

Product:
MXE Series

Title:
Safety Installation and User Guide



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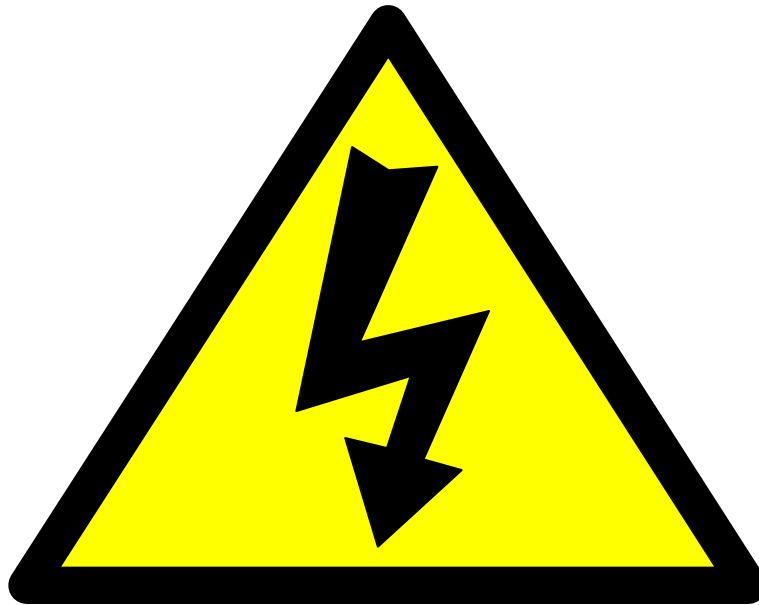
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SAFETY



DANGER HIGH VOLTAGE RISK OF ELECTROCUTION

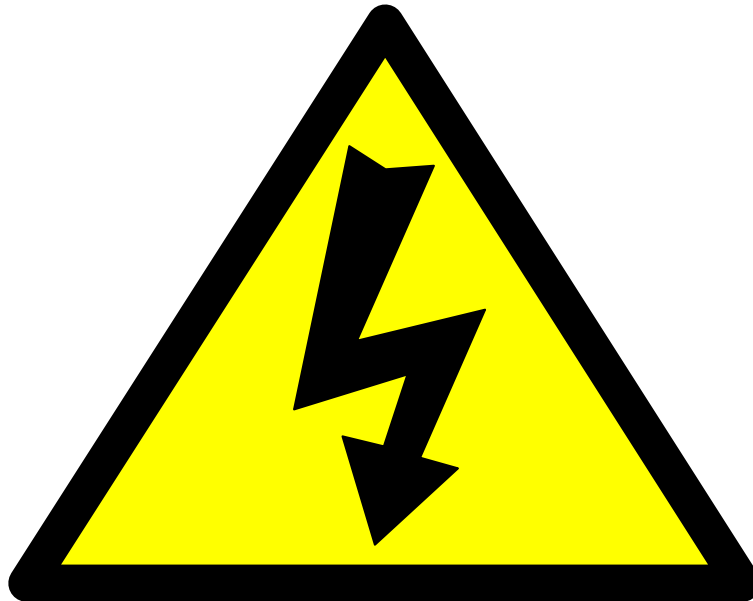
Observe extreme caution when working with this equipment

- 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 pièce remplaçables par l'utilisateur dans l'unité, retourner au fournisseur pour l'entretien.

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1. Unit Description

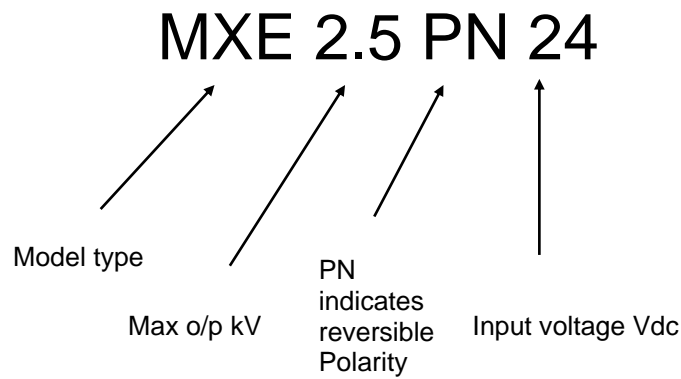
Spellman’s MXE series is a family of high voltage, high performance, ultra-compact, hot-switchable polarity reversing modules with output voltages ranging from 2.5kV to 10kV.

The units are designed for operation from a 24V dc input and will supply up to 200µA of output current.

The MXE series is controlled via analog interface, provided via a standard 15-pin D-type connector. The units feature a differential program input for low noise control and TTL compatible Enable and Polarity control signal inputs.

The HV output is via a 1m long un-terminated HRG58 screened cable.

The part number for a given unit describes its characteristics:



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1.1 Unit Ratings

1.1.1 Power Input

The input rating for all units is 24Vdc \pm 1.2V, 0.5A

1.1.2 HV Output

The units provide the following rated HV outputs:

Unit	Max Voltage	Max Current
MXE2.5PN24	\pm 2.5 kV	200 μ A
MXE5PN24	\pm 5 kV	200 μ A
MXE10PN24	\pm 10 kV	200 μ A

1.1.3 Protection

Arc and short circuit protected. Not designed to withstand continuous arcing.

The power supply will fully recover once the short is removed with no subsequent damage to load, supply, input control, or input supply.

1.2 Environmental conditions

The operating temperature range is 10°C to +45°C.

Storage: -20°C to 85°C

Relative Humidity: 5% to 90% RH, non-condensing

Altitude 0 to 2000m above mean sea level

2. Safety

The conditions of this manual must be complied with to maintain safety; operating the unit in a manner not defined in this manual may compromise the protection from electric shock.

The MXE units are contained in an earthed case with a screened HV output cable and the HV output cable must be terminated safely before the unit is operated. These unit must be sourced with a UL recognised double insulated or SELV 24 V dc supply.

The units shall be properly bonded to the main protective earthing termination in the end product.






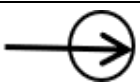
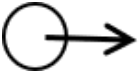
The units have been evaluated for use in a Pollution Degree 2, Installation Category II environment.

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

- a. Permissible Limits Tests with the unit installed in the end product.
- b. Temperatures on any accessible surfaces.

The case is a heat sink to the unit and can exceed 60°C, therefore access to the unit shall be prevented during operation.

2.1 Meaning of Symbols

SYMBOL	MEANING
	Refer to manual before operating
	Caution, possibility of electric shock
	Protective conductor terminal (PE)
	Functional Earth
	Caution, hot surface
	Unit input rating
	Unit output rating

2.2 Applicable standards

The unit is designed to meet the requirements of EN 61010-1, UL 61010-1 and CAN/CSA-22.2 No. 61010-1. Please consult the factory for further approval information.

2.3 Unit Grounding

The unit is contained in an earthed case. The case of the unit shall be properly bonded to the main protective earth termination in the end product.

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3. Installing the Unit

3.1 Electrical Installation

1. The unit is designed for indoor use and is to be supplied from a double insulated or SELV UL recognised, 24V dc supply.
2. The unit shall be properly bonded to the main protective earthing termination in the end product.
3. The unit should only be used in a Pollution Degree 2 Installation Category II environment.
4. Consideration should be given to conduct the following tests with the power supply installed in the end product:
 - a. Dielectric withstand test, between live parts of the power supply and the end product chassis.
 - b. Permissible Limits Test with the power supply installed in the end product.
5. The input and output connectors are not intended for field connections and should only be connected to internal wiring in the end use equipment.
6. The unit is intended for use as a component and no surface of the unit should be accessible in the end product.
7. All external circuits connected to High Voltage outputs shall be Double/Reinforced insulated from any accessible parts.
8. The unit is contained in an enclosed case and can be mounted in any orientation.
9. A suitable airflow or ventilation is needed to ensure the ambient temperature around the unit stays within the environmental temperature specification limits.

3.2 Connections

3.2.1 Power input and unit control

The power input and the analogue communication are via a 15-way male 'D' connector. See the table below for pin-out details.

Pin	Signal	I/O	Description
1	24Vdc Return	I	Input voltage return
2	+24Vdc Input	I	Input voltage +24dc @ 0.5A max
3	Voltage Monitor Output	O	0 to 10Vdc = 0 to 100% rated output, Zout=330Ω
4	Polarity Set Input	I	TTL level or open/short contact signal. Low or short = Positive, high or open = Negative Zin= 10 kΩ
5	N/C	-	Pin used internally - do not connect
6	Voltage Program Return	I	0 to 10Vdc differential between pin 7 and pin 6 = 0 to 100% of rated output, Zin=100kΩ
7	Voltage Program Input	I	
8	Current Monitor Output	O	0 to 10Vdc = 0 to 200μA, Zout=330Ω
9	N/C	-	Pin used internally - do not connect
10	N/C	-	Pin used internally - do not connect
11	Signal Ground	-	Signal ground for control and monitoring
12	Enable Input	I	TTL level or open/short contact signal. Low or short = enabled, high or open = disabled Zin= 10 kΩ
13	Control Pin	-	Connect to pin 14
14	Control Pin	-	Connect to pin 13
15	N/C	-	Pin used internally - do not connect

3.2.2 HV Outputs

Captive 39.4" (1 metre) long un-terminated shielded HRG58 red cable (URM76 compatible)

3.3 Mechanical Installation

1. The units are only to be used in a pollution degree 2 (PD 2) environment.
2. The unit is intended for use as a component and no surface of the unit should be accessible in the end product.
3. The unit is contained in an enclosed case and can be mounted in any orientation.
4. A suitable airflow or ventilation is needed to ensure the ambient temperature around the unit stays within the environmental temperature specification limits.

The physical outline of the units is shown in Appendix A - Mechanical layout.

Fixings:

Four M4 blind clinch nut inserts, maximum thread depth 7mm.

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

Unit weight:

1.7kg

Mechanical Dimensions - see drawing in Appendix A - Mechanical layout.

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4. Operating the Unit

The units are controlled and monitored using the following analogue signals.

PARAMETER	Description
Voltage control	Differential 0 to 10V = 0 to Full scale output Accuracy $\pm 1\%$ or $\pm 10V$, whichever is greater Note: a stable, low noise reference source is recommended to achieve full unit performance.
Enable	Low = Enabled. Designed to be operated by TTL or CMOS logic or open collector transistor.
Polarity Set	Low = Positive. Designed to be operated by TTL or CMOS logic or open collector transistor.
Voltage monitor	0 to 10V for 0 to full-scale output (wrt signal ground) Accuracy $\pm 2\%$ or $\pm 20mV$, whichever is greater
Current monitor	0 to 10V for 0 to full-scale output (wrt signal ground) Accuracy $\pm 5\%$ or $\pm 50mV$, whichever is greater

Appendix A - Mechanical layout

