

# SUPPLY MONITORING DEVICE SERIES SM500

## Ordering Catalog Nos.:

MD71B9	MGH3BF
MD71BH	MGH3BY
MD71BF	MG73BR
MG73B9	MGH3BH
MG73BH	MGI3BF
MG73BF	MG73BQ



## FEATURES:

- Adjustable Reference voltage
- Monitors own supply
- Phase Loss & Neutral loss detection.
- Phase Reverse detection
- Phase Asymmetry 10% (Phase to Phase)
- Adjustable Over & Under voltage trip level
- Adjustable Operate Time & Release Time
- SPDT, DPDT Relay output (5 A, Resistive)
- Din rail & base mounting
- LED indications
- Instant trip in case of Interruption, Phase Reverse and Phase Loss

## CAUTION:

- Do not touch the terminals while power is being supplied.
- Tighten terminal screws with the specified torque.
- Always follow instructions stated in product leaflet.
- Before installation, check to ensure that specifications agree with intended application.
- During installation, keep 10mm distance on both sides of product from adjacent devices.
- Suitable dampers should be provided in the event of excessive vibrations.
- Only qualified persons are authorized to install the product.
- Use slow blow fuse of 250mA rating in series with product supply.
- Device should be kept away from wet, dust & humidity environments.
- Device manufacturer will not be responsible if any incident occur due to negligence of cautions.

## SUITABILITY FOR USE:

These are products with Auto reset, hence never use the products for an application involving significant risk to life without ensuring that the system as a whole has been designed to address the risks and that our products are properly rated and installed for the intended use within the entire system or equipment.

## NOTE:

- The technical information provided in this document was correct at the time of publish.
- Product innovation being a continuous process, we reserve the right to alter specifications without any prior notice.

## FUNCTION DESCRIPTION:

### MD71B9, MD71BH, MD71BF

- Output relay will energize after operate time if all phases are present & Healthy with in the levels set.
- Output relay will de-energize after release time if any of or all phases exceeds OV or UV trip levels.

### MG73B9, MG73BH, MG73BF, MG73BR

Rated voltage - 240 VAC Un (PH - N)

**MGH3BH** - Rated voltage - 220 VAC Un (PH - N)

**MGH3BF** - Rated voltage - 220 VAC Un (PH - N)

**MGH3BY** - Rated voltage - 220 VAC Un (PH - N)

**MGI3BF** - Rated voltage - 230 VAC Un (PH - N)

- Output Relay will energize after operate time if following conditions are within limit:

1. All phases are present and phase voltages are within the over & under voltage trip levels set on the device.

2. If Phase Sequence is ok.

3. If Phase to phase asymmetry is less than value mentioned in technical specification.

- Relay will trip after release time if any of Phase exceeds over voltage and under voltage trip levels.
- Relay will be trip in <100ms if any phase fail, Line interruption or phase Reverse.

### MG73BQ

- Rated voltage 120 to 240 VAC Un(PH - N) selectable

- Output Relay will energize after operate time if following conditions are within limit:

1. All phases are present and phase voltages are within the over & under voltage trip levels set on the device.

2. If Phase Sequence is ok.

3. If Phase to phase asymmetry is less than value mentioned in technical specification.

Relay will trip after release time if any of Phase exceeds over voltage and under voltage trip levels. Relay will be trip in <100ms if any phase fail, Line interruption or phase Reverse.

**TECHNICAL SPECIFICATION:**
**SUPPLY MONITORING DEVICE,  
SERIES: SM500, 3-PHASE 4-WIRE AND 1-PHASE**

Cat. No.:		MD71B9	MD71BH
Function		Phase and Voltage Control	
Reference Supply Voltage (≡) 1-Phase or 3-Phase 4-Wire		240 VAC	
Frequency		47 to 63 Hz	
Power Consumption		4 VA (Max.)	
Trip Levels	Under Voltage (UV)	55% to 95% of ≡	
	Over Voltage (OV)	105% to 125% of ≡	
	Hysteresis for UV/OV	7V±2V	
	Asymmetry	N.A.	
Setting Accuracy		+/- 5% of full scale (Voltage setting are with respect to neutral)	
Power ON Delay		< 500 msec	
Setting Accuracy ±10% of Full scale	On Delay	0 - 15 min	0.5 - 15 s
	Off Delay	5 s fixed	5 s fixed
Note		Phase Reverse trip time is <100 ms. For Non-Inductive loads Phase Fail trip time is < 100 ms.	
<b>LED</b>	<b>Condition / Faults</b>	<b>Indications or Status of LED</b>	
ON (Green)	Power ON	Continuous ON	
UV (RED)	Under Voltage	Continuous ON	
OV (RED)	Over Voltage	Continuous ON	
	High Cut OFF	N.A.	
ASY / REV (RED)	Phase Asymmetry	N.A.	Blinking
	Phase Reverse	N.A.	Continuous ON
Relay Output	Contact Arrangement	1 C/O	2 C/O (Minimum load of 5mA is recommended)
	Contact Rating	5 A (Res.) @ 250 VAC / 28 VDC	
	Contact Material	Ag Alloy	
Utilization Category (AC-15)	Ue Rated Voltage V Ie Rated Current I	120/240V 3.0/1.5A	
Utilization Category (DC-13)	Ue Rated Voltage V Ie Rated Current I	24/125/250V 2.0/0.22/0.1A	
Mechanical Life Expectancy		3 x 10 <sup>4</sup> Operations	
Electrical Life Expectancy		1 x 10 <sup>5</sup> Operations	
Operating Temperature		-15°C to +55°C	
Storage Temperature		-25°C to +70°C	
Humidity (Non-Condensing)		95% (Rh)	
Max. Operating Altitude		2000 m	
Degree of Protection		IP-20 for Terminals ; IP-30 for Housing	
Pollution Degree		Type II	
Housing		Flame Retardant UL 94-V0	
Mounting		Base / Din-Rail (35 mm Symmetrical)	
Dimensions in mm (W xHx D)		36 x 60 x 90	
Weight (Unpacked)		120 g Approx.	
Certifications		CE, RoHS	

Cat. No.:		MD71BF	MG73B9
Function		Phase and Voltage Control	
Reference Supply Voltage (≡) 1-Phase or 3-Phase 4-Wire		240 VAC	
Frequency		47 to 63 Hz	
Power Consumption		4 VA (Max.)	
Trip Levels	Under Voltage (UV)	55% to 95% of ≡	
	Over Voltage (OV)	105% to 125% of ≡	
	Hysteresis for UV/OV	7V±2V	
	Asymmetry	N.A.	10% (Hysteresis: 1.3%±1%)
Setting Accuracy		+/- 5% of full scale (Voltage setting are with respect to neutral)	
Power ON Delay		< 500 msec	
Setting Accuracy ±10% of Full scale	On Delay	5 s fixed	0 - 15 min
	Off Delay	0 - 15 s	5 s fixed
Note		Phase Reverse trip time is <100 ms. For Non-Inductive loads Phase Fail trip time is < 100 ms.	
<b>LED</b>	<b>Condition / Faults</b>	<b>Indications or Status of LED</b>	
ON (Green)	Power ON	Continuous ON	
UV (RED)	Under Voltage	Continuous ON	
OV (RED)	Over Voltage	Continuous ON	
	High Cut OFF	N.A.	
ASY / REV (RED)	Phase Asymmetry	N.A.	Blinking
	Phase Reverse	N.A.	Continuous ON
Relay Output	Contact Arrangement	1 C/O	2 C/O (Minimum load of 5mA is recommended)
	Contact Rating	5 A (Res.) @ 250 VAC / 28 VDC	
	Contact Material	Ag Alloy	
Utilization Category (AC-15)	Ue Rated Voltage V Ie Rated Current I	120/240V 3.0/1.5A	
Utilization Category (DC-13)	Ue Rated Voltage V Ie Rated Current I	24/125/250V 2.0/0.22/0.1A	
Mechanical Life Expectancy		3 x 10 <sup>4</sup> Operations	
Electrical Life Expectancy		1 x 10 <sup>5</sup> Operations	
Operating Temperature		-15°C to +55°C	
Storage Temperature		-25°C to +70°C	
Humidity (Non-Condensing)		95% (Rh)	
Max. Operating Altitude		2000 m	
Degree of Protection		IP-20 for Terminals ; IP-30 for Housing	
Pollution Degree		Type II	
Housing		Flame Retardant UL 94-V0	
Mounting		Base / Din-Rail (35 mm Symmetrical)	
Dimensions in mm (W xHx D)		36 x 60 x 90	
Weight (Unpacked)		120 g Approx.	
Certifications		CE, RoHS	

\*All LEDs should off incase of Single Phase Loss, 2 Phase Loss & 3 Phase Loss conditions.

Cat. No.:		MG73BH	MG73BF
Function		Phase and Voltage Control	
Reference Supply Voltage (≡) 1-Phase or 3-Phase 4-Wire		240 VAC	
Frequency		47 to 63 Hz	
Power Consumption		4 VA (Max.)	
Trip Levels	Under Voltage (UV)	55% to 95% of ≡	
	Over Voltage (OV)	105% to 125% of ≡	
	Hysteresis for UV/OV	7V±2V	
	Asymmetry	10% (Hysteresis: 1.3%±1%)	
Setting Accuracy		+/- 5% of full scale (Voltage setting are with respect to neutral)	
Power ON Delay		< 500 msec	
Setting Accuracy ±10% of Full scale	On Delay	0.5 - 15 s	5 s fixed
	Off Delay	5 s fixed	0.5 - 15 s
Note		Phase Reverse trip time is <100 ms. For Non-Inductive loads Phase Fail trip time is < 100 ms.	
<b>LED</b>	<b>Condition / Faults</b>	<b>Indications or Status of LED</b>	
ON (Green)	Power ON	Continuous ON	
UV (RED)	Under Voltage	Continuous ON	
OV (RED)	Over Voltage	Continuous ON	
	High Cut OFF	N.A.	
ASY / REV (RED)	Phase Asymmetry	Blinking	
	Phase Reverse	Continuous ON	
Relay Output	Contact Arrangement	2 C/O (Minimum load of 5mA is recommended)	
	Contact Rating	5 A (Res.) @ 250 VAC / 28 VDC	
	Contact Material	Ag Alloy	
Utilization Category (AC-15)	Ue Rated Voltage V Ie Rated Current I	120/240V 3.0/1.5A	
Utilization Category (DC-13)	Ue Rated Voltage V Ie Rated Current I	24/125/250V 2.0/0.22/0.1A	
Mechanical Life Expectancy		3 x 10 <sup>6</sup> Operations	
Electrical Life Expectancy		1 x 10 <sup>5</sup> Operations	
Operating Temperature		-15°C to +55°C	
Storage Temperature		-25°C to +70°C	
Humidity (Non-Condensing)		95% (Rh)	
Max. Operating Altitude		2000 m	
Degree of Protection		IP-20 for Terminals ; IP-30 for Housing	
Pollution Degree		Type II	
Housing		Flame Retardant UL 94-V0	
Mounting		Base / Din-Rail (35 mm Symmetrical)	
Dimensions in mm (W xHx D)		36 x 60 x 90	
Weight (Unpacked)		120 g Approx.	
Certifications		CE, RoHS	

Cat. No.:		MGH3BF	MGH3BY
Function		Phase and Voltage Control	
Reference Supply Voltage (≡) 1-Phase or 3-Phase 4-Wire		220 VAC	
Frequency		47 to 63 Hz	
Power Consumption		4 VA (Max.)	
Trip Levels	Under Voltage (UV)	55% to 95% of ≡	
	Over Voltage (OV)	105% to 125% of ≡	
	Hysteresis for UV/OV	7V±2V	
	Asymmetry	10% (Hysteresis: 1.3%±1%)	
Setting Accuracy		+/- 5% of full scale (Voltage setting are with respect to neutral)	
Power ON Delay		< 500 msec	
Setting Accuracy ±10% of Full scale	On Delay	5 s fixed	~500 ms
	Off Delay	0.5 - 15 s	
Note		Phase Reverse trip time is <100 ms. For Non-Inductive loads Phase Fail trip time is < 100 ms.	
<b>LED</b>	<b>Condition / Faults</b>	<b>Indications or Status of LED</b>	
ON (Green)	Power ON	Continuous ON	
UV (RED)	Under Voltage	Continuous ON	
OV (RED)	Over Voltage	Continuous ON	
	High Cut OFF	N.A.	
ASY / REV (RED)	Phase Asymmetry	Blinking	
	Phase Reverse	Continuous ON	
Relay Output	Contact Arrangement	2 C/O (Minimum load of 5mA is recommended)	
	Contact Rating	5 A (Res.) @ 250 VAC / 28 VDC	
	Contact Material	Ag Alloy	
Utilization Category (AC-15)	Ue Rated Voltage V Ie Rated Current I	120/240V 3.0/1.5A	
Utilization Category (DC-13)	Ue Rated Voltage V Ie Rated Current I	24/125/250V 2.0/0.22/0.1A	
Mechanical Life Expectancy		3 x 10 <sup>6</sup> Operations	
Electrical Life Expectancy		1 x 10 <sup>5</sup> Operations	
Operating Temperature		-15°C to +55°C	
Storage Temperature		-25°C to +70°C	
Humidity (Non-Condensing)		95% (Rh)	
Max. Operating Altitude		2000 m	
Degree of Protection		IP-20 for Terminals ; IP-30 for Housing	
Pollution Degree		Type II	
Housing		Flame Retardant UL 94-V0	
Mounting		Base / Din-Rail (35 mm Symmetrical)	
Dimensions in mm (W xHx D)		36 x 60 x 90	
Weight (Unpacked)		120 g Approx.	
Certifications		CE, RoHS	

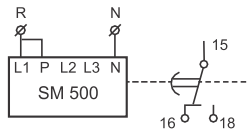
\*All LEDs should off incase of Single Phase Loss, 2 Phase Loss & 3 Phase Loss conditions.

Cat. No.:		MG73BR	MGH3BH
Function		Phase and Voltage Control	
Reference Supply Voltage (≡) 1-Phase or 3-Phase 4-Wire		240 VAC	220 VAC
Frequency		47 to 63 Hz	
Power Consumption		4 VA (Max.)	
Trip Levels	Under Voltage (UV)	173 V ± 10 V	55% to 95% of ≡
	Over Voltage (OV)	288 V ± 10 V	105% to 125% of ≡
	Hysteresis for UV/OV	7V±2V	
	Asymmetry	20% ± 4%, Hyst. 4%±2%)	10%
Setting Accuracy		+/- 5% of full scale (Voltage setting are with respect to neutral)	
Power ON Delay		< 500 msec	
Setting Accuracy ±10% of Full scale	On Delay	0.5-10 s ±1s	0.5 - 15 s
	Off Delay	0.5 - 5s	5 s fixed
Note		Phase Reverse trip time is <100 ms. For Non-Inductive loads Phase Fail trip time is < 100 ms.	
<b>LED</b>	<b>Condition / Faults</b>	<b>Indications or Status of LED</b>	
ON (Green)	Power ON	Continuous ON	
UV (RED)	Under Voltage	Continuous ON	
OV (RED)	Over Voltage	Continuous ON	
	High Cut OFF	N.A.	Blinking
ASY / REV (RED)	Phase Asymmetry	Blinking	
	Phase Reverse	Continuous ON	
Relay Output	Contact Arrangement	2 C/O (Minimum load of 5mA is recommended)	
	Contact Rating	5 A (Res.) @ 250 VAC / 28 VDC	
	Contact Material	Ag Alloy	
Utilization Category (AC-15)	Ue Rated Voltage V Ie Rated Current I	120/240V 3.0/1.5A	
Utilization Category (DC-13)	Ue Rated Voltage V Ie Rated Current I	24/125/250V 2.0/0.22/0.1A	
Mechanical Life Expectancy		3 x 10 <sup>6</sup> Operations	
Electrical Life Expectancy		1 x 10 <sup>5</sup> Operations	
Operating Temperature		-15°C to +55°C	
Storage Temperature		-25°C to +70°C	
Humidity (Non-Condensing)		95% (Rh)	
Max. Operating Altitude		2000 m	
Degree of Protection		IP-20 for Terminals ; IP-30 for Housing	
Pollution Degree		Type II	
Housing		Flame Retardant UL 94-V0	
Mounting		Base / Din-Rail (35 mm Symmetrical)	
Dimensions in mm (W xHx D)		36 x 60 x 90	
Weight (Unpacked)		120 g Approx.	
Certifications		CE, RoHS	

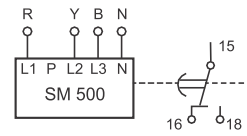
Cat. No.:		MG13BF	MG73BQ
Function		Phase and Voltage Control	
Reference Supply Voltage (≡) 1-Phase or 3-Phase 4-Wire		230 VAC	120 to 240 settable
Frequency		47 to 63 Hz	
Power Consumption		4 VA (Max.)	
Trip Levels	Under Voltage (UV)	55% to 95% of ≡	80% of ≡
	Over Voltage (OV)	105% to 125% of ≡	
	Hysteresis for UV/OV	7V±2V	
	Asymmetry	10% (Hysteresis: 1.3%±1%)	
Setting Accuracy		+/- 5% of full scale (Voltage setting are with respect to neutral)	
Power ON Delay		< 500 msec	
Setting Accuracy ±10% of Full scale	On Delay	5 s fixed	
	Off Delay	0 - 15 s	
Note		Phase Reverse trip time is <100 ms. For Non-Inductive loads Phase Fail trip time is < 100 ms.	
<b>LED</b>	<b>Condition / Faults</b>	<b>Indications or Status of LED</b>	
ON (Green)	Power ON	Continuous ON	
UV (RED)	Under Voltage	Continuous ON	
OV (RED)	Over Voltage	Continuous ON	
	High Cut OFF	N.A.	Blinking
ASY / REV (RED)	Phase Asymmetry	Blinking	
	Phase Reverse	Continuous ON	
Relay Output	Contact Arrangement	2 C/O (Minimum load of 5mA is recommended)	
	Contact Rating	5 A (Res.) @ 250 VAC / 28 VDC	
	Contact Material	Ag Alloy	
Utilization Category (AC-15)	Ue Rated Voltage V Ie Rated Current I	120/240V 3.0/1.5A	
Utilization Category (DC-13)	Ue Rated Voltage V Ie Rated Current I	24/125/250V 2.0/0.22/0.1A	
Mechanical Life Expectancy		3 x 10 <sup>6</sup> Operations	
Electrical Life Expectancy		1 x 10 <sup>5</sup> Operations	
Operating Temperature		-15°C to +55°C	
Storage Temperature		-25°C to +70°C	
Humidity (Non-Condensing)		95% (Rh)	
Max. Operating Altitude		2000 m	
Degree of Protection		IP-20 for Terminals ; IP-30 for Housing	
Pollution Degree		Type II	
Housing		Flame Retardant UL 94-V0	
Mounting		Base / Din-Rail (35 mm Symmetrical)	
Dimensions in mm (W xHx D)		36 x 60 x 90	
Weight (Unpacked)		120 g Approx.	
Certifications		CE, RoHS	

\*All LEDs should off incase of Single Phase Loss, 2 Phase Loss & 3 Phase Loss conditions.

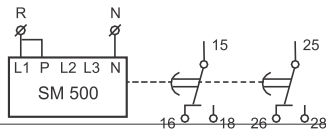
**FOR SINGLE PHASE APPLICATION**



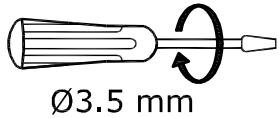
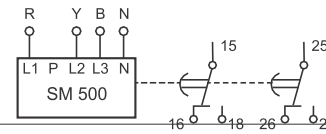
**FOR THREE PHASE APPLICATION**



**FOR SINGLE PHASE APPLICATION**



**FOR THREE PHASE APPLICATION**



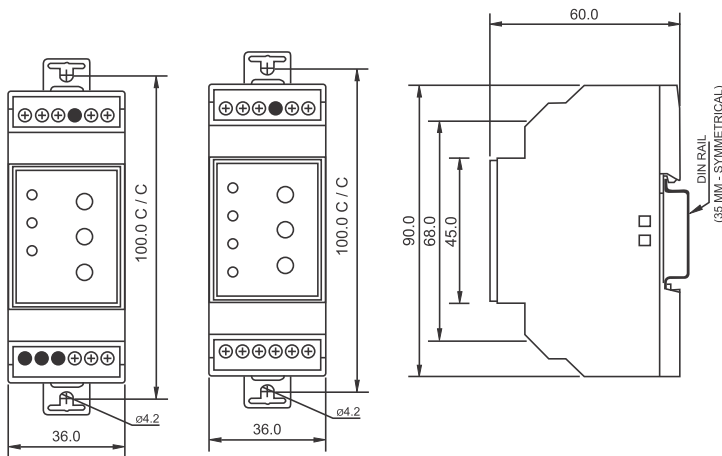
**0.54 N.m (5 Lb.in)**  
Terminal screw - M2.6



**1 x 0.2...3.3 mm<sup>2</sup>**  
Solid Wire

**AWG**

**1 x 24 to 12**



**OPERATING MODES:**

All products operates in Single Phase as well as Three Phase Mode.

**Three Phase Mode:**

Connect three phases at L1, L2, L3 and Neutral at N terminal. Keep P terminal open.

**Single Phase Mode:**

Connect a link between L1 & P and Neutral at N terminal. L2 & L3 connections are don't care. In single phase mode, device monitors only L1 phase for UV & OV condition.

**Note :**

The technical information provided in this document is correct at the time of going to the press. Product innovation being a continuous process , we reserve the right to alter specifications without any prior notice.

**CERTIFICATION :**

Product Standard :IEC 60255-1		
<b>EMI/EMC :</b>		
Harmonic Current Emission	IEC 61000-3-2	Class A
ESD	IEC 61000-4-2	Level III
Radiated Susceptibility	IEC 61000-4-3	Level III
Electrical Fast Transients	IEC 61000-4-4	Level IV
Surge	IEC 61000-4-5	Level IV
Conducted Susceptibility	IEC 61000-4-6	Level III
Voltage Dips and Interruptions (AC)	IEC 61000-4-11	
Conducted Emission	CISPR 14-1	Class A
Radiated Emission	CISPR 14-1	Class A
<b>Safety:</b>		
Test Voltage Between I/P & O/P	IEC 60947-5-1	2 kV
Impulse Voltage Between I/P & O/P	IEC 60947-5-1	Level IV
Single Fault	IEC 61010-1	
Insulation Resistance	UL 508	>50 KΩ
Leakage Current	UL 508	<3.5 mA
<b>Environmental:</b>		
cold Heat	IEC 60068-2-1	
Dry Heat	IEC 60068-2-2	
Vibration	IEC 60068-2-6	5 g
Repetitive Shock	IEC 60068-2-27	45g,6ms
Non-repetitive Shock	IEC 60068-2-27	30g,15ms

E-Waste Regulatory notice:  
Kindly treat, recycle or dispose of this equipment in an environmentally sound manner after End of Life, as per WEEE (Waste Electrical and Electronic Equipment) regulations; or hand it over to General Industrial Controls Pvt. Ltd, through website <https://www.gicindia.com/get-in-touch/>