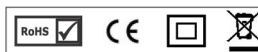


SUPPLY MONITORING DEVICE SERIES SM-175

Ordering Catalog Nos.:

MK21D5
MC21D5
MA21DN
MD21DF
MG21DH
MG21DF
MN21D5
MGD1DR
MOF1D51



PRODUCT DESCRIPTION:

Digital supply monitoring relay (Series SM 800) monitors Over voltage, under voltage, over frequency, under frequency, phase loss, Phase asymmetry, Phase sequence & neutral fail in 3 phase system.

FEATURES:

- Controls own supply voltage.
- Multi-voltage from 3x208 to 3x480 V
- LED status indication.
- SPDT Relay output (5A resistive)
- 30 to 40ms instant tripping for 2 & 3-phase interruption.
- Din Rail & Base mounting.

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.
- Installation to be done by skilled electrician
- Suitable dampers should be provided in the event of excessive vibrations.

SUITABILITY FOR USE:

These are products with Auto reset and Auto Switch On, 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 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.

FUNCTION DESCRIPTION:

MK21D5

Controls:-

1. Correct sequence of three phases.
2. Failure of any of three phases when voltage falls below rated minimum of threshold.

MC21D5

Controls:-

1. Correct sequence of the three phases.
2. Failure of any of the three phases.
3. Failure due to Asymmetry fixed at 30%.

MA21DN

Controls:-

1. Correct sequence of the three phases.
2. Failure of any of the three phases .
3. Failure due to Asymmetry adjustable from 5% to 15%.

MD21DF

Controls:-

1. Correct sequence of the three phases.
2. Failure of any of the three phases.
3. Under & Over Voltage adjustable from 2 to 20% of Un
(Up to - 12% across 3x208 V Range;
Up to - 16% across 3x220 V Range; Up to +10% across 3x480 V Range)

MGD1DR

Controls:-

1. Correct sequence of the three phases.
2. Failure of any of the three phases.
3. Under & Over Voltage adjustable from 5 to 25%.
4. Failure due to Asymmetry fixed at 10%.

MG21DH/MG21DF

Controls:-

1. Correct sequence of the three phases.
2. Failure of any of the three phases.
3. Under & Over Voltage adjustable from 5 to 25% of Un
(Up to - 12% across 3x208 V Range;
Up to - 16% across 3x220 V Range;
Up to +20% across 3x440 V Range;
Up to +10% across 3x480 V Range)
4. Failure due to Asymmetry fixed at 10%.

MN21D5

Controls:-

1. Failure of any of the three phases.
2. Failure due to Asymmetry fixed at 30%.

MOF1D51

Controls:-

1. Failure of any of the three phases.
2. Failure due to Asymmetry fixed at 10%.

Incase of any query, please write us at service@gicindia.com
Or visit www.gicindia.com

SUPPLY MONITORING DEVICE SERIES : SM-175

| Cat. No.: | | | MK21D5 | MC21D5 |
|--|----------------------|----------------------|---|-----------|
| Function | | | Phase Control | |
| Supply Voltage (≡) | | | 208 to 480 VAC, 3P3W (-12% to +10% of ≡) | |
| Frequency | | | 47 to 63 Hz | |
| Power Consumption | | | 3 VA (Max.) | |
| Adjustable Nominal Voltage (≡) | | | N.A. | |
| Trip Levels | Under Voltage | | N.A. | |
| | Over Voltage | | N.A. | |
| | Asymmetry | | N.A. | 30% fixed |
| Setting Accuracy | | | +/- 5% of full scale | |
| Setting Accuracy (±10% of full scale) | Operate Time | | <750 ms | |
| | | | MK21D5,MC21D5,MN21D5 & MOF1D51 products 'Operate Time' at Power ON is <1.5 sec. For MGD1DR & MG21DH OT is 1.5 sec if pot is at 0 range. | |
| | Power ON Delay | | <1.5 sec | |
| | Release Time | UV, OV and Asymmetry | ~ 550 ms | |
| | | Phase Reverse | <65 ms. | |
| | | Phase Loss | For Phase Loss Fault in the absence of Motor load Release Time is <65 ms. | |
| LED Indications | R/≡ | Healthy | R Continuous ON | |
| | | Ph Reverse | R Flashing | |
| | | Asymmetry | N.A. | R OFF |
| | OV | | N.A. | |
| | UV | | N.A. | |
| | AS | | N.A. | |
| | ALL LEDS | OFF | Phase Fail or Higher Cut OFF (> 560 VAC) or lower cut off (<175 VAC) (for MOF1D51,MK21D5, MC21D5 & MN21D5 Lower Cut Off is < 138 VAC) | |
| | | Flashing | N.A. | |
| Relay Output | Contact Rating | | 1 C/O , 5A (Res.) @ 250 VAC / 30 VDC | |
| | 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 | |
| | Contact Material | | Ag Alloy | |
| Mechanical Life Expectancy | | | 3 x 10 ⁶ Operations | |
| Electrical Life Expectancy | | | 1 x 10 ⁵ Operations | |
| Operating Temperature | | | -15 °C to +60 °C | |
| Storage Temperature | | | -20 °C to +80 °C | |
| Humidity (Non-Condensing) | | | 5 to 95 % (Non-Condensing) | |
| Max. Operating Altitude | | | 2000 m | |
| Degree of Protection | | | IP-20 for Terminals; IP-30 for Housing | |
| Pollution Degree | | | II | |
| Housing | | | Flame Retardant UL 94-V0 | |
| Mounting | | | Base / Din-Rail (35 mm Symmetrical) | |
| Dimensions in mm (W xH x L) | | | 18 x 59 x 90 | |
| Weight (Unpacked) | | | 70 gm Approx. | |
| Certifications | | | CE, RoHS | |

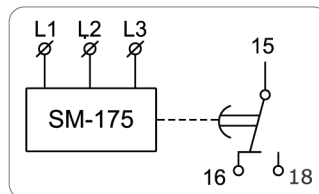
| Cat. No.: | | | MN21D5 | MA21DN |
|--|----------------------|----------------------|---|--------------|
| Function | | | Phase Control | |
| Supply Voltage (≡) | | | 208 to 480 VAC, 3P3W (-12% to +10% of ≡) | |
| Frequency | | | 47 to 63 Hz | |
| Power Consumption | | | 3 VA (Max.) | |
| Adjustable Nominal Voltage (≡) | | | N.A. | |
| Trip Levels | Under Voltage | | N.A. | |
| | Over Voltage | | N.A. | |
| | Asymmetry | | 30% fixed | 5 to 15% |
| Setting Accuracy | | | +/- 5% of full scale | |
| Setting Accuracy (±10% of full scale) | Operate Time | | <750 ms | 5 s fixed |
| | | | MK21D5,MC21D5,MN21D5 & MOF1D51 products 'Operate Time' at Power ON is <1.5 sec. For MGD1DR & MG21DH OT is 1.5 sec if pot is at 0 range. | |
| | Power ON Delay | | <1.5 sec | |
| | Release Time | UV, OV and Asymmetry | ~ 550 ms | <0.55 to 15s |
| | | Phase Reverse | <65 ms. | |
| | | Phase Loss | For Phase Loss Fault in the absence of Motor load Release Time is <65 ms. | |
| LED Indications | R/≡ | Healthy | R Continuous ON | |
| | | Ph Reverse | N.A. | R Flashing |
| | | Asymmetry | R OFF | R OFF |
| | OV | | N.A. | |
| | UV | | N.A. | |
| | AS | | N.A. | |
| | ALL LEDS | OFF | Phase Fail or Higher Cut OFF (> 560 VAC) or lower cut off (<175 VAC) (for MOF1D51, MK21D5, MC21D5 & MN21D5 Lower Cut Off is < 138 VAC) | |
| | | Flashing | N.A. | |
| Relay Output | Contact Rating | | 1 C/O , 5A (Res.) @ 250 VAC / 30 VDC | |
| | 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 | |
| | Contact Material | | Ag Alloy | |
| Mechanical Life Expectancy | | | 3 x 10 ⁶ Operations | |
| Electrical Life Expectancy | | | 1 x 10 ⁵ Operations | |
| Operating Temperature | | | -15 ℃ to +60 ℃ | |
| Storage Temperature | | | -20 ℃ to +80 ℃ | |
| Humidity (Non-Condensing) | | | 5 to 95 % (Non-Condensing) | |
| Max. Operating Altitude | | | 2000 m | |
| Degree of Protection | | | IP-20 for Terminals; IP-30 for Housing | |
| Pollution Degree | | | II | |
| Housing | | | Flame Retardant UL 94-V0 | |
| Mounting | | | Base / Din-Rail (35 mm Symmetrical) | |
| Dimensions in mm (W xH x L) | | | 18 x 59 x 90 | |
| Weight (Unpacked) | | | 70 gm Approx. | |
| Certifications | | | CE, RoHS | |

| Cat. No.: | | | MOF1D51 | MD21DF |
|---------------------------------------|----------------------|----------------------|---|---|
| Function | | | Phase Control | Phase and Voltage Control |
| Supply Voltage (≡) | | | 208 to 480 VAC, 3P3W (-12% to +10% of ≡) | |
| Frequency | | | 47 to 53 Hz | 47 to 63 Hz |
| Power Consumption | | | 3 VA (Max.) | |
| Adjustable Nominal Voltage (≡) | | | N.A. | 208 - 220 - 380 - 400 - 415 - 440 - 480 VAC |
| Trip Levels | Under Voltage | | N.A. | -2 to -20% of ≡ |
| | Over Voltage | | N.A. | 2 to 20% of ≡ |
| | Asymmetry | | 10% fixed | N.A. |
| Setting Accuracy | | | +/- 5% of full scale | |
| Setting Accuracy (±10% of full scale) | Operate Time | | <750 ms | 5 s fixed |
| | | | MK21D5,MC21D5,MN21D5 & MOF1D51 products 'Operate Time' at Power ON is <1.5 sec. For MGD1DR & MG21DH OT is 1.5 sec if pot is at 0 range. | |
| | Power ON Delay | | <1.5 sec | |
| | Release Time | UV, OV and Asymmetry | ~ 550 ms | <0.55 to 15s |
| | | Phase Reverse | <65 ms. | |
| | | Phase Loss | For Phase Loss Fault in the absence of Motor load Release Time is <65 ms. | |
| LED Indications | R/≡ | Healthy | R Continuous ON | ≡ Continuous ON |
| | | Ph Reverse | N.A. | ≡ Flashing |
| | | Asymmetry | R Flashing | N.A. |
| | OV | | N.A. | Over Voltage |
| | UV | | N.A. | Under Voltage |
| | AS | | N.A. | |
| | ALL LEDS | OFF | Phase Fail or Higher Cut Off (> 560 VAC) or lower cut off (<175 VAC) (for MOF1D51,MK21D5, MC21D5 & MN21D5 Lower Cut Off is < 138 VAC) | |
| | | Flashing | N.A. | ≡Ref. Pot changed during running conditions |
| Relay Output | Contact Rating | | 1 C/O , 5A (Res.) @ 250 VAC / 30 VDC | |
| | 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 | |
| | Contact Material | | Ag Alloy | |
| Mechanical Life Expectancy | | | 3 x 10 ⁶ Operations | |
| Electrical Life Expectancy | | | 1 x 10 ⁵ Operations | |
| Operating Temperature | | | -15 °C to +60 °C | |
| Storage Temperature | | | -20 °C to +80 °C | |
| Humidity (Non-Condensing) | | | 5 to 95 % (Non-Condensing) | |
| Max. Operating Altitude | | | 2000 m | |
| Degree of Protection | | | IP-20 for Terminals; IP-30 for Housing | |
| Pollution Degree | | | II | |
| Housing | | | Flame Retardant UL 94-V0 | |
| Mounting | | | Base / Din-Rail (35 mm Symmetrical) | |
| Dimensions in mm (W xH x L) | | | 18 x 59 x 90 | |
| Weight (Unpacked) | | | 70 gm Approx. | |
| Certifications | | | CE, RoHS | |

| Cat. No.: | | | MG21DH | MG21DF |
|---------------------------------------|----------------------|----------------------|---|---------------|
| Function | | | Phase and Voltage Control | |
| Supply Voltage (≡) | | | 208 to 480 VAC, 3P3W (-12% to +10% of ≡) | |
| Frequency | | | 47 to 63 Hz | |
| Power Consumption | | | 3 VA (Max.) | |
| Adjustable Nominal Voltage (≡) | | | 208 - 220 - 380 - 400 - 415 - 440 - 480 VAC | |
| Trip Levels | Under Voltage | | -5 to -25% of ≡ | |
| | Over Voltage | | 5 to 25% of ≡ | |
| | Asymmetry | | 10% fixed | |
| Setting Accuracy | | | +/- 5% of full scale | |
| Setting Accuracy (±10% of full scale) | Operate Time | | 550 ms | 5 to 100s |
| | | | MK21D5,MC21D5,MN21D5 & MOF1D51 products 'Operate Time' at Power ON is <1.5 sec. For MGD1DR & MG21DH OT is 1.5 sec if pot is at 0 range. | |
| | Power ON Delay | | <1.5 sec | |
| | Release Time | UV, OV and Asymmetry | 5 s fixed | <0.55 to 100s |
| | | Phase Reverse | <65 ms. | |
| | | Phase Loss | For Phase Loss Fault in the absence of Motor load Release Time is <65 ms. | |
| LED Indications | R/≡ | Healthy | ≡ Continuous ON | |
| | | Ph Reverse | ≡ Flashing | |
| | | Asymmetry | N.A. | |
| | OV | | Over Voltage | |
| | UV | | Under Voltage | |
| | AS | | Asymmetry | |
| | ALL LEDS | OFF | Phase Fail or Higher Cut OFF (> 560 VAC) or lower cut off (<175 VAC) (for MOF1D51, MK21D5, MC21D5 & MN21D5 Lower Cut Off is < 138 VAC) | |
| | | Flashing | ≡ Ref. Pot changed during running conditions | |
| Relay Output | Contact Rating | | 1 C/O , 5A (Res.) @ 250 VAC / 30 VDC | |
| | 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 | |
| | Contact Material | | Ag Alloy | |
| Mechanical Life Expectancy | | | 3 x 10 ⁶ Operations | |
| Electrical Life Expectancy | | | 1 x 10 ⁵ Operations | |
| Operating Temperature | | | -15 °C to +60 °C | |
| Storage Temperature | | | -20 °C to +80 °C | |
| Humidity (Non-Condensing) | | | 5 to 95 % (Non-Condensing) | |
| Max. Operating Altitude | | | 2000 m | |
| Degree of Protection | | | IP-20 for Terminals; IP-30 for Housing | |
| Pollution Degree | | | II | |
| Housing | | | Flame Retardant UL 94-V0 | |
| Mounting | | | Base / Din-Rail (35 mm Symmetrical) | |
| Dimensions in mm (W xH x L) | | | 18 x 59 x 90 | |
| Weight (Unpacked) | | | 70 gm Approx. | |
| Certifications | | | CE, RoHS | |

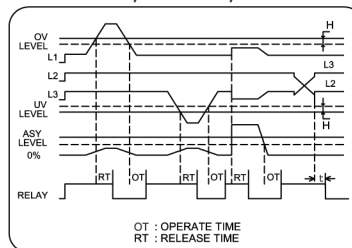
| Cat. No.: | | | MGD1DR | |
|---------------------------------------|----------------------|---|---|----------|
| Function | | | Phase and Voltage Control | |
| Supply Voltage (≡) | | | 400 VAC, 3P3W | |
| Frequency | | | 47 to 63 Hz | |
| Power Consumption | | | 3 VA (Max.) | |
| Adjustable Nominal Voltage (≡) | | | N.A. | |
| Trip Levels | Under Voltage | | -5 to-25% of ≡ | |
| | Over Voltage | | 5 to 25% of ≡ | |
| | Asymmetry | | 10% fixed | |
| Setting Accuracy | | | +/- 5% of full scale | |
| Setting Accuracy (±10% of full scale) | Operate Time | | <550ms to 100s | |
| | | | MK21D5,MC21D5,MN21D5 & MOF1D51 products 'Operate Time' at Power ON is <1.5 sec. For MGD1DR & MG21DH OT is 1.5 sec if pot is at 0 range. | |
| | Power ON Delay | | <1.5 sec | |
| | Release Time | UV, OV and Asymmetry | ~ 550ms to 15s | |
| | | Phase Reverse | <65 ms. | |
| Phase Loss | | For Phase Loss Fault in the absence of Motor load Release Time is <65 ms. | | |
| LED Indications | R/≡ | Healthy | ≡ Continuous ON | |
| | | Ph Reverse | ≡ Flashing | |
| | | Asymmetry | ≡ Continuous ON | |
| | OV | | Over Voltage | |
| | UV | | Under Voltage | |
| | AS | | Asymmetry | |
| | ALL LEDS | OFF | Phase Fail or Higher Cut OFF (> 560 VAC) or lower cut off (<175 VAC) (for MOF1D51, MK21D5, MC21D5 & MN21D5 Lower Cut Off is < 138 VAC) | |
| | | Flashing | N.A. | |
| Relay Output | Contact Rating | | 1 C/O , 5A (Res.) @ 250 VAC / 30 VDC | |
| | 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 | |
| | | Contact Material | | Ag Alloy |
| Mechanical Life Expectancy | | | 3 x 10 ⁶ Operations | |
| Electrical Life Expectancy | | | 1 x 10 ⁵ Operations | |
| Operating Temperature | | | -15 ℃ to +60℃ | |
| Storage Temperature | | | -20 ℃ to +80℃ | |
| Humidity (Non-Condensing) | | | 5 to 95 % (Non-Condensing) | |
| Max. Operating Altitude | | | 2000 m | |
| Degree of Protection | | | IP-20 for Terminals; IP-30 for Housing | |
| Pollution Degree | | | II | |
| Housing | | | Flame Retardant UL 94-V0 | |
| Mounting | | | Base / Din-Rail (35 mm Symmetrical) | |
| Dimensions in mm (W xH x L) | | | 18 x 59 x 90 | |
| Weight (Unpacked) | | | 70 gm Approx. | |
| Certifications | | | CE, RoHS | |

CONNECTION DIAGRAM

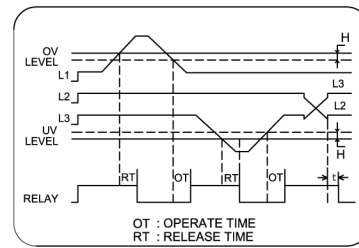


FUNCTION DIAGRAM

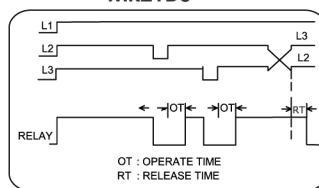
MG21DH/MG21DF/MGD1DR



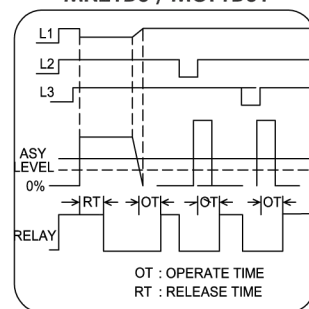
MD21DF



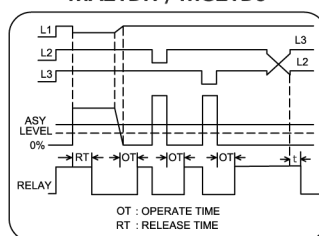
MK21D5



MN21D5 / MOF1D51



MA21DN / MC21D5



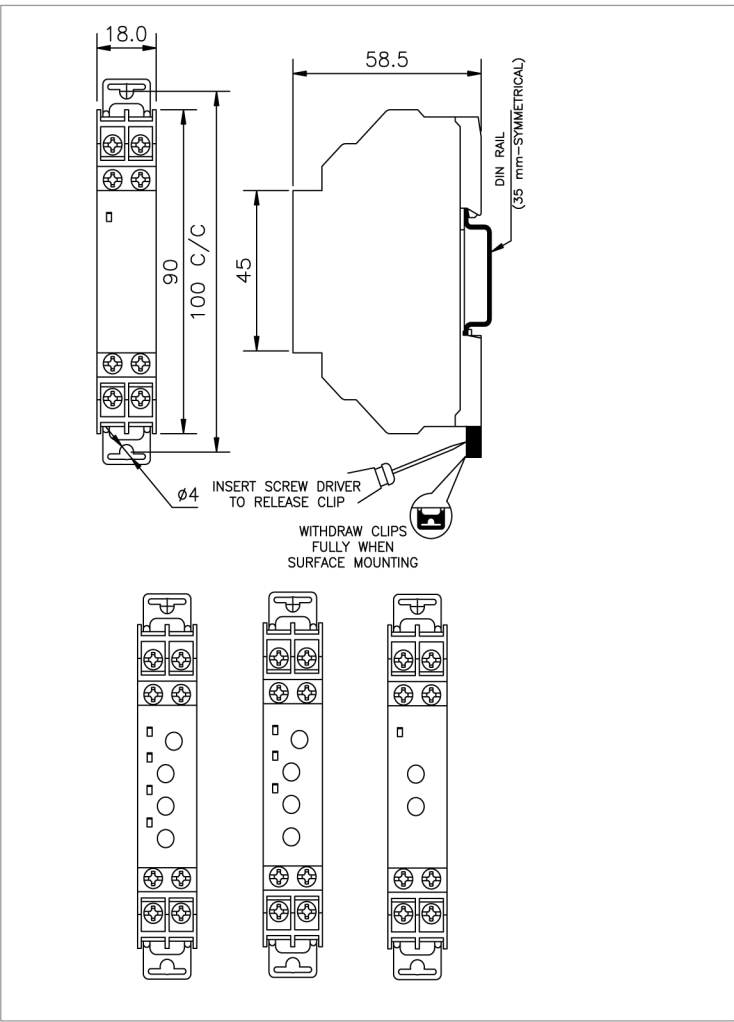
Note:

- In case of MC21D5, MG21DH/MG21DF, phase imbalance levels are fixed. So, for very large motors with excessive back e.m.f. relay suitability to be checked by the user.
- Minimum threshold supply voltage of tripping is 140 VAC for MK21D5, MC21D5.

Terminal Details :

| | |
|---|---|
| <p>Ø4.....5.0mm Combi Head Bit./Flat</p> | <p>0.5 Nm (4.4lb.in) to 0.7 Nm (6.2lb.in)</p> |
| <p>2 x 2.5 mm² Solid / Standard Wire</p> | |
| <p>AWG</p> | <p>20 to 12</p> |

OVERALL MOUNTING DIMENSIONS (in mm)



CERTIFICATION :

| EMI/EMC : | | |
|------------------------------------|----------------|-----------|
| Harmonic Current Emission | IEC 61000-3-2 | Class A |
| ESD | IEC 61000-4-2 | Level II |
| Radiated Susceptibility | IEC 61000-4-3 | Level III |
| Electrical Fast Transients | IEC 61000-4-4 | Level IV |
| Surge | IEC 61000-4-5 | Level III |
| Conducted Susceptibility | IEC 61000-4-6 | Level III |
| Voltage Dips, & Interruptions (AC) | IEC 61000-4-11 | |
| Radiated Emission | CISPR 14 -11 | Class A |
| Conducted Emission | CISPR 14 -11 | Class A |

Safety :

| | | |
|-------------------------------------|---------------|----------------|
| Test Voltage between I/P and O/P | IEC 60947-5-1 | 2kV |
| Impulse Voltage between I/P and O/P | IEC 60947-5-1 | 2.5kV |
| Single Fault | IEC 61010- 01 | Level IV |
| Insulation Resistance | UL 508 | >50 k Ω |
| Leakage Current | UL 508 | <3.5 mA |

Environmental :

| | | |
|----------------------|----------------|--------------|
| Cold Heat | IEC 60068-2-1 | |
| Dry Heat | IEC 60068-2-2 | |
| Vibration | IEC 60068-2-6 | 10 Hz - 55Hz |
| Repetitive Shock | IEC 60068-2-27 | 40 g, 6 ms |
| Non-Repetitive Shock | IEC 60068-2-27 | 30 g, 15 ms |

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/](https://www.gicindia.com/get-in-touch/)

