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## High Voltage Power Supply ML1350P/N50/24 & ML650P/N30/24

# SAFETY AND INSTALLATION INSTRUCTIONS

Issue	4	5	6
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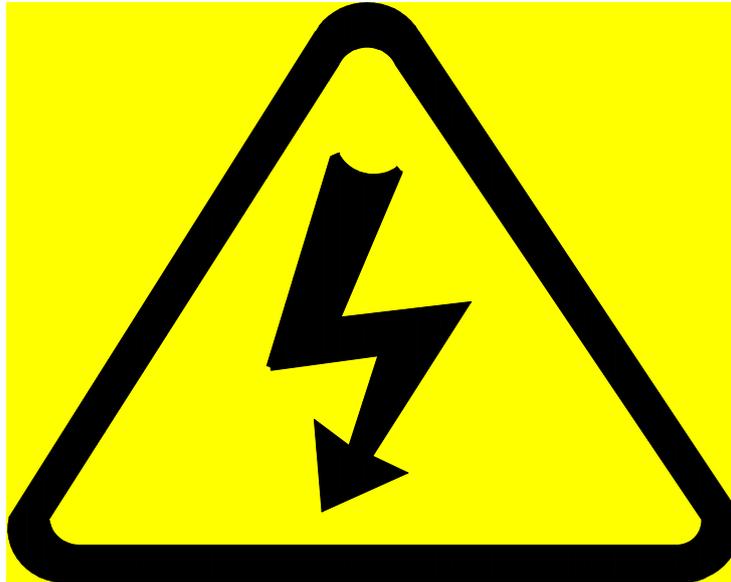
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## CHANGE HISTORY

Page/ Section	Reason for Change	Issue
All	Pre-Production Release	1
6	UL installation considerations added	2
All	Changed to generic document to cover ML1350 range	3
All	ML650 range added.	4
2.0 3.0 5.2c)	Added "and the 0V pin". The units are CE marked. Maximum temperature was 40°C, now 50°C.	5
2.0 3.0 4.0 5.2 5.3 5.4	Include statement concerning safe use and symbol for hot surfaces. UL recognition mark Update standards Pollution degree and Material group added Add input voltage range and current, earth requirements Environmental conditions added	6

# SAFETY



## **DANGER HIGH VOLTAGE RISK OF ELECTROCUTION**

Observe extreme caution when working with this equipment

- ◆ High voltage power supplies must always be connected to protective earth
- ◆ Do not touch connections unless equipment is turned off and the capacitance of both the load and power supply are grounded
- ◆ Allow adequate time for discharge of internal capacitance of the power supply
- ◆ Do not ground yourself or work under wet or damp conditions

### **Servicing Safety**

- ◆ When maintenance of equipment fitted with this power supply requires removing the equipment cover with the power on, this should only be done by qualified personnel aware of the hazards
- ◆ This power supply has no user serviceable parts. Return to supplier for servicing

## 1.0 Unit Description

The ML1350P/N50/24 & ML650P/N30/24 series are four output, high voltage power supplies (may be followed by any number or combination of Alphanumeric). They are designed for operation from a 24V dc input. The input power and enable signals are connected to the unit by solder pins. The unit provides four outputs:

ML650P/N30/24	ML1350P/N50/24
Positive 650V output	Positive 1350V output
Negative 650V output	Negative 1350V output
Positive 245V output	Positive 245V output
Negative 245V output	Negative 245V output

## 2.0 Safety

The outputs of the unit are hazardous.

The conditions of this manual must be complied with to maintain safety.

Protection from electric shock provided by the unit may be impaired if the unit is operated in manner not specified in these instructions.

The unit is contained in an earthed, open sided case, which must be mounted to a suitably designed PCB layout before use in a vertical orientation.

The PCB must be mounted inside a suitable enclosure, which prevents operator access to the face on which the high voltage output pins exit and affords overall protection against impact.

The case of this high voltage power supply and the 0V pin shall be properly bonded to the main protective earth (PE) termination in the end product.

The case performs the function of heat sink and can exceed 60°C, therefore accessibility must be prevented during operation and use in the end product.

The unit should be powered from a double insulated 24V dc supply.



This symbol on the unit means “read the manual before powering the equipment”.



This symbol on the unit means “Caution; risk of electric shock”.



This symbol in the unit means “Caution, hot surface”.

## 3.0 Marking

The units are CE marked and carry the UL component recognition mark.

## 4.0 Standards

The Standards applied are:

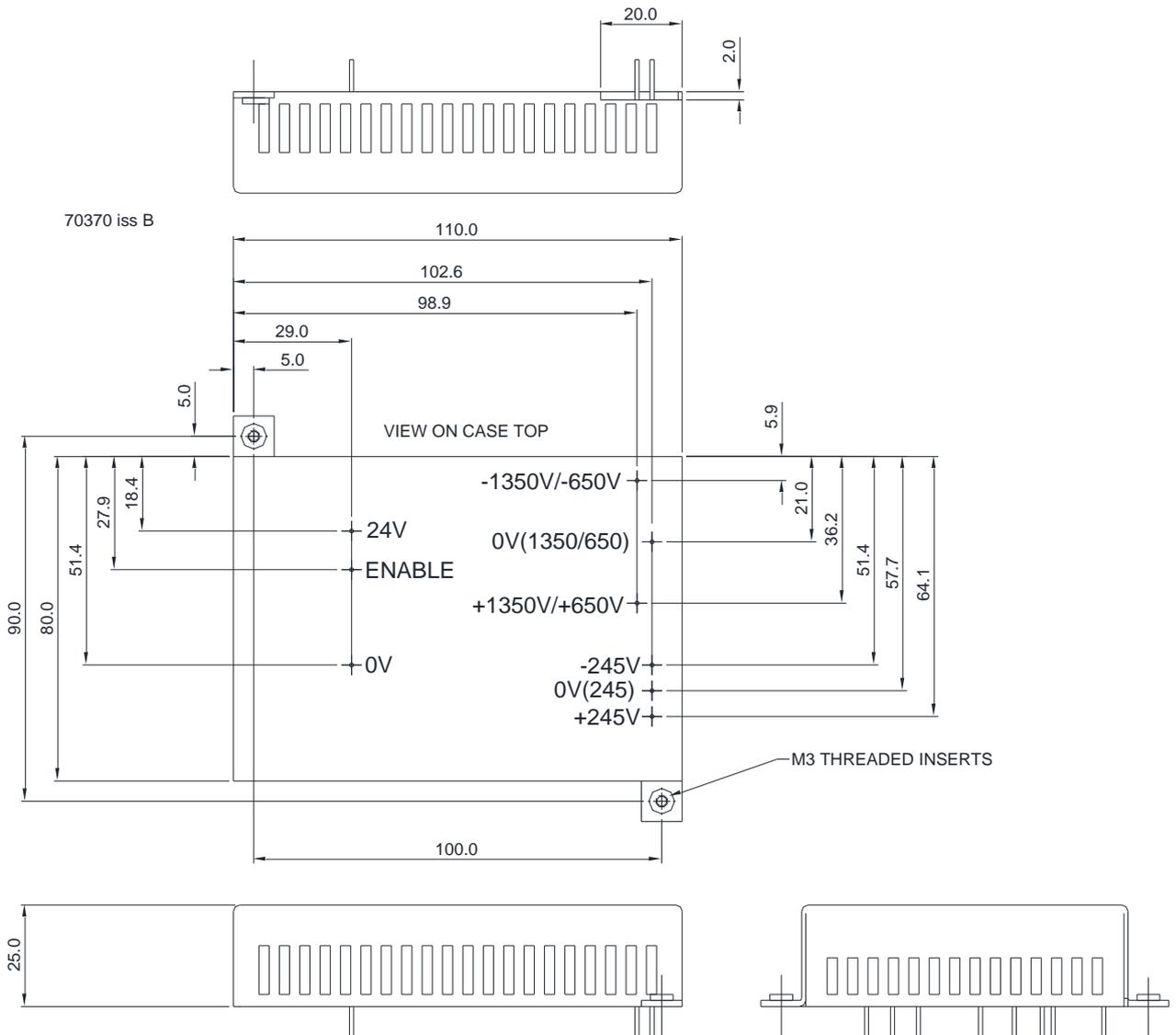
UL 61010-1, CAN/CSA-C22.2 No. 61010-1, 3rd Edition, Electrical Equipment For Measurement, Control, and Laboratory Use - Part 1: General Requirements

EN61010-1: 2010 - Safety requirements for electrical equipment for measurement, control and laboratory use.

## 5.0 Installation

The unit is contained in an earthed, open sided case, which must be securely mounted to a suitably designed PCB layout before use, in a vertical orientation. The PCB must be mounted inside a suitable enclosure, which prevents operator access to the face on which the high voltage output pins exit. No surface of the unit shall be accessible in the end product.

### 5.1 Pin allocation



## 5.2 PCB Layout constraints

No part of any high voltage track may run within the specified creepage distance of the case (pollution degree 2, material group 1). The case material thickness is 1mm.

Nominal output voltage	Creepage distance
245V	2mm
650V	4mm
1350V	8mm

The recommended pad diameter for the high voltage pins is 2.5mm (0.1").  
The recommended hole diameter for all pins is 1.09mm (0.043").  
Tracks should exit the area of the case on the underside of the PCB.  
No high voltage tracks may run under the control (left hand) half of the unit.

5.3 Input voltage: 24 Vdc  $\pm$  1.2V, 3A max.

Earth: Case and 0v pin shall be connected to the end system PE

## 5.4 Environmental Conditions

### Operating

Temperature: 0°C to 50°C

Relative humidity rating (RH)%: 80% at 31°C (non-condensing)

Altitude: Up to 2000m above mean sea level

Pollution degree: 2

### Storage

Temperature: -35°C to +85°C

Relative humidity rating (RH)%: 80% at 31°C (non-condensing)

Altitude: Up to 2000m above mean sea level

Consideration should be given to conducting the following tests with the power supply installed in the end product :

- Dielectric withstand test, between live parts of the power supply and the end product chassis.
- Permissible Limits Test with the power supply installed in the end product.
- Temperatures of power electronic components transformer windings and any accessible surfaces. The maximum operating ambient of the unit is 50°C.

**Note: Failure to comply with all the above could compromise the safe operation of the unit and invalidate the warranty.**