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1. INPUT POWER:

Input Line Voltage Range

100VAC ~ 240VAC, 50/60Hz , 8 Amp RMS max.

2. OUTPUT VOLTAGE PERFORMANCE:

2.1 Tube Voltage Operational Range

40kV ~ 160kV

2.2 kV Accuracy

The high voltage measured at the X-ray tube shall be within +/-2% of the selected value.

2.3 kV Ripple



The low frequency ripple ($<1\text{kHz}$) shall be within 1% (P-P) of the total kV.

2.4 Voltage Regulation

Better than 1% for $\pm 10\%$ of nominal input line voltage.

2.5 Voltage Regulator Precision

0.5kV

2.6 kV/mA Rise time

The kV and mA rise time may be controlled digitally. Minimum ramp-up time is 200mS.

3. OUTPUT CURRENT (mA) PERFORMANCE:

3.1 Tube Current

1.0mA~3.0mA @ 160kV, 500W maximum.

3.2 mA Regulation

Better than 1% between 80~160kV, 1.0mA to 3.0mA.

4. PROTECTION CIRCUITRY:

4.1 Current Protection

The OVER mA trip point is set at 50% over selected output current value.

4.2 Voltage Protection

The OVER kV trip point is set at 25% over selected output current value.

4.3 Over temperature protection (Option)

Over temperature interlock point shall be set 65°C as measured from tank body.

5. FILAMENT POWER AND FOCAL SPOT:

5.1 Filament Current Output: 3.2A

5.2 Filament Voltage Output: 3.5V

5.3 Focal Spot Size: 1.2mm \times 0.8mm



6. RADIATION SAFETY REQUIREMENTS:

X-ray leakage is less than 0.5mR/hr measured 5cm from the external surface at 1.0mA emission current and 150kV, with output window blocked.

7. OPERATION SPECIFICATIONS:

7.1 Operation Mode

Continuous or pulsing operation.

7.2 Seasoning

Digitally controlled seasoning available (digital board required).

7.3 Operating Ambient Temperature: 0°C~40°C

7.4 Storage Temperature: -20°C~60°C

7.5 Humidity: ≤85%, no condensation

7.6 Dimensions

X-ray generator head: 860mm×240mm×230mm; Weight: 75kg

Controller box: 400mm×400mm×120mm; weight: 5kg

7.7 X-ray Beam Filtration

2mm Glass + 12mm Oil (equivalent) + 3mm PEEK

7.8 X-ray Beam Geometry

Fan beam: $80^{\circ} \pm 2^{\circ}$ ($40^{\circ} + 40^{\circ}$) \times $10^{\circ} \pm 1^{\circ}$ ($5^{\circ} + 5^{\circ}$)

7.9 Cooling Mechanism

Head inside: Oil convection

External: Forced oil cooling.

8. COMPONENT

8.1 X-ray Generator Head

8.2 Controller Box



Including digital and analog control boards and one cable from X-ray generator head to the controller box (length 1.6 meter).

8.3 Collimator

Optional to customer request.

9. INTERFACE SPECIFICATION

9.1 AC Power Connector

AC Power input (PL5) , Amp CPC connector is used for AC input.

| Connector: Amp PN. 206036-2 | | |
|-----------------------------|------------------|------------------|
| Pin | Contact (Amp PN) | Description |
| 1 | 66261-2 | LINE (Hot, Fire) |
| 2 | 66261-2 | NEUTRAL (Zero) |
| 3 | 66262-2 | GND |

9.2 Control Signal Connector

Control Signal Connector (PL4) , This connector carries signals for X-ray ON, and interlocks mains power cutout. It uses a Amp CPC connector with AMP contact sockets.

| Connector: Amp PN.206705-1 | | |
|----------------------------|------------------|---------------------------|
| Pin | Contact (Amp PN) | Description |
| 1 | 66565-4 | X-ray On- Collector |
| 2 | 66565-4 | X-ray On return - Emitter |
| 3 | 66565-4 | Enable In |
| 4 | 66565-4 | Enable Return |
| 5 | 66565-4 | |



| | | |
|---|---------|------------------------|
| 6 | 66565-4 | Spare Port |
| 7 | 66565-4 | Spare Port |
| 8 | 66565-4 | Interlock In |
| 9 | 66565-4 | GND (Interlock Return) |

9.3 RS232 Connector

RS232 Connector PL1 (Digital Signals Interface):

RS232: PL1-2 (RXD)

RS232: PL1-3 (TXD)

RS232: PL1-5 (GND)

9.4 GND Connector PL6

Ground stud provided on chassis

9.5 X-ray Generator Power Connector PL2

PL2-1, PL2-3: Transmission power to the filament

PL2-4, PL2-5: Transmission power to the High voltage transformers

9.6 X-ray Generator Signal Connector PL3

PL3-1: - kV feedback signal

PL3-2: +kV feedback signal

PL3-3: kV_GND

PL3-5: mA_GND

PL3-6: +mA feedback signal

PL3-7: S_GND

PL3-8: - mA feedback signal

9.7 Indicator information

POWER: When power-on, the bright lights

INTERLOCK: When interlocked conditions set up, bright lights



X-RAY ON: When the X-ray emission, bright lights

FAULT: When the fault occurred, the bright lights

9.8 Analog Signals Interface

- Tube voltage input signal (H9-PIN3): 0~5 VDC analog signal.
- Tube voltage output signal (H9-PIN1): 0~5 VDC analog signal.
- Tube current input signal (H9-PIN4): 0~5 VDC analog signal.
- Tube current output signal (H9-PIN2): 0~5 VDC analog signal.
- X-ray On/OFF signal (PL4-1, PL4-2):

| Parameter | Value |
|------------------------|-------|
| Open circuit voltage | 30V |
| Max Continuous current | 1mA |

- Interlock Input signal (PL4-8, PL4-9):

| Parameter | Value |
|---|-------|
| Open circuit voltage | 24V |
| Minimum closed circuit continuous current | 15mA |
| Nominal closed circuit continuous current | 100mA |
| Maximum closed circuit continuous current | 150mA |
| Inrush current | < 1A |

- Enable Inputs Signal (PL4-3, PL4-4):

| Parameter | Value |
|--------------------------|---------------------|
| Input Voltage (asserted) | |
| Asserted | > 20V (nominal 24V) |
| Not Asserted | < 5VDC |
| Nominal Current | 10mA |



| | |
|-------------|------|
| Max Current | 20mA |
|-------------|------|

- X-ray READY signal: $kV > 80kV$ and $mA > 1.0mA$

| | | |
|-----------------|-------------|----------------------|
| | LD2 | H10-4 (READY signal) |
| X-ray READY | Illuminated | Low level |
| X-ray NOT READY | Dimm | High level |

- The current high signal (mA OVER): The mA OVER trip point is set at 50% over current fault signal.

| | | |
|---------------|-------------|------------------------|
| | LD4 | H10-9 (mA OVER signal) |
| mA OVER range | Illuminated | Low level |
| mA Normal | Dimm | High level |

- The voltage high signal (kV OVER): The kV OVER trip point is set at 25% over voltage fault signal.

| | | |
|---------------|-------------|------------------------|
| | LD3 | H10-7 (kV OVER signal) |
| kV OVER range | Illuminated | Low level |
| kV Normal | Dimm | High level |

- Fault signal (H10-PIN5):

| | | |
|--------|--|----------------------|
| | | H10-5 (ERROR signal) |
| Error | | Low level |
| Normal | | High level |

- Signal Ground:

(H10-3, H10-6, H9-5)

9.9 Communication Interface (RS232)

RS232 connector is standard 9-Pin D-sub male connector.

Baud Rate Setting: 9600

Parity: Even

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Data Bits: 8

Stop Bits: 1