

# TECHNICAL DATA SHEET

## LIGHTNING PROTECTION INTERNATIONAL PTY LTD

*Comprehensive Lightning and Surge Protection*

ABN 11 099 190 897

- Direct Strike Protection
- Earthing Products & Solutions
- Surge & Transient Protection for Power, Data, Communications and RF Lines



### LPI® Spark Gap Power Protection Module in Enclosure

#### Features

- High performance surge protector for an operating voltage of 220 - 277Vac
- Nominal impulse discharge current Ph-N 50kA 10/350µs, 135kA 8/20µs / Single Mode
- Shunt protection in a metal enclosure



#### Product Description

The LPI Power Protection Module is a power line shunt surge protection device housed in a metal enclosure. The LPI Power Protection Modules comes in 2 ranges: 1 Phase and 3 Phase. Each has Class I surge protection rated for 50kA 10/350µs, 135kA 8/20µs between P-N, and 100kA 10/350µs, 150kA 8/20µs between N-E. The unit is designed for mounting at main power switchboards and distribution boards in LP Zones 0 and 1 location as per IEC 62340. The unit is supplied with IEC 61643 Class I Spark Gap Surge Diverters which provide the most effective surge protection with low let through voltage.

| Ordering Code                               |                  | LPI 1PPMSG135kA-NE                                                        |  | LPI 3PPMSG135kA-NE                                                          |  |
|---------------------------------------------|------------------|---------------------------------------------------------------------------|--|-----------------------------------------------------------------------------|--|
| Description:                                |                  | Power Protection Module, Shunt , 135kA 8/20µs P-N, 100kA 10/350µs , N-E   |  | Power Protection Module, Shunt , 3 x 135kA 8/20µs P-N, 100kA 10/350µs , N-E |  |
| Power distribution systems:                 |                  | TT, TN-S, TN-C, TN-C-S (MEN)                                              |  |                                                                             |  |
| Dimensions/ Weight:                         |                  | 300 (H) x 200 (W) x 150 (D) mm Approx. 5kg                                |  | 300 (H) x 200 (W) x 150 (D) mm Approx. 5kg                                  |  |
| Environmental rating / Enclosure/ Mounting: |                  | IP 55 / Metal enclosure/ Wall mount type                                  |  |                                                                             |  |
| Conductor size / Colour:                    |                  | Accepts: 35mm²                                                            |  |                                                                             |  |
| Operating temperatures:                     |                  | -35 to +55°C, 0 – 95% humidity                                            |  |                                                                             |  |
| Response time:                              |                  | < 100ns                                                                   |  |                                                                             |  |
| Standards:                                  |                  | IEC 61643 Class I, BS 6651 Cat A & B                                      |  |                                                                             |  |
| Surge withstand:                            |                  | ANSI C62.41 Cat A, Cat B, Cat C, IEC61643 AS/NZS 1768 Cat A, Cat B, Cat C |  |                                                                             |  |
| Application:                                |                  | Main and sub-distribution boards                                          |  |                                                                             |  |
| Warranty:                                   |                  | 5 Years                                                                   |  |                                                                             |  |
| Ph-N Protection                             |                  |                                                                           |  |                                                                             |  |
| Surge rating:                               | I <sub>max</sub> | 135kA 8/20µs                                                              |  | 3 x 135kA 8/20µs                                                            |  |
| Max. Impulse discharge current :            | I <sub>imp</sub> | 50kA 10/350µs                                                             |  | 3 x 50kA 10/350µs                                                           |  |
| Nominal voltage:                            | U <sub>n</sub>   | 220 – 277Vac @ 50/60Hz                                                    |  | 220 – 277Vac @ 50/60Hz                                                      |  |
| Let through voltage:                        | U <sub>p</sub>   | < 1.3kV @ 50kA 10/350µs                                                   |  | < 1.3kV @ 50kA 10/350µs                                                     |  |
| Energy capability per phase:                | W/R              | >600kJ                                                                    |  | >600kJ                                                                      |  |
| Follow Current Interrupt rating:            | I <sub>fi</sub>  | 25kA @ 255Vrms 50/60Hz                                                    |  | 25kA @ 255Vrms 50/60Hz                                                      |  |
| Max Backup Fuse:                            |                  | 315A gL/gG                                                                |  | 315A gL/gG                                                                  |  |
| Max Operating Voltage:                      |                  | 480Vrms                                                                   |  | 480Vrms                                                                     |  |
| N-E Protection                              |                  |                                                                           |  |                                                                             |  |
| Surge rating:                               | I <sub>max</sub> | 150kA 8/20µs                                                              |  | 150kA 8/20µs                                                                |  |
| Surge rating:                               | I <sub>imp</sub> | 100kA 10/350µs                                                            |  | 100kA 10/350µs                                                              |  |
| Insulation resistance (R <sub>isol</sub> ): |                  | >1000MΩ                                                                   |  | >1000MΩ                                                                     |  |

## Operation

LPI 1PPMSG135kA-NE and 3PPMSG135kA-NE Shunt Protectors are designed to operate on 220-277 Vac, 50/60Hz power lines. The protectors are designed for use with TN-C, TN-S, TN-C-S (MEN) and TT

## Installation

1. Ensure power is disconnected prior to commencing installation.
2. The unit is labelled showing the incoming (point of entry) and outgoing (load) terminals to be used. PHASE IN and PHASE OUT are at the top of the unit whilst the EARTH and NEUTRAL are at the bottom.
3. Ensure that the "V" or Kelvin connections as per figure 1 are observed.
4. Incoming cabling should enter the enclosure on the left hand side and load side cables should exit the enclosure on the right-hand side. This separation is important to ensure induction from "dirty" to "clean" lines does not occur.
5. The earth terminal must be connected to a low impedance earth (<10 Ohms) deploying a single point earthing system, which should be connected to an equipotential earth plane. Integral to this is the elimination of earth loops. It is common, but incorrect from the point of lightning protection to have separate earths for various services. The use of single or multi core copper earth cable of not less than 25mm<sup>2</sup> (Max. 50mm<sup>2</sup>) is recommended.
6. Once connections are completed apply power and observe correct operation

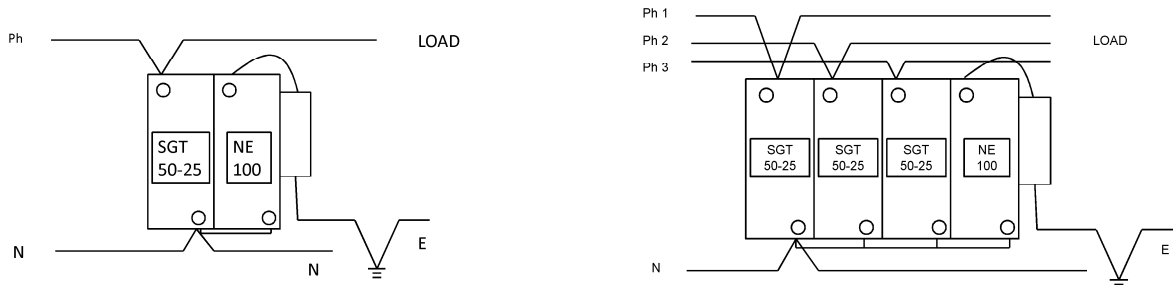
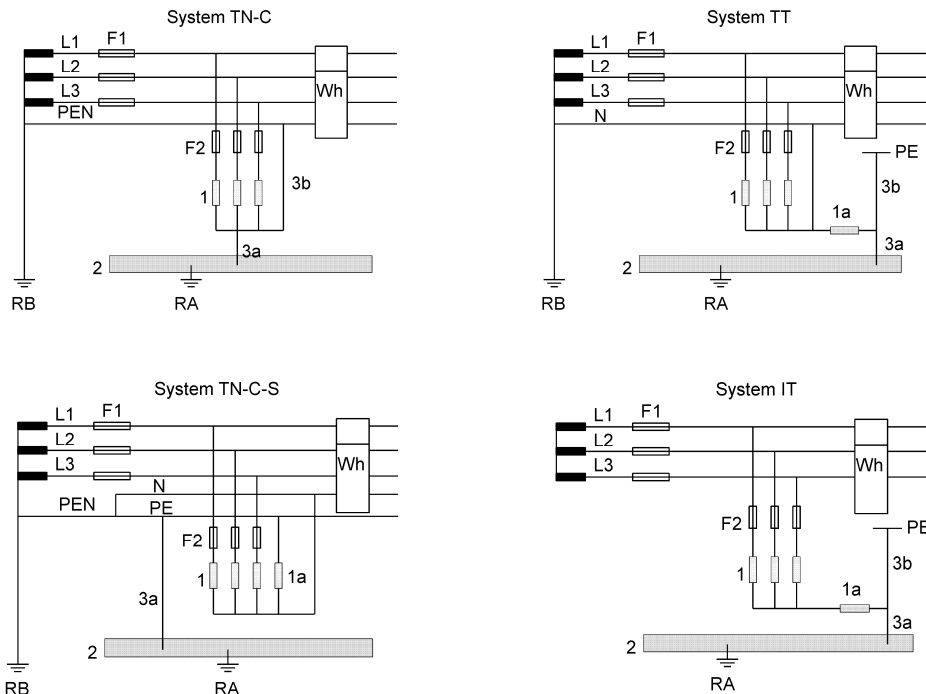


Figure 1 - Connection and Wiring Method (Kelvin Method) for 1Ph and 3Ph

## Location

The Shunt Protection device should be installed at the "Point of Entry" of the power mains, but after the power meter and main breaker so as to protect all downstream power connected equipment.

## Schematic Diagram for different distribution system



### Legend

- 1 LPI SGT50-25/ SG60
- 1a LPI NE100
- 2 Main equipotential bus bar
- 3a, 3b Grounding wires for arresters
- F1 Main back-up fuse of service main
- F2 Recommended back-up fuse 315AgL/gG (only if the main back-up fuse F1 is fitted with back-up fuses >315AgL/gG)
- RA Equipment grounding
- RB Grounding system

## Recommended Fuse and Cable Sizes

| Fuse F1<br>gL/gG | C2 mm <sup>2</sup><br>connection at F2 | C3 mm <sup>2</sup><br>connection to gnd | Fuse F2<br>gL/gG |
|------------------|----------------------------------------|-----------------------------------------|------------------|
| 25A-80A          | 10                                     | 16                                      | -                |
| 100A-125A        | 16                                     | 16                                      | -                |
| 160A             | 25                                     | 25                                      | -                |
| 200A-315A        | 35                                     | 35                                      | -                |
| ≥500A            | 35                                     | 35                                      | 315A             |

**Connection options:**

1. It is recommended that the "V" or Kelvin connection be employed as shown at Fig: 2a to minimize the over voltage applied on the protected equipment. Be sure not to run input and output wiring parallel.

2. If "V" connection is not possible, "T" connection is preferred as shown at Fig: 2b. With this connection method, the input lead length should be kept as short and thick as possible and the wires should be bundled together.

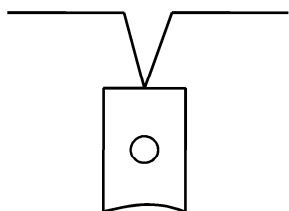
**Preferred**

Fig 2a. Connection to moduels

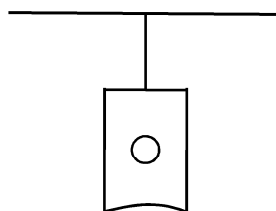
**Alternative**

Fig 2b. Alternative Connection

*LPI<sup>®</sup> has a policy of continuing product development. Therefore, the above specifications are subject to change without notice.*

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