

Voltage Monitoring Series SM 500

- Protects against Phase Loss, Phase Reversal & Phase Asymmetry
- Can be configured for 3 Phase 4 Wire or 1 Phase system
- Selectable Over Voltage / Under Voltage Trip level
- Selectable Time Delay
- LED Indications for Power and Fault conditions
- Voltage Sensing principle
- 1 C/O or 2 C/O Configuration





Ordering Information

Cat. No.	Description
MD71BH	240 VAC, UV / OV with Selectable ON Delay (0.5 to 15 sec), 1 C/O
MD71BF	240 VAC, UV / OV with Selectable OFF Delay (0.5 to 15 sec), 1 C/O
MD71B9	240 VAC, UV / OV with Selectable ON Delay (0.5 s to 15 min), 1 C/O

Voltage Monitoring Series SM 500



Cat. No.		MD71BH	MD71BF	MD71B9
Parameters				
Supply Voltage (ϕ)		240 VAC (1 Phase & 3 Phase, 4 Wire)		
Frequency		50/60 Hz		
Power Consumption (Max.)		4 VA		
Trip Settings	Phase Loss	Yes	Yes	Yes
	Phase Sequence	N.A	N.A	N.A
	Phase Asymmetry	N.A	N.A	N.A
	Under Voltage	55% to 95% (of ϕ)		
	Over Voltage	105% to 125% (of ϕ)		
Time Delay	ON Delay	0.5 to 15 s (Selectable)	5 s	0.5 s to 15 min (Selectable)
	Trip Time (OFF Delay)	5 s	0.5 to 15 s (Selectable)	5 s
Output	Relay Output	1 C/O		
	Contact Rating	5A @ 250 VAC / 28 VDC (Resistive)		
	Electrical Life	1X10 ⁵		
	Mechanical Life	3X10 ⁶		
Utilization Category	AC - 15	Rated Voltage (Ue): 120/240 V, Rated Current (Ie): 3.0/1.5 A		
	DC - 13	Rated Voltage (Ue): 24/125/250 V, Rated Current (Ie): 2.0/0.22/0.1 A		
LED Indication		Separate indications for Power ON, UV and OV		
Operating Temperature		-15° C To + 55° C		
Storage Temperature		-25° C To + 70° C		
Humidity (Non Condensing)		95% (Rh)		
Enclosure		Flame Retardant UL 94-V0		
Dimension (W x H x D) (in mm)		36 X 90 X 60		
Weight (unpacked) Approx.		120 g		
Mounting		Base / DIN rail		
Degree of Protection		IP 20 for Terminals, IP 40 for Enclosure		
Certification		 		

EMI / EMC

Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

Environmental

Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

Note: 1) Voltage setting is with respect to Neutral. Voltage Setting Accuracy: $\pm 5\%$ of Full Scale; Time Setting Accuracy: $\pm 10\%$ of Full Scale

Voltage Monitoring Series SM 500





Ordering Information

Cat. No.	Description
MG73B9	240 VAC, UV / OV & Single Phasing Preventor (SPP) with Selectable ON Delay (0.5 s to 15 min), 2 C/O
MG73BH	240 VAC, UV / OV & SPP with Selectable ON Delay (0.5 to 15 sec), 2 C/O
MG73BF	240 VAC, UV / OV & SPP with Selectable OFF Delay (0.5 to 15 sec), 2 C/O
MG73BQ	120 - 240 VAC Selectable, UV / Selectable OV & SPP with Selectable OFF Delay (0.5 to 15 sec), 2 C/O
MG73BR	240 VAC, Fixed UV / OV & SPP, 20% Asymmetry with Fixed ON (10 sec) & OFF (5 sec) Delay, 2 C/O
MGH3BH	220 VAC, UV / OV & SPP with Selectable ON Delay (0.5 to 15 sec), 2 C/O
MGH3BF	220 VAC, UV / OV & SPP with Selectable OFF Delay (0.5 to 15 sec), 2 C/O
MG13BF	230 VAC, UV / OV & SPP with Selectable OFF Delay (0.5 to 15 sec), 2 C/O

Voltage Monitoring Series SM 500



Cat. No.		MG73BH	MG73BF	MG73B9
Parameters				
Supply Voltage (ϕ)		240 VAC (1 Phase & 3 Phase, 4 Wire)		
Frequency		50/60 Hz		
Power Consumption (Max.)		5 VA		
Trip Settings	Phase Loss	Yes		
	Phase Sequence	Yes		
	Phase Asymmetry	10% (of ϕ)		
	Under Voltage	55% to 95% (of ϕ)		
	Over Voltage	105% to 125% (of ϕ)		
	Hysteresis	7 V (\pm 2 V)		
Time Delay	ON Delay	0.5 to 15 s (Selectable)	5 s	0.5 s to 15 min (Selectable)
	Trip Time (OFF Delay)	5 s	0.5 to 15 s (Selectable)	5 s
Output	Relay Output	2 C/O		
	Contact Rating	5A @ 250 VAC / 28 VDC (Resistive)		
	Electrical Life	1X10 ⁶		
	Mechanical Life	3X10 ⁶		
Utilization Category	AC - 15	Rated Voltage (Ue): 120/240 V, Rated Current (Ie): 3.0/1.5 A		
	DC - 13	Rated Voltage (Ue): 24/125/250 V, Rated Current (Ie): 2.0/0.22/0.1 A		
LED Indication		Separate indications for Power ON, UV and OV; ON: Phase Reverse; BLINK: Phase Asymmetry		
Operating Temperature		-15° C To + 55° C		
Storage Temperature		-25° C To + 70° C		
Humidity (Non Condensing)		95% (Rh)		
Enclosure		Flame Retardant UL 94-V0		
Dimension (W x H x D) (in mm)		36 X 90 X 60		
Weight (unpacked)		120 g		
Mounting		Base / DIN rail		
Degree of Protection		IP 20 for Terminals, IP 40 for Enclosure		
Certification		 		

EMI / EMC

Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

Environmental

Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

Note: 1) Voltage setting is with respect to Neutral. Voltage Setting Accuracy: \pm 5 % of Full Scale; Time Setting Accuracy: \pm 10 % of Full Scale

Voltage Monitoring Series SM500 - Neutral Loss Protection

- Phase loss (failure) detection
- Neutral loss detection
- Phase reverse detection
- Phase asymmetry
- Adjustable Over & Under voltage trip level
- LED indication for all failure conditions
- Automatic recovery on fault removal





Ordering Information

Cat. No.	Description
MAC04D0100	415 VAC, Neutral Loss Protection with Phase and Voltage Control, 2 C/O
MAC04D0119	380 VAC, Neutral Loss Protection with Phase and Voltage Control, 2 C/O

Voltage Monitoring Series SM500 - Neutral Loss Protection



Cat. No.		MAC04D0100			
Parameters					
Supply Voltage (ϕ)		415 VAC (Ph-Ph); 3 Phase, 4 Wire			
Frequency		47 to 53 Hz			
Power Consumption (Max.)		10 VA (max)			
Trip Settings	Phase Loss	Yes			
	Phase Sequence	Yes			
	Phase Asymmetry	94V \pm 4V (Ph-Ph)			
	Under Voltage	55% to 95% (of ϕ)			
	Over Voltage	105% to 125% (of ϕ)			
	Hysteresis	7 V (\pm 2 V)			
Time Delay	ON Delay	5 s \pm 1 s (Fixed)			
	Trip Time (OFF Delay)	For Phase failure phase Imbalance Under voltage / Over Voltage	5 s \pm 1 s (Fixed)		
		For Neutral Fail	500 ms -1s		
Output	Relay Output	2 C/O			
	Contact Rating	5A @ 250 VAC / 28 VDC (Resistive)			
	Electrical Life	1X10 ⁵			
	Mechanical Life	1X10 ⁷			
Utilization Category	AC - 15	Rated Voltage (Ue): 120/240 V, Rated Current (Ie): 3.0/1.5 A			
	DC - 13	Rated Voltage (Ue): 24/125/250 V, Rated Current (Ie): 2.0/0.22/0.1 A			
LED Indications on front plate	Respective fault condition will be indicated by LED immediately & Relay will be tripped after specified trip time only.				
		GREEN	UV	OV	Blink: ASY, ON: REV
	Power ON	ON	OFF	OFF	OFF
	Phase reverse	ON	OFF	OFF	ON
	Asymmetry	ON	OFF	OFF	BLINK
	UV	ON	ON	OFF	OFF
	OV	ON	OFF	ON	OFF
	Phase Fail	BLINK	OFF	OFF	OFF
	Phase Fail *	BLINK	ON	OFF	BLINK
Neutral Fail	ON	BLINK	BLINK	BLINK	
* Phase fail indications when I/P voltages are below UV set point and below asymmetry					
Operating Temperature		-10° C To + 60° C			
Storage Temperature		-10° C To + 70° C			
Humidity (Non Condensing)		95% (Rh)			
Enclosure		Flame Retardant UL 94-V0			
Dimension (W x H x D) (in mm)		36 X 90 X 60			
Weight (unpacked)		120 g			
Mounting		Base / DIN rail			
Degree of Protection		IP 20 for Terminals, IP 40 for Enclosure			
Certification		 			

EMI / EMC

Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

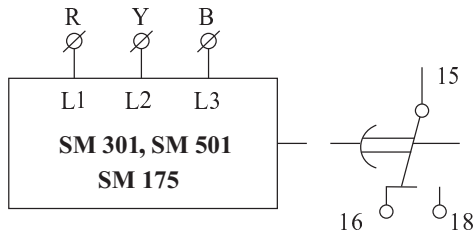
Environmental

Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

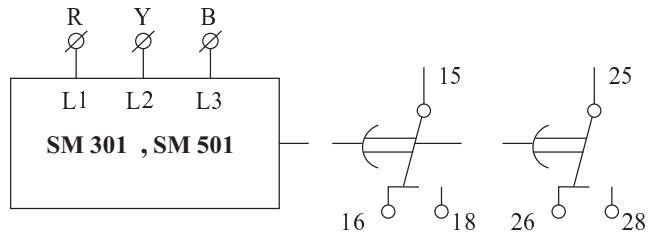
Voltage Monitoring Series



CONNECTION DIAGRAM

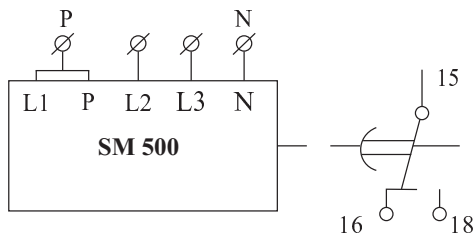


MA51BC, MA51BK, MN21D5, MK21D5, MC21D5
MA21DN, MD21DF, MG21DH, MG21DF, MGD1DR

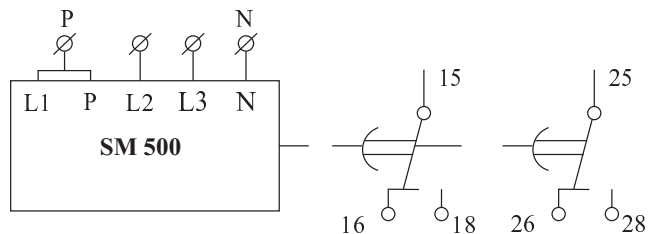


MG53BH, MG53BF, MG63BH, MG63BF
MG53BI, MG53BO, MB53BM, MC21B5

SINGLE PHASE

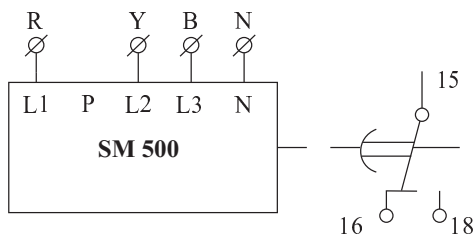


MD71BH, MD71BF, MD71B9

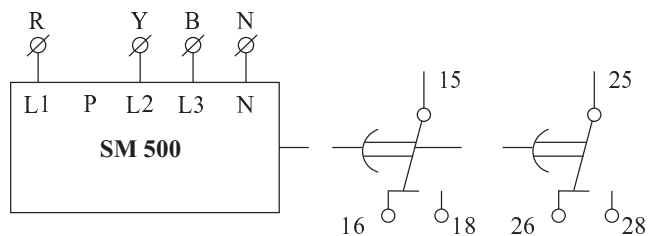


MG73BH, MG73BF, MG73B9

THREE PHASE

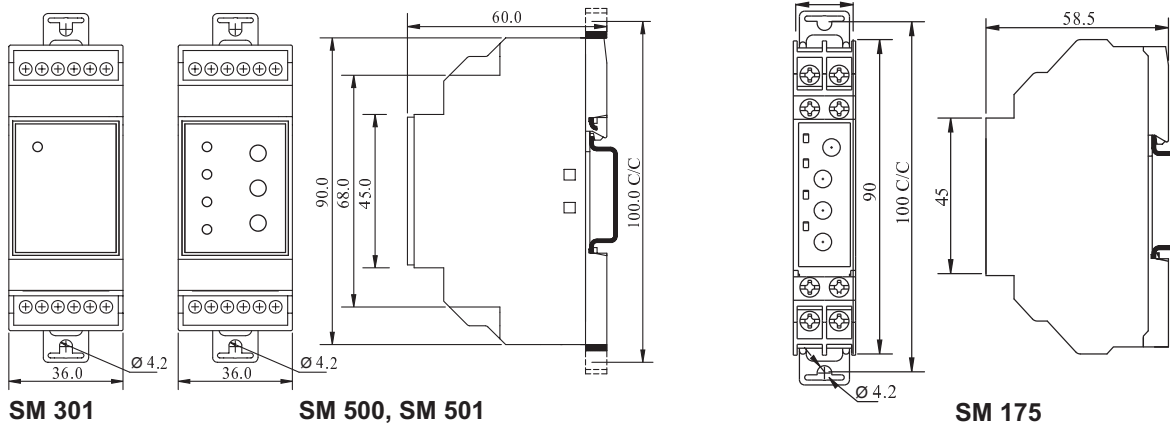


MD71BH, MD71BF, MD71B9





MG73BH, MG73BF, MG73B9, MAC04D0100 (P is not applicable in neutral loss)



MOUNTING DIMENSION (mm)



TERMINAL TORQUE & CAPACITY

 Ø 3.5	0.54 N.m (6 Lb.in)
	1 x 2.5 mm ² Solid Wire/Stranded
AWG	1 x 24 to 12

SM 301, SM 500, SM 501

 Ø 3.5 mm....5.0mm	0.80 N.m (7.1 Lb.in)
	2 x 2.5 mm ² Solid/Stranded Wire
AWG	2 x 20 to 14

SM 175