

# Solutions for Medical Gas Projects & Services

DESIGN

MAINTENANCE

more than  
**25**  
years  
experience

SUPPLY  
&  
INSTALLATION





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- Design and Consultancy
- Supply of Equipment
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- Installation
- Testing and Commissioning
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- Certification to recognised International Medical Standards

## Pipeline Materials & Accessories

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- Copper Pipes & Fittings
- Line valves
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- Area Valve Service Unit (AVSU) Module
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- Flow meters, humidifiers
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PRODUCTS

- Oxygen Generators
- Medical Air Plants
- Medical Vacuum Plants
- Medical Gas Manifolds
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- System Alarm Units

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PRODUCTS

- \* Bedhead Units
- \* Pendants
- \* Nurse Call
- \* Wall Protections
- \* Privacy Solutions

# Company Introduction

Tektraco is a Maltese company established in 1990 by professional engineers and entrepreneurs who pooled together their considerable experience in doing business in Libya and Malta.

Three distinct divisions were set-up as a natural continuation of their ongoing activities and these still form the core business of the company. These divisions are:

- **TEKTRACO MEDICAL**
- **TEKTRACO TELECOMS**
- **TEKTRACO LABORATORY SOLUTIONS**

Tektraco's marketing efforts initially focused on two specific countries – MALTA and LIBYA. The island's proximity to North Africa, the ease of travel to Libya and the very good relations existing between the two countries were all advantages which helped in no small way in building our business in these two markets.

As a result of Tektraco's professional approach to business the company now enjoys a very good reputation in both countries.

With over 25 years' experience in the Medical gas field, Tektraco expanded its markets and took on projects in other parts of the world. To date apart from having a branch office in Tripoli, Libya we also have another Branch Office in Tirana, Albania and a Representative office in Muscat, Oman.

## Philosophy and Mission

The strength of the company lies in the significant technical capabilities of its personnel. The divisions within the company are managed by professional electrical and chemical engineers and are supported by a team of experienced and qualified technicians.

Tektraco has, as from its formation, adopted a policy of treating clients and Principals as both being its 'partners'. This sense of partnership is established by involving, at all stages of any project the collaboration of all parties concerned thus building up the necessary confidence and assurance of project success.

As the main objective of the company is to provide a complete and professional service to its clients it is of course necessary to constantly train engineering and technical staff to ensure they keep abreast with the latest technological innovations.

Another important factor that has contributed to the company's success is the 'support element' which is invariably given to clients. This service could be very simple or much more comprehensive, depending on the nature and size of the project.

**Tektraco is ISO 9001 certified.** This standard specifies requirements for a quality management system where an organization:

- needs to demonstrate its ability to consistently provide product that meets customer and applicable statutory and regulatory requirements, and
- aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements



## Certificate of Registration

Quality Management System  
MSA EN ISO 9001:2008

This is to certify that:

**Tektraco Ltd**  
**176, Birkirkara Road'**  
**San Gwann, SGN 4190**  
**Malta.**



are holders of **Certificate No. S065** and operate a Quality Management System which complies with the requirements of MSA EN ISO 9001:2008. The **scope** covered by the Quality Management System includes:

Provision and maintenance of Telecommunication and IT infrastructure, laboratory equipment and products and medical gas installations.

  
*Ing. Francis Farrugia*  
*Director General*  
*Standards and Metrology*



**17 July 2015**

Initial Registration

**17 July 2015**

Current Registration

**16 July 2018**

Expiry Date

This certificate is the property of Malta Competition and Consumer Affairs Authority (MCCAA) trading as Standards and Metrology Institute (SMI). It shall be returned upon request.  
Address: Malta Competition and Consumer Affairs Authority, Standards and Metrology Institute, Mizzi House, National Road, Blata l-Bajda, Malta  
Tel: +356 2395 2000, Fax: +356 21 242 406; e-mail: [certification@mccaa.org.mt](mailto:certification@mccaa.org.mt); url: [www.mccaa.org.mt](http://www.mccaa.org.mt)

SMI-F12/Rev. 6/June2011

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# Typical Projects

## Local Hospitals



### **Mater Dei Hospital – Malta**

**Number of beds:** 1 000

**Operating Theatres:** 25

**Supply and installation of:**

- Complete Medical Gas System (Pipeline & Plant)
- Bed Head Units
- Laboratory Gas Network for pathology and other labs



### **SAMOC - Sir Anthony Mamo Oncology Centre – Malta**

**Number of beds:** 120

**Supply and installation of:**

- Complete Medical Gas System (Pipeline & Plant)
- Bed Head Units



### **Hilltop Gardens Care Home – Malta**

**Number of beds:** 325

**Supply and installation of:**

- Nurse Call System
- Bed Head Units



### **St. James Hospital (Capua) – Malta**

**Number of beds:** 60

**Operating Theatres:** 3

**Supply and installation of:**

- Complete Medical Gas System (Pipeline & Plant)
- Bed Head Units
- Nurse Call System



### **St. Thomas Hospital – Malta**

**Number of beds:** 30

**Operating Theatres:** 2

**Supply and installation of:**

- Complete Medical Gas System (Pipeline & Plant)
- Bed Head Units
- Nurse Call System



# Foreign Hospitals



## **Libyan European Hospital – Benghazi, Libya**

**Number of beds:** 80

**Operating Theatres:** 2

**Supply and installation of:**

- Complete Medical Gas System (Pipeline & Plant)
- Bed Head Units



## **St. James Hay Demasq Hospital – Tripoli, Libya**

**Number of beds:** 70

**Operating Theatres:** 2

**Supply of:**

- Complete Medical Gas System (Pipeline & Plant)
- Bed Head Units



## **Makiungu Hospital – Singida Region, Tanzania**

**Number of beds:** 400

**Supply and installation of:**

- Oxygen Concentrator
- Piping Network



## **American Hospital – Tirana, Albania**

**Number of beds:** 126

**Operating Theatres:** 7

**Supply of:**

- Medical Gas Equipment & Accessories



## **BP Khazzan Hospital – Oman**

**Number of beds:** 5

**Supply and installation of:**

- Complete Medical Gas System (Pipeline & Plant)
- Bed Head Units
- Laboratory Gas Network & Air Compressors

# Tektraco Medical

In the Medical Engineering field, Tektraco is a 'specialist' in **Medical Gas Systems** and the associated piped networks. Our team of certified medical gas engineers design the system, procure and install all plant and pipe works and perform the rigid tests associated with the medical field.

In addition the company also provides and installs various forms of **Patient Services** such as 'Alarm Units', 'Bed Head' units, 'Theatre Pendants' and 'Nurse Call Systems' whenever necessary.

In Malta the company is considered to be the leader in this field as it has executed practically all medical gas installation projects since 1990.





## PATIENT SERVICES

- NURSE CALL
- BEDHEAD UNITS
- PENDANTS



## MEDICAL GAS SYSTEMS

### PRODUCTS

- PIPELINE EQUIPMENT  
Pipes & Fitting and Pipeline material
- SOURCE EQUIPMENT  
Plants, Manifolds and Alarm units

### SERVICES

- SITE SURVEYS & DESIGN
- PROJECT MANAGEMENT
- SUPPLY & INSTALLATION
- GAS PURITY TESTING
- PREVENTIVE MAINTENANCE

# Services

## Site Surveys

Our surveys provide you with a comprehensive, photographically illustrated report of the compliance of your system with respect to HTM 02:01 or ISO 7396-1 and other relevant publications and relate deficiencies to the consequent risks to patients, users and equipment.

We will provide you with a report that will help you understand your gas systems and what is needed to bring them up to current specifications.



## Design and Consultancy

We offer consultancy to various turnkey project contractors in order to provide them with the design of the medical gas system both for new or refurbished hospitals and other healthcare centres.

Our qualified personnel are able to provide consultancy and design services to the latest standards of medical gas installations and our in-house planning and design unit can provide complete network drawings for all medical gases from plant to patient's outlet.

In conjunction with the client, the requirements for projects ranging from small clinics to complete hospitals can be established and formulated into a working format.

Once the basic requirements have been defined, detailed engineering designs are produced, in close collaboration with the medical staff. At this stage, requirements for specific gases are established, as well as positions of terminal units, alarm panels and so on. Proposals are always based on recommendations of HTM/EN document, as appropriate.



## Supply of Equipment

We procure all necessary medical gas plant, and pipeline products from reputable suppliers and ensures that products supplied will be to required specifications.

All plant and equipment is thoroughly tested before shipment to ensure minimal problems at the job site. All requirements for protection of materials during shipping are strictly observed.

Handling of all parts is also very important at the installation site, to ensure that there will be no contamination of the materials before or during installation.

## Project Management

Project Management is part of Tektraco's core service and our focus is always on our client's requirements.

Through the valuable experience acquired from the large number of successful projects that we have executed, Tektraco is able to overcome major issues that arise during a project and easily coordinate with other service providers to ensure a smooth and successful overall installation.

Throughout the project we maintain continuous quality control and assurance by project supervision.

Our methodologies are built upon patient safety, planning and phasing works appropriately to ensure minimum disturbance to patients.

Through project management, we ensure clients always have a primary point of contact, keeping the client up to date with the project progress and coordinating forthcoming procedures.

## Installation

Apart from Project management and supervision, we also undertake installations through our trained installers who are all certified to carry out medical gas installations to the highest standards.

Installations are invariably executed to the required HTM/EN or other International Standards, as specified and as performed in coordination with other services in an efficient and proper manner.

Pressure tests are performed as necessary and brazing is only performed during purging of N<sub>2</sub>O as per EN 7396-1 and HTm 02-01 standard and recommendations.

All piped medical gas pipelines are installed using the approved grade of copper pipes and copper fittings, complete with fluxless brazing technique for jointing.

## Testing and Commissioning

Testing is performed in line with the installation in order to ensure that there are no flaws within the piped network.

Frequent spot checks are also performed on brazed joints and terminations.

Integrity tests are performed to ensure:

- the recommendations laid down in the relevant specifications have been strictly adhered to
- satisfactory performance of the system
- the installation is safe for use, and Certificates of Commissioning are raised.

Final 'as fitted' drawings are produced.





## Preventive Maintenance

In order to keep the medical gas system in a safe working condition, we offer Scheduled Preventive Maintenance together with 'On Call' Break down service.

All Preventive maintenance is undertaken by Authorised and Competent Persons who are certified to work on medical gas plant and equipment.

We are engaged in several maintenance contracts, whereby routine maintenance on each and every aspect of the Medical Gas system is performed according to scheduled maintenance procedures, as dictated by HTM/EN or other internationally recognised standards.

We are strong believers in the importance of having a technically strong and dedicated team of technicians to perform such routine maintenance on all kinds of medical gas plant and associated equipment.

It is desirable, and cost-effective, for customers to let maintenance out to contract. This gives them peace of mind that the regular preventive maintenance is performed, and the ready availability of an 'expert' in case of any difficulties.





## Pharmaceutical Testing

Before final handing over to the client, Quality Control testing must be performed. Tektraco can provide services via independent testing agencies for Gas Identity, Purity and Quality as per HTM02- 01: 2006 requirements.

Medical Gas systems deliver gases directly to patients and must therefore be tested for purity. This applies to new systems as well as existing systems, which must periodically be tested to ensure that all is well.

Routine quality control testing of Medical Gases on site is essential for any District/Clinic/General Hospital with a full Piped Medical Gas System or a small medical oxygen installation.

This relates to the purity, quality and identity testing of the Medical quality gases including surgical air gas, dental air and medical vacuum terminal units (TU's) or outlets at clinics/hospitals, where required, following guidance given in HTM02-01:2006, EP2009 and EN7396-1:2007.

Responsible persons will liaise with the Authorised Person and hospital staff to connect to the TU's, NIST or plant sample points and what other outlets can be safely tested during the day's testing session. Testing is generally undertaken first at plant sample points and then in distal departments.

Operatives will leave site areas following hospital protocols.

At the conclusion of the identity, purity and quality testing in a hospital, a report is prepared containing results, other observations and constructive comments.

## Certification to recognised International Medical Standards

In Medical Gas installations and maintenance it is very important that International Medical standards are followed by qualified personnel.

We, at Tektraco, can supply and install to any standard requested, however we emphasize that the best, safe and most reliable standards to follow are either the Health Technical Memorandum British Standard (HTM02:01) and ISO 7396-1 2016 (MGPS) European Standard.

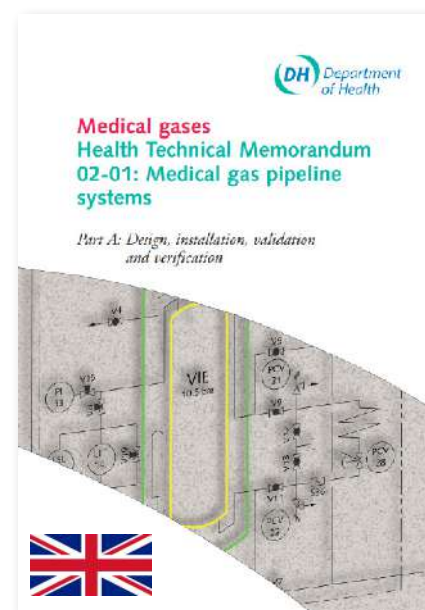
These standards give comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology used in the delivery of healthcare.

### Tektraco personnel are qualified to highest standards in Medical Gas Pipeline Systems

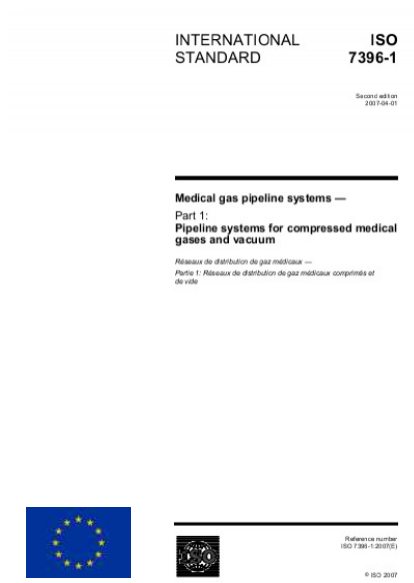
With over 25 years experience in this field both locally and abroad, we have always recognised the importance of following 'International Medical Standards' and have thus invested in training and certifying our personnel as 'Authorised Persons' or 'Competent Persons' by a foreign professional and independent Medical Gas Training provider (accredited by Educational Institutes like City & Guilds or BTEC.)

### HTM02:01 and ISO 7396 Authorised Person & Competent Person (MGPS) Training Courses

These courses are aimed at all those with management responsibility (AP) or other staff (CP) whose duties include the safe operation, installation and maintenance of medical gas pipeline systems, particularly those who are (or will be) designated Authorised Persons or Competent Persons by Health Service organisations or contractors responsible for the installation and maintenance of such services.



**HTM 02-01**



**ISO 7396**

# Product Portfolio

All equipment supplied  
is compliant to international  
Standards

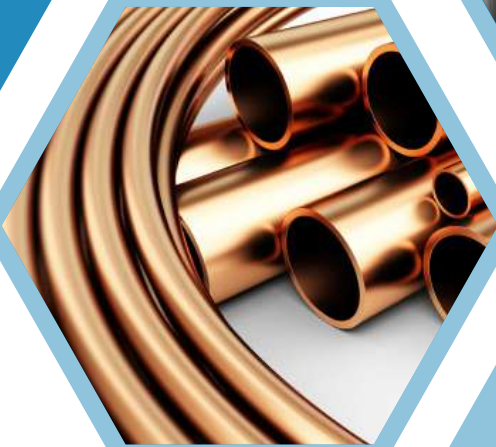
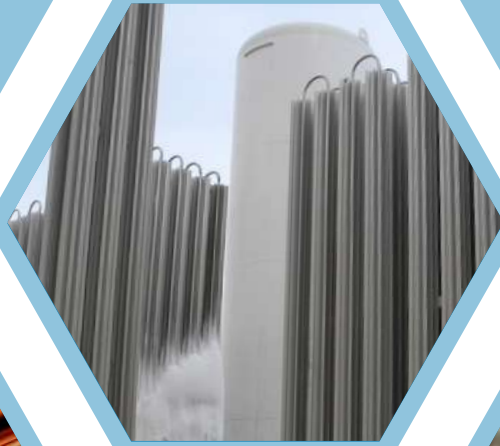
EN7396-1 and HTM 02

PIPELINE  
EQUIPMENT

SOURCE  
EQUIPMENT

QUALITY  
PRODUCTS

REPUTABLE  
SUPPLIERS



HIGHEST  
INDUSTRY  
STANDARDS



PATIENT  
ENVIRONMENT

# Pipeline Materials & Accessories

Our comprehensive portfolio comprises everything you need for safe, reliable and efficient medical gas distribution and control.





## Copper Pipes & Fittings

Degreased copper tube is manufactured in the UK under BS EN 13485 Medical Devices: Quality Management Systems. All tube is manufactured under strict quality control procedures to ISO 9001:2008. Our copper tube is CE marked as a class IIa Medical Device 93/42/EEC .

It is designed for use in Medical gas pipeline system installations and incorporates the specialist requirement of the MGPS industry to include cleanliness, packaging and usability required to attain the levels of quality as

### Specific Features Include:

- Each pipe is cleaned to have a maximum carbon level 0.20mg/dm<sup>2</sup>
- Each pipe is individually end capped and packed in sealed polythene bags as bundles to maintain cleanliness.
- Chemical composition CU.DHP to ISO 1190-1/CW024A to EN 1412.
- BSI Kitemarked
- Batch numbered for traceability.
- All copper tube from sizes 12mm through to 108mm are engraved/ permanently ink marked with the following information: EN 13348, nominal dimensions, manufacturer details, part no., CE Mark, Medical Device
- Directive to 93/42/EEC, time and date of production.
- 25 year guarantee.



## Copper Fittings

Copper fittings are manufactured in UK under BS EN 13485 Medical Devices: Quality Management Systems.

All fittings are degreased for medical gas use, engraved with EN 1254, size and manufacturer details and individually packed.

Cleanliness is guaranteed below 0.01 mg/cm<sup>2</sup> of hydrocarbons on the degreased surface of the fitting.

### Standards:

- EN 1254: Specification for Capillary Copper Fittings
- BS 684: Specification for Copper Fittings used with Copper Tubes
- ASTM B280: Cleanliness Testing
- HTM 02-01: NHS Health Technical Memorandum
- C11: NHS Model Engineering Specification-Medical Gases
- EN 7396 - 1: Medical Gas Pipelines for Compressed Medical Gases and Vacuum
- BS EN 740: Active Anaesthetic Gas Scavenging Pipeline System
- CE marked as a Class IIa Medical Device 93/42/EEC with notified body British Standard Institute

## Line valves

Lockable line valves are manufactured under BS EN 13485 Medical Devices: Quality Management Systems and CE marked with notified body British Standards Institute under the Medical Device Directive 93/42/EEC.

They comprise of a 2-piece full bore male threaded nickel plated brass ball valve c/w chrome plated brass ball, blow-out proof stem, stem O-ring, Teflon ball seals and flat face copper stub pipe assemblies. The copper stub pipe assemblies are manufactured from medical gas copper tube compliant to BS EN 13348 and are factory soldered to brass flat face seal housings chemically cleaned and degreased.

The copper pipe stubs enable easy fluxless brazing to the medical gas pipeline system.

The handle is lockable in open or closed position to prevent unauthorised operation of the valve.

All line valves are factory tested for tightness and leakage, batch numbered and individually end capped and bagged in clear polythene bag to maintain cleanliness.



## Medical gas outlet

We can supply a range of medical gas outlets in accordance to BS 5682, DIN 13260-2, AFNOR NFS90-116, AA875 24 30, and UNI 9507 standards.

Medical gas outlets can be supplied suitable for wall mounting, flush wall mounting and bedhead mounting.

The second fix of the outlets can be supplied in plastic, all metal construction and also metal ring.



### Designed to meet:

- HTM 02-01 Health Technical Memorandum Medical Gas Pipeline Systems
- C11 NHS: Model Engineering Specification- Medical Gases
- EN 7396-1 Pipelines for Compressed Medical Gases and Vacuum
- Medical Device Directive 93/42/EEC.
- (NIST) Low Pressure Connectors for Medical Gases.
- BS EN 18082 Non-interchangeable Screw Threaded

## Compact Area Shut Off Valve Unit:

Multi valve compact area control boxes are installed at the entrance of wards to control the supply and also monitor medical gases to the wards.

Designed to comply with EN ISO 7396-1 including pressure monitoring, Low and high pressure alarm, and emergency supply inlet.

Apart from analogue displays we can also offer optional digital displays, consumption measurement, temperature measurement, door tamper alarm and History Observation.



## HTM 02 Area Valve Service Unit (AVSU) Module

The HTM 02 AVSU module can accommodate up to six gases together with an area alarm and is usually installed at the entrance to a ward to provide zoning to the said ward.

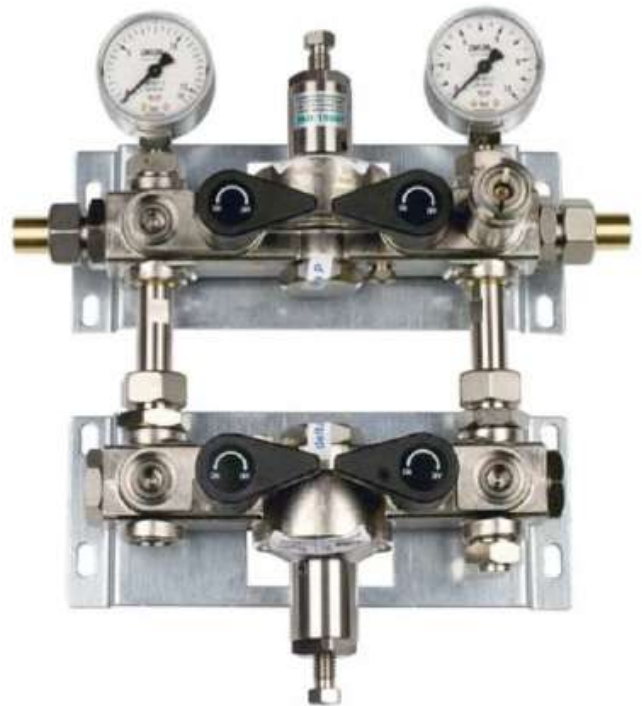
- Modules can be supplied as flush or surface mounting. Fully compliant to HTM 02-01, BS EN 18082 and C11
- Include Upstream and Downstream NIST connectors.
- Gas types available Oxygen, Nitrous Oxide, Entonox, Medical Air, Surgical Air, Vacuum, Carbon Dioxide, Nitrogen, Helium Mix, Lab Gas, other gas types available on request.
- Factory Tested and certified and Pre piped for easy installation.
- Front covers can be supplied as epoxy coated steel or Polymer laminated anti microbial cover.
- Analogue or Digital Area alarm can be factory fitted in the module.
- Option flow measurement for each individual gas type to provide flow data 24 hours each day.



## Second Stage Reduction box

Tektraco can supply and install Line pressure reduction units for medical gases in line with ISO 10524-2 and CE marked to medical device directive 93/42/CEE.

These can be supplied either as separate wall mounted, as simplex or duplex or else, multi regulators for different gases can be housed in a box.



The main features common to all the boxes are the following:

- Metallic boxes for wall embedding or external mounting to contain simplex or duplex regulators and vacuum in different configurations
- Available in powder coating or INOX
- Windows for checking of pressure status
- Provided with key lock door and emergency opening system



## Suction Therapy

At patient level, suction is carried out via a vacuum regulator and collecting jar.

Suction may be used to clear the airway from secretions, blood, vomit or saliva so that a patient may breathe.

Available for different vacuum levels 0-1000, 0-600 and 0-250 mbar/hPa

Available with different probes for UNI/AFNOR/DIN/BS. CE marked for medical use.



## Rail Mounting

The showed kit allows the installation of the vacuum regulator on to the rails.

## Suction trolleys

Available in two standard configurations with single or double vacuum regulator.



## Safety jars 150 or 500cc

Safety jar 150 or 500 cc, for the direct connection to the vacuum regulator. Clear MAKROLON body autoclavable at 121°C, equipped with single patient antibacteria filter and overflow safety valve. Serigraphic indication of the maximum fill level. The safety jar does not replace the collecting jar.



### Accessories for vacuum regulator

- Collecting jars - 1lt, 2lt and 4lt
- Screw caps for 1lt and 2lt, pressure cap for 4lt
- Disposable sac used with special jars 1lt and 2 lt
- Wall slide to fix the vacuum regulator or the jars on the wall
- Universal bracket to fix the vacuum regulators or the jars on rail
- Silicon hose
- Suction tips
- Catheter holder single or double
- Spare part filters for safety jar



### Ambulance Pipe Line Systems

Tektraco can offer a range of Ambulance Pipeline Accessories.

#### Tee pieces



#### Adult Mask



#### Adult Nasal Canulae including 1.8m tube Ambulance Pipeline Accessories



#### Assembled units



# Medical Gas Accesories

## Gas Therapy

Tektraco can supply a range of Suction and Gas Therapy equipment, providing a complete solution for all your medical gas needs.

### Flow meters with fixed flow selector

Flow meters with fixed flow selector which can be connected to terminal units.  
Flowmeter complete with probe to the following standards:

- UNI 9507
- BS5682
- AFNOR NF S90-116
- DIN 13260-2
- SS 8752430



### Variable Flow Medical Gas Flowmeters

Single or Double type medical gas flow meters with adjustable calibrated tube.

These can be supplied complete with Afnor/UNI/DIN or BS probe.

Flow rates: Available in 0 -1 0L/min or 0-15L/min.

### Rail mounted Flowmeters

The device is suitable for rail systems mounting and it allows to connect the terminal units of the medical gas distribution systems, with a quick and precise gas supply.

The body is made of anodized aluminium and is equipped with a replaceable filter to protect the dosing system.



## Humidifiers

To prevent patient's mouth getting dry during medical gas therapy, humidifiers are connected to flow meters to give humidity to the gas before being breath in by the patient.



## GAS Cylinder Pressure Regulators for gas therapy

Pressure regulators for oxygen therapy with flow meter and projected in accordance with ISO 10524-1 standard.

### Main Features

- Available in the following full scales: 0-10 L/min; 0-15 L/min (graduated scales)
- The cylinder connection can be manual gripping or with classic hexagonal screw nut



# Miscellaneous Equipment

## Hoses for medical gases and suction

The products we offer fulfill all the current and future requirements for medical gas hoses.

They are designed to be fully compliant with the most recent specifications and conforms to BS EN ISO 5359:2008 (2014) + A1:2011.



## Medical Equipment Rail - Universal rail Available in 1m , 2m or 3m.

The ISO standard rails are designed to carry a wide range of medical equipment, in close proximity to the patient.

Both the aluminium and stainless steel rail systems are designed with hygiene in mind therefore, once installed, they are easy to clean and maintain with no visible fixings.



### Features

- The extruded aluminium section fits directly to the wall, without additional distance pieces and fixing kits
- The rail is suitable for both general and heavy-duty purposes
- Various Rail Clamps, including the DIN and Modura type fit this profile

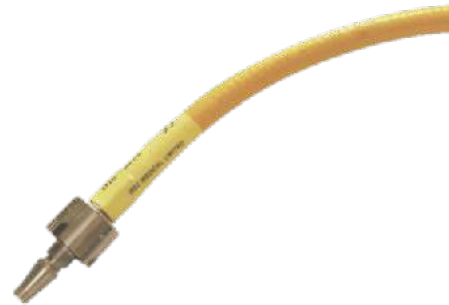


## Hose Servicing

As per EN7396-1 and HTM 02 recommendations, hoses should be inspected and maintained. When it is not easy to inspect hoses such as in pendants, these hoses are normally assigned a service life, after which hoses are replaced.

Tektraco offers the service of hose and probe inspection.

Existing hose will be inspected for its condition and tolerance, and if necessary it will be replaced by new gas hose manufactured to current standards including a new traceable I.D shrink Sleeve and O ring for Nist Probe and test. Out of tolerance Probes or Nists can be replaced at time of rebuild.



## Probes & Nists

Tektraco can provide a wide range of Probes & Nists and a range of custom NISTS and Probes with different threads and fittings.

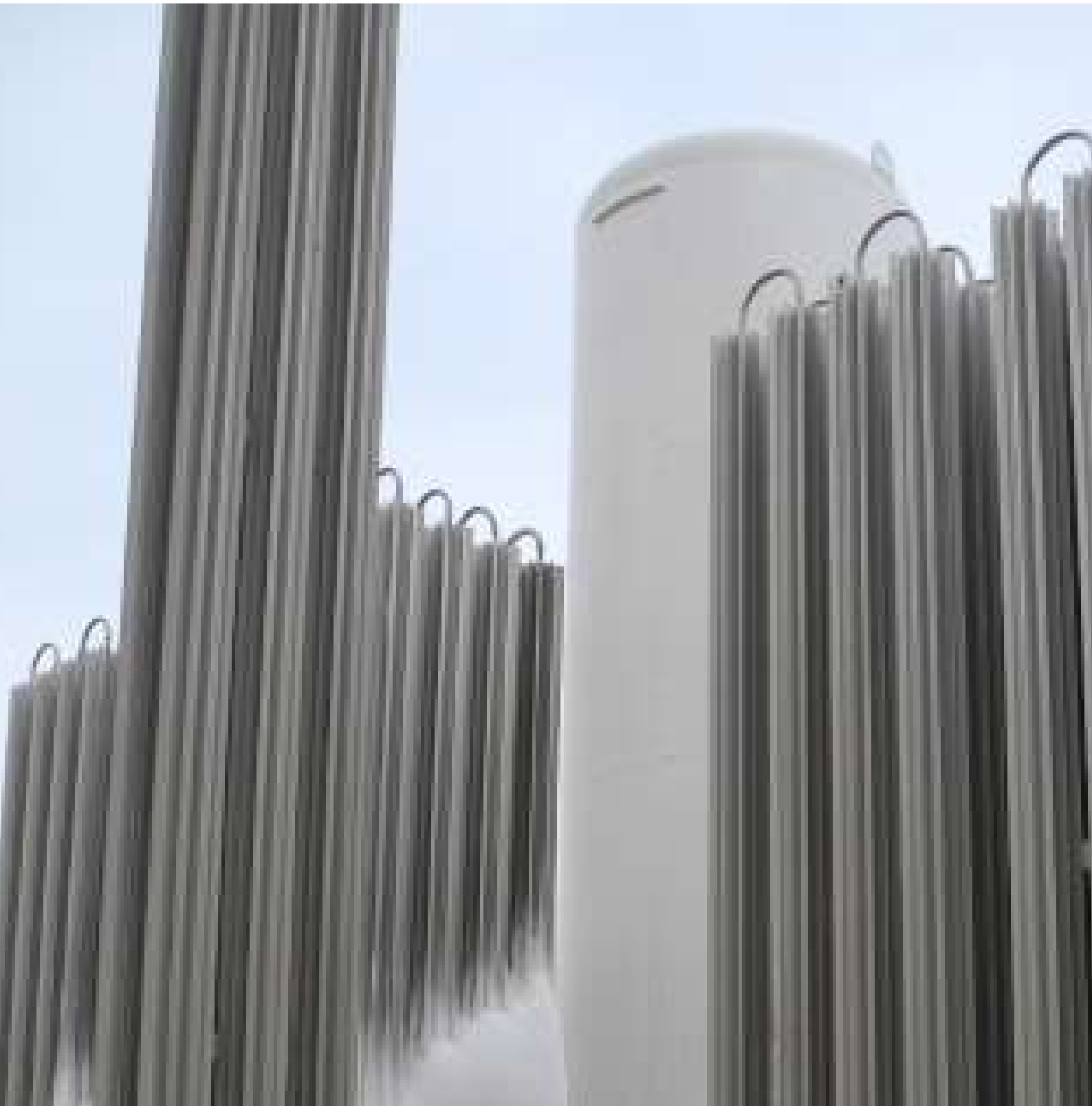
## Cylinder Holders

Tektraco can offer cylinder wall mounted holders for the safe storing of empty or new cylinders and also cylinder transportation trolleys.



# Source Equipment

Supplying High-quality Medical Gas Systems equipment that fully complies with the requirements of international standards EN ISO 7396-1 or HTM 02-01.



## Oxygen Generators

Oxygen generators provide a central source of Oxygen up to 95% +/- 3% purity in a variety of configurations and are ideal to remote areas where the gas supplier is very far away to provide a reliable supply of liquid oxygen or oxygen gas in cylinders.

The system will comprise Air compressors, dryer and filters, air receivers, PSA oxygen generator and oxygen receiver. LCD controllers and oxygen sensor/ analyser is included complete with alarm to ensure that the produced oxygen purity is within acceptable parameters.

Oxygen generators are designed to comply to ISO 10083 standards and air quality to the European Pharmacopoeia monograph and conform to HTM and EN standards.



## Medical Air Plants

Medical Air Plants provide a continuous supply of medical quality air conforming to the European Pharmacopoeia requirements, for respiratory use in healthcare facilities.

Medical air plants supplied are designed to provide a fully automatic system in accordance with the requirements ISO 7396-1 and HTM 02-01.

The Medical Air Plants consist of carefully designed medical compressors with after-coolers, air receiver(s), duplex filtration dryer and pressure regulation assembly, all necessary control cabinets, circuitry and interconnecting cabling.

Utilising desiccant media and heatless regeneration, the dryers are a fully automatic duplex (2 x 2 columns) configuration. The dryer media can be emptied and refilled without the need to disassemble, making it easy to service.

The control circuitry and power management system fully monitors the safety of the medical air plant, by signalling into the alarm system, which meets the requirements of EN 7396-1 and HTM 02-01.





## Medical Vacuum Plants

Medical Vacuum Plants are intended to provide a continuous supply of medical vacuum to a pipeline system in healthcare facilities. The system shall be 'duplexed' such that the supply is maintained in single fault condition.

Two standby pumps shall be provided, such that the specified volumetric flow rate is achieved with two reserve pumps on standby.

Horizontal Medical Vacuum Plants shall be supplied pre-piped, fully tested and comply with the United Kingdom Department of Health (DoH) publication HTM 02-01, BS EN ISO 7396- 1 and NHS Model Engineering Specification C11.

The Medical Vacuum Plant shall be fully tested. A test certificate shall be provided showing the results of the tests, including the free-air flow rate obtained at an inlet vacuum of 450 mmHg.

Vacuum pumps shall be air-cooled; oil lubricated rotary vane type suitable for both continuous and frequent start/stop operation at nominal inlet vacuum levels of between 475 mmHg and 650 mmHg.

### **Plants supplied will be:**

- fully compliant to HTM 02-01, C11, and EN 7396-1
- CE marked under Medical Device Directive 93/42/EEC

## Medical Gas Manifolds

Gas manifolds are designed to supply the pipeline system with sufficient quantity of gas by cylinders and/or tanks.

The typical manifold for medical gases (oxygen, nitrogen, CO<sub>2</sub> or medical air) according to EN ISO 7396-1 or HTM 02-01 usually consists of a two-sided cylinder supply with automatic changeover between the empty and full side, and an additional third source for emergency supply.



### Analog/Digital Pressure Display

- Automatic Changeover Manifolds are intended to provide a continuous supply of medical gases for respiratory, clinical and surgical use in healthcare facilities. The system shall be duplex such that the supply is maintained in single fault condition.
- Designed to meet requirements of EN 7396-1, and HTM 02-01 and are CE marked under Medical Device Directive 93/42/EEC.
- Wall mounting or Floor mounting options.
- Various flow capacities available.
- Optional: Touch screen, BMS digital Outputs and SMS texting Alarm.

## Anaesthetic Gas Scavenging System

During operating procedures with inhalational anesthetic, the patient exhales anaesthetic gas which is not safe for the medical staff in the operating theatre.

NIOSH (the National Institute for Occupational Safety and Health) reports the effects of high concentration exposures to WAGs include dizziness, feelings of light headiness, nausea, fatigue, headache, irritability and depression. Other effects include liver and kidney disease. Exposed workers can experience difficulty with cognitive, perception, judgement, and motor skills placing themselves and others at risk.

Effects of exposure to low concentrations can also include miscarriage, birth defects (genetic damage), and cancer in exposed workers and their spouses (in cases of miscarriages and birth defects).

An Anesthetic Gas Scavenging System collects the exhaled anesthetic gases in the environment via suction, and expels the harmful gases away from personnel in designated location outside the hospital or



- Anaesthetic Scavenging Systems provide a centralised source for the safe removal of anaesthetic gases exhaled in the operating theatres by patients.
  - Available in simplex or duplex configurations according to clients requirements.
  - Designed to meet ISO 7396-1, HTM 02-01, BS EN 6834 and C11.
  - Low voltage 24V remote switches.
  - Easy to install
  - Available in Single or 3 Phase.
- CE marked under Medical Device Directive 93/42/EEC.



## Alarm Units

In medical gases there are mainly two types of alarms - Area Alarms and Central Alarms.

Area Alarms are used to monitor pipeline pressure within a ward. Pipeline pressure transducers in the pipeline are connected to the Area Alarms and monitor the line pressure within a ward.

Should the pressure go below or go higher than the acceptable level, a Low or High pressure alarm is initiated in order to alert the ward staff. Also, a fault in the wiring between the transducer/pressure switch to the alarm will result in a system fault alarm.

### Digital Area Alarm

- Alarm indication up to 6 Gas Services.
- Ultra low 12V Digital Touchscreen Alarm.
- EN 7396-1 HTM 02-01 & SHTM02-01 fully compliant.
- Battery back up in case of power failure.
- Anti microbial fascia laminate.
- Outputs for digital connection to Hospital BMS.
- 2 Year Warranty.



Central Alarms monitor the plant equipment such as air compressors, vacuum pumps and automatic change over panels and give an alarm when there is a fault in these plants or when a duty bank of cylinders is exhausted. These alarms are normally installed at 24 hour manned locations.

# Patient Environment

Solutions to meet any requirement for Hospitals, Clinics  
and Nursing Homes.



## Bedhead Units

Tektraco can supply and install various models of bedhead units designed to enhance patient experience and delivery of care.

The bedhead unit is permanently installed as horizontal, vertical, ceiling mounted or as suspended mounting and is intended to supply services such as electric power, lighting, extra low voltage communications, medical gases, entertainment and monitoring facilities.

### Horizontal Bedhead units

#### Standard Solution

- Easy to Install, easier to Maintain.
- Powder Coating, Powered Hygiene.
- Can be supplied with 2 lighting configuration; only direct lighting, direct and indirect lighting and can house all medical gas outlets adequately segregated from the electrical components.



#### Custom-made Solution

Bedheads can be made custom made to client's specifications, with the following options to choose from;

- Panel mounted sockets with no visible screws
- Dedicated metal segregation boxes for each position of the following:
  - Voice/Data or IM&T services / Nurse call module / Mains, ELV and SELV electrical services /
  - Medical gas terminal units / Surface mounted examination light
- Electrical wiring according to BS 7671;
- Pre-gassing according to HTM02-01



## Paediatric Solution

Designed to make children's recovery more pleasant, this bedhead is made of an innovative acrylic sheet onto which it is applied a colourful film, featuring cartoons. Upon request we can supply the unit with our exclusive backlighting LED system offering a selective illumination of just some of the characters which will be visible while all the lights are off.



## Design Solution

The particular model is made of fireproof HPL laminated wood panels easy to clean and disinfect. The device may be fitted with gas outlet for medical gas supply, as well as sockets, switches and data ports. OKI FLAT may also be fitted with a state-of-the-art touch screen tablet management system, to make the hospital stay more comfortable and allowing the patient to connect to the web.



## Vertical Bedhead units

### Vertical Solutions

Designer preferences or architectural limitations are the main reasons for vertical bed head units to be planned.

### Ceiling Mounted Bedhead units

Ceiling mounted solutions are highly recommended whenever medical pipelines and electrical conducts are ceiling fitted.



## Pendants



### Medical Pendants for operating theatres

Pendants are intended to distribute medical gases, AGSS and electrical services to the operating table/ anaesthetic machine.

They also keep the area around the operating table free from hoses and cables.

Together with the anaesthetists and surgeons who are the most important personnel in the theatre, and client, Tektraco can supply and install various models of pendants to suit any requirement.

#### **RIGID**

Rigid pendants are ceiling mounted fixed columns complete with first fix plate and ceiling shroud, with an epoxy powder coated finish.

A maximum of 9 medical gas and AGSS terminal units together with a maximum of 8 electrical sockets can be accommodated.

Other specialist outlets can be incorporated into the pendant as required.

Designed to comply with BS EN 7396, ISO 1197, HTM 02-01, BS EN 18082, BS EN 9170 and medical Device Directive 93/42/EEC Medical Device Class IIb.

#### **RETRACT**

Retractable Pendants differ from Rigid pendants in that they are height adjustable. The height to the underside of the pendant can be adjusted throughout a 300mm predetermined range.

A maximum of 9 medical gas and AGSS terminal units together with a maximum of 8 electrical sockets can be accommodated.

Other specialist outlets can be incorporated into the pendant as required.

Designed to comply with BS EN 7396, ISO 1197, HTM 02-01, BS EN 18082, BS EN 9170 and medical Device Directive 93/42/EEC Medical Device Class IIb.

## Suspended unit for ICU and Operating theatre

Complete Configuration. Both wet and dry sides are safely guaranteed by this specific system that allows a number of combinations: single or double arms for each column to make it ergonomically adequate for all types of action needed on the patient.

Available in Motorised or manual movement.

The hydraulic breaking system guarantees maximum stability, accuracy and ease of any movement.

Bioclean shelves and drawers can be supplied. These offer a microbe shield thanks to the non-porous material making it extremely easy to clean.

Free from added chemicals, as it does not contain additives and durable in time due to the extremely solid material that maintain colour and gloss over the years.

## Multimovement pendants

Tektraco can supply and install multimovement pendants specifically for special intensive care units and operating theatres.

These can be configured either for the surgeon or the anaesthetist and the service head can be equipped with all the needed electrical and medical components in compliance with any specification given.







## Bridge System

The Bridge solution houses all needed services such as lights, sockets and switches, nurse call systems, gas outlets.

These can be arranged on each side, both internally and externally.

## Ceiling Mounted Solution

Ceiling mounted Solution, enabling mounting anywhere in the room with a wide range of accessories and rotating equipment making this vertical pendant the ideal solution for special intensive care units.



## Flexible Pendants

The flexible pendant provides a cost effective solution.



## Nurse Call

Nurse call systems in a hospital and/or Old Peoples' Homes give the ability to a patient to ask for assistance by the push of a button from the bedside or via a pull cord from a shower or WC. Nurse call systems also give the possibility of nurses calling for assistance at the bed side of the patient via emergency calls and Code blue buttons.

Tektraco offers various Nurse call systems, from basic wired systems with or without speech, IP based systems and also Wireless systems.

### Wired Nurse Call system

Hard-wired means exactly that – using cables underground and in-wall to connect your system. This is a more labour intensive process initially, but is a reliable method and highly recommended as suitable for any new construction, but also available for refurbishments where required.

Wired Nurse Call systems are typically preferred for new constructions and projects due to the lower levels of ongoing maintenance required. This implies a more labour intensive process but offer better peace-of-mind in the long run.

Our Wired Nurse Call systems may also be IP-based.

IP Nurse Call systems offer centralised control and administration of both the nurse call system and any other IP-based systems in use in the hospital environment. This allows all the IP-based systems to be maintained to a higher level, from a central point.

Employing an IP-based nurse call system allows these traditionally simple systems, to become a far more useful tool, offering benefits for the patient, clinical staff and the estates department.

### Wireless Nurse Call system





## Wall Protectors

Tektraco can supply and install a full product range of bumpers, corner guards, hand rails and wall coverings, which include the following features:

- Shock-absorbing
- Newly developed with non-toxic antibacterial plastic materials
- European Certification EN 13823 and EN ISO 11925-2 "B-s2,d0" for medical usage.



## Privacy Solutions

Tektraco can supply and install a range of fixed, adjustable and portable systems for privacy solutions inside wards and intensive care wards for hospitals, clinics and medical structures.

Versatile and useful mobile solution allowing patients' privacy in all circumstances where fixed or semi-fixed systems are not provided.

It is highly recommendable for emergencies, where instant effective solutions are required to create privacy areas anywhere in the hospital.

This mobile system on wheels made of stainless steel or anodized aluminum, onto which it can be mounted one or two telescopic supports or infusion arms. The smooth regular surface allows easy cleanliness and disinfection. It is designed to offer the maximum stability and reliability in all situations.

The top quality of the fabric makes our curtains resistant to the most insidious wear and tear and fading even after a great number of washes.

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