



MODULAR OPERATION THEATRE



407-412, 4th Floor, Span Centre,
South Avenue, Santacruz (W),
Mumbai - 400 054, India.



+91-22 62396666 / +91 9321759250



+91-22 62396060



+biox@biox.co.in



www.bio-xmedical.com
www.biox.co.in



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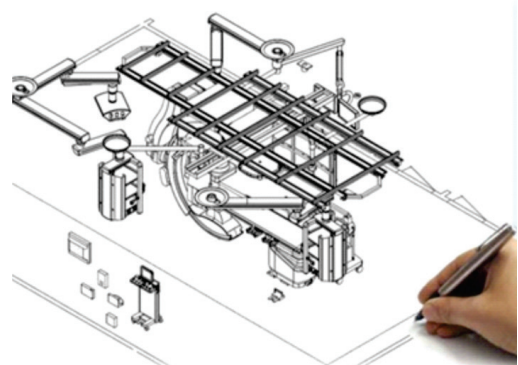
We would like to introduce ourselves as an ISO certified manufacturers of Modular Operation Theatres.



Modular represents a unique combination of design, quality, innovation and flexibility which enable customised adaptations, upgrades and the integration of new devices to be carried out at any time.

The highest quality standards are met, prefabricated modules are tailor-made to the customers' requirements and the integration of new systems and devices for operating rooms, preparation rooms and scrub areas.

We are focused on providing ideal clinical conditions in operating rooms. An OR is a dynamic work environment in which its important to communicate, have a sterile, filtered air, flushed antibacterial surfaces and controlled conditions in the OR.



Planning:

The design of the modular system is carried out in accordance with technical building requirements. We are focused on planning, designing, providing 3D visualizations and simulations for our customers according to the needs. We suggest the ideal materials which can be used, integrate all the medical equipment's and technologies internally as well as externally in order to provide the best possible solution for our customers. Our main focus remains ensuring the best possible use of resources for our customers.

Design:

Our solutions are in accordance with the international guidelines, regulations and norms. We follow NABH, GMP and FDA guidelines.

Construction:

The turnkey solutions for the OR's include complete wall and ceiling panels, HVAC, Laminar flow, antibacterial vinyl / epoxy flooring, medical gas outlets and all the medical equipment's to complement and integrate all parameters essential for the smooth operation of an OR.

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The advantage of the modular systems are:

- Quick installation time.
- Surfaces easy to clean and disinfect.
- Ease of access to all equipments and wiring behind the wall panels.
- Easy dismantling for new construction, renovation and maintenance.
- Perfect Integration with other equipment's.
- Modern and aesthetic.

We offer the below mentioned solutions for the OR:

Wall Systems And Ceiling Systems:

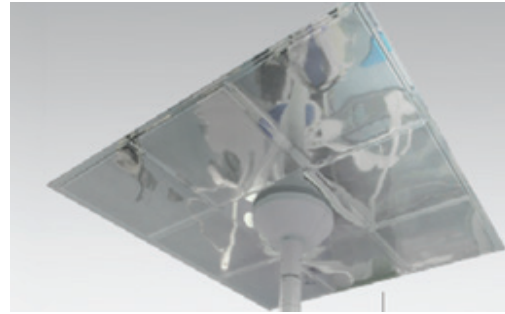
Stainless-Steel PUFF panels, Pre-painted Stainless-Steel panels, GI panels with anti-microbial paint, Antibacterial PU paint on brick wall, Antibacterial PVC panels, HPL PUFF paneling, Glass, Corian and Radio-opaque lining on walls. The wall paneling is usually 50 mm thick where-as the ceiling is 30mm thick. Graphic images can also be added to add a soothing effect on the healthcare professionals and the patient.



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Laminar Ceiling with Air Diffusers:

The Laminar ceiling air diffusers are an integral part of the modular operation theatres and clean rooms. The Laminar ceiling is equipped with absolute H14 filters with 99.99% filtration efficiency and provide balanced flow speed to 0.15-0.3m/s linear airflow within the operating table area, thus maintain a Class 100 type room. This type of airflow complies with the highest hygienic requirement. Each diffuser is made of a set of modular, tightly connected, standard Stainless-Steel or powder coated aluminum structure which precisely control the Air changes in the room. The diffuser made out of S S 304 perforated sheet or two layer of mono-filament precision woven polyester for the plan-air ceiling to give a "LAMINAR FLOW" to the filtered air.



Ducting and Insulation:

Galvanized steel and aluminium are the most common materials for sheet metal ducts since they are least likely to harbour dangerous moulds or growths because they have non-porous surfaces.

Ducts are conduits or passages used in heating, ventilation, and air conditioning (HVAC) to deliver and remove air. The needed airflows include-supply air, return air and exhaust air. Ducts commonly also deliver ventilation air as part of the supply air. 22G aluminium ducting provide an ideal ducting solution and long life.



HVAC ductwork and systems require external thermal insulation to keep air temperature and systems running as designed. Investing in a fully adapted external insulation solution also has numerous benefits for project owners (reduced energy consumption), installers (lightweight and easy to handle) and occupants (improved comfort). Reduce the amount of heat (or cold) energy needed

to maintain the air temperature as designed, while also preventing the formation of condensation.

Significantly reduce the amount of noise transmitted through the ductwork and pipework in the HVAC system. To protect building users and occupants with our non-combustible insulation materials, with no contribution of toxic smoke or flaming droplets. 13 & 19mm thick class 'o' nitrile rubber with aluminium foil is ideally preferred.

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Doors:

The OR door must include the following features- Air tightness, Noise free, Stable and reliable operation, Intelligent safe as well as Eligant and Simple. Our robust construction, ensures operational reliability even in the most demanding of conditions. Non-porous surface, Good stability towards water-vapor, High scratch and impact resistance, High chemical resistance, Antistatic. Maintenance free, Maintains an air tight atmosphere. We provide flush doors both sliding and swing type- PUFF insulated for acoustic and thermal insulation which is 49mm thick with using of 0.8 mm thick sheet of SS, Powder coated GI or Antibacterial PVC sheet with a 4mm plain see through glass flush on both sides. We use high quality rubber sealing, 4-sided EPDM Gasket ensures hermetic sealing. We provide lead lined doors for medical radiation shielding & nuclear radiation shielding projects



Windows:

Observation window flushed in the walls with double glazed glass. Optionally can be equipped with manual, automatic and electrically operated blinds and shutters and can be provided with lead glass for radiation protection.



Flooring:

We use high quality 2mm thick Flexible Homogeneous vinyl Floor covering with an electrical resistance of $5 \times 10^4 \leq R \leq 10^6$ (EN 1081). The conductive carbon coated PVC pellets create the permanent static-conductive properties. It complies with EN 649. Vinyl roll is made up of several layers, comprising a fiberglass core for stability, a foam or polyester backing for acoustic and thermal insulation, and



a transparent wear layer and polyurethane (PU) treatment layer, which provides resistance against spills and stains.

Alternatively you can also use epoxy flooring which is easy to maintain and because of its seamless and liquid-tight nature, it is extremely easy to clean and very hygienic.

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Surgeon Control Panel:

The control panel is mainly used in operation theatre rooms to display the operation time, time of the day, controlling and displaying Temperature & Humidity, medical gas alarm and telephone. We manufacture and supply a wide range of Surgeon Control Panel. We are manufacturing the membrane type, touch glass type and touch screen type control panels.

Our control panels are CE Marked.

Samsung Touch Screen

The touch sensitive monitor is available in 22", 27" and 32" screen from Samsung which operates and monitors OT parameters like temperature, humidity. The graphical interface is capable of displaying all kinds of complex topologies. The status and command information is presented in a manner that is well structured and clear. The android based software is both modular and flexible, enabling it to be adapted or expanded, or to accommodate new technologies. The touch screen comprises of the following features:



1. Daytime Digital Clock Elapsed
2. Time Digital Clock
3. Anesthesia Countdown (Reverse Countdown)
4. Temperature & Humidity Indicator
5. Peripheral & OT Light Controller
6. Medical Gas Alarm (Hi/Low/Normal)
7. Hands Free Telephone
8. Music System
9. Room Differential Pressure
10. HEPA Filter Status

SPECIFICATION:

Cut-out Dimension :	860 mm X 470 mm X 200 mm.
Circuit Voltage :	24V & 12V DC.
Digital Clock :	(HH:MM:SS).
Elapsed Clock :	(HH:MM:SS) (Start-Stop-Reset).
Anesthesia Clock :	(HH:MM:SS) Reverse Countdown. Separate Switch For Display ON/OFF.
Light Control :	3 Channel (2 For Peripheral Lights & 1 For Plan Air) 0-10V Dimming Range 2 Channel (2 For OT Lights On/Off) and 2 OT Lights.
Temperature & Humidity :	Display Room Temperature & Humidity.
Gas Alarm :	5 Channel (4 Gases + 1 Vacuum) (High/ Low/ Normal/ Indication).
Hans Free Phone :	Dialing & Receiving Calls With Caller ID.
Hepa Filter :	Shows Hepa Filter Status (Normal/Choke).
Music Player :	Plays Mp3 & Other Supported Files Through Wired And Bluetooth Transmission.

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21" Touch Screen Monitor



With the touch sensitive monitor, is a 21" touch screen monitor which can be operated directly at the touch of a finger. We have incorporated the following features in the control panel:

1. Daytime Digital Clock Elapsed
2. Time Digital Clock
3. Anesthesia Countdown (Reverse Countdown)
4. Temperature & Humidity Indicator
5. Peripheral & OT Light Controller
6. Medical Gas Alarm (Hi/Low/Normal)
7. Hands Free Telephone
8. Music System
9. Room Differential Pressure
10. HEPA Filter Status

SPECIFICATION:

Cut-out Dimension	:	615 mm X 425 mm X 120 mm.
Circuit Voltage	:	24V & 12V DC.
Digital Clock	:	(HH:MM:SS).
Elapsed Clock	:	(HH:MM:SS) (Start-Stop-Reset) Separate Switch for Display ON/OFF.
Light Control	:	3 Channel (2 For Peripheral Lights & 1 For Plan Air) 0-10V Dimming Range 2 Channel (2 For OT Lights On/ Off).
Temperature & Humidity	:	Display Room Temperature & Humidity.
Gas Alarm	:	5 Channel (4 Gases + 1 Vacuum) (High/ Low/ Normal/ Indication).
Hands Free Phone	:	Dialing & Receiving Calls With Caller ID.
HEPA Filter	:	Shows Hepa Filter Status (Normal/ Choke).

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10" Industrial Touch Screen

The touch sensitive monitor 10" industrial touch panel is extremely robust



We have incorporated the following features in the control panel:

1. Daytime Digital Clock.
2. Elapsed Time Digital Clock.
3. Anesthesia Countdown (Reverse Countdown).
4. Temperature & Humidity Indicator.
5. Peripheral & OT Light Controller.
6. Medical Gas Alarm (Hi/Low/Normal).
7. Hands Free Telephone.
8. Music System.
9. Room Differential Pressure.
10. HEPA Filter Status
11. IPS and UPS alarm

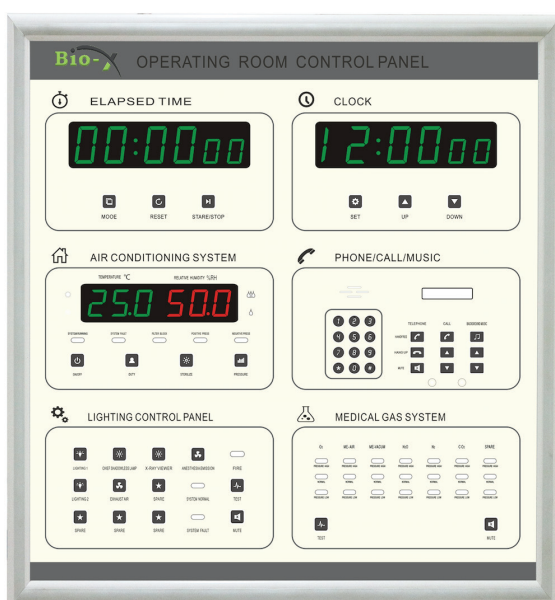
SPECIFICATION:

Cut-out Dimension	: 245 mm X 155 mm X 150 mm.
Circuit Voltage	: 24V & 12V DC.
Digital Clock	: (HH:MM:SS).
Elapsed Clock	: (HH:MM:SS) (Start-Stop-Reset) Separate Switch for Display On/Off.
Temperature & Humidity	: Display and control of Room Temperature & Humidity.
Light Control	: 2 Channel (2 For Peripheral Lights with 0-10V Dimming Range) 2 Channel (2 For OT Lights On/ Off)
Gas Alarm	: 5 Channel (4 Gases + 1 Vacuum) (High / Low / Normal Indication).
Hands Free Phone	: Dialing & Receiving Calls With Caller ID.
HEPA Filter	: Shows Hepa Filter Status (Normal/ Choke).
Room Pressure	: Displays Differential Room Pressure.
IPS and UPS Alarm	: Displays IPS and UPS Alarm
Music	: Option of Local and Bluetooth.

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Touch Glass

Bio-X Touch Glass Surgeon Control Panel which uses capacitive touch sensing is made from glass or acrylic making it extremely hygienic and easy to clean. The chances of the keys getting spoilt in the membrane type panel because of constant pressing or using sharp objects is eliminated in the touch glass control panel. Control panel comprising of following features, which the user can opt as per their requirements.



1. Daytime Digital Clock Elapsed.
2. Time Digital Clock.
3. Temperature & Humidity Indicator And Controlling.
4. Peripheral Light Controller.
5. Medical Gas Alarm (Hi/ Low/ Normal).
6. LCD Hands Free Telephone.
7. Music System.
8. Room Differential Pressure.
9. HEPA Filter Status.

SPECIFICATION:

Cut-out Dimension	: 685 mm X 745 mm X 120 mm.
Circuit Voltage	: 12 and 24 V AC/DC.
Digital Clock	: Green Color Display (1.8" Character HH:MM:SS) (Set-Up-Down).
Elapsed Clock	: Red Color Display (1.8 "Character HH:MM:SS) (Start-Stop-Reset) Lights Control.
Temperature & Humidity	: Display Room Temperature & Humidity With Controlling Outputs For Both Temperature & Humidity.
Light Control	: 3 Channel (2 For Peripheral Lights & 1 For Plan Air) 0-10V Dimming Range And 2 Surgical Lights.
Gas Alarm	: 5 Channel (4 Gases + 1 Vacuum) (High / Low / Normal Indication).
Hands Free Phone	: Dialing & Receiving Calls With Caller ID.
Music Player	: Which Can Play Music If Required.
Optional Features Include	: HEPA Filter Status Indicator Differential Room Pressure Reading.

MODULAR OPERATION THEATRE

Membrane Control Panel

Bio-X Membrane Surgeon Control Panel been designed to cope with the operating theatre environment. PCB based model which is designed to be user friendly and extremely durable and can be customized as per requirement. The control panel comprising of following features.

1. Daytime Digital Clock Elapsed.
2. Time Digital Clock.
3. Temperature & Humidity Indicator.
4. Peripheral Light Controller.
5. Medical Gas Alarm (Hi/ Low/ Normal).
6. LCD Hands Free Telephone.
7. Music System.
8. Room Differential Pressure.
9. HEPA Filter Status.



SPECIFICATION

Cut-out Dimension	: 640 mm X 640 mm X 110 mm.
Circuit Voltage	: 24V DC.
Digital Clock	: Green Color Display (1.8 "Character HH:MM:SS) (Set-Up-Down).
Elapsed Clock	: Red Color Display (1.8 "Character HH:MM:SS) (Start-Stop-Reset).
Light Control	: 3 Channel (2 For Peripheral Lights & 1 For Plan Air) 0-10V Dimming Range. (Can Be Customized To Maximum Of 6 Channel).
Temperature & Humidity	: Display Room Temperature & Humidity With Controlling Outputs For Both Temperature & Humidity.
Gas Alarm	: 5 Channel (4 Gases + 1 Vacuum) (High / Low / Normal Indication).
Hands Free Phone	: Dialing & Receiving Calls With Caller ID.
Optional Features Include	: Measurement And Display Of Differential Room Pressure Music System. Display HEPA Filter Status.

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Sensors:

Temperature And Humidity Sensor – Honeywell

To measure the temperature and humidity inside the OR (0-50 – °C/0-100%)

2 X Analog Output 0-10V



Room Pressure Sensor – Beck

To measure the differential pressure between the OR and the external environment.

Analog output – 0-10V or 4-20mA.

With reset button.



Medical Gas Sensor - Ma-TER



For pressure switch calibrated 3.2V (low level) for O₂, Air 4, Air 7, N₂O, CO₂.



For pressure switch calibrated -0.4bar (low level) for vacuum.

Hepa Filter Sensor - Beck

Pressure switch to measure the differential pressure between the inlet and outlet of the hepa filter.



Pendants:

We manufacture Single and double arm anaesthesia and surgical horizontal and vertical pendants. The Pendant is made up of 3 mm thick high strength Aluminium Extrusion with option of having gas outlet and electrical outlets. It also consists of IV pole which are made up of stainless steel 304 grade. The trays are made up of High Strength Aluminium Alloy. High quality imported Steel bearing is used for the rotation. The pendants are capable of a 330° rotation. The pendant is designed to be ceiling-mounted ensuring best possible ergonomics. All pendants have a High strength Aluminium Extrusion Arm with stainless steel fasteners. PVC ducting is used to isolate the internal wiring.



MODULAR OPERATION THEATRE

Magnetic Writing Board



The magnetic writing board for the clean rooms is used for writing down information by doctors / technicians. The magnetic writing board is flushed into the Clean room wall.

The board is also coated with an antimicrobial coating making it useful for all clean rooms. The front panel can be made from Magnetic powder coated sheet and glass.

Size : 845 X 550 X 29 mm

Cutout Size : 825 X 530 mm

Pass Box – Static And Dynamic

We manufacture static and dynamic pass boxes with the following features.

The pass boxes are made from high quality Stainless Steel 304 Matte material.

It comes with a 1.2 mm double skinned door with matte finishing with 4 mm thick toughened glass to view inside.

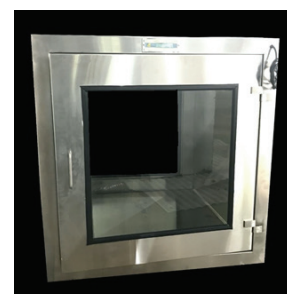
Protected with Electro-magnetic locks.

It consists of LED Light and UV Light.

Electrical on / off switch with both side displays.

The dynamic pass box consists of blower with vertical down flow creating a class 100/ ISO class 5 environment.

The Velocity at Grill is 0.45 ± 0.05 mps (90 ± 20 FPM), Noise level < 65Db on scale and it comes with H-14 grade HEPA Filter having efficiency 99.999% at $0.3 \mu\text{m}$. It comes with a Magnehelic pressure gauge to measure the pressure inside the chamber.



Scrub Sink



Scrub sinks are made from Stainless Steel 304 material. We manufacture Single, Double and Triple scrub sink station in combination of Manual, IR operated, Knee Operated and foot switch operated configuration. The scrub sinks are made from high quality stainless steel SS 304 having electronic or manual taps with thermostatic controller which can be floor or wall mounted.

The scrub sinks can have extra accessories such as automatic, electrical and manual soap dispensers, paper towel dispensers and endoscope and catheter washing trays and hooks.

MODULAR OPERATION THEATRE

Pressure Relief Damper

Bio-X supplies SS 304 grade Pressure relief dampers with SS blade to maintain +ve pressure inside the OT. Gear operated manual dampers to be operated from laminar flow to plenum all complete as per Specifications.

Characteristics of our PRD include:

Ideal for maintaining differential room pressure, when doors are opened between clean rooms & external atmosphere.

Remains closed at pressure below the set pressure & open fully at pressure only fractionally above the threshold.

Pressure:

Cut-out Dimension: 325 (H) X 300 (W) X 100 (D)

We can customized the size as per user requirement.



Storage System



Operation Room Storage is used for storing medical equipment, devices, medicines etc and made from Stainless Steel with height adjustable shelves and drawers with clear glass and hinged door.

LED Peripheral Luminaries

Bio-X specializes in the manufacture of LED Peripheral OT Ceiling Light Panels.

FEATURES:

- ➔ Bio-X Luminaries Are Designed To Avoid Reflections (Anti-Glare).
- ➔ Bio-X Luminaries Are Designed Specially To Facilitate The Seamless Design Of The Modular Operation Theatre In Hospitals.
- ➔ Bio-X Luminaries Are Ip54 Grade Suited Ideally For Clean Room.



PROPERTIES

Led Life	-	100,000 Hours
Colour Rendering	-	> 90%
Efficiency	-	> 85%
Colour Temperature	-	6500K
Maximum Surface Luminance	-	> 13000 Lux
Dimensions	-	300 mm X 600 mm & 600 mm X 600 mm

MODULAR OPERATION THEATRE

LED X-Ray View Box (High End Version)

Bio-X specializes in the manufacturing of LED based X-Ray Film Viewers (X-Ray Illuminator / X-Ray View Box).

Keeping the needs of the doctors in mind along with the continuously changing demands of Hospitals and Nursing Homes, we have developed a sleek and effective LED Viewing System to view M.R.I, C.T. and X-Ray images. Bio-X offers Single Screen, Double Screen (Dual Screen), Three Screen (Triple Screen), Four Screen (Quadruple Screen) View Boxes.



FEATURES:

- ➔ Slim, Durable and Energy Effective.
- ➔ Efficient: Savings Range From 82% To 93%.
- ➔ No UV Emission.
- ➔ Unparallel latest LED backlight technology. 4-5 times longer than regular CCFL/EEFL.
- ➔ Power Efficient. L.E.D Light With Long Life - Upto 100,000 Hours.
- ➔ Reliable Magnetic Nipper.
- ➔ Initial Brightness Can Be Set.
- ➔ Film Activation Switch-automatic Shutdown If No Film Inserted.
- ➔ 12 Step Digital Dimmer To Get The Perfect Brightness.

SPECIFICATIONS:

PARAMETER		SINGLE SCREEN	DUAL SCREEN	TRIPLE SCREEN	QUADRUPLE SCREEN
Dimensions (mm)	Frame (W x H x D)	503 (W) x 503 (H) x 29 (D) mm	880 (W) x 503 (H) x 29 (D) mm	1255 (W) x 503 (H) x 29 (D) mm	1631 (W) x 503 (H) x 29 (D) mm
	Viewing Area (W x H)	360 (W) x 440 (H) mm	736 (W) x 440 (H) mm	1112 (W) x 440 (H) mm	1488 (W) x 440 (H) mm
Power Consumption		15W	30W	45W	60W
Light Source		LED	LED	LED	LED
Power Supply Input		AC100-240V 50/60Hz	AC100-240V 50/60Hz	AC100-240V 50/60Hz	AC100-240V 50/60Hz
Brightness (LUX)		> 10,000	> 10,000	> 10,000	> 10,000
Net Weight (Kgs)		4.8	8.8	12.4	16

MODULAR OPERATION THEATRE

LED X-Ray View Box (Economy Version)



The economy version of Bio-X slim LED X Ray Viewer is available in Single Screen and Double Screen.

We offer a combination of benefits that is unmatched by our competition: reliability, distinctive product line designed to match your requirements, technical support for layouts, excellent service and stunning looks.

This extremely slim model has the power adaptor outside the view box.

FEATURES:

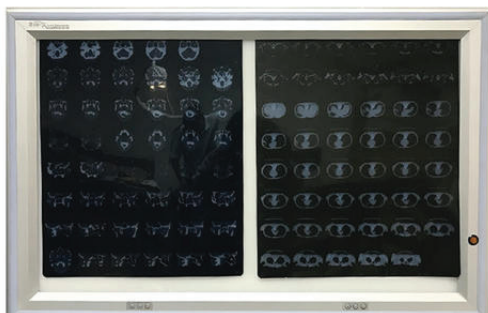
- Slim, Durable And Effective.
- Energy Efficient: Savings Range From 82% To 93%.
- No UV Emission.
- Unparalleled Latest LED Technology. 4-5 Times Longer Than Regular CCFL / EEFL.
- Power Efficient. L.E.D Light With Long Life- Upto 100,000 Hours.
- 10 Steps Digital Dimmer To Get The Perfect Brightness.
- External Power Adapter.

SPECIFICATIONS:

PARAMETER		SINGLE SCREEN	DUAL SCREEN
Dimensions (mm)	Frame (W x H x D)	430 (W) x 490 (H) x 16 (D) mm	763 (W) x 490 (H) x 16 (D) mm
	Viewing Area (W x H)	360 (W) x 440 (H) mm	736 (W) x 440 (H) mm
Power Consumption		15W	30W
Light Source		LED	LED
Power Supply		AC100-240V 50/60Hz	AC100-240V 50/60Hz
Brightness (LUX)		>6,500 LUX	>6,500 LUX
Net Weight (Kgs)		3.6	7

MODULAR OPERATION THEATRE

Flush Mounted LED X-Ray Viewer



We have developed the flush mounted L.E.D X-ray viewer which can be concealed into the wall of the operation theatre especially incase of modular operation theatres. This ensures a seamless design hence maintaining a clean and sterile environment.

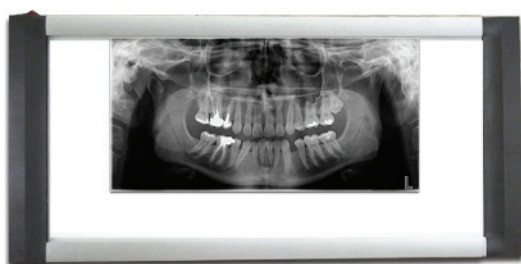


SPECIFICATIONS:

Parameter		Single screen	Double Screen	Triple Screen	Four Screen
Dimension (mm)	Frame Size (L x H x T)	470 x 550 x 29 mm	845x550x29 mm	1220x550x29 mm	1595 x 550 x 29 mm
	Cutout Size (L x H x T)	450 x 530 x 29 mm	825x530x29 mm	1200x 530 x 29 mm	1575 x 530 x 29 mm
Viewing Area (W x H)		360 x 440 mm	736 x 440 mm	1112x 440 mm	1488x 440 mm
Power Consumption		15W	30W	45W	60W
Light Source		LED	LED	LED	LED
Power Supply Input		AC100-240V, 50 Hz	AC100-240V, 50 Hz	AC100-240V, 50 Hz	AC100-240V, 50 Hz
Surface Brightness (LUX)		> 10,000	> 10,000	> 10,000	> 10,000
Colour Temperature		6500K	6500K	6500K	6500K

Dental LED X-Ray Viewer

We have developed the dental L.E.D X-ray viewer which can be used by dentists to view OPG films.



Parameter		Dental View Box
Dimensions (mm)	Frame (L x H x T) mm	575 (W) x 260(H) x 20 (D)
	Viewing Area (W x H) mm	492 x 217
Power Consumption		10W
Light Source		LED
Power Supply		AC100-240V 50Hz
Brightness (LUX)		>7,500
Net Weight (Kgs)		2.8