VJ X-Ray ***A VJ Technologies Company***	DWG NUMBER: SPC – P375 SHT 1 OF 7	REV:1

FILES ASSOCIATED WITH THIS SPECIFICATION

FILENAME	CONTENTS
SPC – P375.doc	This Document

CHANGE HISTORY

ORIGINATOR	DATE	DESCRIPTION OF CHANGE
Jenny He	5/11/22	Initial Specification. Modified from P265 - 100-200KV, 0.2-5mA, 500W peak. Continuous mode: 400W max. - Fan Beam: 90º x 10º (Beam port allows for 105º max.) - Focal Spot Size: 0.8 per IEC60336 - Specialized Pump - HP Radiator - Type C Control box, Firmware P562 - Input Power 220VAC

TITLE: IXS200BP500P375	
GENERATED BY: Jenny He	DOC OWNER: X-ray Eng. & Sales
REVIEWED BY: Joseph Zhou	REVIEW DATE: 5/18/22
APPROVED BY: NY Eng. Team	APPROVAL DATE: 5/26/22

Contents

1. OVERVIEW

The IXS200BP500P375 X-ray generator is a 200kV, 500W, High Frequency, Power Factor Corrected generator. It consists of an integrated X-ray tube, a high voltage, and a filament power supply. The Generator is controlled, programmed, and monitored via a RS232 interface or Ethernet interface. The Generator is built in accordance with the following specifications:

2. INPUT POWER

Input Line Voltage Range

- 220VAC±10%, 50/60Hz. Single phase. 3.7Amps RMS max.

3. HIGH VOLTAGE PERFORMANCE

a. Output Power:
100-200KV, 0.2-5mA, 500W peak. Continuous mode: 400W max.

b. Tube Voltage Operational Range:
The high voltage is programmed within the range of 100 to 200 kV.

c. kV Accuracy:
The High Voltage measured at the X-ray tube is within +/-2% of the selected value.

d. kV Ripple:
The peak to peak value of Total kV is +/-1%.

e. Voltage Regulation:
< 0.1% for Line Input changes over specified range
< 0.1% for Load Output changes over specified range

f. kV Rise Time at maximum power:
The kV rise time is ~ 1sec from 10% to 90% of the output voltage.

g. kV Overshoot
The kV Overshoot will be <= 5% of full output voltage.

4. TUBE CURRENT (mA) PERFORMANCE

a. Tube current Operational Range:
0.2mA to 5.0mA @ 500W peak.

b. mA Accuracy:
The X-ray tube current is within +/-1% of the selected value.

c. mA Regulation:
< 0.5% for Line Input changes of 220VAC±10%.
< 0.5% for the output voltage change of 100kV to 200kV.

5. PROTECTION AND SAFETY CIRCUITRY

a. Over-current protection:
The Over-current trip point is set for within 5.3 to 5.6mA. This will disable the high voltage output. A Reset is required to clear this fault

b. Over voltage protection:
The Over voltage trip point is set within 210kV to 220kV. This will disable the high voltage output. A Reset is required to clear this fault.

c. Over temperature protection:
Over temperature trip point is set within 57°C to 63°C. This will disable the high voltage output. A Reset is required to clear this fault.

d. Arc Detection Fault:
When an Arc occurred, the arc fault LED will be ON. If multiple arcs occurred within 10sec, the arc fault signal will be latched. This will disable the high voltage output & a reset is required to clear this fault.

e. Reg. Fault:
When KV or mA output is out of regulation, the unit will disable the high voltage output. A Reset is required to clear this fault.

f. Power Limit Fault:
When the kV/mA feedback values exceed the maximum rated power limit, this will disable the high voltage output. A Reset is required to clear this fault.

g. X-ray On Relay:
The X-Ray on relay will operate when HV is enabled & there is no faults occurred.
The X-Ray on relay will de-energize when the X-Ray output is OFF.
The maximum rating of this contact is 30V DC ⩽200mAmp.

h. Safety Interlock:
J2-1 & J2-2 to close through external interlock switches to satisfy the safety. X-Rays will not be produced & interlock open message will be displayed unless J2-1 & J2-2 are connected together through safety switches.

6. FILAMENT POWER SUPPLY

Filament Current Output:
Filament Current = 3.0 to 4.0 Amps RMS

Filament Voltage Output:
Filament Output Voltage 2 to 5Vac

7. SAFETY REQUIREMENTS

a. Safety Compliance: Designed to meet CE, EN/UL 61010-1 and EN 61326-1.
b. X-ray Leakage: Less than 0.5mR/hr at 5cm from the surface of the chassis as per FDA 21 CFR 1020.40.

8. X-RAY BEAM

a. X Ray Beam Filtration: 1.5mm of Ultem
b. X-ray Beam geometry: Fan beam 90° x 10° (Beam port allows for 105° max.)
c. Focal Spot Size: 0.8 per IEC60336
d. Target Material: Tungsten
e. Tube Inherent Filtration: 0.8mm Be + 1.5mm Glass

9. PHYSICAL SPECIFICATIONS

a. **Environmental**
- Maximum operating ambient temperature: 5°C to 40°C.
- Maximum operating housing temperature: 55ºC
- Storage ambient temperature: -20°C to +60°C
- Thermal cut off: 60ºC ± 3ºC of oil temperature.

b. **Humidity**
98% non-condensing

c. **Dimensions**
See figures in Item 15

d. **Weight**
X-ray generator: ~65 lbs
Control box: 7 lbs

e. **Cooling method**
Through an integrated cooler.

10. AC POWER INPUT CONNECTOR – J1
- Voltage:220VAC±10%, 50/60Hz
- Current: 3.7 Amps RMS max.

11. LED INDICATORS

Power (Green)	Illuminated when Power is present
X-ray On (Red)	Illuminated when Interlock is closed & HV is enabled
Arc (Yellow)	ARC-ing fault
OC (Yellow)	Over Current Fault
OT (Yellow)	Illuminated when oil temperature exceeds 60±3ºC
OP (Yellow)	Over Power, Illuminates when selected power exceeds the rated power
OV (Yellow)	Over Voltage fault

12. CONTROL CABLE AND CONNECTOR

a. **J1 Connector: AC Input**

b. **J2 Connector:** (Interlock 9 Pin Male)

Pin Out	Name
1	Interlock out
2	Interlock In
3	X-Ray On Relay contact Common
4	X-Ray On Relay contact N/C
5	X-Ray On Relay contact N/O
6	N/A
7	N/A
8	N/A
9	N/A

c. **J3 Connector:** (RS232 9 Pin Female)

Pin Out	Name
1	N/A
2	TX-
3	RX+
4	N/A
5	SIGNAL GRD
6	N/A
7	N/A
8	N/A
9	N/A

d. **RJ45 Ethernet Digital Interface:** (USR-TCP232-T)

Pin Out	Name
1	TX+
2	TX-
3	RX+
4	N/A
5	N/A
6	RX-
7	GROUND
8	GROUND

e. **J4 Connector:** 24VDC (Molex 39-30-0040)

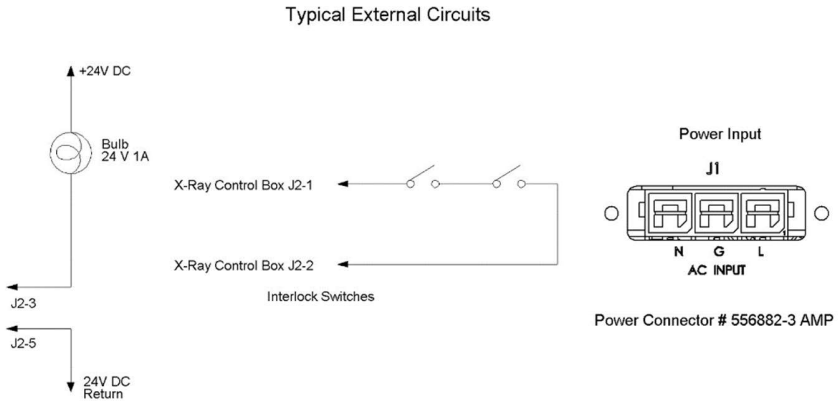
Pin In	Name
1	+24VDC@3.0A for Pump and Fans
2	24VDC Return for Pump and Fans
3	+24VDC@1.5A for Control Circuit & Control Fan
4	24VDC Return for Control

f. **Control Cable:** 4ft standard

13. DIGITAL INTERFACE

Refer to document P562-IXS-FIRMWARE-P562.

14. TYPICAL EXTERNAL CIRCUITS



15. MECHANICAL DRAWINGS

Figure 1: X-ray Generator

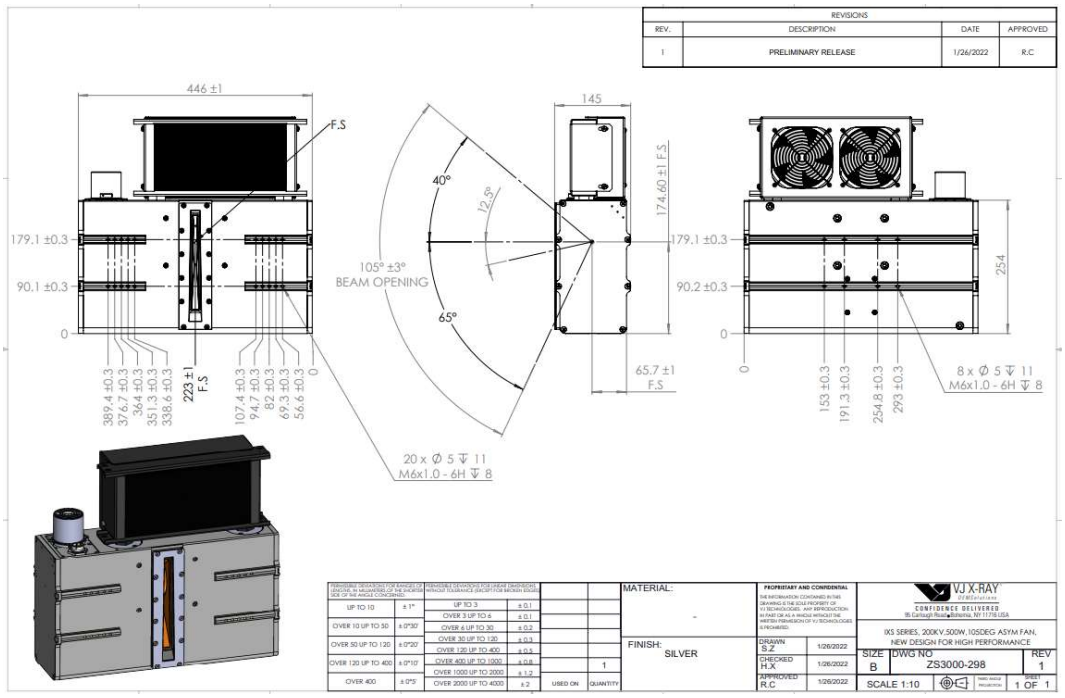
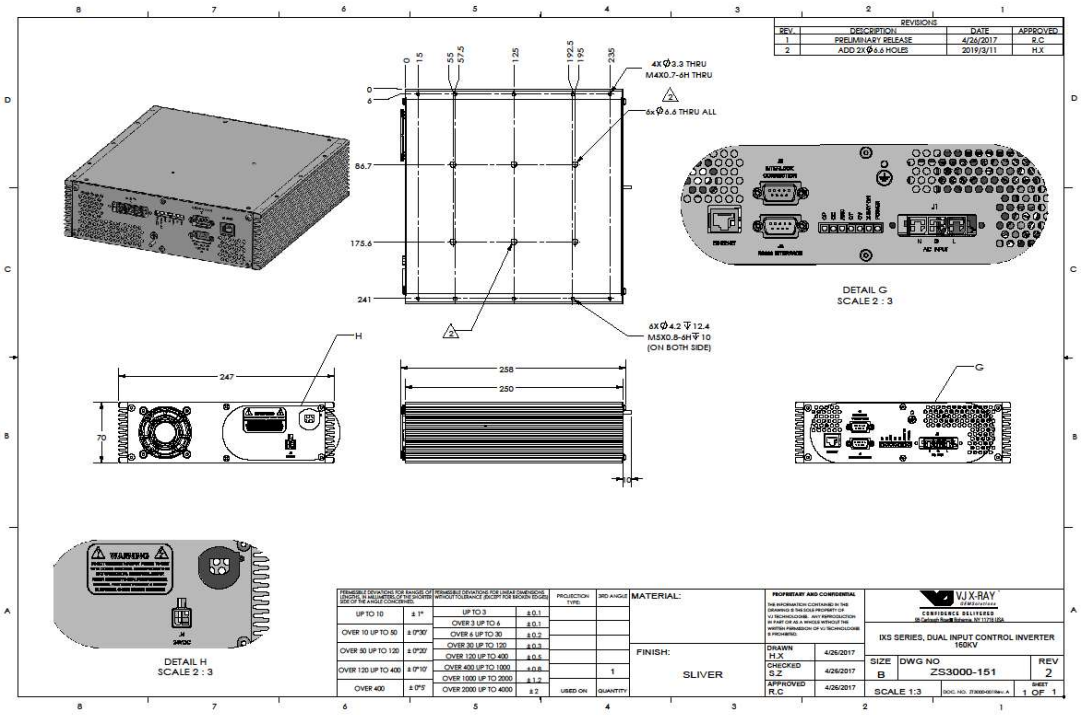


Figure 2: Control Box



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