

# SPECIFICATIONS



## Configuration

### **Hardware**

1 IQM Detector with battery power supply, 1 IQM Detector mount, 1 IQM Transceiver with power supply, 1 Serial cable, 1 Network cable, 1 IQM Workstation (with wall-mount), 2 IQM Virtual Server (Server hardware optional), 1 IQM Service Dummy

### **Software**

1 IQM Database, 1 IQM CALC license, 1 IQM MON license, license-free IQM Review application, site specific interfaces

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## Detector

### **Type of Detector**

Air-vented large area ionization chamber with gradient response

### **Number of Detectors**

1 (single) ion chamber

### **Ion chamber volume**

550cc

### **Active Size**

26.5cm x 26.5cm

### **Minimal Field Size:**

Unlimited

### **Maximum Field Size**

40cm x 40cm

### **Detector Resolution**

Continuous spatial resolution (similar to radio-chromic film)

### **Active Detection Area**

100% (one single detector with continuous spatial

resolution – no  
discrete detector  
spacing)

### **High Voltage**

500V

### **Polling repetition rate**

200 ms

### **Dose Range**

0.1MU x cm<sup>2</sup> to  
unlimited

### **Dose rate dependency**

< 0.2% between 20  
MU / min and 2400  
MU / min

### **Energy range**

Photon energies from  
1MV to unlimited (incl.  
FFF)

### **Dynamic range**

Between 50 counts /  
minute and 5.000.000  
counts / minute

### **Signal reproducibility**

> 99.95%

### **Signal linearity (dose output)**

100% proportional

### **Air Kerma correction**

Built-in Thermometer  
and Barometer

### **Inclinometer (built- in)**

- Inclinometer  
resolution: 0.1°

- Gantry angle resolution: 1°
- Collimator angle resolution: 1°

### **Battery**

4 Lithium-Ion batteries  
(medical device certified)

### **Battery life**

>24 hours

### **Battery Management System**

Monitors and displays current battery status

### **Battery recharge time**

Approx. 25min (20%),  
approx. 5 hours (100%)

### **Data connection**

Bluetooth

### **Detector enclosure material**

Aluminum with  
Carbon Fiber cover

### **LED Indicators**

5 on Front Panel  
(Power On/Off,  
Electrometer,  
Inclinometer,  
Bluetooth, Battery)

### **Manufactured**

100% Made in  
Germany

**Dimensions**

45cm x 35cm x 3.5cm  
(17.7" x 13.8" x 1.37")

**Weight (incl. battery)**

4.3kg (9.48lb)

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**Beam Attenuation****Beam Attenuation Type**

Homogeneous, energy dependent  
6MV – approx. 5.5%  
18MV – approx. 4.5%

**Effect on surface dose**

3% to 5% increase of local surface dose (at SSD 90cm)

**Effect on beam quality**

Negligible

**Effect on beam spectrum**

Negligible

**Integration of beam attenuation in TPS**

Tray Factor  
or  
Modified Beam Model

**Supplied IQM Service Dummy**

Same beam attenuation as IQM detector during service or repair

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## Connectivity

### **Detector signal data transfer**

Via Bluetooth to IQM Transceiver in the treatment room (including country-specific power supply)

Via Serial Cable between treatment room and control room

### **Serial cable**

23m (optional 15m or 30m)

Between treatment room and control room

### **IQM Transceiver**

Bluetooth transceiver installed in treatment room

### **Network cable**

10m

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## **IQM Database**

## **IQM CALC (Calculator)**

Fully automated reference calculation based on imported DicomRT plan datasets

Features

- Automated data import
- Automated patient creation
- Automated reference calculation
- Automated matched energy handling
- Automated "alias" handling
- Automated e-mail reporting
- Automated error reporting
- Automated activity logging

## **IQM MON (Monitor)**

Real-time comparison of the calculated and measured signal at every control point

Features

- Automated patient synchronization
- Automated patient data loading
- Automated tolerance level application
- Automated data acquisition
- Automated data processing
- Automated data comparison
- Automated treatment verification
- Automated error detection
- Automated report generation

**IQM Rev (Review)**

Offline review software

**Data output format**

Portable document format (.PDF), Microsoft Excel (.XLSX) and text format (.CSV)

**Workstation**

**Processor**

Intel® 6th generation Core™ i5 Quad Core

**Display**

23.8" WLED, Full HD 1920x 1080 resolution with anti-glare coating; projected capacitive touch screen

**Video**

Integrated Intel® HD Graphics 530 (6th generation Core i5/i7 CPUs), Optional 2GB AMD Radeon™ R7 A370, 2GB

**Memory**

8GB (2x4GB) 1600MHz DDR3L Non-ECC dual-channel 2133 MHz DDR4 SDRAM, supports up to 16GB



## Networking

Integrated Intel® I219-LM Ethernet LAN 10/100/1000; supports optional wireless M.2 802.11ac + Bluetooth 4.1

## I/O Ports

8 External USB: 6 x 3.0 2 side/4 rear (1 side with Powershare) and 2 x 2.0 2 rear, HDMI 1.4 In/Out, DisplayPort 1.2, RJ-45, 1 Universal Headset (Side), Line-out 1 Rear

## Removable Media

Supports optional optical disc drive and standard media card reader

## Hard Drives

500GB 5400RPM SATA Hard Drive

## Camera

2.0MP FHD webcam with Privacy Cover

## Mouse

Dell(TM) MS111 USB Optical Mouse

## Keyboard

Dell KB212-B QuietKey USB Keyboard Blac

## Operating System

Microsoft® Windows 10 Pro 64-bit

## Dimensions (H x W x D)

39.290 x 57.524 x

## Weight

8.150 kg

6.269cm

17.968 lbs

15.468 x 22.647 x

2.468"

### Wall mount

Ergotron LX HD

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## Virtual Server

### Server Virtualization supported

Yes

### Supported VM types

Hyper-V and VMWare

### Number of Virtual Machines required

2 (1x IQM DB, 1x IQM  
Services)

### Minimum Hardware Requirements

for each virtual machine:

- Processor: 2.5 gigahertz (GHz) or higher, 4

vCPUs or more

- RAM: 8 gigabyte (GB) RAM or more
- Hard disk storage: 1 TB or more + (1 TB on IQMAPPSERVER for each additional IQM detector)

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## Server (optional)

### **Processor**

Intel Xeon Gold 6132  
Processor 2,6 GHz, 14  
Cores/ 28 Threads

### **Operating System**

Microsoft®  
Windows Server 2016  
Standard

### **Memory**

32GB RAM

### **RAID**

4 Hard Drives – RAID  
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### **Hard Drives**

4x 4TB HDD SATA

### **Network**

2x Network Adapters  
with Ethernet  
connections

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## Additional information

### **Multi Treatment Room Support**

Yes (optional)

### **Multi-Linac energy matching support**

Yes (supports Linac group configuration)

### **Data Acquisition**

During patient treatment for Fraction QA or Plan QA  
In absence of patient for Plan QA or Machine QA

### **Type of Fraction QA**

Intra-fractional verification in real-time during patient treatment

### **Verification frequency**

Every beam segment individually (per control point)

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# Regulatory

## **Regulatory Certification**

- CE certified as Safety Class IIb Medical Device  
(click to download)
- FDA 510(k) as Safety Class II Medical Device  
(click to download)
- Health Canada Approval as Safety Class III  
Medical Device (click to download)

## **Life cycle**

2 x 6 years (with scheduled exchange batteries every 2 years and of detector electronics and IQM workstation after 6 years)

## **Availability**

IQM is not available for sale in all countries

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*"This allows everyone to stay ahead of the game of QA."*

< Stanley Benedict, Ph.D. Professor & Vice Chair of Clinical Physics, Department of Radiation Oncology, University of California at Davis Comprehensive Cancer Center, USA >

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< QA AUTOMATION

VERIFYING TOTAL BODY IRRADIATION  
WITH IQM >



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