



- All-in-one unit combining Reverse Power, Overload, Over Current and Short Circuit functions
- “Predictor” early action feature
- One common alarm output eases installation
- “Pathfinder” function (Over Current and Short Circuit)
- One fast response analogue output (<50mS)
- Optional Slave Indicator

**Specifications**

Monitored Voltage:	100-120, 200-240, 380-415 or 440-460VAC, 40-70Hz
Optional Auxiliary Voltage:	24, 48 or 110VDC
Current Input:	1 or 5A C.T.
Contact Rating:	AC: 100VA -250V/2A max. DC: 50W -100V/1A max.
Adjustments Available: (depending of selected model)	R/P trip level: 0-20% R/P trip delay: 0-30sec O/L trip level: 0-100% O/L trip delay: 0-30sec O/C trip level: 50-150% In O/C & O/C1 trip delay: 0-120sec O/C2 trip delay: 0-30sec S/C trip level: 150-300% In S/C trip delay: 0,1-1sec
Analogue Output:	Up to 20mA, max 500R Up to 10V, min 100kohm
Temperature:	-20 to +70°C
Weight:	0.5kgs
Front protection:	IP21

The unit meets IEC60092-504 and the relevant environmental and EMC tests specified in IEC60068/60092 and IEC61000/60533 respectively, to comply with the requirements of the major Classification Societies.

**Application**

The digitally controlled MAG10x generator guard combines Reverse Power (R/P), Overload (O/L), Over Current (O/C) and Short Circuit protection (S/C) in one unit. Features depend on selected model.

Available for 3-phase 3-wire (2W3) and 4-wire (3W4) systems.

Normally the auxiliary voltage is supplied from the monitored voltage input. Use step-down transformer for input voltage higher than 460VAC.

Relay operation depends on the selected model. Only three functions are available in each unit. Other combinations are available on request.

A trip timer will reset if the fault is removed during count-down. Remote alarm reset input. Fixed hysteresis prevents relay "chatter".

Full functionality control during power-up/power-down, with 500mS power-out reservoir.

User settable trip levels and delays. Colour of LEDs indicates alarm status. LEDs flash during count-down.

The **Pathfinder** indicates the phase causing an overcurrent or short circuit trip by the flashing pattern of the relevant LED.

True RMS current measurements, not affected by any distorted waveform, provides precision (class 1.0) active/reactive power and highest up current protection. Less than 50mS processing time.

Fast response mA output signal proportional to FSD-range (A, V, Hz, kW or kVAr).

Optional slave indicator with scale and status display.



**Description**

**MAG100 (2W3) / MAG104 (3W4)**

**Over Current, Short Circuit and Reverse Power Guard**

Both relays simultaneously trip after the full Reverse Power, Over Current or Short Circuit definite time delay. Depending on application either the NC or NO contact of relay R2 or R3 can be used to operate the generator breaker. The "opposite" relay may be used for alarm, etc. R1 is a separate Short Circuit alarm relay.

MAG100 MAG104	R/P	O/C	S/C	Fail safe	Latch	Predictor
R1			✓		✓	
R2	✓	✓	✓		✓	
R3	✓	✓	✓	✓	✓	

**MAG100A (2W3) / MAG104A (3W4)**

**Over Current, Short Circuit and Reverse Power Guard**

With three separate relays (R1, R2 and R3). R1 and R3 are normally energised (fail to safety), R2 is normally de-energised. Each relay will trip after the Reverse Power, Over Current or Short Circuit pre-set time delay.

MAG100A MAG104A	R/P	O/C	S/C	Fail safe	Latch	Predictor
R1	✓			✓	✓	
R2		✓				
R3			✓	✓	✓	

**MAG100E (2W3) / MAG104E (3W4)**

**Over Current, Short Circuit and Reverse Power Guard**

R3 trips after the full Reverse Power, Over Current or Short Circuit definite time delay. Depending on application either the NC or NO contact can be used to operate the generator breaker. R1 and R2 are additional alarm relays and can be used to provide an alarm signal to an alarm system or PM-System.

MAG100E MAG104E	R/P	O/C	S/C	Fail safe	Latch	Predictor
R1	✓				✓	
R2		✓	✓		✓	
R3	✓	✓	✓	✓	✓	

**MAG100C (2W3) / MAG104C (3W4)**

**Over Current, kW Overload and Reverse Power Guard**

With three separate relays (R1, R2 and R3). R1 is fail safe and energises when the unit is powered. R2 & R3 are normally de-energised. Each relay will trip after the Reverse Power, Overload or Over Current pre-set time delay.

MAG100C MAG104C	R/P	O/L	O/C	Fail safe	Latch	Predictor
R1	✓			✓	✓	
R2		✓				
R3			✓		✓	

**MAG100D (2W3) / MAG104D (3W4)**

**2 x Over Current and Reverse Power Guard**

Both R1 & R3 simultaneously trip after the full Reverse Power or Over Current definite time delay. Depending on application either the NC or NO contact of relay R1 or R3 can be used to operate the generator breaker. R2 is a separate Over Current alarm (O/C2) with individual setting. This can be used as a preferential trip or for early action functionality. R2 auto-resets when the fault is removed.

MAG100D MAG104D	R/P	O/C1	O/C2	Fail safe	Latch	Predictor
R1	✓	✓		✓	✓	
R2			✓			
R3	✓	✓			✓	

**MAG102 (2W3) / MAG106 (3W4)**

**Over Current, Short Circuit and Reverse Power Guard with "PREDICTOR" early action (R1 & R2) function**

One common relay (R3) for generator breaker trip, and two early action "Predictor" relays (R1 & R2) for preference load tripping and/or bus-tie breaker opening. R3 de-energises at trip. R3 trips after the full set Reverse Power, Over Current or Short Circuit definite time delay, and is used to open the generator breaker. R1 will trip 1 second before the set O/C trip and R2 will trip 200mS before the set S/C trip. The "Predictor" function may prevent an anticipated blackout.

MAG102 MAG106	R/P	O/C	S/C	Fail safe	Latch	Predictor
R1		✓				✓
R2			✓			✓
R3	✓	✓	✓	✓	✓	

**MAG102B (2W3) / MAG106B (3W4)**

**Over Current, Short Circuit and Reverse Power Guard with "PREDICTOR" early action (R2) function**

One common relay (R3) for generator breaker trip, and an early action "Predictor" relay (R2) for preference load tripping and/or bus-tie breaker opening. R3 de-energises at trip. R1 is an additional common alarm relay. R2, the predictor relay, will trip 1sec before R3 on O/C & 200mS (400mS optional) before R3 on S/C trip. The "Predictor" function may prevent an anticipated blackout. R3 trips after the full set Reverse Power, Over Current or Short Circuit definite time delay, and is used to open the generator breaker. The release time on O/C & S/C will be setpoint + the predictor time. (+200mS for S/C & 1 sec for O/C).

MAG102B MAG106B	R/P	O/C	S/C	Fail safe	Latch	Predictor
R1	✓	✓	✓		✓	
R2		✓	✓			✓
R3	✓	✓	✓	✓	✓	



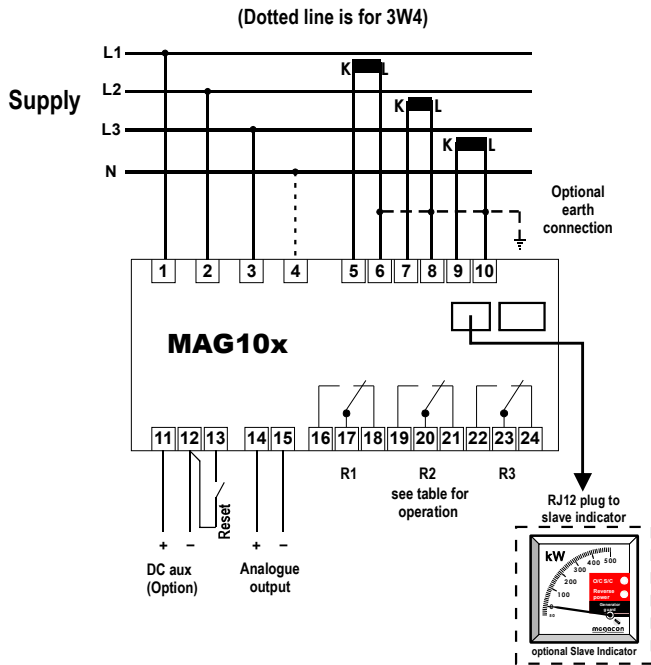
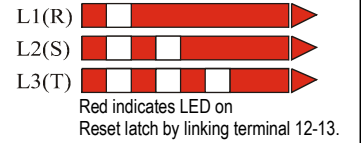
### Analogue Outputs

To specify an analogue output on any unit, add the suffix below to designate the output required:

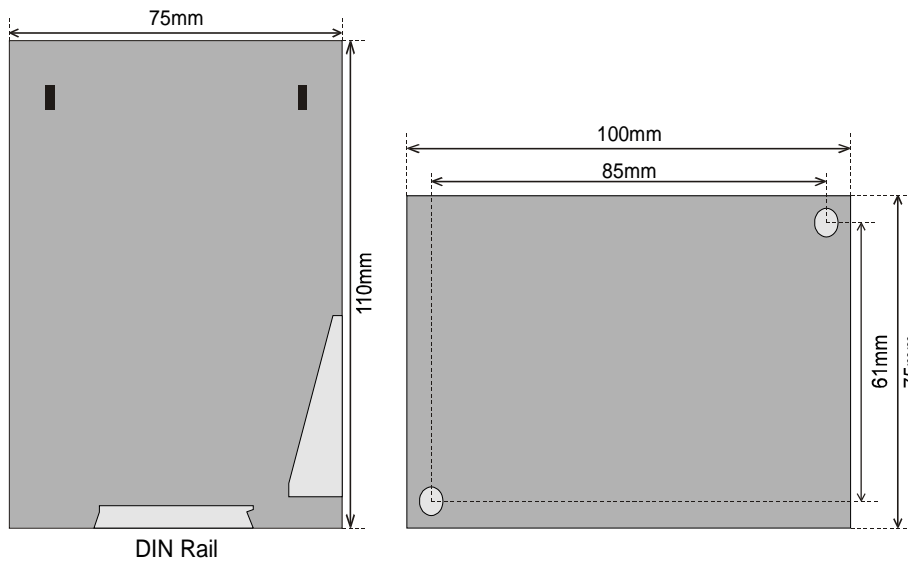
- |                  |                    |
|------------------|--------------------|
| O/P 1: 0/10mA    | O/P 5: 4/5,45/20mA |
| O/P 2: 0/20mA    | O/P 6: -10/0/+10mA |
| O/P 3: 4/20mA    | O/P 7: -20/0/+20mA |
| O/P 4: 4/12/20mA | O/P 8: 0/10V       |

#### Pathfinder Function

When either overcurrent or short-circuit trip the relevant LED will flash in the following pattern to indicate the phase causing the trip.



### Dimensions



The MEGACon policy is one of continuous improvement, consequently equipment supplied may vary in detail from this publication.

#### ORDERING EXAMPLE:

Type: MAG102  
 Aux. Supply: 200-240V  
 Input Voltage: 690/230V  
 Input Current: 1500/1A  
 Range: -150/0/+1500kW  
 Analogue O/P: 4-5,45-20mA

