



OPERATION & MAINTENANCE MANUAL - TORREX 120D/150D

SECTION 1

GENERAL DESCRIPTION

1.1 Scope of the Manual

This instruction manual for EG&G, Astrophysics Corporations' X-ray Inspection System, includes a general description, specifications, operating instructions, circuit theory, troubleshooting procedure, adjustment and calibration procedure and parts list.

1.2 General Description

The X-ray Inspection System is a completely self-contained X-ray machine. This machine is an ideal instrument for non-destructive testing of materials and components by radiographic or fluoroscopic techniques. The system has great utility for examining metal castings, and electronic components and assemblies. It is an economical instrument for satisfying quality control requirements of small parts and assemblies. This equipment is also an indispensable tool for use in research, design and production. The system is a useful instrument to anyone in industry concerned with dependable production, low operating costs, and human safety.

The X-ray Inspection System is equipped with a thin Beryllium window X-ray tube which makes the unit ideally-suited for low and high voltage radiography. A 0.6mm focal spot provides a high degree of resolution. The high voltage is continuously variable from 0 to maximum system potential at currents of 1mA to 5mA. A unique current regulating circuit is employed. This circuit maintains the X-ray tube current constant within $\pm 1\%$ over the operating range of 105VAC to 125VAC. The X-ray generator is oil insulated and cooled. For cooling oil is forced into the anode cavity of the X-ray tube at approximately 1000 cc/minute. The heated oil then passes through an external heat exchanger. This heat exchanger is force-air cooled with a high efficiency positive pressure blower. The oil temperature remains sufficiently low, even under continuous operation at maximum power, to ensure maximum X-ray tube life.

Operator protection against X-ray radiation hazards is afforded by the use of lead shielding. An interlock on the door of the radiation chamber prevents radiation hazards to operating personnel. This interlock cuts off the high voltage power from the emitting X-ray tube when the door to the radiation chamber is opened.

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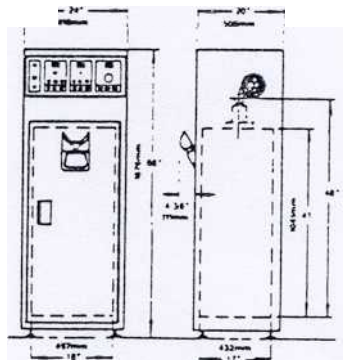
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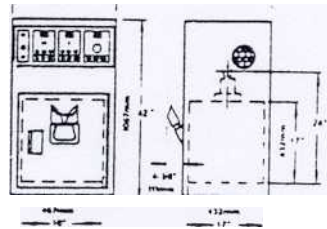
1.3 Specifications

	TORREX 120	TORREX 150
Standard Line Voltage Requirements*	115VAC - 50 or 60Hz	115VAC - 50 or 60Hz
Power Requirements	625 V.A. Maximum	850 V.A. Maximum
Output Rating, Kilo-volts (by Variac Control)	0-120	0-150
Tube Current Rating (by Thumbwheel Control)	1.0 to 5.0 Milliampères	1.0 to 5.0 Milliampères
X-ray Tube Model	Astro 120	Astro 150
Focal Spot Size	.6mm +/- .1mm	1.5mm +/- .2
Source to Film Distance	24" or 48"	24" or 48"
Cooling	Forced Oil	Forced oil
Duty Cycle	100%	100%
Beam Angle	46°	46°
Inherent Filtration	.6mm Beryllium Window	1.2 Beryllium Window
Timer Range	1 Second to 2.75 Hours	1 Second to 2.75 Hours
Cassette capacity	Up to 14" x 17"	Up to 14" to 17"
Weight - Maximum - 24"	630 lbs 720 lbs (crated)	630 lbs 720 lbs (crated)
Weight - Maximum - 48"	850 lbs 1150 lbs (crated)	850 lbs 1150 lbs (crate)

* 230 VAC - 50Hz available



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Specifications

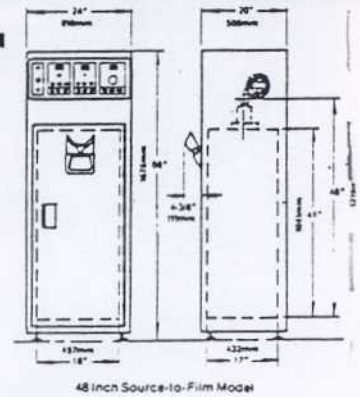
Radiation Safety: Meets or exceeds Federal Standard 21CFR, Section 1020.40 for Cabinet X-Ray Systems.

	TORREX 120	TORREX 150
Standard Line Voltage Requirements*	115.0 VAC — 50 or 60 Hz	115.0 VAC — 50 or 60 Hz
Power Requirements	625 V.A. Maximum	850 V.A. Maximum
Output Rating, Kilovolts (By Variac Control)	0-120	0-150
Tube Current Rating (By Thumbwheel Control)	1.0 to 5.0 Milliampères	1.0 to 5.0 Milliampères
X-Ray Tube Model	Astro 120	Astro 150
Focal Spot Size	.6mm ± .1mm	1.5mm ± .2mm
Source to Film Distance	24" or 48"	24" or 48"
Cooling	Forced Oil	Forced Oil
Duty Cycle	100%	100%
Beam Angle	46°	46°
Inherent Filtration	.6mm Beryllium Window	1.2 Beryllium Window
Timer Range	1 Second to 275 Hours	1 Second to 275 Hours
Cassette Capacity	Up to 14" x 17"	Up to 14" to 17"
Weight — Maximum — 24"	400 Pounds	400 Pounds
Weight — Maximum — 48"	800 Pounds	800 Pounds

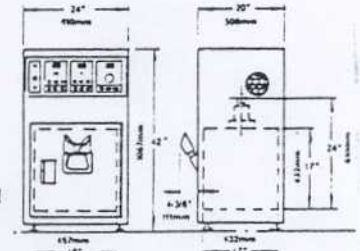
Specifications subject to change without notice

*230 VAC — 50 Hz available

NOTE: BOTH MODELS ARE AVAILABLE IN 120 OR 150 KILOVOLTS

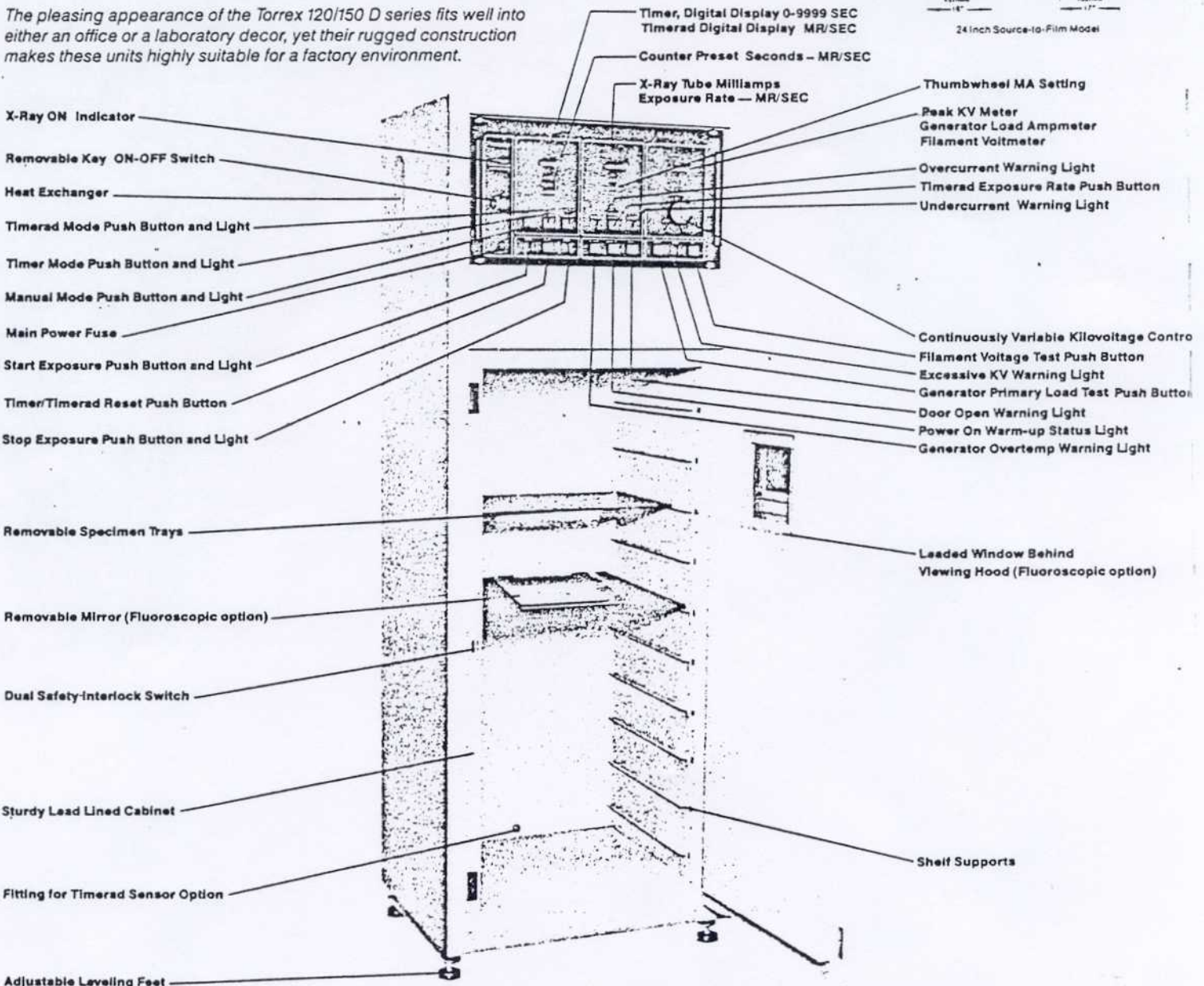


48 Inch Source-to-Film Model



24 Inch Source-to-Film Model

The pleasing appearance of the Torrex 120/150 D series fits well into either an office or a laboratory decor, yet their rugged construction makes these units highly suitable for a factory environment.

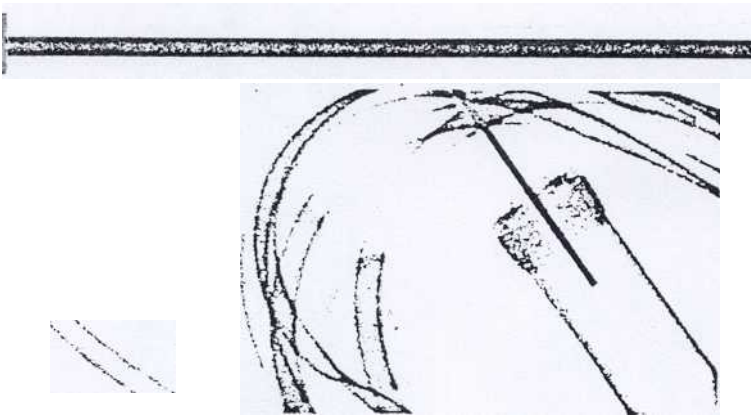


THE TORREX SYSTEMS ARE DISTRIBUTED BY:



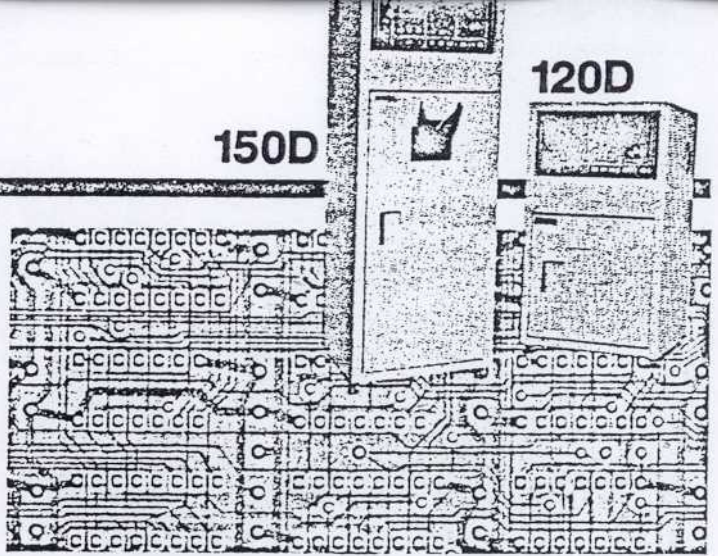
1526 West 240th Street
Harbor City, California 90710
(213) 534-4370
TELEX: 686-233 ASTRO HRBO

East Coast Office:
109 Terraca Hall Avenue
Burlington, Mass. 01803
(617) 273-5010



Sterile Pharmaceutical Kits.

Sterile pharmaceutical catheter kit showing an undesirable crimp in plastic tubing.



Multi-layered Printed Circuit Boards.

By means of Polaroid® film rapid quality control analysis can be performed right on the production line.

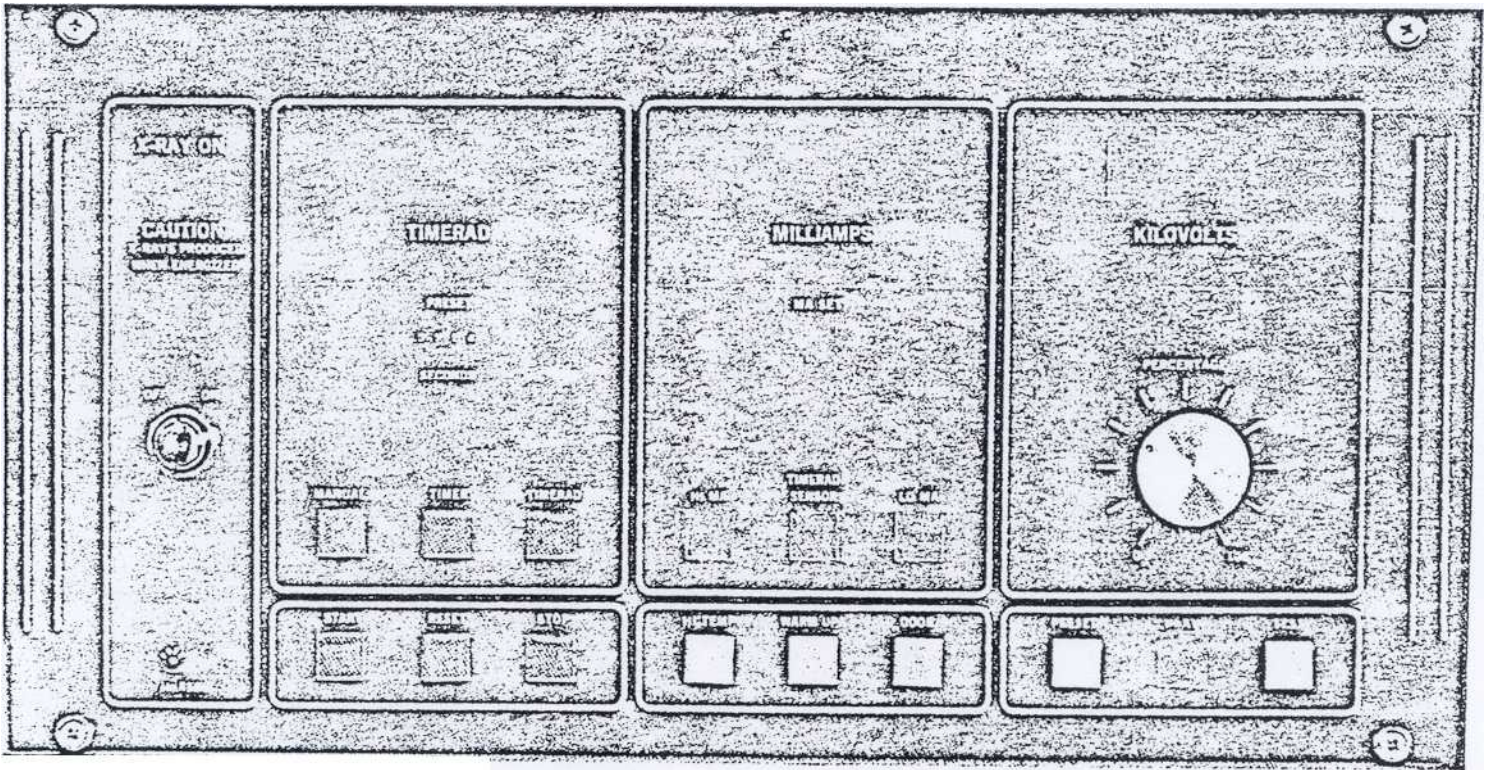


Encapsulated Circuits.

In delicate electronic components injection molding can often create loose or broken wires which can be readily detected by a quick and simple radiograph.

Die Castings.

Die cast tubes showing porosity, shrinkage and trapped gas.



Easy to Read Control Panel.

All meters are digital LE. D. indicators and the KV meter can be preset to the desired kilovoltage. When the test button is depressed, the KV meter indicates the filament voltage and is used as a system diagnostic function.

The electronic digital timer resets at zero automatically or when the reset button is depressed. If an exposure is interrupted, the timer will stop at that point and the exposure can be completed when the door is closed or the malfunction corrected. The timer operates in a range of from one second to two and three quarters hours in one second increments.