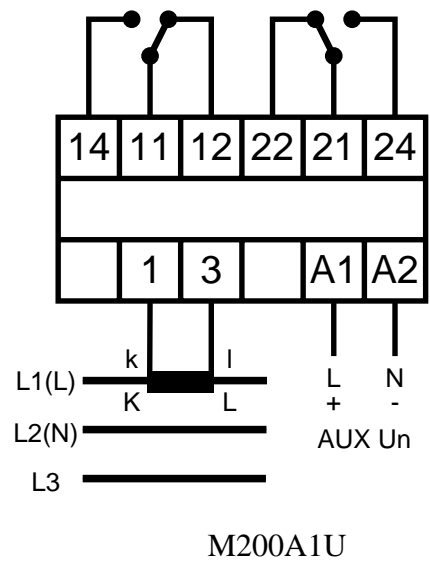
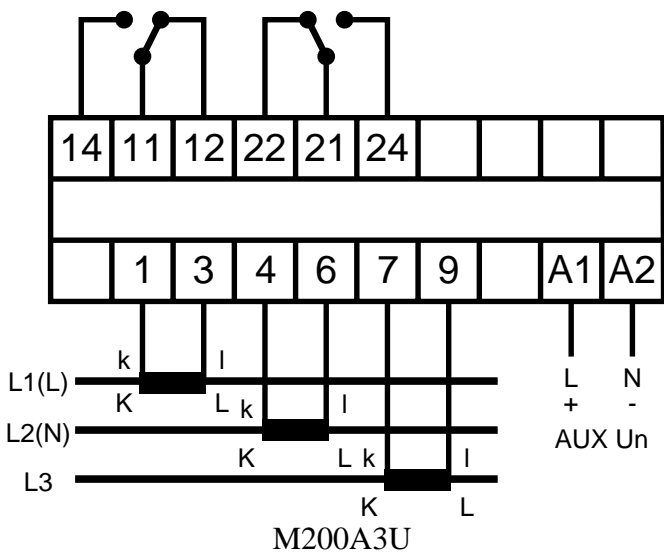
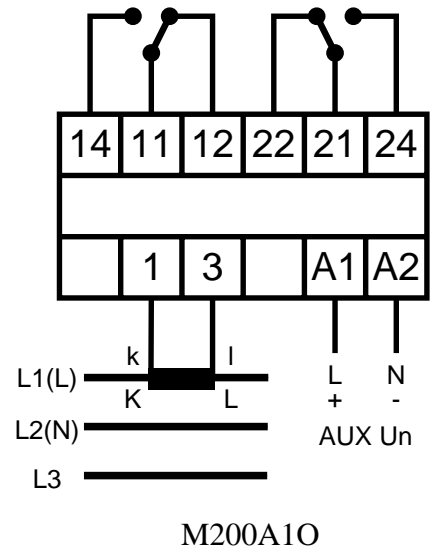
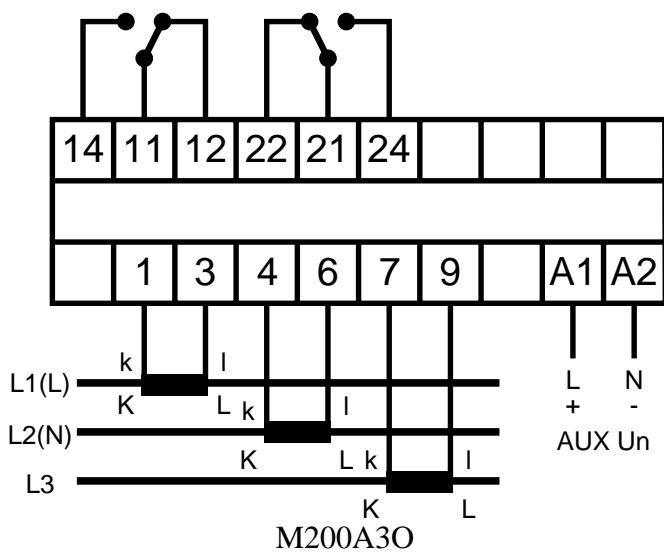
Under over and combined under/over units are available.

The relay operates when the adjustable trip point is reached. An externally adjustable time delay is provided to prevent nuisance tripping.

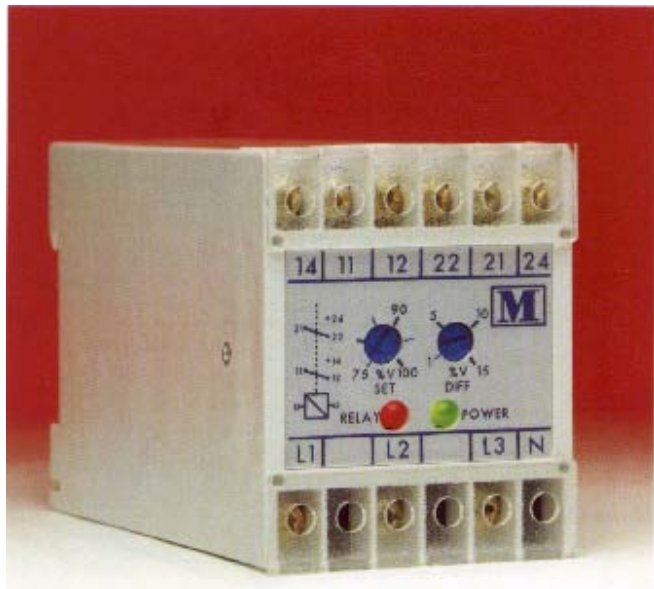
As is common with all the M200 relays, on over units the relay energises when the input signal exceeds the trip point. On under units the relay de-energises when the input signal goes below the trip point.

A red LED indicates the state of the relay, whilst a green LED indicates the condition of the power supply.

# AC CURRENT CONNECTION DIAGRAMS



# AC VOLTAGE



## SELECTION GUIDE

M200-V1U	Single phase under voltage
M200-V1O	Single phase over voltage
M200-V1C	Single phase combined voltage
M200-V33U	3 phase 3 wire under voltage
M200-V33O	3 phase 3 wire over voltage
M200-V33C	3 phase 3 wire combined
M200-V34U	3 phase 4 wire under voltage
M200-V34O	3 phase 4 wire over voltage
M200-V34C	3 phase 4 wire combined voltage

## TYPICAL APPLICATIONS

The M200 AC voltage relay provides voltage monitoring and protection in both single and 3 phase systems. Used in applications such as mains failure, regulation of power supplies and to protect voltage sensitive equipment. Under, over and combined under/over units are available. The relay operates when the externally adjustable trip point is reached. An external differential control is provided with adjustment 1-15%. The differential ensures that the parameter being measured returns to % set above or below (depending on whether it is under or over unit) the trip point before the relay returns to its original state. As is common with all the M200 relays; on over units the relay energises when the input signal exceeds the trip point. On under units the relay de-energises when the input signal goes below the trip point. A red LED indicates the state of the relay, whilst a green LED indicates the condition of the power supply.

## TECHNICAL SPECIFICATION

### INPUT

Rated value $U_n$	Single phase 57.8 < 500 V Three phase 100 < 500 V
Frequency	50/60/400 Hz
Burden	< 2.5 VA per phase single units < 3 VA per phase combined units
Overload	1.5x $U_n$ continuous 2 x $U_n$ for 3 seconds

### SETPOINT

Range under	Adjustable 75% to 100% $U_n$
Range over	Adjustable 100% to 125% $U_n$
Repeatability	Better than 0.5% of full span
Differential	Adjustable 1 to 15%
Operating time	Typically 200ms

### AUXILIARY

All units self powered.

### WEIGHT & CASE SIZE

Single units	Approx. 0.4kg. 55mm case
Combined units	Approx. 0.6kg. 100 mm case

## ORDERING INFORMATION

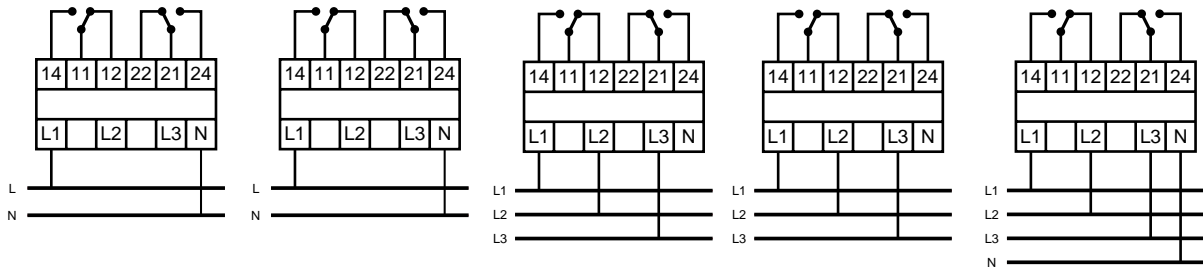
Product Code	Input	Freq	Options
M200-V34U/D	230V	50Hz	5 sec t/d

## OPTIONS

- On all of the above units, except the combined, an internally set time delay is available for any value between 1 & 10 seconds. To order use the above codes adding a D at the end of the code, e.g. M200-V34U/D 5 seconds (state the fixed delay period).
- To prevent nuisance tripping when there is a slight variation in the voltage supply the following option is available. The external differential is replaced on the following products with an externally adjustable time delay. On these units the time delay is adjustable from 200ms to 10 seconds, and the differential is fixed at 1%.
 

M200-V1X	Single phase under voltage
M200-V1Y	Single phase over voltage
M200-V1W	Single phase combined voltage
M200-V33X	3 phase 3 wire under voltage
M200-V33Y	3 phase 3 wire over voltage
M200-V33W	3 phase 3 wire combined voltage
M200-V34X	3 phase 4 wire under voltage
M200-V34Y	3 phase 4 wire over voltage
M200-V34W	3 phase 4 wire combined voltage
- Calibration at temperatures other than 23° C

# AC VOLTAGE CONNECTION DIAGRAMS



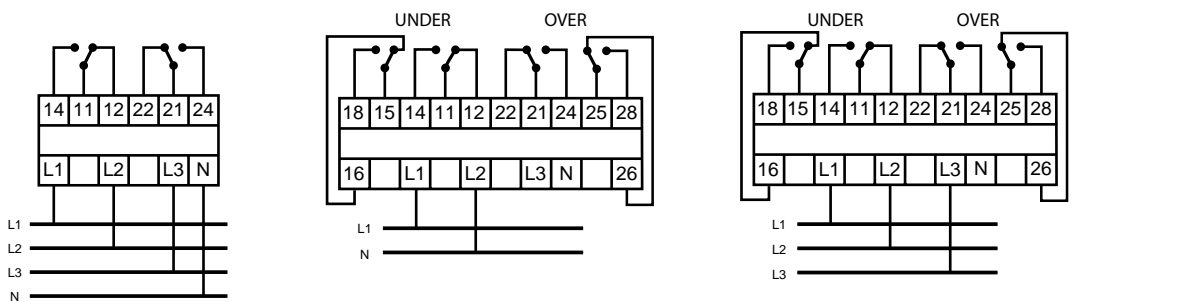
M200V1O

M200V1U

M200V33O

M200V33U

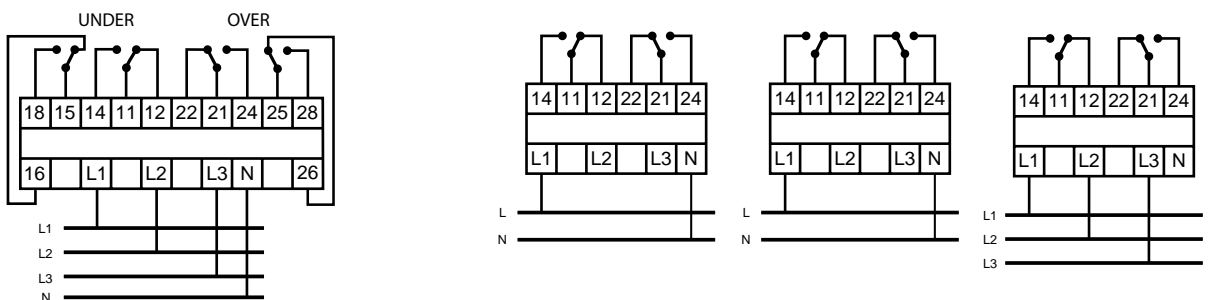
M200V34O



M200V34U

M200V1C

M200V33C

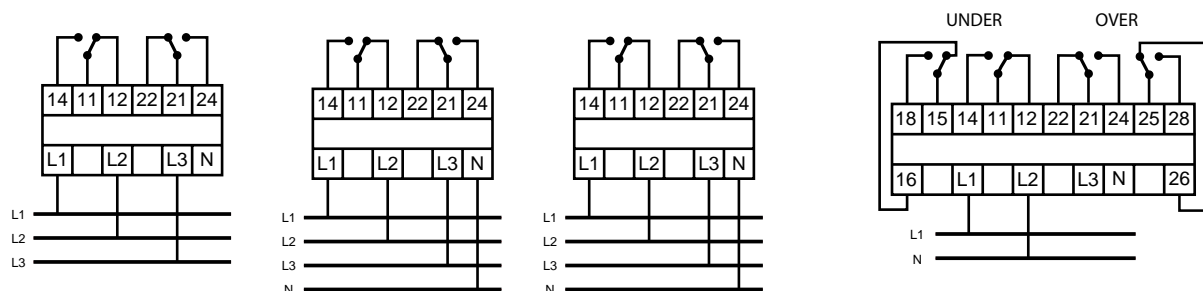


M200V34C

M200V1X

M200V1Y

M200V33X

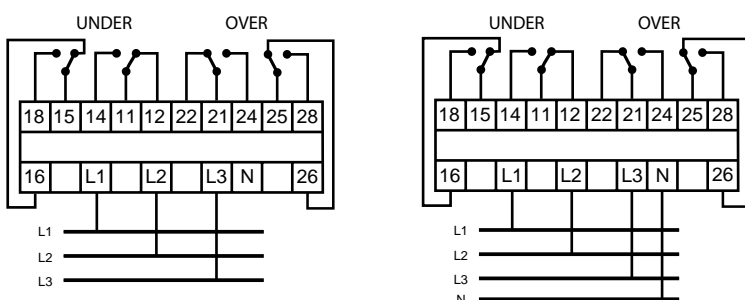


M200V33Y

M200V34X

M200V34Y

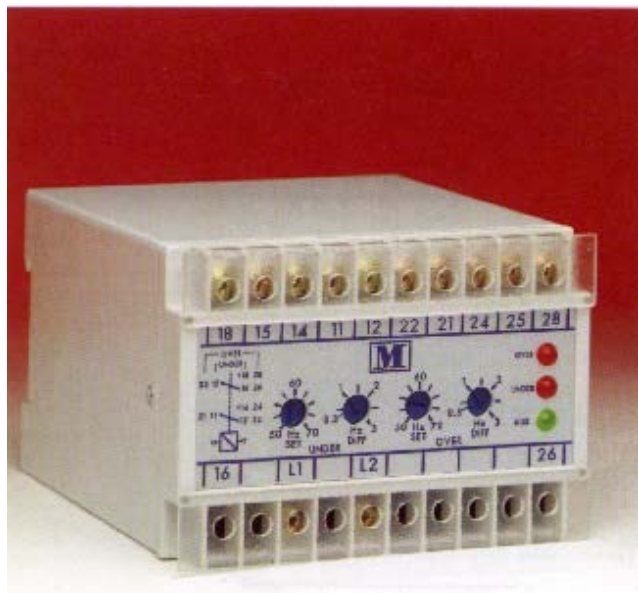
M200V1W



M200V33W

M200V34W

# FREQUENCY



## SELECTION GUIDE

M200-F1U	Single or 3 phase under frequency
M200-F1O	Single or 3 phase over frequency
M200-F1C	Single or 3 phase combined frequency

## TYPICAL APPLICATIONS

The M200 series frequency relays are designed to monitor the frequency of a system and if the frequency deviates outside the adjustable pre-set limits, the relay will operate.

Typically used in protecting generators against over or under speed, this is achieved as speed is proportional to frequency. Other uses such as monitoring mains power supplies, computer supplies etc.

The user is provided with adjustment of both the trip point of frequency being monitored and the differential. As is common with all the M200 relays; on over units the relay energises when the input signal exceeds the trip point. On under units the relay de-energises when the input signal goes below the trip point.

A red LED indicates the state of the relay, whilst a green LED indicates the condition of the power supply. The frequency relays monitor their own power supply so no auxiliary power is necessary.

## TECHNICAL SPECIFICATION

### INPUT

Rated value $U_n$	57.8<500V+ 25%
Rated Frequency	50/60/400 Hz
Burden	<25 VA
Overload	1.5 x $U_n$ continuous 2 x $U_n$ for 3 seconds

### SETPOINT

Range 50Hz nominal	Adjustable 40 to 60Hz
Range 60Hz nominal	Adjustable 50 to 70Hz
Range 400Hz nominal	Adjustable 360 to 440Hz
Differential 50 & 60Hz	Adjustable 0.3 to 3Hz
Differential 400Hz	Adjustable 3 to 30Hz
Repeatability	Better than 0.5% of full span
Operating time	Typically 200 ms

### AUXILIARY

All units self powered

### WEIGHT & CASE SIZE

Single units	Approx. 0.4kg. 55mm case
Combined units	Approx. 0.6kg. 100mm case

## ORDERING INFORMATION

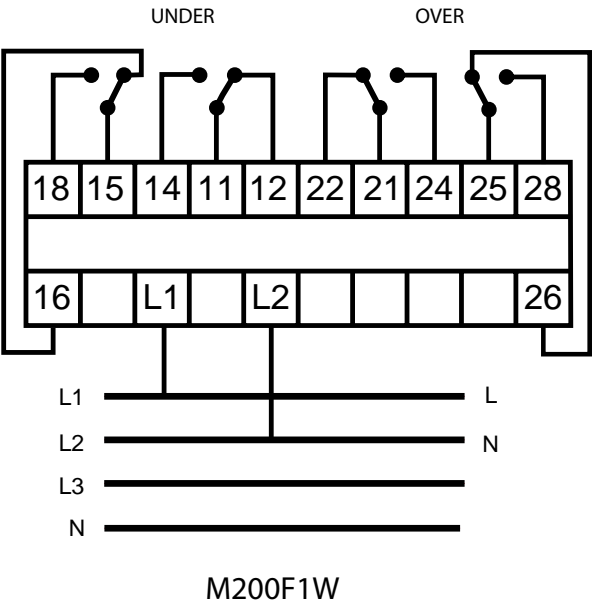
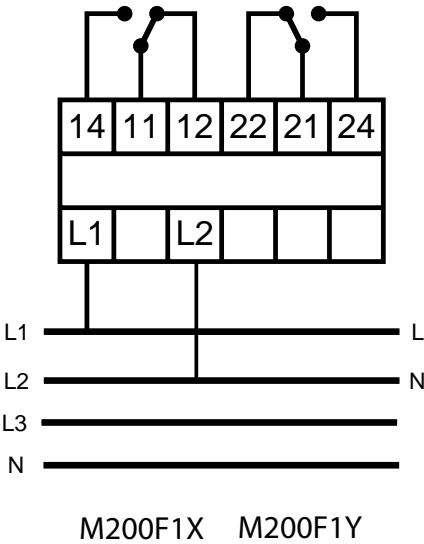
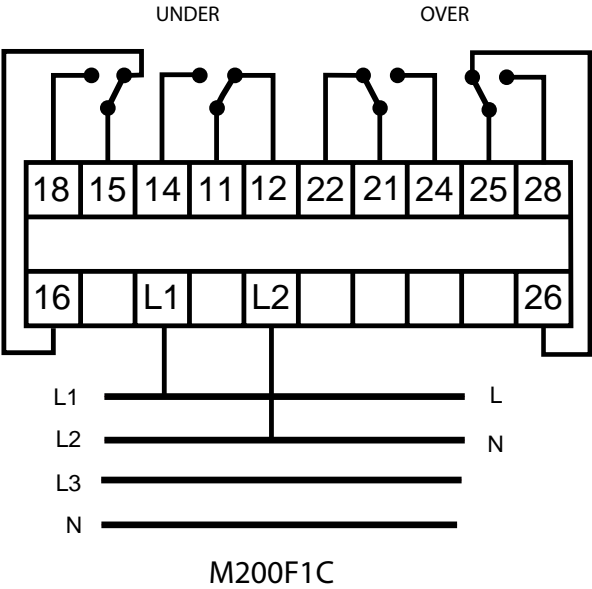
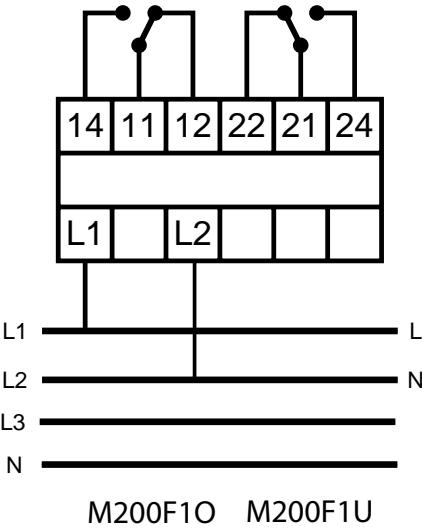
Product Code	Input V	Nominal Freq.	Options
M200-F1C	230v	50Hz	

## OPTIONS

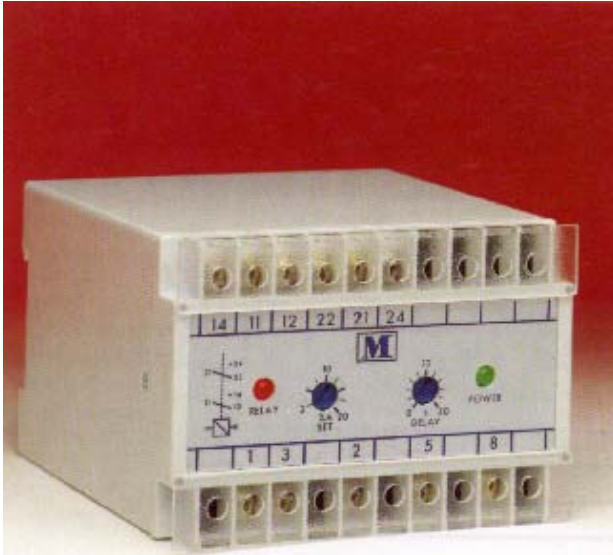
1. On all of the above units an internally set time delay is available for any value between 1 & 10 seconds. To order use the above code, adding a D at the end of the code, e.g. M200-F1U/D 7 seconds (state the fixed delay period)
2. AC auxiliary in range 57.7 to 480 volts
3. Calibration at temperature other than 23° C
4. To prevent nuisance tripping when there is a slight variation in the frequency, the following option is available. The external differential is replaced with an external time delay. On these units the time delay is adjustable from 200ms to 10 seconds, and the differential is fixed at 1%.

M200-F1X	Single or 3 phase under frequency
M200-F1Y	Single or 3 phase over frequency
M200-F1W	Single or 3 phase combined frequency

# ***FREQUENCY CONNECTION DIAGRAMS***



# REVERSE POWER



## SELECTION GUIDE

M200-RP1	Single phase or 3 phase 4 wire
M200-RP3	3 phase 3 wire

## TYPICAL APPLICATIONS

The M200 reverse power relay is used to monitor the direction of power from AC generators. If the current in the system being monitored is reversed, to a value greater than the customer adjustable pre-set limit, the relay will energise.

The adjustable trip point is 2 to 20% of input current. An adjustable time delay of 0 to 20 seconds is provided. Correct setting of the trip point and time delay will ensure protection against motoring in the event of a generator failure and prevent tripping due to transients encountered during synchronising.

A red LED indicates the state of the relay and a green LED indicates the condition of the power supply

## TECHNICAL SPECIFICATION

### INPUT

Rated value $U_n$	57.8 < 500V $\pm$ 25%
Rated value $I_n$	C. T operated 1 or 5A amp direct connection 0.2 to 10A
Frequency	50 / 60 / 400Hz
Burden	< 3VA voltage < 0.5 VA current
Overload	1.5 x $U_n$ 2 x $I_n$ continuous 2x $U_n$ 10 x $I_n$ for 3 seconds

### SETPOINT

Range	2% to 20% reverse current
Repeatability	Better than 0.5% of full span
Time delay	Adjustable 200ms to 20 sec
Hysteresis	1%

### AUXILIARY

All units self powered

WEIGHT & CASE SIZE Approx. 0.6kg. 100mm case

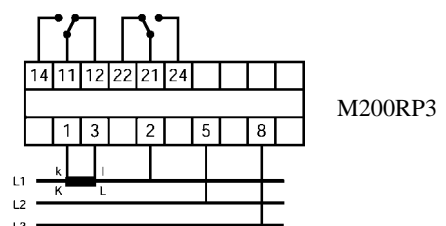
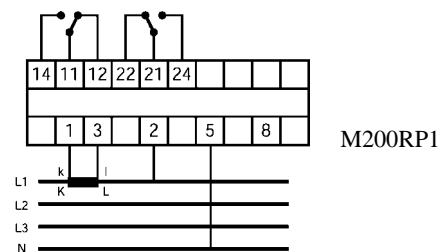
## ORDERING INFORMATION

Product Code	$I_n$	$U_n$	Input Freq.
M200-RP3	1 Amp	400V	50Hz

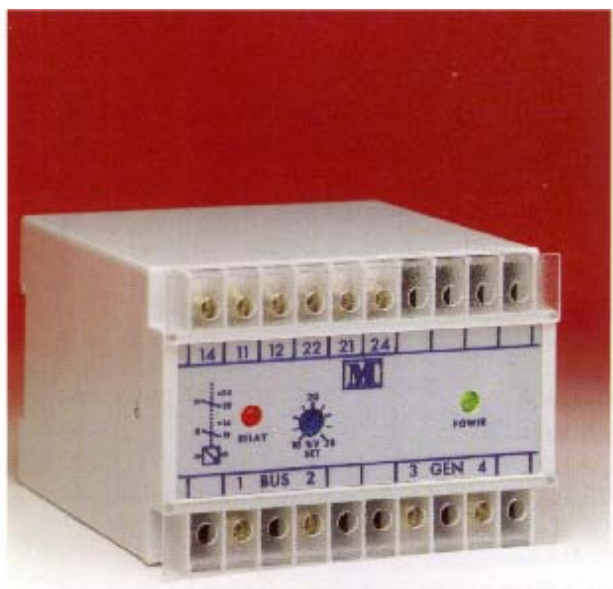
## OPTIONS

1. Adjustable time delay max 30 seconds
2. AC auxiliary in range 57.7 to 480 volts
3. Calibration at nominal Hz 35 450Hz
4. Calibration at temperature other than 23 C

## CONNECTION DIAGRAMS



# SYNCHRONISING CHECK



## TECHNICAL SPECIFICATION

<b>INPUT</b>	
Rated value $U_n$	$57.8 < 500V \pm 25\%$
Frequency	50 /60/400 Hz
Burden	<4VA terminals marked GEN <2VA terminals marked BUS
Overload	1.5x $U_n$ continuous 10x $U_n$ for 3 seconds
<b>SETPOINT</b>	
Range	Adjustable 10% to 30% of nominal system voltage (6-20 electrical degrees)
Repeatability	Better than 0.5% of full span
Differential	Fixed at 5%
Operating time	Typically 500ms

**AUXILIARY**  
Both units self powered.

**WEIGHT & CASE SIZE** Approx. 0.6kg. 100mm case

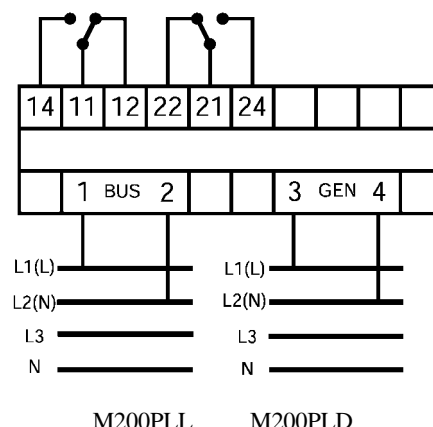
## ORDERING INFORMATION

Product Code	System Voltage	Freq.	Options
M200-PLD	400V	50Hz	Cal at 35° C

## OPTION

1. Calibration at temperature other than 23° C

## CONNECTION DIAGRAM



## SELECTION GUIDE

M200-PLL	1 generator 1 bus or 2 generators
M200-PLD	1 generator 1 bus with dead bus facility

Both units can be used on Single or 3 phase systems.

## TYPICAL APPLICATIONS

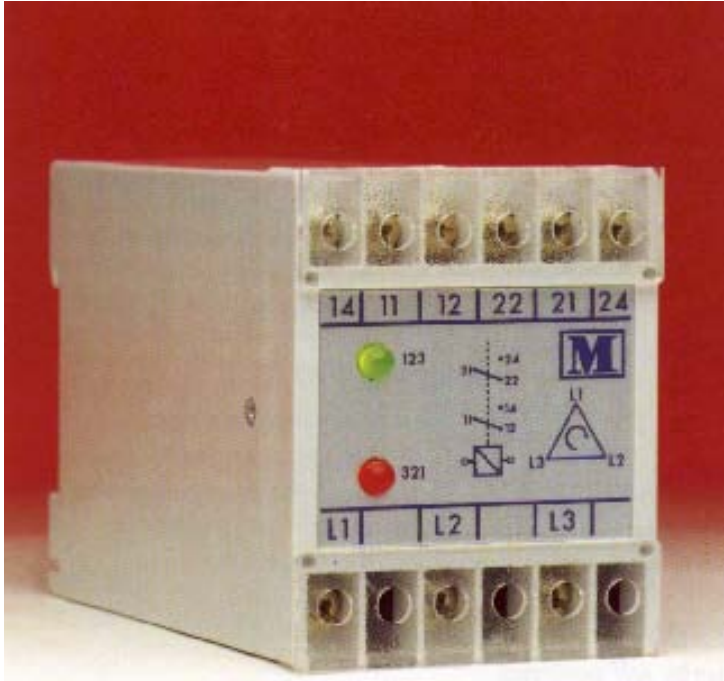
The M200-PLL & PLD are synchronising check relays, also known as paralleling relays. They are used to ensure at two AC supplies are synchronised. For a system to be synchronised, frequency, phase angle and voltage have to within pre-set limits.

The M200-PLL can monitor either mains bus bar and incoming generator or two generators.

The PLL has customer adjustment of the differential voltage between 10 to 30%. This voltage corresponds to 6 to 20 electrical degrees. The unit compares the input voltage and phase relationship of the bus bar to that of the generator when the signal is within the pre-set limits, the relay energises.

The M200-PLD operates as the M200-PLL but has the additional feature of the dead bus facility. This enables the relay to energise with a generator supply only, which is a common requirement when mains failure occurs.

# PHASE SEQUENCE



## SELECTION GUIDE

M200-PS1 3 phase 3 or 4 wire

## TYPICAL APPLICATIONS

The M200-PS1 provides phase and sequence phase failure protection. Used to ensure the sequence is correct when connecting 3 phase loads.

With an incorrect phase sequence the relay will de-energise preventing the starting of incorrectly connected machinery.

The relay will also trip if there is a phase loss and can therefore be used as a phase failure relay.

Note if regenerated voltage is present in the open phase the M200-PB1 or M200-PB2 should be used.

The red LED "ON" indicates phase sequence incorrect and relay is de-energised.

The green LED "ON" indicates phase sequence correct and relay is energised.

## TECHNICAL SPECIFICATION

### INPUT

Rated value $U_n$	$57.8 < 500V \pm 25\%$
Frequency	50/60/400 Hz
Burden	<3VA
Overload	$1.5 \times U_n$ continuous $2 \times U_n$ for 3 seconds

### SETPOINT

Not adjustable

### AUXILIARY

Self powered.

WEIGHT & CASE SIZE Approx. 0.4kg. 55mm case

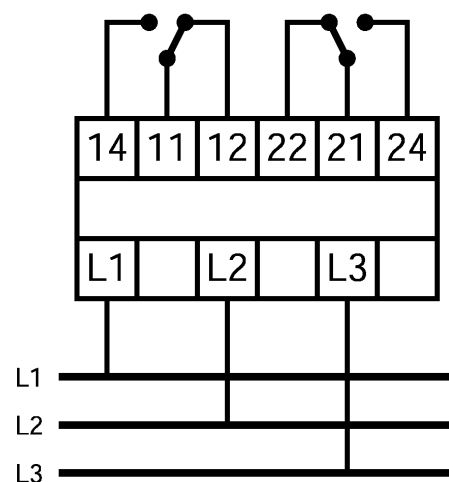
## ORDERING INFORMATION

Product Code Input  $U_n$  Freq. Options  
M200-PS1 415v 50Hz Cal 35° C

## OPTIONS

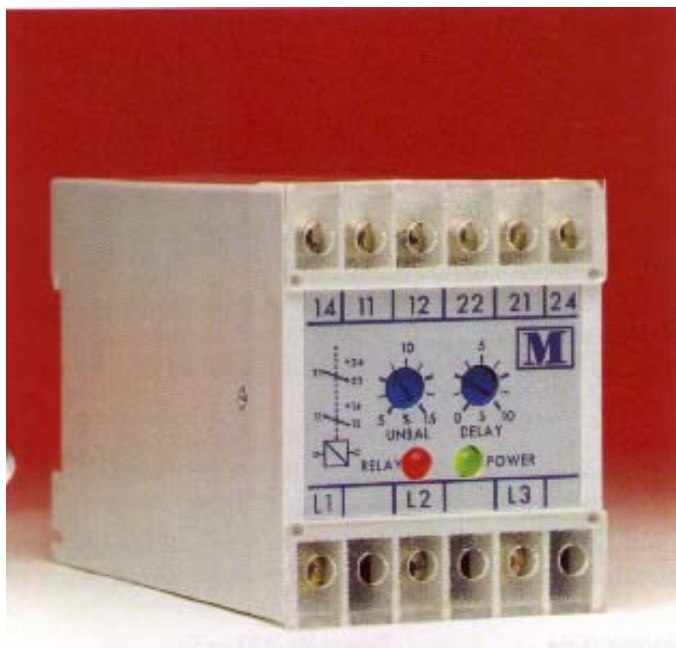
1. Calibration at nominal Hz 35...450Hz
2. Calibration at temperature other than 23° C

## CONNECTION DIAGRAM



M200PSI

# PHASE BALANCE



## SELECTION GUIDE

- M200-PB1** Detects phase loss & phase unbalance  
**M200-PB2** Detects phase loss, phase unbalance & symmetrical under-voltage

## TYPICAL APPLICATIONS

The M200-PB1 can detect the following conditions in phase 3 or 4 wire systems. Phase Unbalance, Phase Loss, Phase Reversal and Phase Sequence.

The phase balance relays are used to detect phase loss and unbalance in systems using motors, generators, heater elements, transformers etc. A Phase unbalance as small as 10% in a 3 phase motor can cause the temperature in the motor winding to increase by more than 120%, correct setting of the PB1/PB2 will ensure this does not occur. Protection against open phase regenerated voltage, created if a single phase should fail is also provided.

Customer adjustment of unbalanced voltage between 5 to 15% is provided along with time delay adjustment of 200ms to 10 seconds.

If the system being monitored is healthy, the relay is energised, and the red LED will be illuminated. If a phase unbalance greater than the pre-set level or phase loss / reversal occurs, the relay de-energises after the time delay period. The M200-PB2 provides all the protection features of the PB1 with the additional benefit of having symmetrical under voltage protection. This means that if all the phase voltages remain balanced but drop below a pre-set value, the relay will de-energise. The under voltage is internally set. For standard units it is set at 85% below the nominal voltage, but this value can optionally be between 70% and 90%

## TECHNICAL SPECIFICATION

### INPUT

Rated value $U_n$	$57.8 < 500V \pm 25\%$
Frequency	50/60/400 Hz
Burden	$< 2VA$
Overload	$1.5x U_n$ $2x U_n$

### SETPOINT

Range	Adjustment 5 to 15% unbalanced voltage
Repeatability	Better than 0.5% of full span
Under-voltage	PB2 only, pre-set 85% of nominal voltage (optional 90% to 70%)

Time delay	Adjustable 200 ms to 10 sec
------------	-----------------------------

### AUXILIARY

Self powered

**WEIGHT & CASE SIZE** Approx. 0.4kg, 55mm case

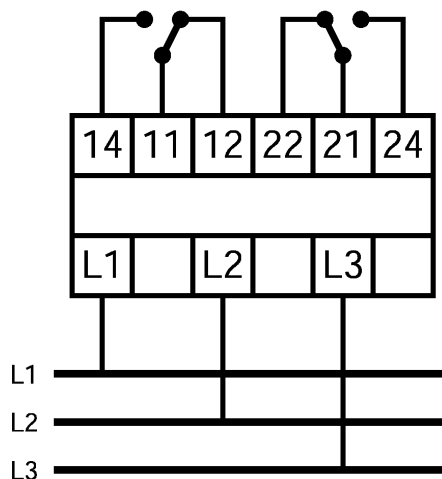
## ORDERING INFORMATION

Product Code	$U_n$	Input Freq.	Option
M200-PB2	415 v	50Hz	Under Volts at 70%

## OPTIONS

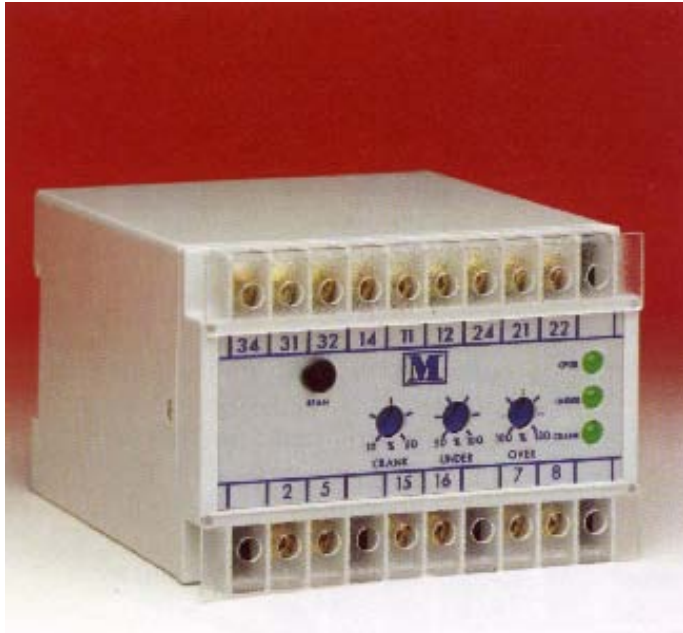
- Adjustable time delay max 30 seconds
- Internal under voltage set between 90% to 70%
- Calibration at nominal Hz 35....450Hz
- Calibration at temperature other than 23° C

## CONNECTION DIAGRAM



M200PB1 M200PB2

# SPEED SENSING



## TYPICAL APPLICATIONS

The M200-ST3 is most commonly used to detect the speed of engines used in generating sets. The pick-up, situated close to the flywheel, produces a high frequency pulse train directly proportional to the number of teeth passing it. The frequency is converted by the ST3 into a mA signal directly proportional to the rotational speed of the flywheel.

The relay provides the user with the following adjustments, which allows the control of start up and normal running and protects against over and under speeds of the generator.

Adjustment of crank speed 10 to 50%

Adjustment of under speed 50 to 100%

Adjustment of over speed 100 to 133 %

A mA output signal proportional to input frequency.

Typical start-up as follows -

When the speed of the motor reaches the crank's set-point, the crank relay energises, disengaging the crank starter. When the under speed set-point is reached, the under speed relay is energised and the motor is now in the normal running condition with all relays energised. Should an under or over speed condition occur the appropriate relay is de-energised. Two other safety features are incorporated; if the pick-up sensor input lead breaks the over speed relay will de-energise also the crank relay will only de-energise when the input frequency goes below 20% of the set-point. The mA output signal can be fed to digital or analogue meters scaled in speed, or to provide a control signal to a PLC etc.

## TECHNICAL SPECIFICATION

### INPUT

Pulses 5V-75V peak to peak  
Frequency 1000-10000 Hz (speed of rotation RPM x number of teeth / 60)

Open circuit protection Over-speed relay de-energised

### OUTPUT

Rated value 0-1mA = 133% of nominal speed  
Load resistance < 10k Ohm  
Calibration Value 0.75mA = 100% of nominal speed

### SETPOINT

Range Crank 10 to 50%  
Under 50 to 100%  
Over 100 to 130%

Repeatability Better than 0.5% of full span  
Hysteresis 2% (under, over) crank resets at 20% setting

Operating time Typically 200 ms

### AUXILIARY

DC Voltage 24 VDC  $\pm$ 20%  
WEIGHT & CASE SIZE Approx. 0.5kg. 100mm case

NOTE: The 3 relays in this product are single pole changeover. The remainder of this specification is as per general specification on page 3.

## SELECTION GUIDE

M200-ST3 Speed sensing relay

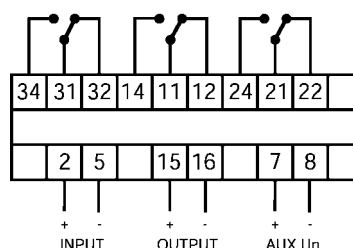
## ORDERING INFORMATION

Product Code M200-ST3  
Normal running speed 1800 rpm  
Number of teeth on flywheel 50  
Magnetic pick up output voltage 10 volt pk-pk

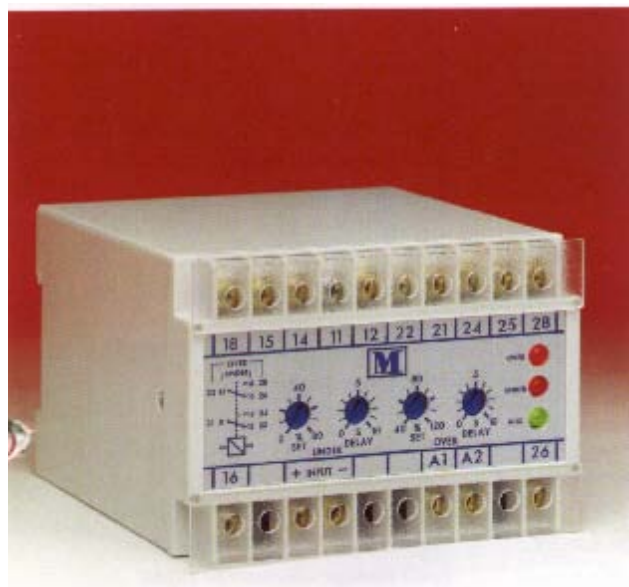
## OPTIONS

1. Calibration at temperature other than 23° C
2. Set-points are factory set. Specify frequency of crank; under speed and over speed settings required.

## CONNECTION DIAGRAM



# DC TRANSDUCER TRIP



## SELECTION GUIDE

M200-TAU	DC volts or mA under trip
M200-TAO	DC volts or mA over trip
M200-TAC	DC volts or mA combined trip

## TYPICAL APPLICATIONS

The M200 DC transducer trips have endless applications. As the name implies they are designed to accept inputs from transducers and transmitters, and provide a relay operation when the transducer signal deviates outside a pre-set limit.

Any of the M100 series transducers can be used with the transducer trip. A typical application is to control power using a M100-WA5 with a 4-20mA signal fed to a M200-TAO. For example the output goes above a pre-set limit of 80%, the TAO relay will close, setting off an alarm or shutting down a process.

Either DC voltage or DC current inputs can be used. As is common with all the M200 relays, on over units the relay energises when the input signal exceeds the trip point and on under units the relay de-energises when the input signal goes below the trip point.

A red LED indicates the state of the relay, whilst a green LED indicates the condition of the power supply.

## TECHNICAL SPECIFICATION

### INPUT

Rated value In	0<20mA or 4- 20mA
Voltage drop	1 volt
Rated value Un	1<50 volt or 1-5 volt
Impedance	10k Ohm / Volt
Overload	2xIn 1.5x Un continuous 10x In 2x Un for 3 seconds

### SETPOINT

Range Over	Adjustable 40% to 120% for both voltage and current input.
Range Under	Adjustable 0% to 80% for both voltage and current input.
Repeatability	Better than 0.5% of full span
Time delay	Adjustable 200 ms to 10 seconds
Differential	Fixed 5%

### AUXILIARY

AC Voltage	115/230/400 V ± 25% / 45-65Hz / 2VA
DC voltage	24 volt (± 20% / galvanically isolated) <3 watt

### WEIGHT & CASE SIZE

Single units	Approx. 0.4kg. 55mm case
Combined unit	Approx. 0.6 kg. 100mm case

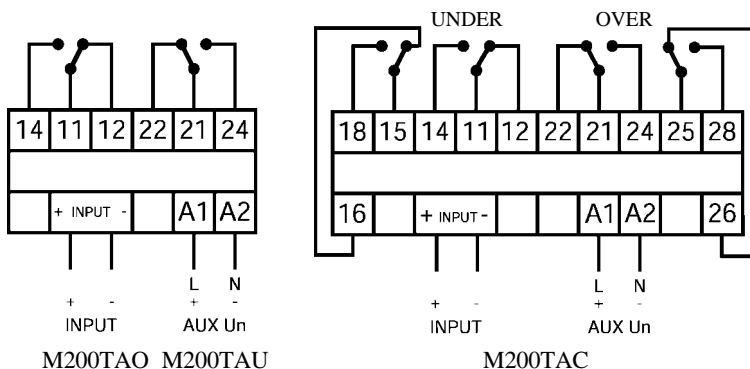
## ORDERING INFORMATION

Product Code	Input Vn or In	Aux	Freq
M200-TAC	1mA	110v	50Hz

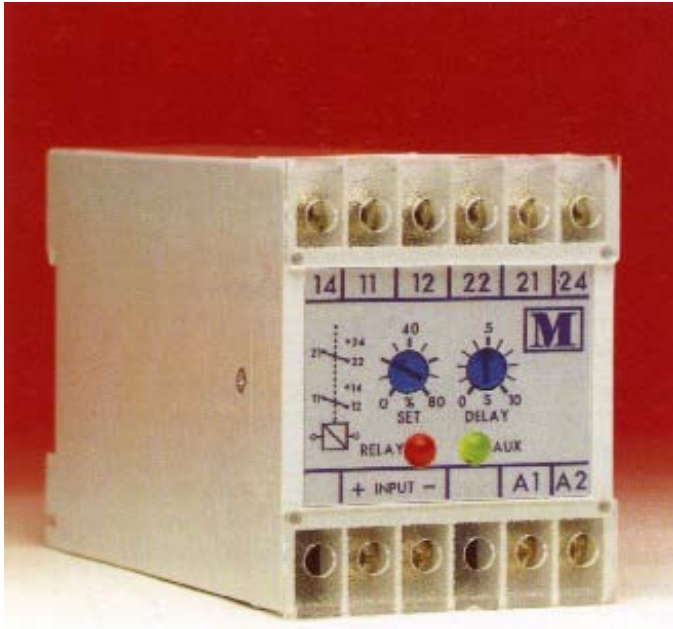
## OPTIONS

1. Adjustable time delay max 30 seconds
2. AC auxiliary in the range 57.7 to 480 volts
3. Calibration at nominal Hz 35.....450Hz
4. Calibration at temperature other than 23° C

## CONNECTION DIAGRAMS



# THERMOCOUPLE



## SELECTION GUIDE

M200-TJU	J type thermocouple under trip
M200-TJO	J type thermocouple over trip
M200-TKU	K type thermocouple under trip
M200-TKO	K type thermocouple over trip

## TYPICAL APPLICATIONS

Designed to monitor thermocouples and provide a relay signal if the temperature being monitored exceeds the pre-set limit. J and K type thermocouples inputs are available covering a wide range of temperatures. As is common with all the M200 relays, on over units the relay energises when the input signal exceeds the trip point and on under units the relay de-energises when the input signal goes below the trip point. A red LED indicates the state of the relay, whilst a green LED indicates the condition of the power supply.

## TECHNICAL SPECIFICATION

### INPUT

Type J Fe/const	Min range 0-185°C (min span 10mV) Max range 0-870°C (max span 50mV)
Type K NiCr/NiAl	Min range 0-245°C (min span 10mV) Max range 0-1230°C (max span 50mV)

Thermocouple  
break protection  
Cold junction  
Compensation  
Overload

Upscale energise  
  
Automatic over range 0-50 C  
10 x Input continuous

### SETPOINT

Range Over	Adjustable 40% to 120% for both voltage and current input
Range Under	Adjustable 0% to 80% for both voltage and current input

Repeatability	Better than 0.5% of full span
Time delay	Adjustable 200ms to 10 seconds
Differential	Fixed 2%

### AUXILIARY

AC Voltage	115/230/400V ± 25% / 45-65Hz / 2VA
DC Voltage	24 volt (± 20% / galvanically isolated) <3 Watt

WEIGHT &  
CASE SIZE

Approx. 0.4kg 55mm case

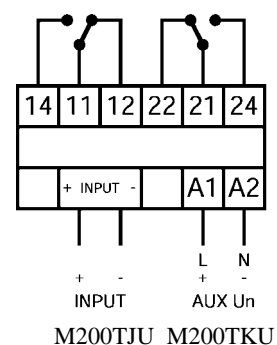
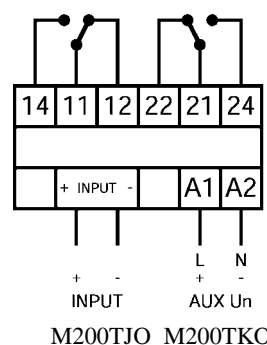
## ORDERING INFORMATION

Product Code Temp range Aux Freq Options  
M200-TJO 0-300°C 120V 60Hz 0-30 sec T/D

## OPTIONS

1. Adjustable time delay max 30 seconds
2. AC auxiliary in the range 57.7 to 480 volts
3. Calibration at temperature other than 23° C

## CONNECTION DIAGRAMS



# THERMISTOR TRIP



## SELECTION GUIDE

M200- TTA	Automatic reset
M200-TTM	Manual reset

## TYPICAL APPLICATIONS

The M200 thermistor trip accepts positive temperature coefficient thermistor inputs. Typically used to monitor temperature in motor windings.

When the thermistor is below its predetermined temperature the resistance is low and the M200-TTA / TTM relay is energised. A green LED indicates the safe condition. When the temperature exceeds the predetermined temperature, the resistance of the thermistor rapidly increases, this increase in temperature is detected by M200-TTA/TTM and the relay is de-energised.

The M200-TTM is manually reset. Once the relay has de-energised it will stay de-energised regardless of the temperature being monitored. The relay can only be reset via the reset push button on the front of the unit. The M200-TTA automatically resets once the temperature has dropped below the trip point

A yellow LED is provided to indicate the condition of the power supply.

## TECHNICAL SPECIFICATION

### INPUT

Positive temperature coefficient thermistors <1500 Ohms max at nominal temperature. Sensors can be connected in series but 1500 ohm must not be exceeded.

Trip point 2500-3500 Ohms  
Reset point 1500-2300 Ohms

Total resistance of sensor loop 1500 Ohms max at nominal temperature

Differential Fixed 5%  
Repeatability Better than 5% of range

### RESET

M200-TTA Automatic  
M200-TTM Manual via push switch on front of product

### AUXILIARY

AC Voltage 115/230/400V  
± 25% / 45-65Hz / 2VA  
DC Voltage 24 volt (± 20% / non isolated)  
<3 watt

WEIGHT & CASE SIZE Approx. 0.3kg 55mm case

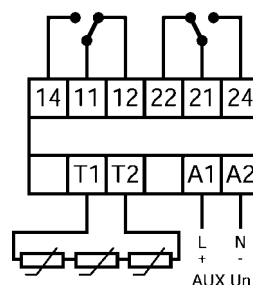
## ORDERING INFORMATION

Product Code Aux Freq Options  
M200-TTA 230V 50Hz

## OPTIONS

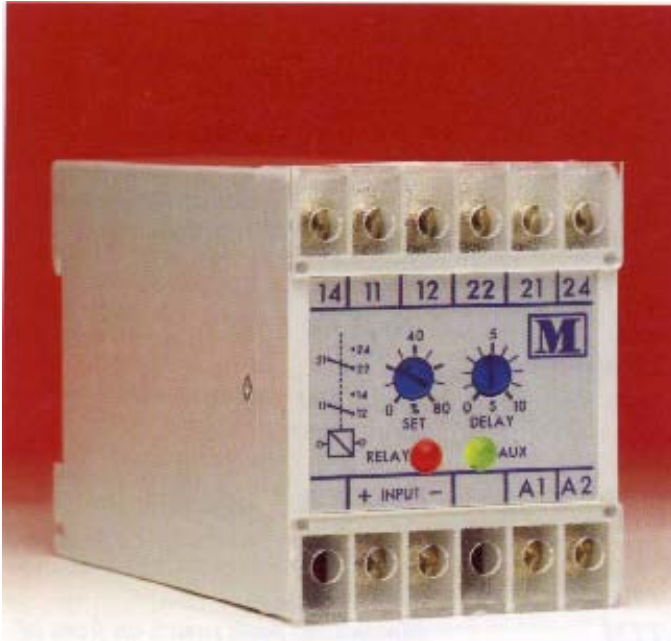
1. AC auxiliary in the range 57.7 to 480 volts
2. Calibration at temperature other than 23 C

## CONNECTION DIAGRAMS



M200TTA M200TTM

# MILLIVOLT TRIP



## SELECTION GUIDE

M200-MVU	mV under trip
M200-MVO	mV over trip
M200-MVC	mV combined trip

## TYPICAL APPLICATIONS

The mV trip relays will accept DC millivolt signals from shunts, sensors and transducers.

A common application is to protect equipment from over current in a DC charging system. For example using a 400A to 75mV shunt. The 75mV signal is fed to the M200-MVO if the customer wishes to ensure the current does not exceed 300 amps then the MVO trip would be set at 75 % (56.25mv). If the current goes above 300 Amps the relay would energise. As is common with all the M200 relays, on over units the relay energises when the input signal exceeds the trip point and on under units the relay de-energises when the input signal goes below the trip point.

A red LED indicates the state of the relay, whilst a green LED indicates the condition of the power supply.

## TECHNICAL SPECIFICATION

### INPUT

Rated value mV dc	10-999.9mV dc
Input Impedance	50k Ohm
Source impedance	100 ohms max
Overload	10 x Input continuous

### SETPOINT

Range Over	Adjustable 40% to 120%
Range Under	Adjustable 0% to 80%
Repeatability	Better than 0.5% of full span
Time delay	Adjustable 200 ms to 10 seconds
Differential	Fixed 5%

### AUXILIARY

AC Voltage	115/230/400V ± 25% / 45-65 Hz / <2VA
DC Voltage	24V (± 20% galvanically isolated) < 3 W

### WEIGHT & CASE SIZE

Single units	Approx. 0.4kg 55mm case
Combined units	Approx. 0.6kg 100mm case

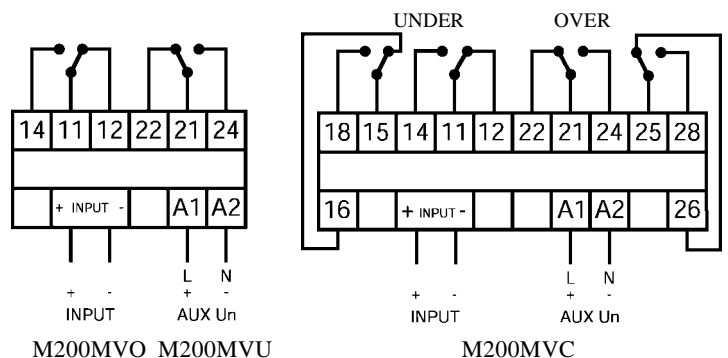
## ORDERING INFORMATION

Product Code	Input	Aux	Freq	Options
M200-MVU	75mV	230V	50Hz	Cal 40°C

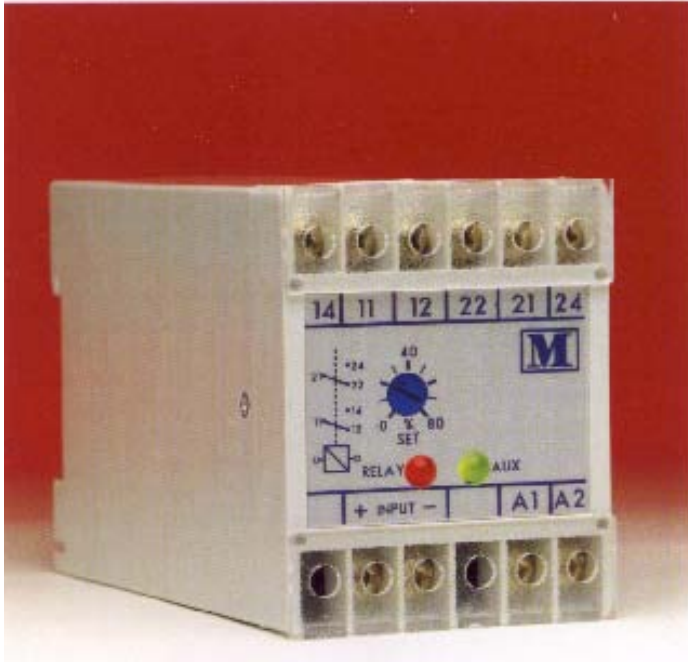
## OPTIONS

1. Adjustable time delay max 30 seconds
2. AC auxiliary in the range 577 to 480 volt
3. Calibration at temperature other than 23° C

## CONNECTION DIAGRAMS



# DC VOLTAGE TRIP



## TECHNICAL SPECIFICATION

### INPUT

Rated value $U_n$	$1 < 150$ volt
Impedance	10k Ohm / Volt
Overload	1.5 x $U_n$ continuous 2 x $U_n$ for 3 seconds

### SETPOINT

Range Over	Adjustable 40% to 120%
Range Under	Adjustable 0% to 80%
Repeatability	Better than 0.5% of full span
Differential	Fixed 5%

### AUXILIARY

AC Voltage	115/230/400V $\pm 25\%$ / 45-65Hz / 2VA
DC Voltage	24 volt ( $\pm 20\%$ / galvanically isolated) <3 watt

### WEIGHT & CASE SIZE

Single units	Approx. 0.4kg, 55mm case size
Combined unit	Approx. 0.6kg, 100mm case size

## SELECTION GUIDE

M200-TVU	DC volts under trip
M200-TVO	DC volts over trip
M200-TVC	DC volts combined trip

## TYPICAL APPLICATIONS

The M200 DC voltage trips are commonly used for monitoring battery voltage conditions but can be used in any application where the dc voltage level is critical. The user is provided with an adjustable set-point of 0-80% on under units and 40-120% on over units. The differential is internally set at 5%; no time delay is provided.

As is common with all M200 relays, on over units the relay energises when the input signal exceeds the trip point and on under units the relay de-energises when the input signal goes below the trip point.

A red LED indicates the state of the relay whilst a green LED indicates the state of the power supply.

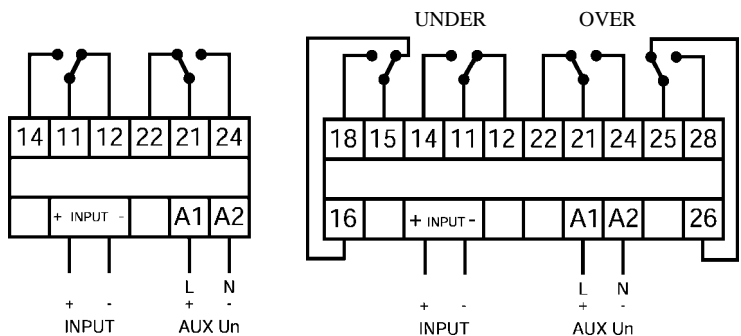
## ORDERING INFORMATION

Product Code	Input $V_n$	Aux	Freq	Options
M200-TVU	24V	110V	50Hz	

## OPTIONS

1. AC auxiliary in the range 57.7 to 480 volts
2. Calibration at nominal Hz 35...450Hz
3. Calibration at temperature other than 23° C

## CONNECTION DIAGRAMS



M200TVO M200TVU

M200TVC



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