MicroFocus Analog Sub-System Description Sheet

Sub-System Specification

System Parameters	Specifications	Note
Target Voltage	25 to 100 kV	Contact Trufocus for applications requires < 25kV
Tube Current	0.02 to 1 mA	
Focal Spot Size	<= 8 um	
Tube Power	8W*	
Tube type	End Window Cone (EWC)	

***Maximum Tube Power depends on Focus Spot Size and target material. 8 W for 8 um. For details, see Focal Spot Size vs. Power table in the enclosed X-ray source data sheet.**

Parts needed to build the Sub-system

Modules	TruFocus Ordered P/N	QTY
MicroFocus X-ray Source	TFX-8100-EWC	**1**
MicroFocus Analog Controller	MFX-CTR-100-1-A	1
High Voltage Module	MFX-HVM-100-1	1
PC Software Driver	Included	

Enclosed please find Data Sheets of the parts described above.

TFX-8100-EWC

MicroFocus X-Ray Source

(End Window Cone)

Contact TruFocus for any modification of Specifications for your application

MFX FAMILY	TruFocus Ordered P/N	Maximum Target Voltage (kV)	Maximum Target Current (mA)	Maximum TUBE Power (W)	Focal Spot Size (um)	Beam Angle	Operation
TFX	**TFX-8100-EWC**	100	1	8*	<= 8	61,5°	Continuous

***Maximum Tube Power depends on Focal Spot Size (FSS) and target material. See Tube Operating Power table below. 8 W for 8 um.

TFX-8100-EWC X-Ray source is part of the TruFocus 8000 series MicroFocus Tube family developed to fulfill the need for high resolution imaging for Industrial, Medical, Aerospace and Analytical applications. The <=8 µm Focal Spot Size produces exceptional image quality and sharpness.

To shorten X-ray system development time, a well matched High Voltage (100kV, 1 mA) power supply , an Analog or Digital (USB) Controller and Software Driver with full control graphic interface developed by TruFocus are available for driving and monitoring the TFX-8100-EWC source.

Operating Power (Continued)

Maximum Tube Operating Power (W) of 8000 series is: 12 W

1W per 1 um Focal Spot Size (FSS) for Tungsten when FSS < 10 **µm**	
Focal Spot Size (um)	**Maximum Target Operating Power (Continuous) (W)**
8	8
9	9
10	10 - 12

X-Ray Tube Specification

Tube Housing	Target Material	Window Material	Window Thickness	Window type	Operating Temp. & Humidity	Storage Temp. & Humidity	Cooling Method	Weights	Flux Stability
Encapsulated	**Tungsten**	**Beryllium**	**0.01 “**	**End Window Cone**	+10° to 55°C / 85% RH	0° to 60°C 85% RH	**Air**	**2.5 lbs**	**<0.2%***

***Relative Standard Deviation over 4 hours of continued operation.**

TFX-8100-EWC

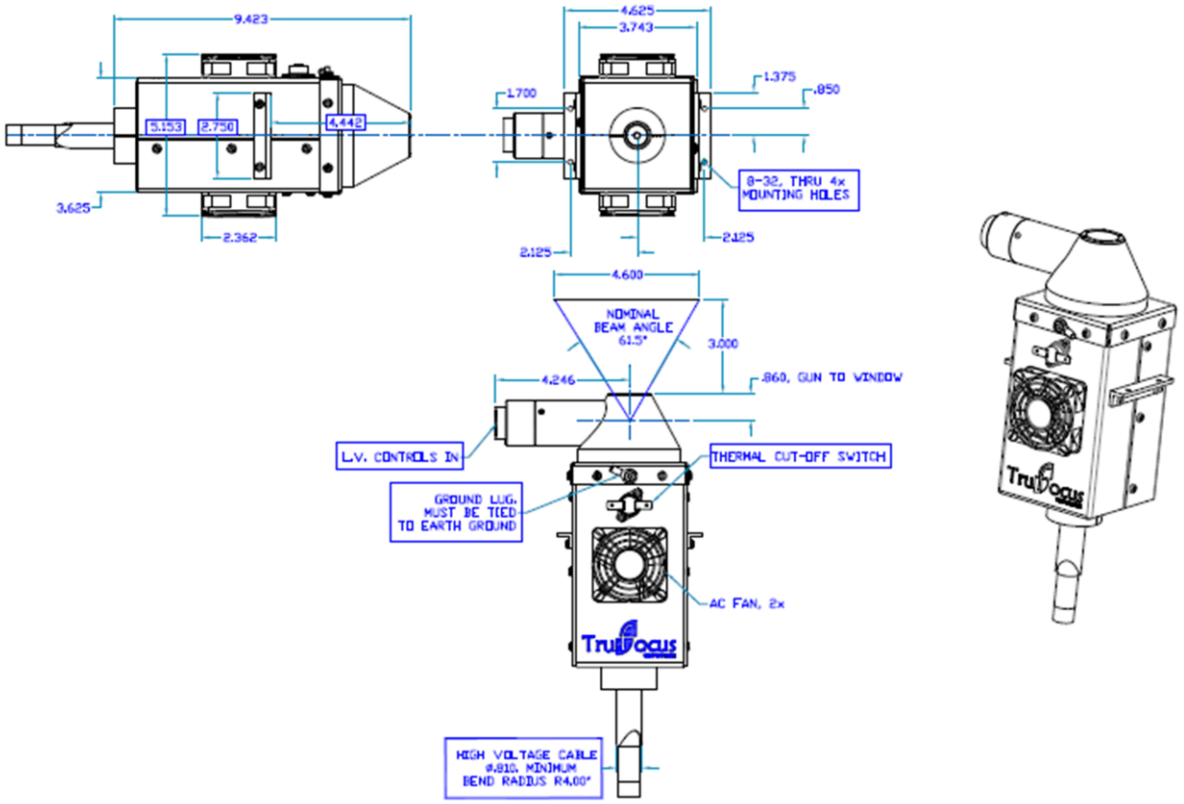
TFX-8100-EWC (With Housing)

Packaged in a metal housing with FAN

OUTLINE DRAWING

Drawing# & Version:	**DW-TFX-8100-EWC-01**
TruFocus P/N:	**TFX-8100-EWC**
Unit:	**In**

- **High Voltage Cable length can be modified based on Customer requirement and needs to be defined at the time of purchase order.**



MFX-CTR-100-1-A

MicroFocus Analog Controller

Family	TruFocus Ordered P/N	Description	Max. Voltage (kV)	Max. Current (mA)	Max. Power (W)	Cooling Method	Weight	Programmable Control Interface
MFX	MFX-CTR-100-1-A	MicroFocus Controller. For controlling 8000 Series MicroFocus X-Ray source	100	1	100	Air	4.5 lb	Yes

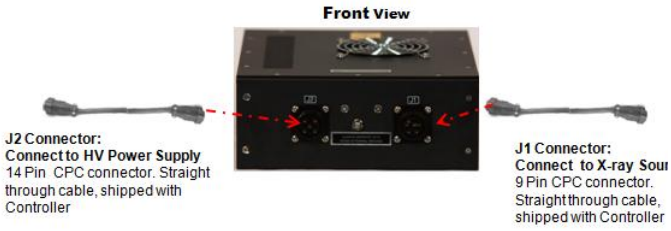
Rear View

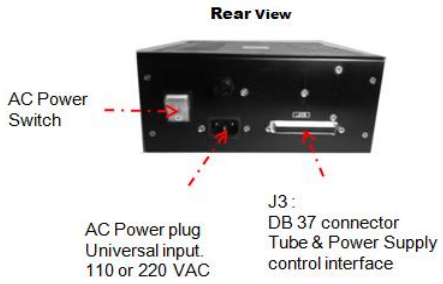
Front View

MicroFocus Analog Controller is specifically designed for controlling TruFocus 8000 Series X-Ray Tube Family. MicroFocus Analog Controller is to be used with TruFocus' High Voltage (HV) Module to form a programmable X-ray High Voltage Power Supply and Control sub-system.

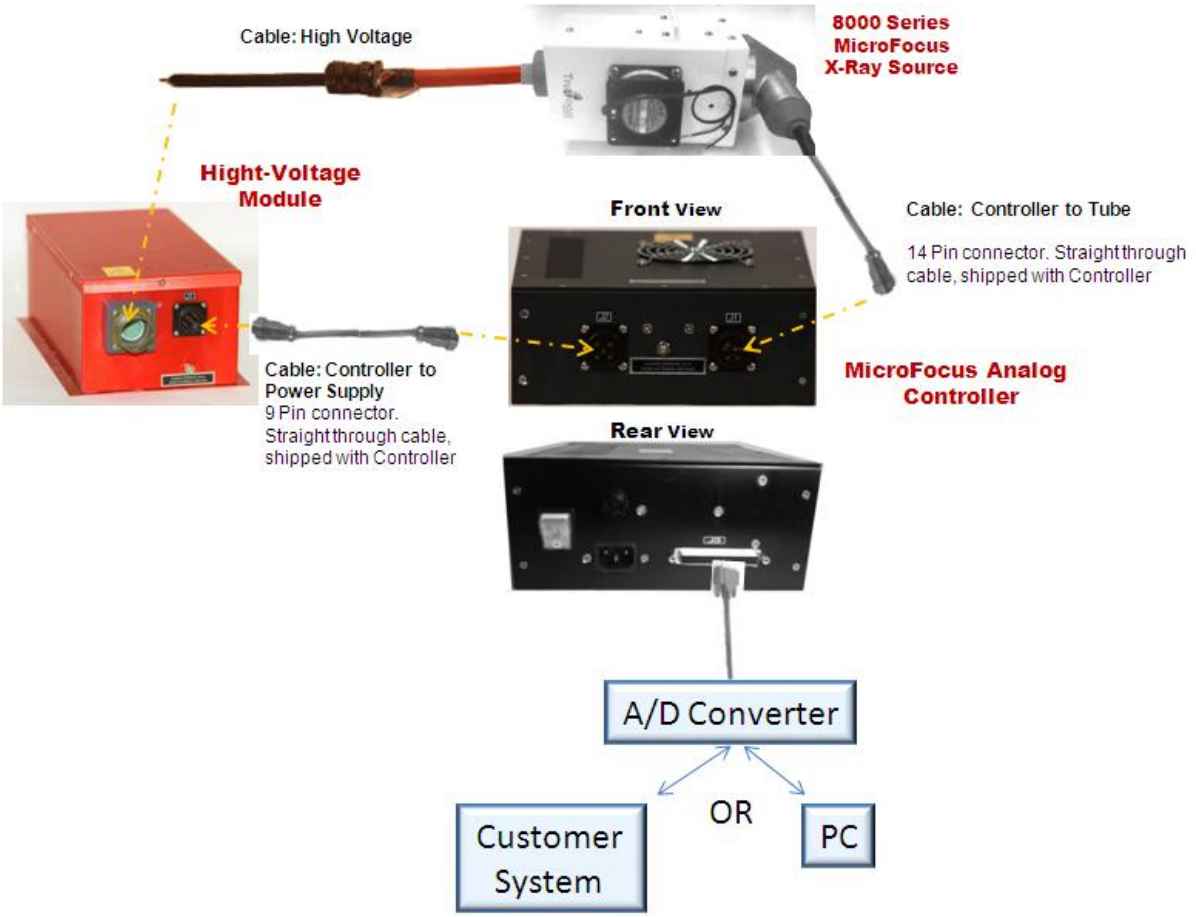
Through DB 37 connector (J3), kV and mA programmable input level and kV and mA output level can be monitored in real time. Other tube parameters and safety signals are available to be accessed through MicroFocus Controller control interface. PC control interface can be implemented by using a Parallel to Series (RS 232) converter.

Functional Overview



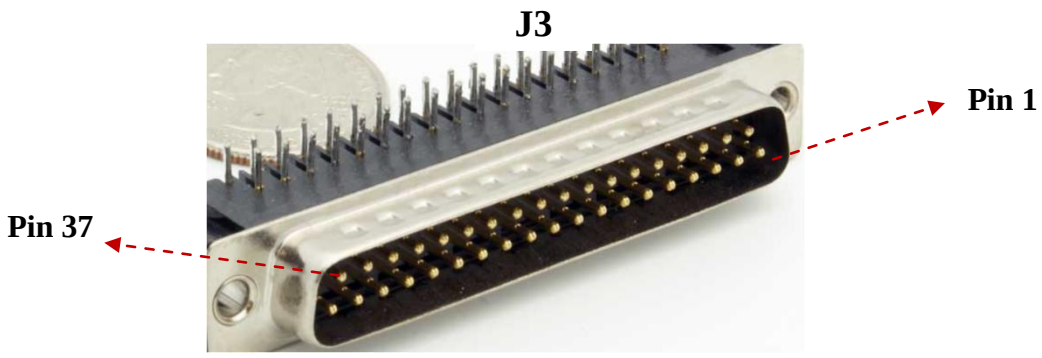


MicroFocus Analog Sub-System Connection



Note;
Customer to provide the A/D converter and or PC.

37-Pin D-Sub Connector Pin-out and Pin Functional Description



1) AWG size: Minimum 24 AWG
2) Not all 37 pins are used
3) Straight through connection (1 to 1; 2 to 2…)

Pin #	Signal Names	Note
1	Jumper1.0	Pin 1 and Pin 2 should be jumpered when pin 4, 23, 22 are not used.
2	Jumper 1.1	See note above
5	GND	
7	GND	
9	kV Program	Input – 0 to 10 VDC (Calibrated input for generating desired Anode voltage in kV)
11	kV Monitor	Output - 0 10 VDC
12	L1 Monitor	Output - 0 to -10 VDC
13	L3 Monitor	Output – 0 to 10 VDC
14	HV Interlock #1	Pin 14 & Pin 15 (Source & return) for Interlock
15		
16	HV Interlock #2	Pin 16 & Pin 17 (Source & return) for Interlock
17		
18	mA Monitor	Output – 0 to 10 VDC
19	Heater Monitor	Output – 0 to 10 VDC
27	mA Program	Input – 0 to 10 VDC (Calibrated input for generating desired Anode current in mA)

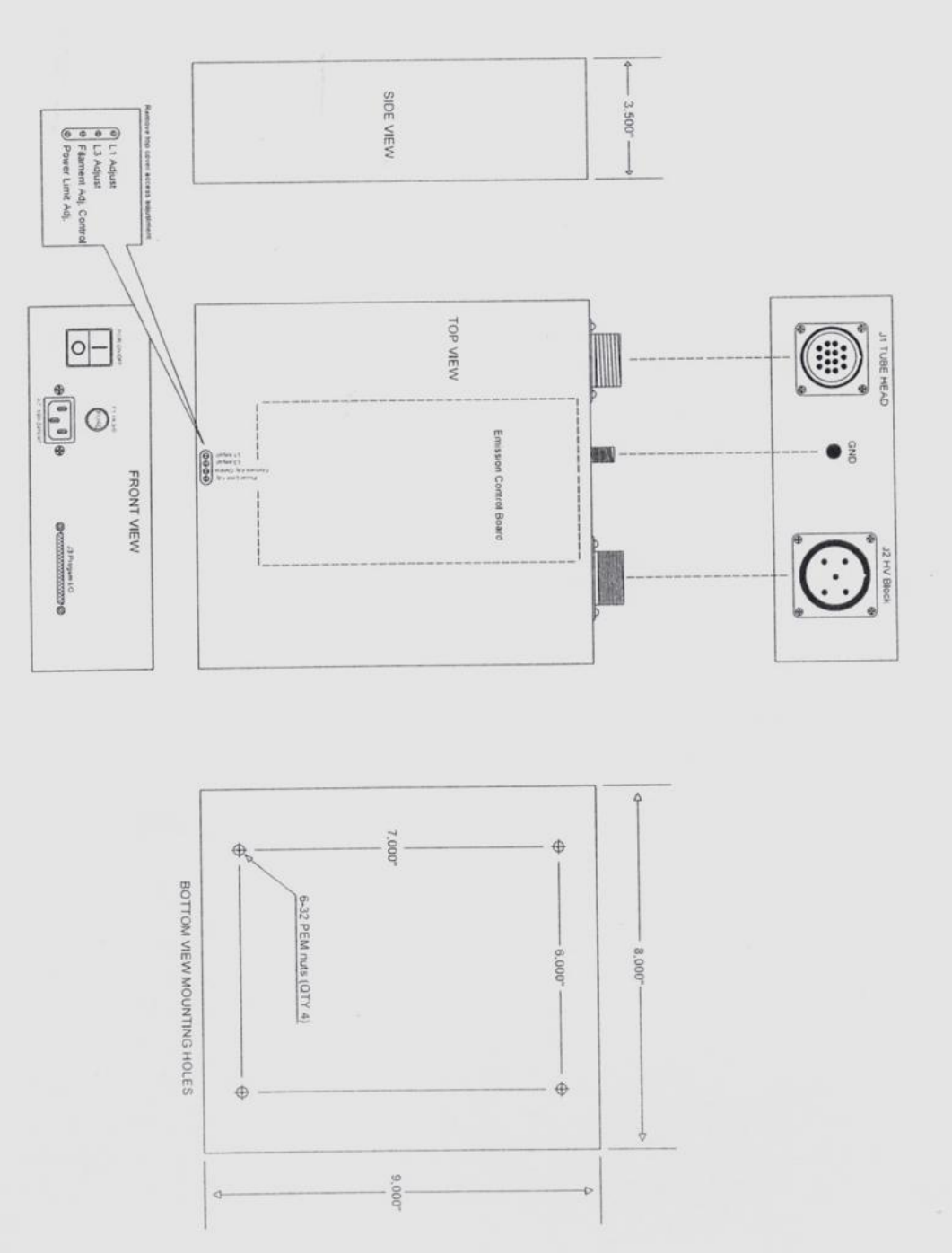
True Table for Pin 4, 23 and 22

	HV/ ON	HV/OFF	XRAY/ON	X-RAY/OFF	Note
4	1	0	N/A	N/A	1 is 5V, 0 is 0 V
23	0	1	N/A	N/A	1 is 5V, 0 is 0 V
22	N/A	N/A	0	1	1 is 5V, 0 is 0 V

Note: Jumper Pins 1 and 2 when NOT using Pins 4, 23, 22

OUTLINE DRAWING

Drawing# & Version	**DW- MFX-CTR-100-1-A**
TruFocus P/N	**MFX-CTR-100-1-A**
Unit	**Inches**



MFX-HVM-100-1

MicroFocus High Voltage (HV) Module

Family	TruFocus Ordered P/N	Description	Max. Voltage (kV)	Max. Current (mA)	Max. Power (W)
MFX	**MFX-HVM-100-1**	MicroFocus High Voltage Module supplies target voltage	100	1	100

HV output connector
to be connected to X-Ray tube

Input Connector
to be connected to MFX Controller

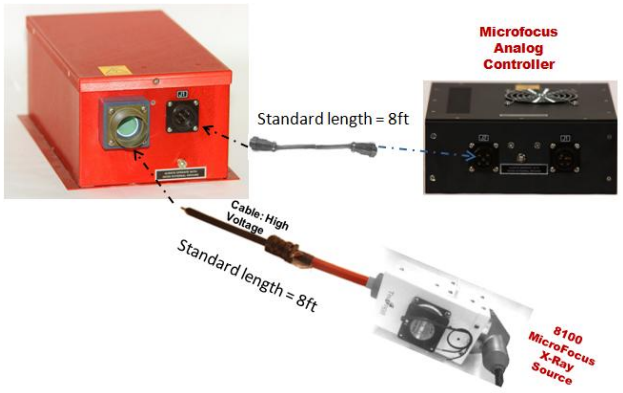
Front View

MicroFocus HV Module is a HV voltage multiplier (High Voltage Divider) and is designed in conjunction with TruFocus' MicroFocus Controller and MicroFocus X-Ray source to form a fully programmable MicroFocus X-Ray sub-system. MicroFocus Controller controls and monitors the output voltage and current of the MicroFocus HV Module.

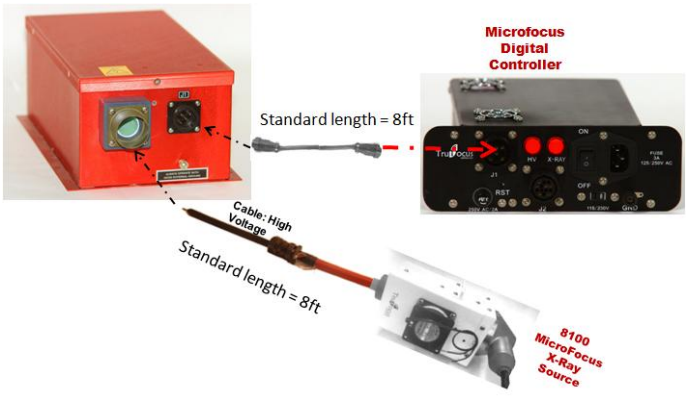
High Voltage output connector

Parrametters	Specification	Note
Output kV	0 to 100 kV	100 kV max
Output Current (mA)	0 to 1 mA	1 mA max
kV Regulation	0.01%	
mA Regulation	0.01%	With feedback control
Output Stability	0.01%/ hr and 0.03%/ 8 hrs	
Ripple	0.1 % maximum	RMS
Temperature Coefficient	100 ppm / ºC	

Connected to MicroFocus Analog Controller

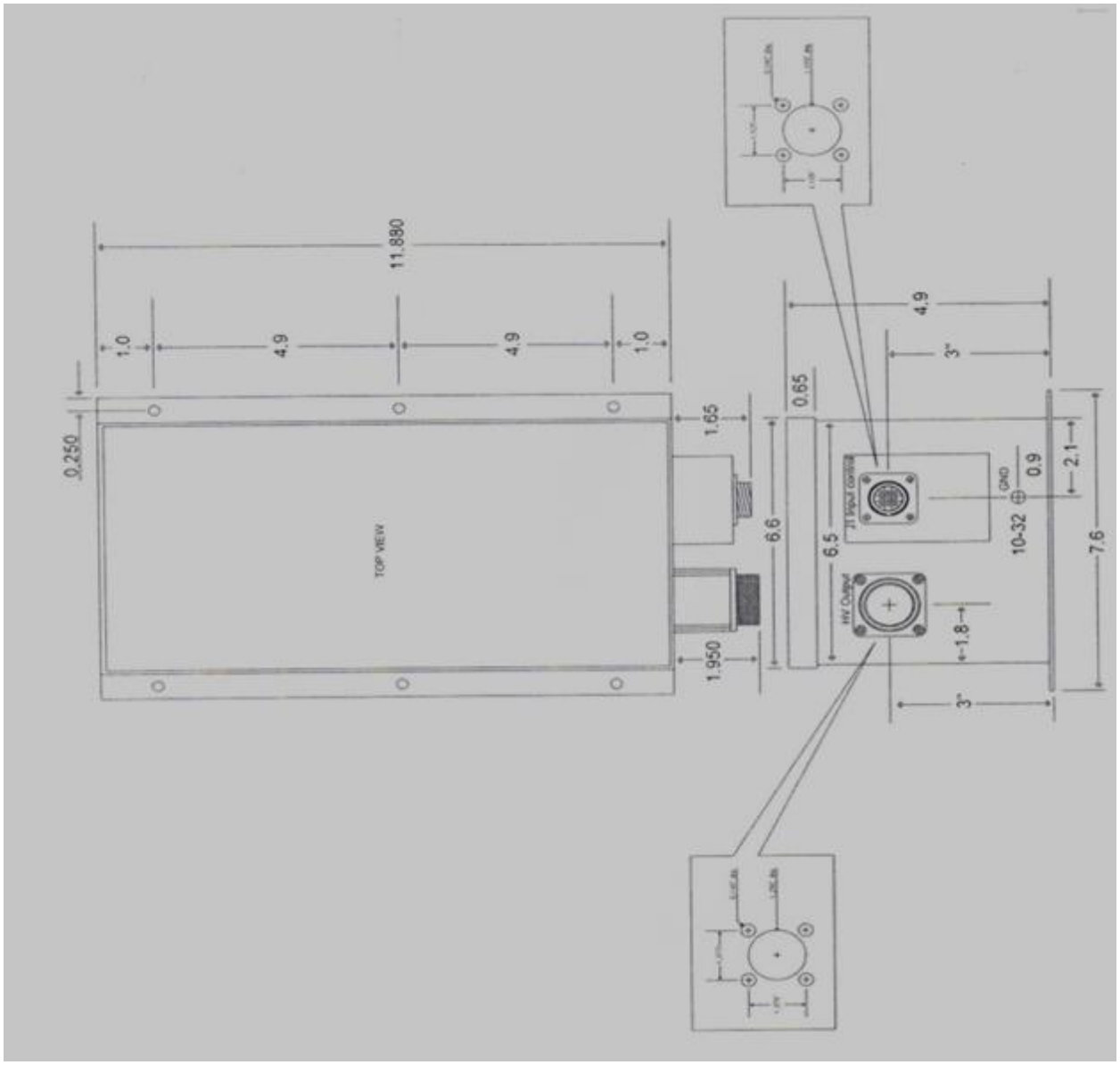


Connected to MicroFocus Digital Controller



OUTLINE DRAWING

Drawing# & Version	**DW- MFX-PS-100-1**
TruFocus P/N	**MFX-PS-100-1**
Unit	**In**



Caution

X-Ray Radiation

1. **X-Ray radiation is harmful to the human body. It is necessary to take all safety precautions when operating this device.**
2. **The x-ray tube should be installed in an x-ray shielded cabinet to avoid exposure. It is recommended that the safety interlock system be used at all times.**
3. **It is the customer's responsibility to provide shielding for the use of this device.**

Warranty Information

This x-ray tube is warranted to be free of defects in materials and workmanship for a period of 365 days (1 year). This warranty is limited to repair or replacement of defective products only. This warranty replacement cost to customer shall be prorated over the duration of the warranty period. The warranty period commences on the date of installation, but no later than 30 days from the date of shipment from TruFocus to the customer. Any loss, damage, failure and/or malfunction relating in any way to accident, abuse, alteration, misuse, neglect, fitting, disassembly, attempted repair, storage, adjustments of the electronics, or failure to use the tube within the specifications or operating instructions provided by TruFocus, or the lack of proper routine maintenance and care of the tube or system in which it is installed are expressly denied coverage under this warranty.

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