

Installation and User Guide

MXP10PN15, 10kV Reversible Dynode and -2.3kV Electron Multiplier Power Supply



Document Number: 80900-4

APPROVAL

Issue	A	B	C
Date	19/01/2021		
Issuing Authority	I-7654		
Engineering Approval			
Sales/Marketing Approval			

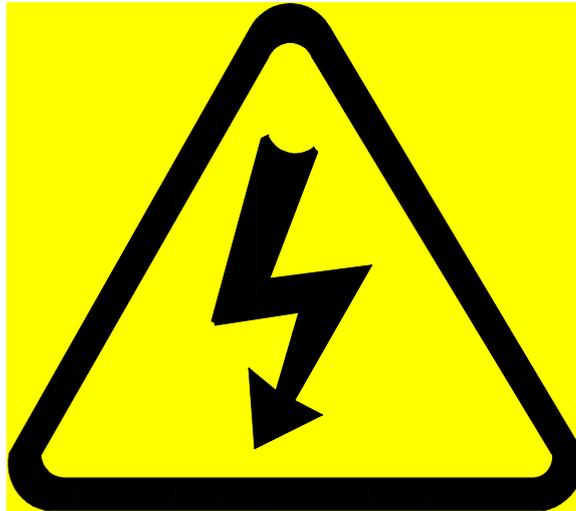
CHANGE HISTORY

Section	Reason for Change	Issue
All	Initial – based on 80900-1	A

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DANGER



HIGH VOLTAGE RISK OF ELECTROCUTION

- **Observe extreme caution when working with this equipment.**
- **High voltage power supplies must always be grounded.**
- **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

- **This unit is not user serviceable. Return to supplier for repair or service.**

1. Unit Description

The MXP10PN15 (MX10Plus) units are 10kV reversible high voltage power supplies with an integrated -2.3kV Electron Multiplier (EM) supply. They are intended for use in mass spectrometry applications, they are particularly suited for dynode detector applications.

Logic signal inputs are used to control the HV outputs, the EM being programmable. The unit provides voltage monitor read-backs for both.

The units are designed for bulkhead mounting and are encapsulated to provide protection against shock, vibration, and the possible ingress of moisture.

1.1. Ratings

Input: 15Vdc \pm 0.75 volt, 500mA (1A reversing)

10kV Output: \pm 10kV, 10 μ A

EM Output: -2.3kV, 230 μ A (max)

1.2. Environmental conditions

Temperature: 5°C to 45°C

Humidity: 10% to 90% RH (non-condensing)

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.

2.1. Meaning of Symbols



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



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

2.2. 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.

3. Installing the Unit

3.1. Electrical Installation

The unit is designed for indoor use and is to be supplied from a double insulated, UL recognised, 15V dc supply.

- a) The unit must be properly bonded to the main protective earthing termination in the end product.
- b) Adding a capacitive load will increase the stored charge and energy, possibly making the output voltage hazardous.
- c) The front top of the case acts as a heatsink for the power electronic components and can exceed 60° C.
- d) Consideration should be given to the conduct of the following tests with the power supply installed in the end product:
 - i) Dielectric voltage withstand test, between live parts of the power supply and the end product chassis.
 - ii) Permissible limit tests with the power supply installed in the end product.
 - iii) Temperatures on power electronic devices and accessible surfaces.
- e) The input and output connections are not suitable as field connections and are only intended for connection to internal wiring inside the end product.

3.2. Connections

3.2.1. Control and Power Input Connector

The input connector is a RoHS compliant flat ribbon cable connector, 20 pin, polarity keyed, 3M Part Number N3428-6002RB or similar. The pin numbers are shown in the table below along with a brief description of each signal.

Pin	Signal	Type
1	+15Vdc input	Power Input
2	+15Vdc input	Power Input
3	N/C	Not used
4	N/C	Not used
5	Ground	Ground
6	Ground	Ground
7	EM Voltage program Control	Vdc Input
8	Signal reference ground	Ground
9	10kV on	TTL Output
10	10kV on	TTL Output
11	10kV Polarity Control	TTL input
12	EM Protect	TTL input
13	±2.3 kV Output Monitor	Analog voltage read back
14	EM On	TTL Output
15	Ground	Ground
16	Ground	Ground
17	±10 kV Output Monitor	Analog voltage read back
18	N/C	Not used
19	+15Vdc input	Power Input
20	+15Vdc input	Power Input

3.2.2. HV Output Connectors

HV output +/- 10kV:

Modified ALDEN A200QX24, 20kV Right Angle Receptacle on a 7" +/-0.25" long flying lead using QX wire (30KV Judd Wire JW1134-06 22AWG TOC RoHS). The connector is modified by removing 5.3mm (0.21") of material from the open end of the connector.

EM output -2.3kV:

MHV bulkhead receptacle Kings p/n KV-79-15 or similar.

3.3. Mechanical Installation

The unit shall be fixed in place in the final system with screws on the hold down points provided. Note that the thread depth of the mounting inserts is 5.3mm (0.21").

Unit weight: 1.8kg

Mechanical Dimensions - see drawing in Appendix A

4. Operating the unit

The unit is controlled and monitored by the signals defined below.

4.1. Control Inputs

- 4.1.1. 10kV Polarity control: TTL Low ($< 0.5V$) = Negative polarity.
TTL High ($> 2.0V$) = Positive polarity.
- 4.1.2. 10kV On Control Signal: TTL Low ($< 0.5V$) = Output On.
TTL High ($> 2.0V$) = Output Off.
- 4.1.3. EM Voltage program: 0V to -9.2V analog input for 0V to -2.3kV output.
Output voltage follows input voltage with a scale factor of 250. Input impedance 50k ohms.
- 4.1.4. EM On Control: TTL low ($< 0.5V$) = Output On.
TTL high ($> 2.0V$) = Output Off.
- 4.1.5. EM Protect Control: TTL low ($< 0.5V$) = Enables EM Output.
TTL high ($> 2.0V$) = Disables EM Output.

4.2. Monitor Outputs

- 4.2.1. 10kV Voltage Monitor: Buffered $\pm 3.3V$ analog output for $\pm 10kV$ output.
Actual output voltage scaled by 3000. Proof against connection to $-15V$. Output impedance 11k ohms. Designed for nominal output of 3V when connected to 100k ohms $\pm 1\%$ measuring circuit. Limits 3V $\pm 3\%$ (2.91V to 3.09V).
- 4.2.2. EM Voltage Monitor: Buffered 0V to -7.12V analog output for 0V to $-2.3kV$ output.
Actual output voltage scaled by 323. Accuracy $\pm 5\%$. Rise and fall times to be $< 15mSec$ (10% to 90%). Ripple 10mV pk-pk max. Output impedance 10k ohms.

4.3. LED Indicators

- 4.3.1. 10kV Polarity On/Off: Two yellow LED's indicate -DYN, +DYN or OFF.
Labelled with -DYN and +DYN.
- 4.3.2. EM On/Off: A yellow LED indicates ON or OFF, labelled EM On.

Annex A - Mechanical Layout

