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Installation and User Guide

MSA Series (MSA1P24, MSA1N24, MSA2P24, MSA2N24, MSA3P24, MSA3N24)

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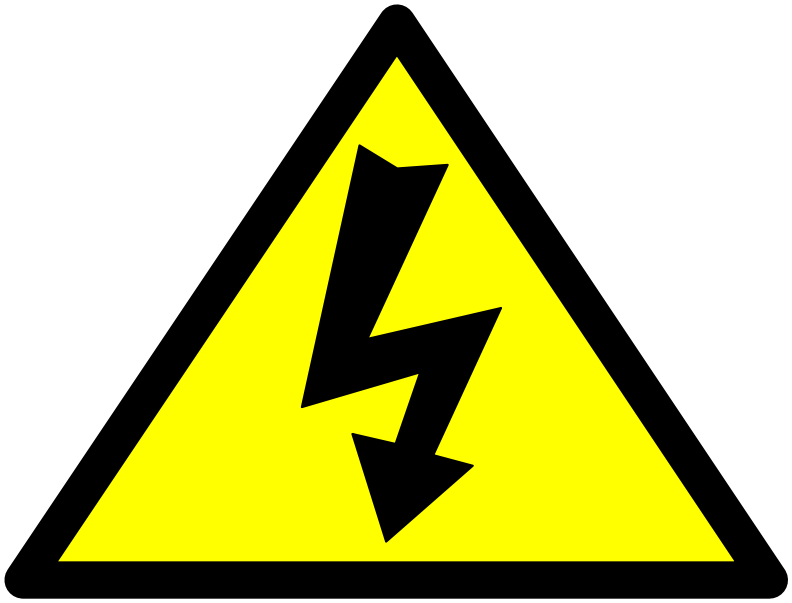
Contents

SAFETY



DANGER
HIGH VOLTAGE
RISK OF ELECTROCUTION

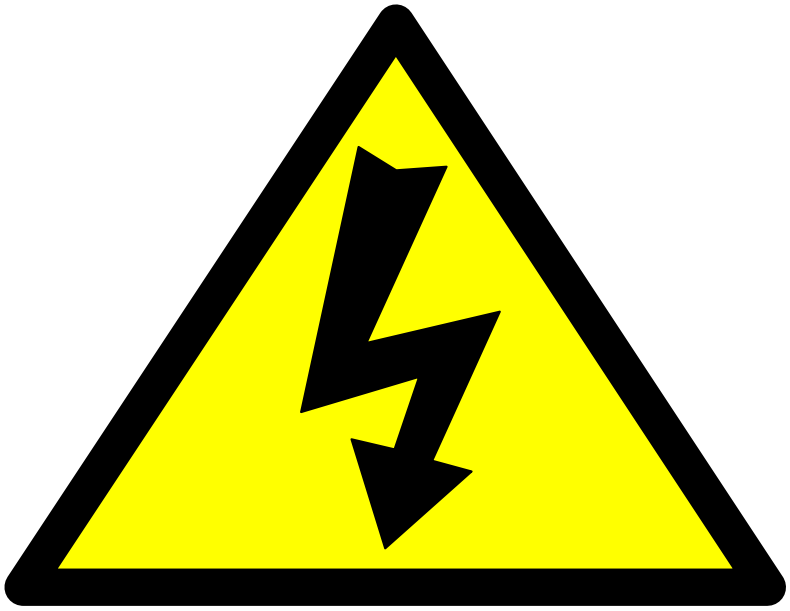
Observe extreme caution when working with this equipment

- **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

- **Maintenance may require removing the Instrument cover with the power on**
- **Servicing should only be done by qualified personnel aware of the hazards**
- **Return to supplier for servicing**

SÉCURITÉ



DANGER
HAUTE TENSION
RISQUE D'ÉLECTROCUTION

Observez une extrême prudence lorsque vous travaillez avec cet équipement

- **Les alimentations haute tension doivent toujours être connectées au conducteur de protection.**
- **Ne pas toucher les connexions à moins que l'équipement soit éteint et que la capacité de la charge et de l'alimentation électrique ne soit mise à la terre.**
- **Prévoir un temps suffisant pour la décharge de la capacité interne de l'alimentation.**
- **Ne pas vous mettre à la terre ou travailler dans des conditions humides.**

Sécurité d'entretien

- **L'entretien ne doit être effectué que par un personnel qualifié et conscient des dangers.**
- **Il n'y a pas de piéce remplaçables par l'utilisateur dans l'unité, retourner au fournisseur pour l'entretien.**

1 Unit Description

The MSA series (see below for list of units) High Voltage power supply units are intended for general use where a compact high performance, PCB mounting power supply is required, for instance to drive an electron multiplier in a mass spectrometer. The units are PCB mounted and consist of one steel case containing the HV and control circuits.

1.1 HV Unit Output Ratings

The units provide outputs rated as follows:

Unit	Polarity	HV Output
MSA1P24	Positive	1kV, 900µA
MSA1N24	Negative	1kV, 900µA
MSA2P24	Positive	2kV, 450µA
MSA2N24	Negative	2kV, 450µA
MSA3P24	Positive	3kV, 300µA
MSA3N24	Negative	3kV, 300µA

1.2 Other Ratings and Dimensions

Input:	24Vdc ± 10%, 150mA (there is no operator changeable fuse)
Operating Temperature:	0°C to 60°C
Relative humidity rating:	5% to 95% (non-condensing)
Altitude:	Up to 4500m above mean sea level
Mass:	200g.
Dimensions:	69.4 X 56.2 X 30.7 mm

2 Safety

The HV outputs of the unit are deemed non-hazardous to EN61010-1. The conditions of this manual must be complied with to maintain safety. Operating the unit in a manner not specified in this manual may impair the protection against hazards that the unit may normally provide.

The unit has been evaluated for use in a Pollution Degree 2, Installation Category II environment.

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

- Dielectric Voltage Withstand Test, between live parts of the unit and the end product chassis.
- Permissible Limits Tests with the unit installed in the end product.
- Temperatures on power electronic components, transformer windings and accessible surfaces.

2.1 Meaning of Symbols

SYMBOL	MEANING IN ENGLISH	SENS EN FRANÇAIS
	Refer to manual before operating	Se référer au manuel avant utilisation
	Caution, Possibility of electric shock	Attention! Risque de choc électrique
	Caution, hot surface	Attention! Surface chaude!

3 Installation of the HV Unit

3.1 Initial Inspection

Inspect the package exterior for evidence of damage due to handling in transit. Notify the carrier and Spellman immediately if damage is evident. Do not destroy or remove any of the packing material used in a damaged shipment.

After unpacking, inspect the panel and chassis for visible damage.

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

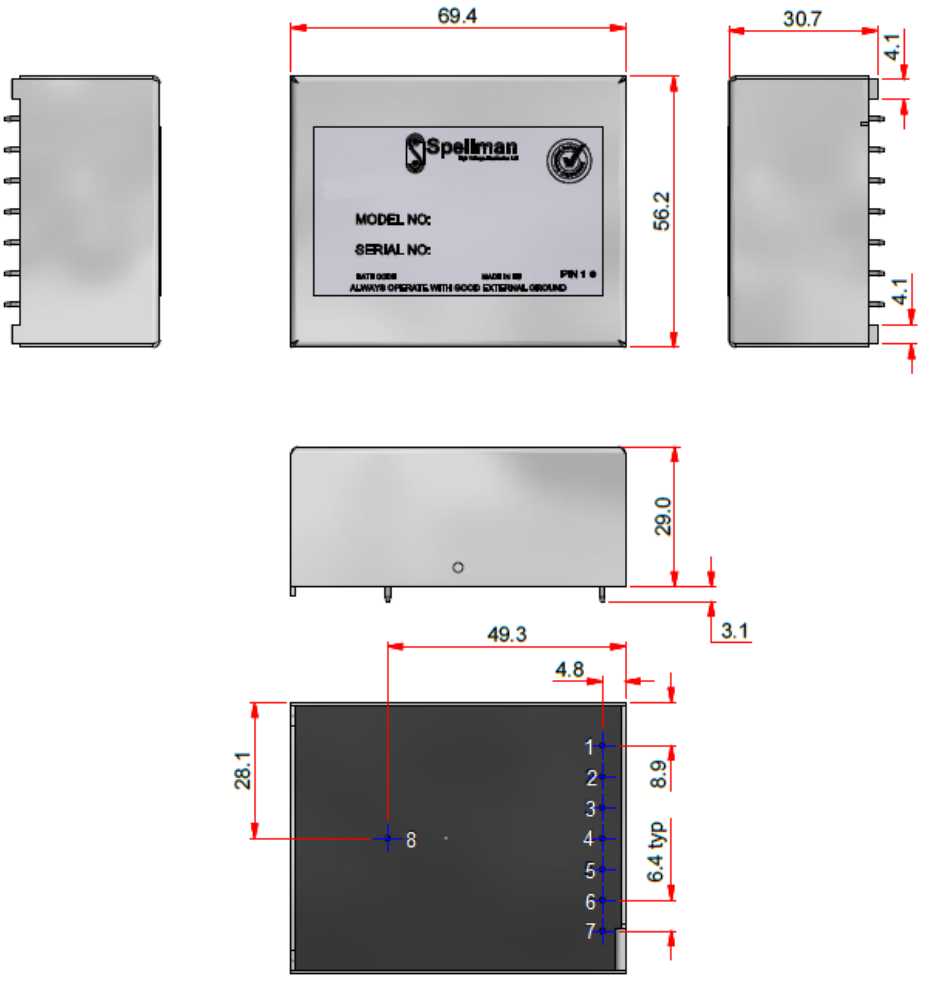
3.2 Mechanical Installation

The MSA units are intended to be PCB mounted in the final system.

The units should only be used in a Pollution Degree 2 Installation Category II environment.

The units are intended for use as a component and no surface of the unit should be accessible in the end product.

Below is a drawing showing the outline and PCB pin locations viewed from below.



3.3 Electrical Installation

The units must be terminated safely before operation. The case of the unit must be connected to the PE earth of the final system using the solder points on the case.

The dc power input shall be provided by a SELV or Double insulated, UL recognised, DC power supply unit.

3.3.1 Input and Output Connections

Output Connection
The HV output is via solder PCB pins as shown in the above outline drawing.

Input Connection
All other connections are made by solder PCB pins. The PCB pins are the same for all versions (MSA3N24, MSA3P24, MSA2N24, MSA2P24, MSA1N24, MSA1P24) as detailed in the table below:

Pin No	Connection	Description
1	ENABLE	To enable the supply output
2	STATUS	To indicate unit is OK
3	V PROGRAM	To set the HV output level
4	V MONITOR	To monitor the HV output level
5	INPUT SUPPLY	24V Power supply
6*	SIGNAL GROUND	Ground reference for control and monitor signals
7*	INPUT GROUND	24V return
8	HIGH VOLTAGE OUTPUT	0 to -3000V for MSA3N24 0 to +3000V for MSA3P24 0 to -2000V for MSA2N24 0 to +2000V for MSA2P24 0 to -1000V for MSA1N24 0 to +1000V for MSA1P24

* Note pins 6 and 7 are linked internally

4 Operation of the HV Unit

The HV unit uses several connections to control and monitor the HV output, as indicated below.

4.1 Control Inputs

Control	Assignment	Pin	Type	Level
Enable HV Output	ENABLE	1	TTL	ENABLE = LO (≤1.2V). DISABLE = HI (≥2.4V) When ENABLE pin is NC, then 10KΩ pull-up to 5V ±10%
Voltage Control	V PROGRAM	3	0-10V	0 to +10V for 0V to full scale HV output. Accuracy ±1%. Zin ≥ 10KΩ

4.2 Output Monitors

Monitor	Assignment	Pin	Type	Level
Unit Status	STATUS	2	0V or 5V	OK = 11kΩ pull-up to 5.1V ±10%. Fault = ≤0.1V Zout = 1KΩ
Voltage Monitor	V MONITOR	4	0-10V	0 to +10V analogue output for 0V to max V Accuracy ±2%. Zout = 20KΩ