osi1103 Series

−160 kV; 1200 W; floating filament



Product introduction

The OSIMAI osi1103 series high-voltage X-ray generator modules are designed specifically for OEM applications, with output voltages up to 160 kV and power of 1200 W. Universal input, a small package and three standard digital interfaces simplify integration into X-ray analysis systems. All models are available for either floating-filament (negative high-voltage polarity) or ground-referenced-filament (positive high-voltage polarity) X-ray tube designs. A DSP-based emission-control circuit provides excellent emission-current regulation and stability.

Product features

- Supports hot-anode or hot-cathode X-ray tubes
- Compact and lightweight
- User-programmable ramp and arc-detection functions
- Universal input with power-factor correction
- Models from −20 kV to −160 kV; 300 W, 600 W and 1200 W
- Standard digital interfaces: USB, Ethernet and RS-232

Specifications

Parameter	Specification
Input voltage	Power-factor-corrected input. 300 W supply: 100–240 VAC ±10% (90–264 VAC), 47–63 Hz, 4.6 A. 600 W supply: 200–240 VAC ±10% (180–264 VAC), 47–63 Hz, 4.3 A. 1200 W supply: 200–240 VAC ±10% (180–264 VAC), 47–63 Hz, 8.2 A.
Output voltage	Eight models: 20 kV, 30 kV, 40 kV, 50 kV, 60 kV, 70 kV, 75 kV, 100 kV and 160 kV.
Output polarity	Negative: floating-filament X-ray tubes. Positive: ground-referenced-filament X-ray tubes.
Power	300 W, 600 W or 1200 W; customizable.
Output voltage regulation	Within the specified input-voltage range: ≤0.01% of rated output voltage. Full-load change: ≤0.01% of rated output voltage.
Emission-current regulation	Within the specified input-voltage range: ≤0.01% of rated output current. For rated output voltage changing from 30% to 100%: ≤0.01% of rated output current. The filament is disabled below 30% of the kV full-scale output.
Ripple	Better than 1% rms at rated output (0.1% rms optional).
Stability	Better than 25 ppm/hour after a 2-hour warm-up.
Temperature coefficient	Voltage and current: better than 50 ppm/°C.
Ambient temperature	Operating: 0°C to 40°C. Storage: −40°C to 85°C.
Humidity	Relative humidity 20% to 85%, non-condensing.
Filament configuration	Closed-loop emission control adjusts the filament setting to provide the desired X-ray tube emission current. Two types are available: floating filament (AC output referenced to the negative output voltage) and ground-referenced filament (DC output referenced to ground).
Cooling	Forced air.
Dimensions	300/600 W: height 120.65 mm, width 152.4 mm, depth 304.8 mm. 1200 W: height 120.65 mm, width 304.8 mm, depth 304.8 mm. 160 kV: height 226.7 mm, width 482.6 mm, depth 546.1 mm.
Weight	300/600 W: 6.35 kg. 1200 W: 11.8 kg. 160 kV: 66.4 kg.

Model selection (300 W)

Rated output (kV)	Rated output (mA)	Positive polarity	Negative polarity
20	15	osi1103P20-300	osi1103N20-300
30	10	osi1103P30-300	osi1103N30-300
40	7.5	osi1103P40-300	osi1103N40-300
50	6	osi1103P50-300	osi1103N50-300
60	5	osi1103P60-300	osi1103N60-300
70	4.28	osi1103P70-300	osi1103N70-300
75	4	osi1103P75-300	osi1103N75-300
100	3	osi1103P100-300	osi1103N100-300
160	1.875	osi1103P160-300	osi1103N160-300

Model selection (600 W)

Rated output (kV)	Rated output (mA)	Positive polarity	Negative polarity
20	30	osi1103P20-600	osi1103N20-600
30	20	osi1103P30-600	osi1103N30-600
40	15	osi1103P40-600	osi1103N40-600
50	12	osi1103P50-600	osi1103N50-600
60	10	osi1103P60-600	osi1103N60-600
70	8.56	osi1103P70-600	osi1103N70-600
75	8	osi1103P75-600	osi1103N75-600
100	1.5	osi1103P100-600	osi1103N100-600
160	3.75	osi1103P160-600	osi1103N160-600

Model selection (1200 W)

Rated output (kV)	Rated output (mA)	Positive polarity	Negative polarity
20	60	osi1103P20-1200	osi1103N20-1200
30	40	osi1103P30-1200	osi1103N30-1200
40	30	osi1103P40-1200	osi1103N40-1200
50	24	osi1103P50-1200	osi1103N50-1200
20	20	osi1103P60-1200	osi1103N60-1200
70	17.12	osi1103P70-1200	osi1103N70-1200
75	16	osi1103P75-1200	osi1103N75-1200
100	12	osi1103P100-1200	osi1103N100-1200
160	7.5	osi1103P160-1200	osi1103N160-1200

DB15 connector signal definitions

Pin	Signal	Description
1	Power-supply fault	Open collector; 35 V, 10 mA maximum.
2	Current programming input	0–10 V = 0–100% rated output; Zin = 10 MΩ.
3	Voltage programming input	0–10 V = 0–100% rated output; Zin = 10 MΩ.
4	Filament-limit input	0–10 V = 0–100% rated output; Zin = 10 MΩ.
5	Local filament limit	Multi-turn panel potentiometer.
6	Filament preheat input	0–10 V = 0–100% rated output; Zin = 10 MΩ.
7	Local filament preheat	Multi-turn panel potentiometer.
8	Voltage monitor	0–10 V = 0–100% rated output; Zout = 4.99 kΩ; 1%.
9	Signal ground	Ground.
10	Current monitor	0–10 V = 0–100% rated output; Zout = 4.99 kΩ; 1%.
11	X-ray enable input	Connect to pin 12 to enable high voltage.
12	X-ray enable output	+15 V open circuit; ≤15 mA closed circuit.
13	Filament monitor	1 V = 1 A; Zout = 10 kΩ.
14	X-ray ON output signal	Open collector; 35 V at 10 mA maximum.
15	NC	/

RS-232 digital interface / DB9 connector signal definitions

Pin	Signal	Description
1	NC	/
2	TX out	Transmit data
3	RX in	Receive data
4	NC	/
5	SGND	Ground
6	NC	/
7	NC	/
8	NC	/
9	NC	/

Filament terminal block TB1 — two-position terminal block

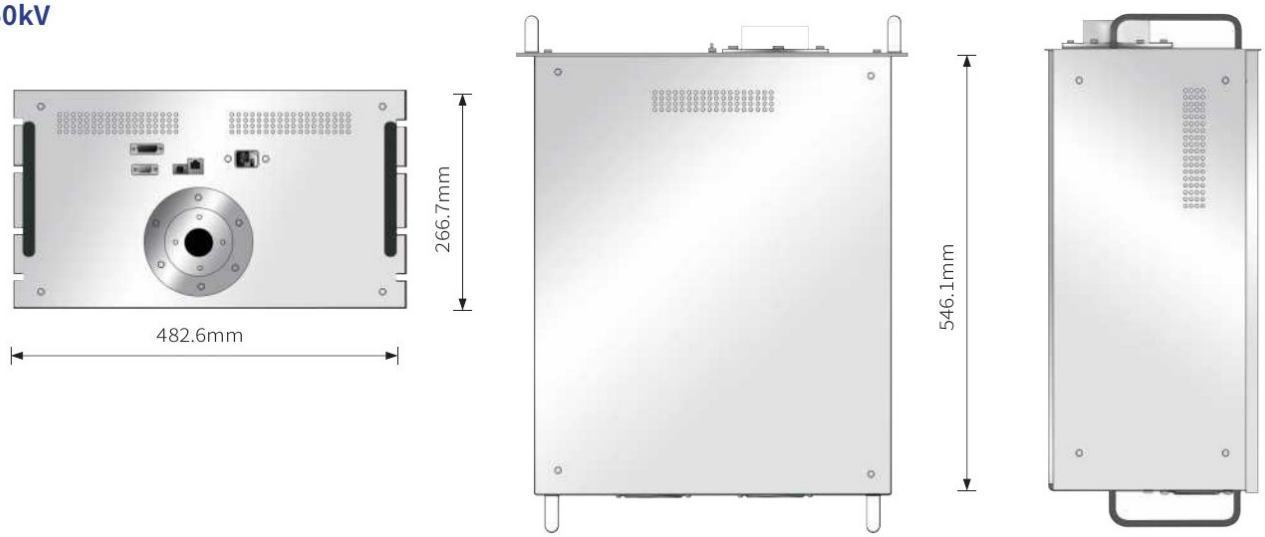
Pin	Signal	Description
1	Filament output	0–5 A; maximum 10 VDC.
2	Filament return	Filament return.

Typical applications

Plastic sorting; crystal inspection; cable measurement; diamond inspection; mineral analysis; X-ray fluorescence; X-ray diffraction.

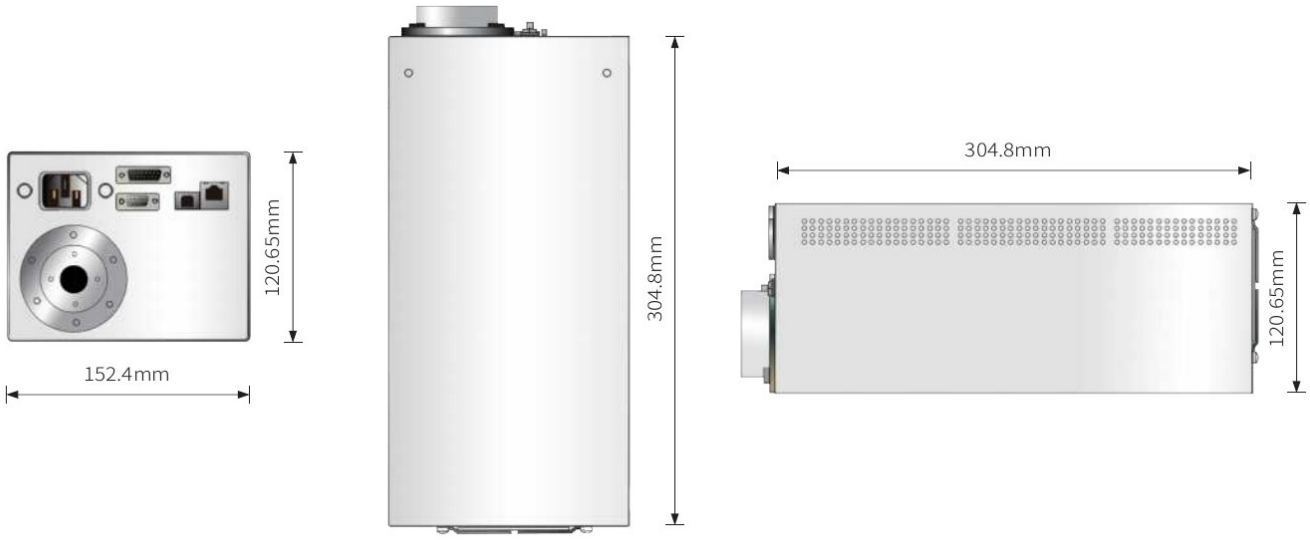
Outline dimensions

160kV



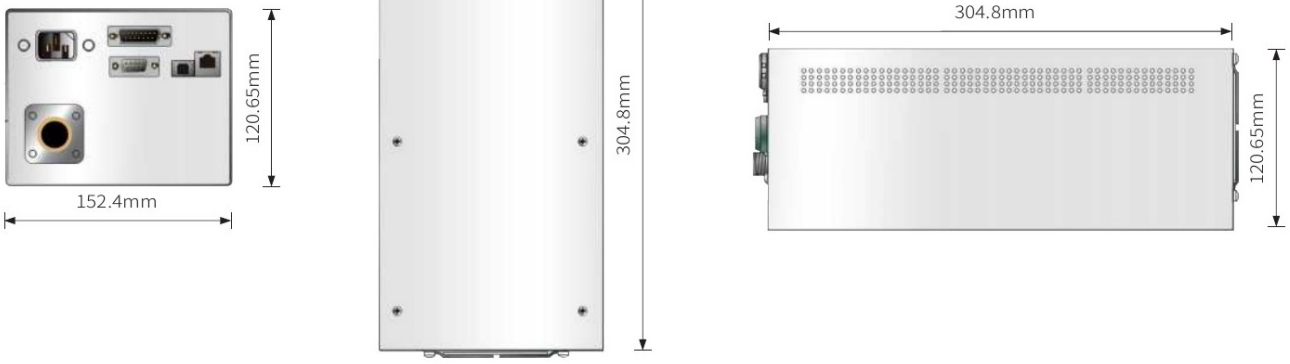
300/600W

Negative polarity — floating filament



300/600W

Positive polarity



1200W

Negative polarity — floating filament



300/600W

Negative polarity — floating filament

