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Trisco

TURNKEY SOLUTIONS
FOR INNOVATIVE
MODULAR OPERATION ROOM

TRICHUR SURGICALS

AN ISO 13485 CERTIFIED COMPANY



■ WHAT SHOULD BE THE DESIRED QUALITY OF MODULAR OPERATION ROOM ?

The desired quality for Modular Operation Room (MOR) should be in line with National Accreditation Board for Hospitals and Healthcare Providers (NABH) and Clean Room Standards. The NABH standard is an abridged form of AHRAE/EU and clean room standards, modified to suit in the Indian context.

THEY ARE BRIEFLY AS UNDER:

- ✔ **TEMPERATURE AND HUMIDITY:** $21^{\circ}\text{C} \pm 30\text{C}$ inside the OR at all times with corresponding relative humidity between 20 to 60%. Appropriate devices to control, monitor and display these conditions inside the OT need to be installed.
- ✔ **AIR CHANGES (ACH):** 20 Air Changes per hour, out of which 20 percent (4 changes) should be Fresh Air component.
- ✔ **AIR VELOCITY:** 25-35 FPM, The airflow needs to be unidirectional and downwards on the OT table. The air face velocity of 25-35 FPM (feet per minute) from non-aspirating unidirectional laminar flow diffuser/ceiling array is recommended.
- ✔ **AIR PRESSURE:** Positive Pressure 2.5 Pascal. The minimum positive pressure recommended is 2.5 Pascal (0.01 inches of water). There is a requirement to maintain positive pressure differential between OT and adjoining areas to prevent outside air entry into OT. Positive pressure will be maintained in OT at all times (operational & non-operational hours).
- ✔ **AIR FILTRATION:** HEPA Filtered Air. Air Quality Class 100 (ISO 5). It essentially means that the quality of air is that the particle count in the air at diffuser grill level should not be more than 100 particles per cubic meter.

Air Filtration: The AHU (i.e. air handling unit) must be an air purification unit and air filtration unit. There must be two sets of washable flange type filters of efficiency 90% down to 10 microns and 99% down to 5 microns with aluminium / SS 304 frame within the AHU. The necessary service panels to be provided for servicing the filters, motors & blowers. HEPA filters of efficiency 99.97% down to 0.3 microns or higher efficiency are to be provided. Air quality at the supply i.e. at grille level should be Class 100/ISO Class 5 (at rest condition).

Note: class 100 means a cubic foot of air should not have more than 0.5 microns or larger.

■ DESIGN CONSIDERATIONS FOR OPERATION THEATRES

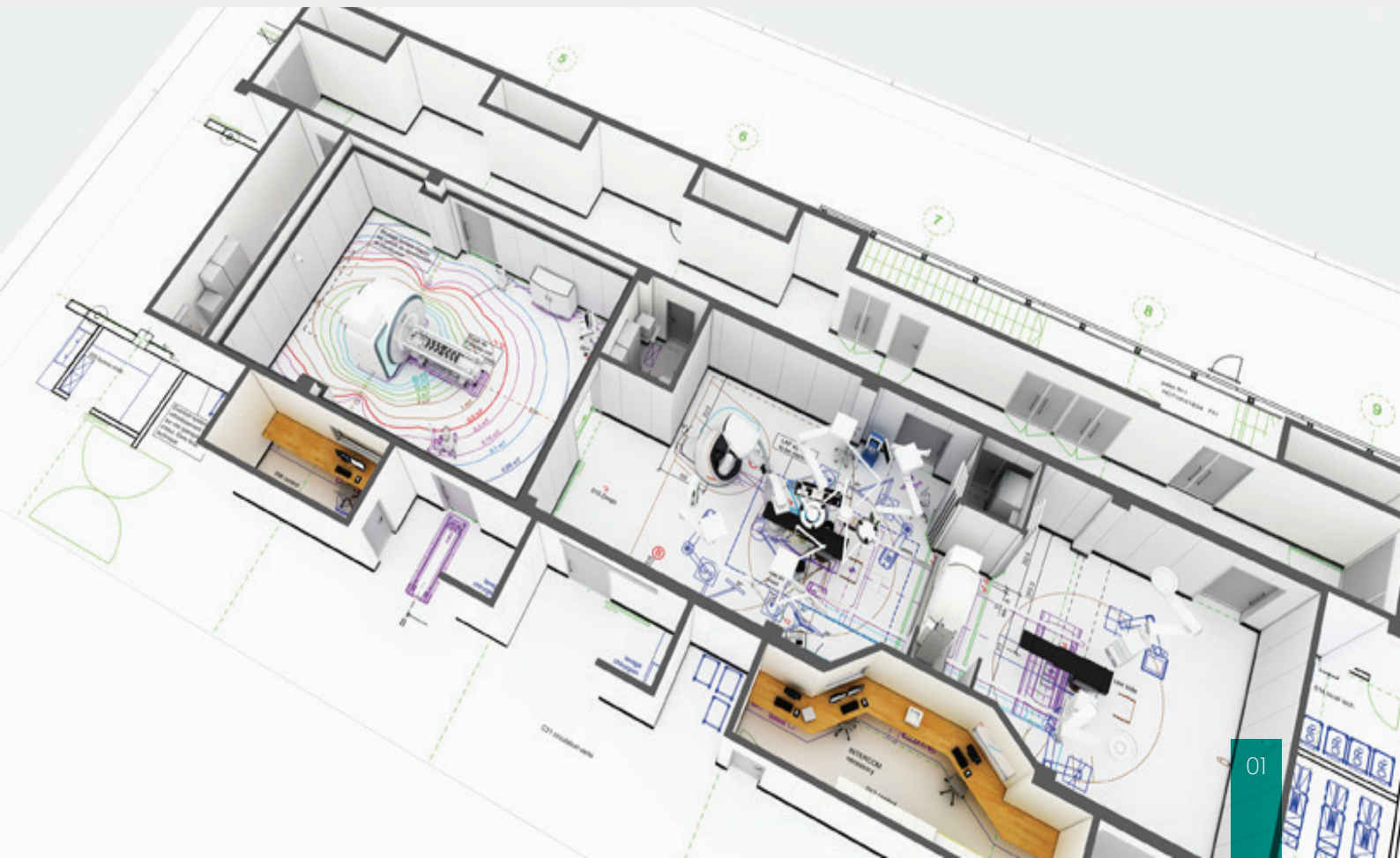
1. Dedicated AHU for each individual OT recommended.
2. AHU to be located in clean area for fresh air intake.
3. Window & split A/c should not be used in any type of OT.
4. During the non-functional hours AHU blower will be operational round the clock (may be without temperature control).
5. Variable Frequency Drive (VFD) may be used to conserve energy.
6. Air changes can be reduced to 25% during non-operating hours through VFD, provided positive pressure relationship is not disturbed during such period.

VALIDATION OF SYSTEM SHOULD BE DONE EVERY 6 MONTHS AND AS PER ISO 14664 STANDARDS.

This should include:

- i. Temperature.
- ii. Humidity check.
- iii. Air particulate count.
- iv. Air Change Rate Calculation.
- v. Air velocity at outlet of terminal filtration unit / filters.
- vi. Pressure Differential levels of the OT with respect to ambient / adjoining areas Validation of HEPA Filters by appropriate tests.
- vii. Preventive Maintenance of the system: It is recommended that periodic preventive maintenance be carried out in terms of cleaning of pre filters, micro-vee filters at the interval of 30 days. Preventive maintenance of all the parts of AHU is carried out as per manufacturer recommendations.

The above are the main Functional and Quality parameters that a buyer need expect from the solution provider of a MOR. However, it needs thorough understanding of the subject, in terms of application of Medical, HVAC, Mechanical, Electronics, Electrical and Civil engineering sciences in constructing a proper MOR that could meet the above parameters.



■ WALL AND CEILING PANEL

Proper selection of Wall and Ceiling Panel is also equally important in that it is one of the most important components that enable the NABH compliant QR requirement.

However, it is important to select the right material quality for the same to suit your requirement in terms of quality, budget, and doctor's requirement.



These are outsourced items from OEM's only. There are number of options available in the market, which most of them are value for money products. We recommend starting with the most economical panel to premium panel, which are mentioned below:

i) PPGI/GI PUF PANEL: Fully compliant with NABH norms, economical in terms of initial investment and life-cycle cost, easy to install, anti-fungal bacteria resistant surface, could last 10-15 years with repainting in three to four years time, extensively used across India, good thermal insulation means less load on AC that could reduce energy cost, good impact resistance, withstand all OT chemicals and cleaning, and good load bearing strength.

ii) SS PUF PENEL: Fully compliant with NABH norms, relatively costly in terms of initial investment, same life-cycle cost as that PPGI, easy to install, anti-fungal bacteria resistant surface, could last 10-15 years, extensively used across India, good thermal insulation means less load on AC that could reduce energy cost, good impact resistance, withstand all OT chemicals and cleaning, and good load bearing strength.

iii) HPL/ GLASS/PVC etc: Fully compliant with NABH norms, relatively costly in terms of initial investment, same life-cycle cost as that PPGI, easy to install, anti-fungal bacteria resistant surface, could last 10-15 years, not extensively used across India, good thermal insulation means less load on AC that could reduce energy cost, good impact resistance, withstand all OT chemicals and cleaning, and good load bearing strength.

■ ANTI-BACTERIAL/ ANTI-FUNGAL PAINTING

The anti bacterial agent is used for inhibiting or reducing the growth of microorganisms on the surface of any material. These antimicrobial coatings are mainly used in healthcare industry for the prevention of hospital associated infections.

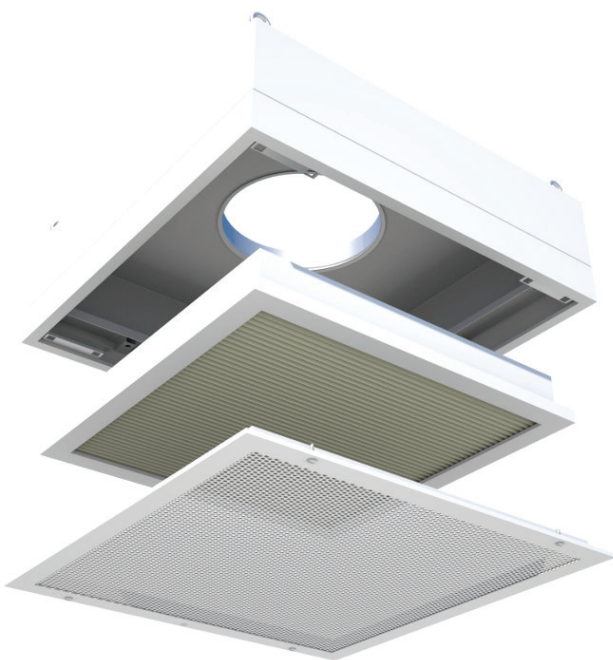


The anti bacterial wall coating & floor coatings are durable in nature and helps in promoting a powerful biocide and stain resistant properties. These coatings can be used where infection control is required like ICU, Clean Room, Labs etc.

■ LAMINAR AIR FLOW SYSTEM

Uni-directional flow management of air is the central and most important component of a MOR.

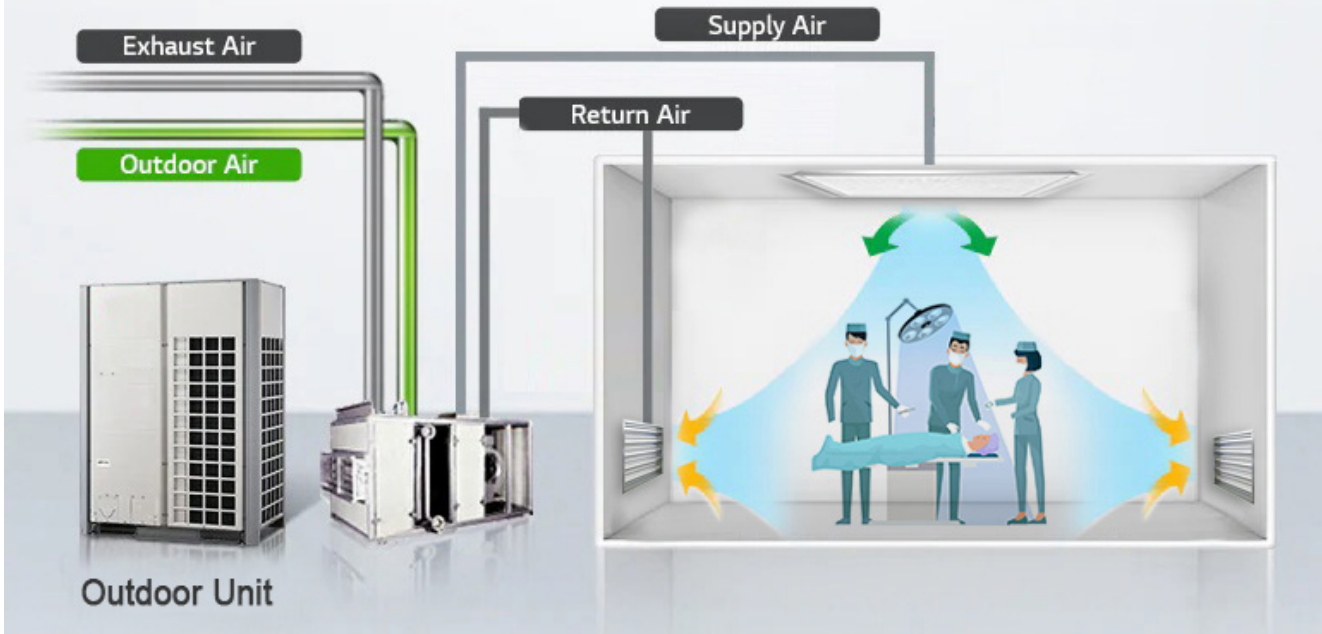
A Laminar is used to control particulate contamination and is defined as air circulating at same velocity and in the same direction with no or minimal cross-over of air streams. If the air flow pattern becomes turbulent then there will be swirls and eddies that might lead to deposition of particles randomly on the surface and unpredictably. Laminar flow systems are required in the environments prone to contamination frequently as they sweep particles in a uniform direction from the clean area to the exit which is present in the back or bottom of the hood. These systems are designed in such a way that the cleanest area will always be the upstream area closest to the filter face. All the work is done in this clean zone as it is made germ free and there is less possibility of creating turbulence.



■ HVAC SYSTEM

The HVAC system may consist of ODU, AHU, Aluminum Ducting, Plenum Box, HEPA, Air Diffuser, Return Ducts, Air balancing Damper, Dehumidifier/Humidifier which forms the Air Purification System, and under decking, AHU Shed (if AHU kept in open) for providing a fail-safe HVAC system, all of which are central to a MOR.

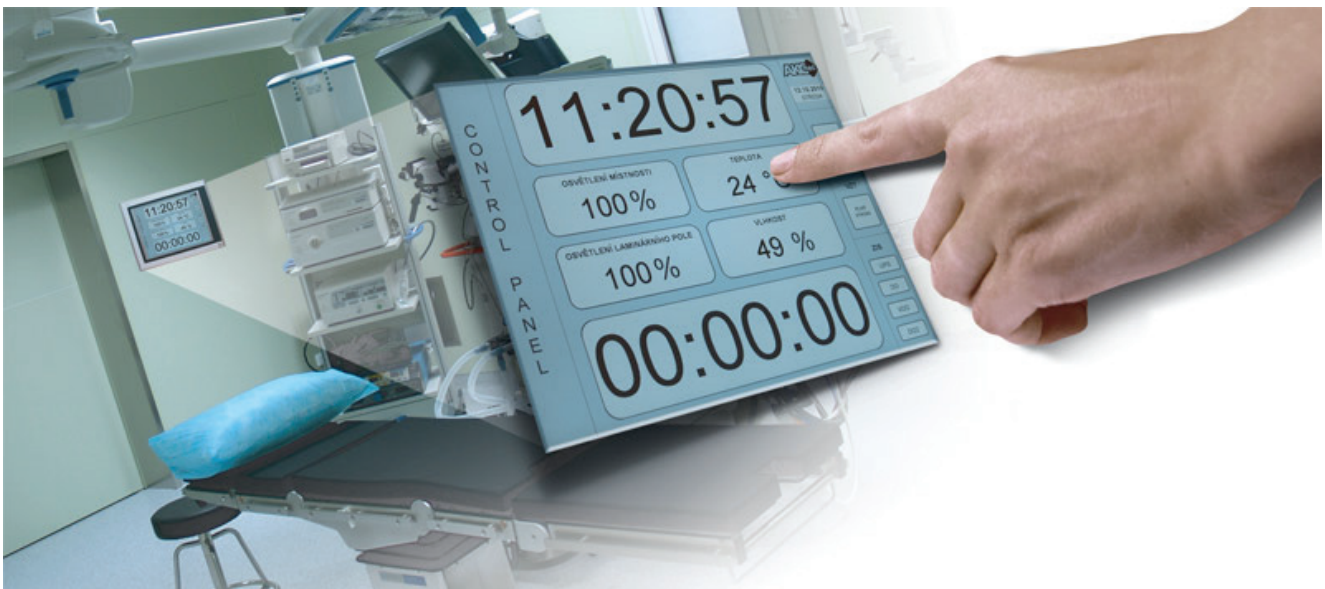
In fact, the careful and prudent selection of an ideal HVAC system could be so critical in determining the outcome of a MOR. If not carefully selected, the running cost including electricity, incidence of shut-downs of OR and therefore, the increasing "Life Cycle Cost" of MOR could make the very project unsustainable.



Proper after-sales services arrangement in the shortest possible time, uptime warranty, availability of CMC etc. are some of the important aspects that need to be actively considered.

Most of the so called "manufacturers" of MOT do not manufacture it, they simply out-source the same since they are not qualified or competent to manufacture the same like ODU (Blustar, Hitachi, Voltas, Carrier etc.), AHU (should be ideally a Eurovent certified), HEPA (AAF, CAMFIL, LAFU etc).

■ OR CONTROL PANEL



Although it is known as Control Panel, it seems that it controls very few parameters and rather only displays parameters that are present. It is a useful component, if it can “CONTROL” Temperature, Humidity (at set level), OT/Peripheral Light, and DISPLAY Differential Pressure, and other usual parameters such as “Day-Time Clock”, “Elapsed Time Clock”, Gas pressure, HEPA status, Telephone etc.

It requires after-sales services, membrane type of control panels being slowly replaced by touch screen control panels. It is very important to select a proper product, lest it could be troublesome.

■ HERMETICALLY SEALING DOORS



Here again, it is an outsourced item from OEMs only. Metaflex is the major supplier in India, among many small to medium level players in the market.

However, it is very important that a proper door that hermetically seals (air-tight so that no loss of air from OT) selected, and proper after sales services are available. Door could be of HPL, SS etc, again it could be Sliding as ideally recommended by NABH, it could be “Hinged” double shutter, and ideally automatic. However, if automatic not affordable, one could select a manually operated door.

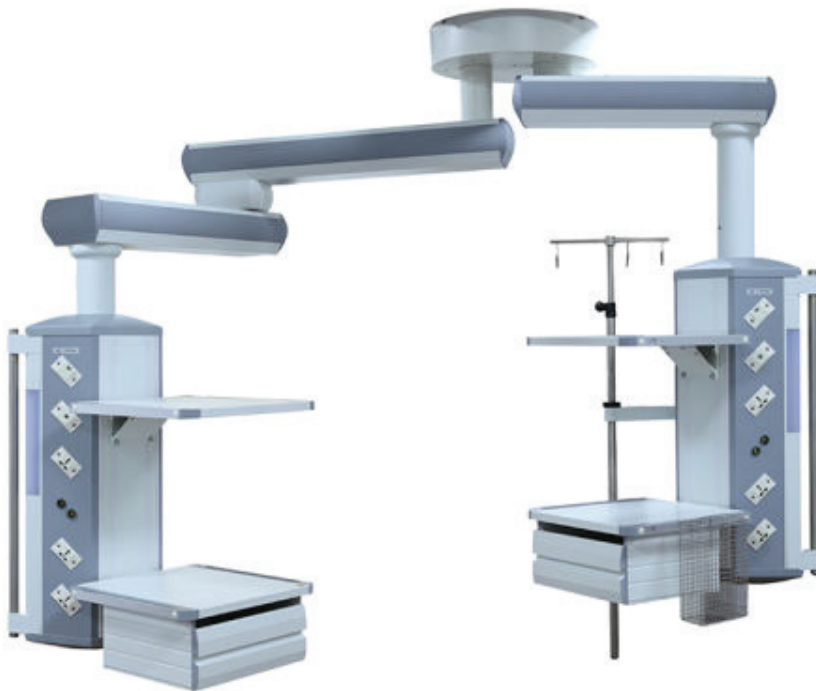


VINYL FLOORING



It is again an outsourced item from importers of Vinyl Flooring, which most popular brands are Gerflor and Tarkett among host of others. The Vinyl flooring has to be Anti-static and conductive flooring as per the norms of NABH. However, the site preparation, application of self-levelling, the curing time etc. plays a very important role for trouble free continuous services.

MEDICAL OR PENDANT



Medical pendants are nothing but a mechanical suspended trunking system OR suspended arm through which gas, electrical and other related services are made available to OT without obstructing the floor movement area in MOR.

A properly selected Indian make should be sufficient for entry level MOR projects. However, imported premium models at 5-10 times costlier are available in the market. No major servicing expected from this product.

■ PERIPHERAL LIGHT



Peripheral lights of reputed brands such as Philips, Wipro, and others with IP54 protocol norms (water and dust ingress protection standard) are recommended for OT. After-sales services may be necessary.

■ DOUBLE GLAZED VACUUMED WINDOW WITH MOTORIZED BLIND



Insulated glazing (IG) also known as double glazing, are double glass window panes, separated by an air or other gas filled space to reduce heat transfer across it. The glass panes are separated by a "spacer" which is a piece that separates the two panes of glass system and seals the space between them. They have Heat insulating and Acoustic insulating properties.

■ X-RAY VIEW BOX/ WRITING BOARD



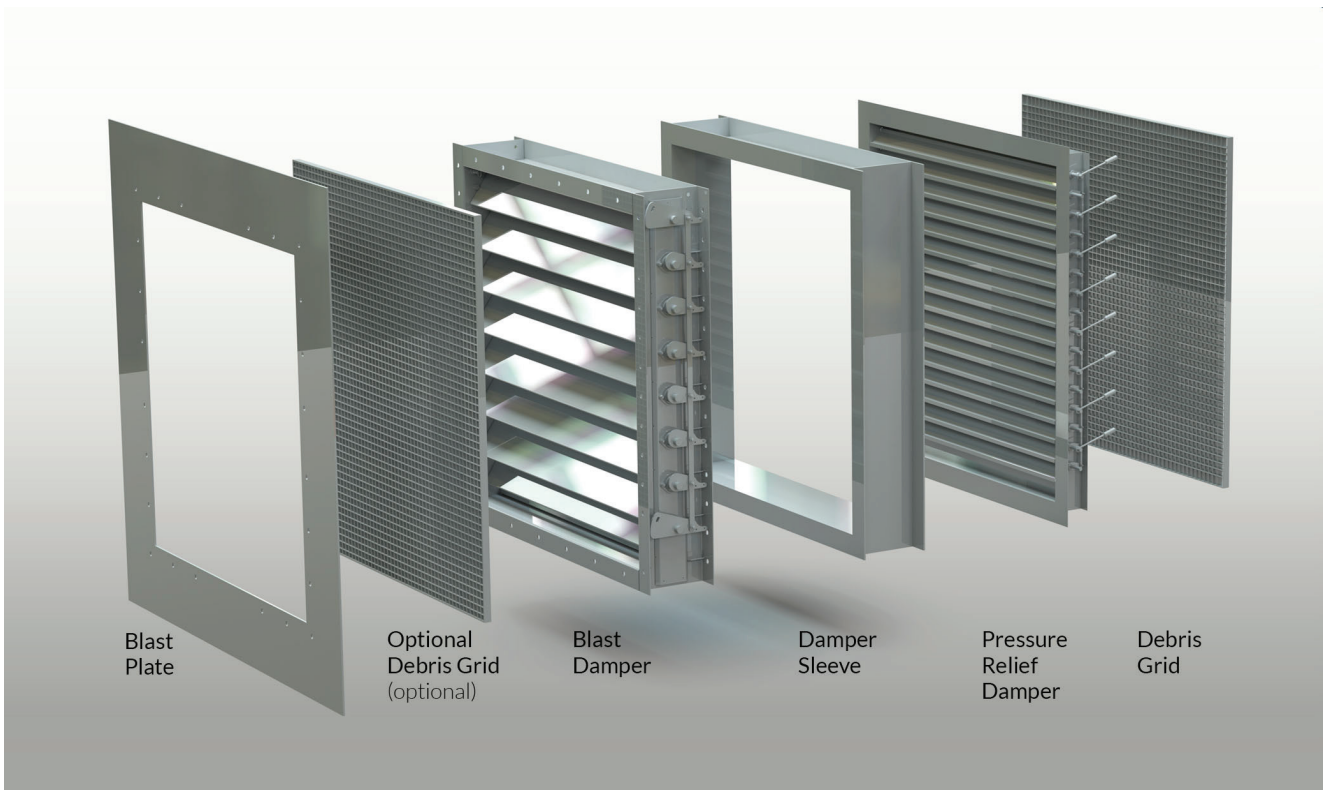
No major brands, it's an assembled product, or even outsourced, should not be a major service problem product.

■ PASS-BOX



A mechanical component with sensor operated electronic locking system for doors for disposal of dirty utilities from OR to dirty corridor. It is a very important component, may not need major services.

■ PRESSURE RELIEF DAMPERS



■ STORAGE UNIT



■ MEDICAL GAS PIPE LINE SYSTEM (INSIDE OR)



■ MUST OPTIONAL

There are few items that forms part of MOR, essential for the smooth operation of MOR, which are often not quoted by MOR solution providers for reasons best known to them.

They are UPS system, an Operation Light, Operation Table, APSC system without which a MOR can not be operated. Incidentally, all of these require a proper review, it needs proper after sales services such as uptime warranty, AMC, CMC etc. to enable proper use of MOR.

■ SCRUB STATION



One of the most important components of MOR, which MOR cannot be used without a proper scrub station. A proper selection as to number of stations or spout required, material of construction from cleaning point of view, ease of operation without touching or foot or elbow operated are some of the features that need to be considered. It could be a product that need occasional after-sales servicing.

■ SURGICAL LIGHTS



A surgical light – also referred to as an operating light or surgical lighthouse – is a medical device intended to assist medical personnel during a surgical procedure by illuminating a local area or cavity of the patient. A combination of several surgical lights is often referred to as a “surgical light system”.

■ SURGICAL TABLES



■ UPS



Modern Medical systems, especially hospital facilities, rely heavily on the continuous, uninterrupted power supply(UPS) to run equipment that saves lives and protects vital electronic data. Even a brief interruption of electricity can be harmful to patients who are undergoing surgery or machine diagnosis.

OPTIONAL

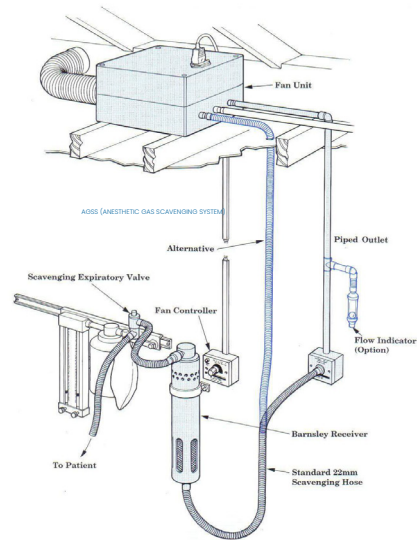
If it is a teaching hospital, a proper camera for video recording, streaming to class-rooms of live surgery etc. will be necessary at some stage, if not immediately. However, these products required proper after sales services.

Form the above, you must have seen that most of the items are outsourced, most of the items require proper technical understanding of the subject. Therefore, the buyer need to consider all the above parameters of MOR as solution, failing which it could be unsustainable, that vendors needs proper resources such as factory, trained manpower for assembly, installations, after-sales services and above all a passion for the chosen field, subject, respect, services and ethical conduct.

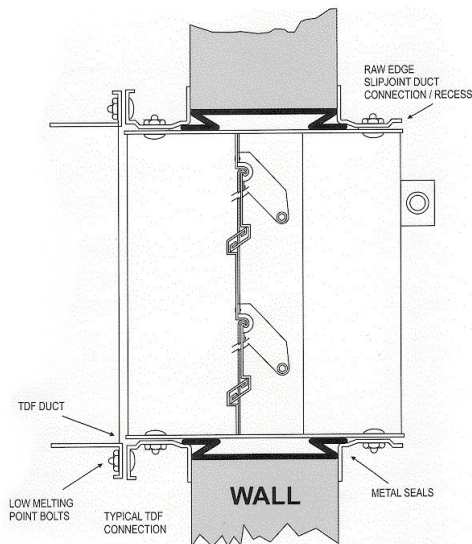
MEDICAL GRADE CAMERA, VIDEO RECORDING AND DISPLAY SYSTEM



■ AGSS (ANAESTHETIC GAS SCAVENGING SYSTEM)



■ FIRE DAMPERS



■ FIRE ALARMS



■ WHAT SHOULD BE THE REASONABLE COST ■ AT WHICH A BUYER MAY ACQUIRE A MODULAR OPERATION ROOM?

Although, the costing will be relative as to who quotes the price, a proper MOR as a package of proper "Product and Services" in PPGI/ GI could cost anything around 30-50lakhs, a SS OT could cost anything around 50-70 lakhs, and Glass, PVC, HPL could be 40-50% costlier than the other two.

■ WHO ARE QUALIFIED TO PROVIDE THE ABOVE ■ MODULAR OPERATION ROOM SOLUTIONS AND SERVICES?

- 1) Anybody who has knowledge, experience, required resources and intent to do a proper job could do it.
- 2) A resourceful company for a turn-key solution as discussed above, who has proper organization, factory, machinery, men, experience and proper after sales services arrangement.

■ AWARDS & RECOGNITIONS

ISO9001:2008 certificate from BSI

Registered with National Small Industries Corporation Ltd (NSIC)

Nehru Peace Foundation Award 2008

Economic Times best Asian healthcare brands 2017

Member of Confederation of Indian Industry (CII)

Registered in Store Purchase Dpt. Govt. of Kerala

Member of ADITI (Association of Dental Industry & Trade of India)

Member of KEDDA (Kerala Dental Dealers Association)



ABOUT US

“ TRICHUR SURGICALS is one of the leading companies in India engaged in the supply and installation of medical and hospital equipment since the last 60 years. Since its inception the company has launched and marked its entire exclusive range of hospital accessories under the brand name ‘TRISCO’ ”

KEY FACTS

- ① 2020 marked Trisco's 63rd anniversary
- ① The only broad-based health service provider with manufacturing, distribution network and exporter of surgical & dental equipment
- ① Serving more than 1500 customers
- ① Process excellence and quality standards
- ① Trusted by hundreds of Hospitals, Clinics and Thousands of Customers
- ① Have wholesale, Retail & Online division

CORE COMPETENCIES

- ① TRISCO have a manufacturing unit with highly skilled engineers to customize the products as per the requirement
- ① 25000 Square feet manufacturing facility
- ① 60+ Workforce
- ① Highly competent and stable leadership team

CERTIFICATION & MEMBERSHIP

Certificate of Registration
 UK GLOBAL
 This is to certify that the Quality Management System for Medical Device **TRICHUR SURGICALS** has been independently assessed and is conformant with the requirements of **ISO 13485:2016**.
 For the following scope of activities:
 MANUFACTURE, SUPPLY AND SERVICE OF HOSPITAL FURNITURE, SURGICAL TABLES & DENTAL EQUIPMENT, ACCESSORIES, INSTRUMENTS AND RELATED ACCESSORIES.
 This certificate is issued under the following conditions:
 1. All initial and subsequent audits are subject to the requirements of the standard.
 2. The certificate remains valid until the manufacturing conditions are changed.
 3. The certificate validity is conditional on the results of surveillance audits.
 4. After fulfilling the relevant standard testing performance, the manufacturer shall affix to each device of the concerned models.
 The compliance is shown above can be used, under the responsibility of the manufacturer, after completion of a Declaration of conformity and compliance with all relevant Standard requirements. The statement is based on a single evaluation of one sample of above-mentioned product. It does not imply an assessment of the whole production.
 Certificate Number: **UQ-1655**
 Validity of this certificate can be verified at www.ukglobal.co.uk/verify
 Initial registration date: 11 MAY 2021 Issue date: 11 MAY 2021
 1st surveillance on or before: 10 MAY 2022 2nd surveillance on or before: 10 MAY 2023
 Authorized Signatory

Certificate of Compliance
 UK GLOBAL
 TRICHUR SURGICALS
 Annexure I
PRODUCT DESCRIPTIONS
 CATEGORY
 1. DED: POWER (ELECTROMANUAL & ELECTROSTATIC) FINGER BEDDING/AUXILIARY & ELECTRICAL PLATING TABLES TO BEI, DENTIST CHAIR
 2. WHEEL CHAIR: ELECTRICALLY OPERATED HEAVY GAUGE & STANDARD DING PROGRAMMABLE DENTIST CHAIRS
 3. DENTAL CHAIR: DENTIST/ANALGESIC, ELECTRICAL, ELECTRO HYDRAULIC SURGICAL TABLE, ELECTRICALLY OPERATED ANTI-DROTAL RECTANGULAR HIGH PRESSURE SINGLE & DOUBLE END STRETCHERS
 4. SURGICAL TABLE: ELECTRICALLY OPERATED ANTI-DROTAL RECTANGULAR HIGH PRESSURE SINGLE & DOUBLE END STRETCHERS
 5. TROLLEY: EMERGENCY RESCUE TROLLEY CHAIR, CART TROLLEY, STRETCHER TROLLEY, INSTRUMENT TROLLEY, MEDICINE TROLLEY & WARD TROLLEY
 6. SURGICAL LIGHT: LED SURGICAL & ENDOSCOPE LIGHT, CEILING TENSILE & DOUBLE DOME
 7. MODULAR OPERATION THEATRE
 8. MOPS & CDD EQUIPMENT
 Certificate Number: **UQ-1654**
 Validity of this certificate can be verified at www.ukglobal.co.uk/verify
 Initial registration date: 11 MAY 2021 Issue date: 11 MAY 2021
 1st surveillance on or before: 10 MAY 2022 2nd surveillance on or before: 10 MAY 2023
 Authorized Signatory

Certificate of Compliance
 This is to certify that
TRICHUR SURGICALS
 VELLYANNUR ROAD, THRISSUR, KERALA-680021, INDIA.
 has been assessed and Certified by BIFMA Certification System
BIFMA
 For the following scope of activities:
 MANUFACTURING AND SUPPLY OF HOSPITAL FURNITURES, PATIENT CARE TROLLEYS, OF ROOM FURNITURES, OT TROLLEYS & OT ROOM FURNITURES, VETERINARY EQUIPMENTS, STERILISERS, DENTAL CHAIR, ELECTRIC AND MANUAL BEGS AND OVER BED TABLES AND RELATED ACCESSORIES.
 Date of Registration: 04/03/2019 1st Surveillance Date: 03/03/2020
 Re-Certification Due: 03/03/2022 2nd Surveillance Date: 03/03/2021
 Certificate No: **1806040319**
 To Verify this certificate please visit at www.bifmacertification.com
 KBIK Certification System
 Validity of this Certificate is Subject to annual Surveillance audits done successfully
 The certificate is provided to the holder by the BIFMA Certification System and shall not be used for any other purpose without the prior written consent of the BIFMA Certification System and shall not be used for any other purpose without the prior written consent of the BIFMA Certification System.
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 Phone: 0426-1886, 096461, 0426-1886, 0426-1886
 Email: info@bifmacertification.com Website: www.bifmacertification.com

THE ECONOMIC TIMES
Best Asian Healthcare Brands 2017

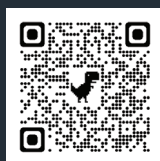




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TRICHUR | CALICUT | COCHIN | TRIVANDRUM