



The PMX70 is Spellman's new high performance X-Ray generator designed to power Varex Mammography X-Ray tubes. It features a 12kW peak high frequency inverter and high voltage section complete with a smart learning filament power supply and high speed starter. State of the art power conversion technology provides stable and accurate X-Ray tube high voltage with fast rise and fall times. Ethernet and RS-232 interfacing provides easy system integration. Preloaded X-Ray tube parameters, easy access interlocks and I/O connections, and internal generator diagnostics. Optional GUI utility software is also offered to help with initial system integration.

## SPECIFICATIONS

### Input Voltage:

230Vac  $\pm$ 10%, single phase, 50Hz/60Hz

### Input Current:

30 amps, customer to fuse.

Mains Contactor – not provided.

Customer is responsible for mains safety disconnection.

Less than 30 amps over a typical scan is defined as following: Due to unknown line impedance, customer supplied external inductors 100uH to 300uH in series with input connections, (200uH to 600uH total), may be required to keep rms currents below 30 amps and to avoid erroneous circuit breaker trips. Spellman can recommend appropriate inductors as required.

### Output (Tube) Voltage

#### Output Voltage Range:

-25kV to -70kV

### Polarity:

Negative output polarity; to drive rotating anode, floating cathode X-Ray tube (Varex M-1581).

### Accuracy:

2% (measured per IEC60601-2-45)

### Reproducibility:

<0.5%

### Output (Tube) Current/Power

#### Output Current Range:

10mA to 200mA

### Output Power:

12kW peak, 400 watt average.

- **Compact Space Saving Modular Format**
- **Fast Rise/Fall Time Minimize Patient Exposure**
- **High Speed Starter, Boost/Brake Capability**
- **Ethernet/RS-232 Interfaces**

### Duty Cycle:

25%. A typical scan being at fixed settings in the range of 40kV-70kV and 16mA-200mA. Pulsed operation is supported.

### Accuracy:

<  $\pm$ 10% on exposure less than 10ms  
(measured per IEC60601-2-45)

### Rise Time:

1-2 milliseconds, typical (HV cable dependent). Fall time is load dependant, and the HV cable is a significant factor. The HV cable which is not provided with the PMX70, has a maximum length of 8 feet (2.4m).

### Fall Time:

<10ms with a HV cable length of 8 feet (2.4 meters)

### Exposure Time (Loading Time):

#### Maximum Single Exposure Time:

20 seconds

#### Shortest Single Exposure Time:

4ms

#### Loading time accuracy:

$\pm$ 3% +1ms (measured per IEC60601-2-45)

#### Maximum mAs:

3200mAs

#### Exposure Timer:

4ms-20 seconds

### Reproducibility:

<0.5%

### Filament Configuration:

AC high frequency filament drive: self-corrected filament preheat settings with closed loop emission control and smart learning algorithm.

### Filament Output:

0-6 amps at a compliance of 5.5 volts, maximum.

### High Speed Starter:

High speed (360Hz) starter configured via the serial interface. Boost and Brake capability provided.

### AC Input Connector:

Two position terminal block

### System Interface Connector:

25 pin male D connector

### Rotor Interface Connector:

Four position terminal block

### Tube and Interlock Interface Connector:

16 pin terminal block

**High Voltage Connector:**

Claymount CA-11 type or equivalent.

**Communication Interface Connector:**

Ethernet, RJ45 jack

**Grounding Point:**

M5 ground stud provided on chassis

**Environmental:**

Temperature Range:

Operating: 10°C to 40°C

Storage: -40°C to 85°C

Humidity:

20% to 85% RH, non-condensing.

**Cooling:**

Forced air, internal fan

**Dimensions:**

10.08" H X 19.49" W X 10.75" D  
(256mm x 495mm x 273mm)

**Weight:**

48.5 pounds (22.0kg)

**Rotational Capability:**

Capable of working on a rotating gantry with a nominal rotating speed of 0.5 Hertz.

**Regulatory Approvals:**

Designed to comply with IEC 60601. RoHS Compliant. Customer provided external EMC filter may be required to meet CE/EMC specifications.

**X-Ray Tube Compatibility:**

Varex M-1581

**PMX70 STANDARD SYSTEM INTERFACE— JB1 25 PIN MALE D CONNECTOR**

PIN	SIGNAL	PARAMETERS
1	GND	Signal Ground
2	+5Vdc Out	+5Vdc, 100mA max.
3	RS-232 Tx Out	RS-232 Transmit
4	RS-232 Rx In	RS-232 Receive
5	PREP	User signal (Contact Closure) to alert the generator that exposure sequence will begin. Once this signal is active, exposure parameters are locked in and cannot be changed. The generator enables the starter to boost the rotor. Contact connection to pin 24. Closed = PREP, the filament is placed in preheat mode
6	READY	Generator signal to user to indicate the rotor runs to speed and the generator is ready for X-Ray exposure Open Collector. Low/Active = Ready
7	ROTOR SHUTDOWN	User signal to brake the rotor drive
8	EXPOSURE	User signal (Contact Closure) to generator to generate X-Rays. Filament is boosted, and high voltage is generated after the boost time. Contact connection to pin 24. Closed = Exposure
9	X-Ray ON 75% Status	Transistor output to indicate X-Ray ON status synchronized with 75% of kVP setting point.
10	X-Ray ON Status	Transistor output to indicate X-Ray ON status synchronized with kV start up.
11	N/C	N/C
12	X-Ray SHUTDOWN/AEC	User signal to generator to rapidly turn HV OFF and ON during serial exposure sequence
13	RS-232 ISO Ground	Isolated ground from RS-232 transceiver IC
14	HVG FAULT Status	Generator signal indicating generator fault. Open collector transistor output. Low/Active = Fault
15	Status Bit 1	3 bit status lines for up to 6 status messages. See separate matrix describing functionality. Open Collector. Low/Active = Message
16	Status Bit 2	
17	Status Bit 3	
18	N/C	N/C
19	N/C	N/C
20	kV Monitor	Signal from generator. 0-10V = 0-50kV. Zout = 1kΩ
21	Emission Monitor	Signal from generator. 0-10V = 0-200mA. Zout = 1kΩ
22	Filament Current Monitor	Signal from generator. 0-10V = 0-6A. Zout = 1kΩ
23	Program/Monitor Return	Ground for reference of program and monitor signals
24	+24Vdc Out	For connection to PREP and EXPOSURE control relay coils
25	SHIELD/GND	For connection of interface cable shield to generator chassis ground

## TB2 ROTOR INTERFACE

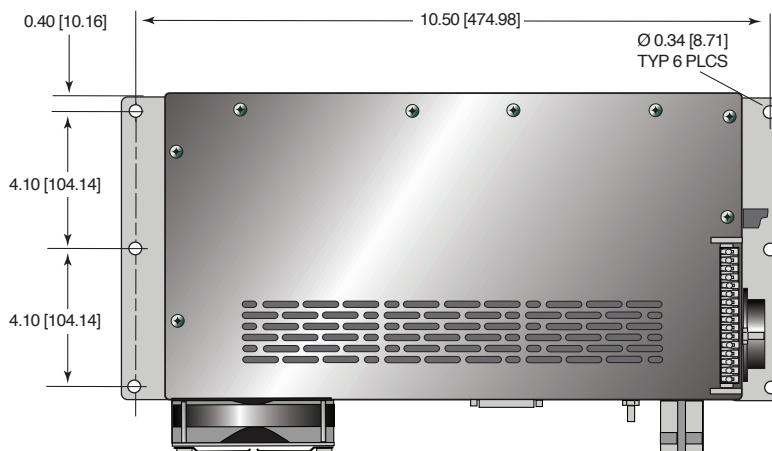
PIN	SIGNAL	PARAMETERS
TB2-1	PHASE	To tube auxiliary winding
TB2-2	RUN	To tube principle winding
TB2-3	COM	To tube common winding
TB2-4	GROUND	To tube housing ground

## TB3 TUBE AND INTERLOCK INTERFACE

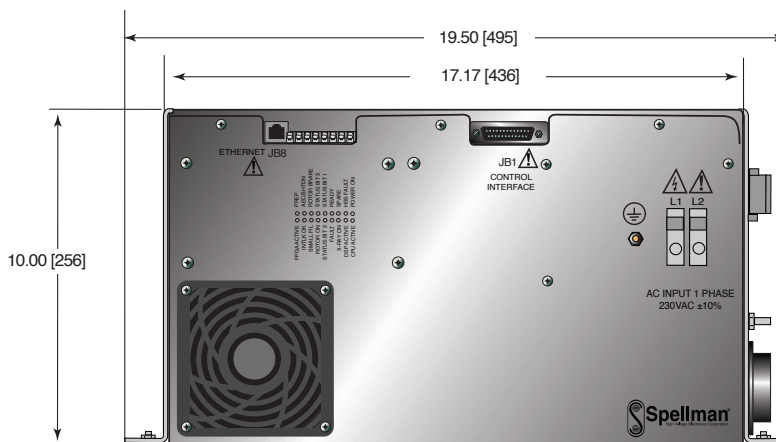
PIN	SIGNAL	PARAMETERS
TB3-1	SMALL FIL	Connection to tube small filament
TB3-2	COMMON	Connection to tube filament common
TB3-3	LARGE FIL	Connection to large filament
TB3-4	GROUND	Generator chassis for cable shield connection
TB3-5	Interlock 2+	Used if tube has separate thermostat switch.
TB3-6	Interlock 2-	Open = OVER TEMP. (short terminals if not used)
TB3-7	Interlock 3+	Used if tube has cooling circulator flow switch.
TB3-8	Interlock 3-	Open = NO FLOW. (short terminals if not used)
TB3-9	Safety Interlock+	User signal (Contact Closure) for safety interlocks such as door interlocks. Open turns HV OFF, or inhibits HV from being generated. Closed = OK 24Vdc @ <1A typical
TB3-10	Safety Interlock-	
TB3-11	Contactor Coil+	Option for contactor coil control
TB3-12	Contactor Coil-	
TB3-13	Spare	N/C
TB3-14	Spare	N/C
TB3-15	Tube Current+	Tube current flows out from this pin
TB3-16	Tube Current-	Tube current flows into this pin

DIMENSIONS: in.[mm]

TOP VIEW



SIDE VIEW



FRONT VIEW

