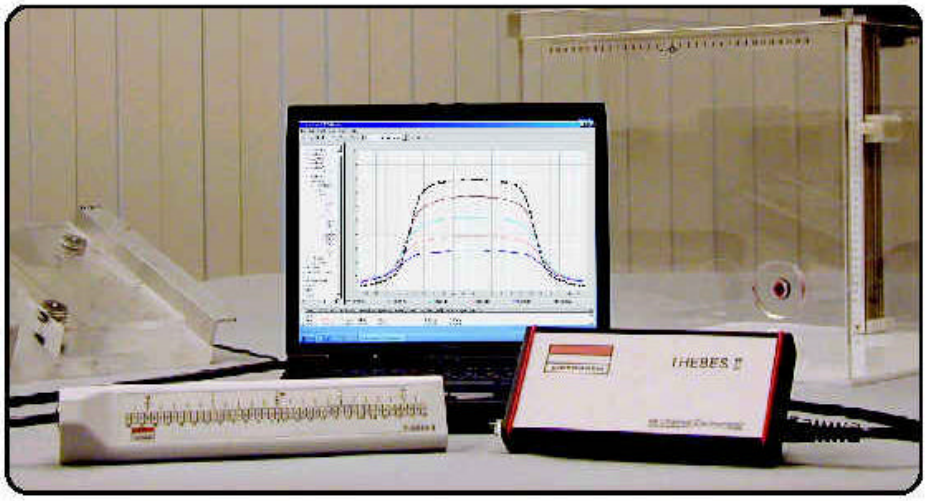
THEBES II

Victoreen Model 7020/7040



FEATURES

Flexible and easy-to-use
Range: 50 to 500 cGy/min
No external power is needed at detector location
Dynamic wedge contour mapping
Daily, weekly, and yearly checks as per TG-40
Use with watertank for depth dose calculations
Microsoft ® Access database compatible
Microsoft Excel data export

INTRODUCTION

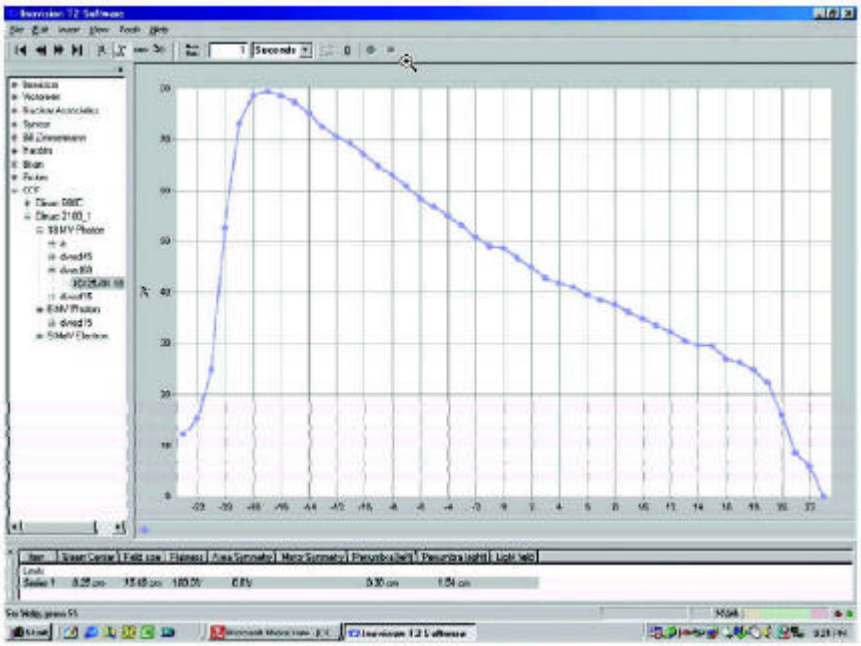
The Victoreen THEBES II consists of a linear ion chamber array, electrometer, communicator, THEBES II Contour Manager software, wall mount power supply, interconnecting cable, and carrying case. An acrylic base plate that holds the ion chamber array and build up plates are also provided.

The linear ion chamber array is permanently connected to the electrometer by a 1.5 m shielded multiconductor cable to eliminate radiation damage to the electrometer.

The THEBES II linear ion chamber array is a waterproof, linear array of 47 ion chambers on 0.5 cm centers. The total active length of the array is 23.42 cm.

The THEBES II communicator provides power and the communication interface for the THEBES II electrometer.

THEBES II Contour Manager Software is a Windows based application that acquires beam contour data from the detector array and display graphically.



60 Degree Dynamic Wedge

APPLICATIONS

The THEBES II is used to perform linear accelerator quality assurance using physicist-preferred air ion chamber technology for dose measurement, avoiding the ion transport issue of the competing liquid chamber technology and radiation damage issues of diode detectors.

The detector array consists of 47 waterproof air ion chambers in a linear array. Two detector arrays are being offered: Model 7020 with 47 ion chambers on a 0.5 cm pitch (23.42 cm total active length) and Model 7040 with 47 ion chambers on a 1 cm pitch (46.88 cm total active length).

The software performs beam contour analysis such as flatness and symmetry. Beam contour data is saved in an Access compatible database, facilitating daily, weekly, and yearly checks, aiding in following the guidelines in TG-40 and TG-51.

Linear array of 47 air ion chambers
0.5 cm spacing
Central axis chamber
Waterproof and vented
Simultaneously checks symmetry, flatness, light field vs. radiation field coincidence, field size, beam center, penumbra, constancy, and integrated total dose
Real-time dose maps for service and setup
No electronics in or near the beam
Windows ® applications software
Calibrated by Global Calibration Laboratory (GCL)

SPECIFICATIONS
LINEAR ION CHAMBER ARRAY
Detector Type Ionization chambers, waterproof and vented
Number of Detectors 47
Dimensions
7020 6.2 (w) x 30.2 (d) x 3.7 cm (h)
7040 6.2 (w) x 53.5 (d) x 3.7 cm (h)
Active Area
7020 1.0 x 23.42 cm (23 cm center to center)
7040 0.88 x 46.88 cm (46 cm center to center)
Detector Spacing
7020 0.5 cm
7040 1.0 cm
Inherent Buildup 0.5 cm polystyrene, .02 cm polycarbonate
Inherent Backscatter
Without Mounting Plate 0.3 cm acrylic
With Mounting Plate 0.3 cm acrylic, 1.0 cm acrylic
Radiation Detected
Photons 60 Co to 25 MV
Electrons 6 MeV to 25 MeV
Beam Limits
Maximum Dose/Pulse 12.5 mGy per pulse
Maximum Pulse Rate 1000 pulses per second
Maximum Continuous Dose Rate 500 cGy/min
Ion Chamber Dimensions
7020 0.42 (w) x 0.95 (d) x 0.50 cm (h)
7040 0.88 (w) x 0.88 (d) x 0.50 cm (h)
Ion Chamber Nominal Volume
7020 0.17 cm 3
7040 0.36 cm 3
Ion Chamber Alignment ± 0.3 mm of chamber outline on top of array in all axes
Nominal Bias Voltage - 300 V
Weight 0.75 lb (0.34 kg)

ELECTROMETER
Number of Channels 48
Amplifiers Non-multiplexed, low leakage, mosfet operational amplifier
Array Scan Time 1.1 ms
Frame Rate 5 frames/sec
Status LEDs 4
Dimensions 10.9 (w) x 21.6 (d) x 3.2 cm (h)
COMMUNICATOR
Computer Interface RS-232, DB-9 connector
Power Requirements 12 VDC, 1 A
Communication Interface
Connector RJ-45
Baud Rate 57.6 K
Dimensions 4.2 (w) x 8.8 (d) x 2.0 cm (h)
SYSTEM
Power Requirements
Input 120 VAC, 60 Hz, 22 W
Output 12 VDC, 1 A
Computer Requirements
Computer IBM ® compatible PC, Intel ® Pentium ® 90 or higher with at least one unused COM port
Operating System Microsoft Windows 98, ME ® , XP ® , 2000
Hard Disk Space 64 MB of available space
Mounting Plate Dimensions
7020 22.8 (w) x 30.5 (d) x 2.5 cm (t)
7040 22.8 (w) x 53.8 (d) x 2.5 cm (t)
Calibration
Accuracy 2%
Reproducibility 1%
Long Term Stability 1%
Linearity 1%
Environmental
Operating Temperature 50º to 104ºF (10° to 40° C)
Storage Temperature -13º to 149ºF (- 25° to 65° C)
Relative Humidity 20 to 75%, non-condensing
Weight 21 lb (10 kg)
Accessories Supplied
Wall Mount Power Supply

Model	**Number Description Typical Geo.**	**Region**
14-328	110 VAC 12 VDC 1000 mA	USA, Japan
14-401	230 VAC 12 VDC 1000 mA	Europe
14-414	414 230 VAC 12 VDC 1000 mA	UK
14-414 and 14-416 adaptor	230 VAC 12 VDC 1000 mA	Australia

Model 1090026000 Communication Cable, 75 ft (23 m)
Model 1080024000 Terminator, 120 ohm
Model 1090005000 Communicator
7020
Model 1070006000 Holding Assembly
Model 1070008000 1 cm Buildup Plate
Model 1070007000 2.5 cm Buildup Plate
7040
Model 1070106000 Holding Assembly
Model 1070108000 1 cm Buildup Plate
Model 1070107000 2.5 cm Buildup Plate
Optional Accessories
Model 1070060001 Wellhöfer Watertank Adaptor
7020
Model 1070049000 9.5 cm Buildup Plates
Model 73037020 3-D Watertank Adaptor
Model 73027020 2-D Watertank Adaptor
Model 1070052000 Tray Adaptor Kit, Varian Type 3
Model 1070055000 Tray Adaptor Kit, Elekta
Model 1070061000 Tray Adaptor Kit, Siemens
7040
Model 1070149000 9.5 cm Buildup Plates
Model 73037040 3-D Watertank Adaptor
Model 73027040 2-D Watertank Adaptor
Available Model(s)
Model 7020 THEBES II 20 cm Field Size Array, includes electrometer, communicator, THEBES II Contour Manager software, and carrying case
Model 7040 THEBES II 40 cm Field Size Array, includes electrometer, communicator, THEBES II Contour Manager software, and carrying case

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